



June 14, 2024

To: Adams County Planning and Zoning Department

Re: Hanks Crossing Energy Project Conditional Use Permit Applications

Dear Mr. Spaid,

Hanks Crossing Energy, LLC (“Hanks Crossing”), a wholly-owned subsidiary of Novis Renewables, LLC (“Novis”), is pleased to formally submit two Conditional Use Permit (CUP) applications for the Hanks Crossing Energy Project (the “Project”) for concurrent review and approval as requested by Adams County. Enclosed with this letter you will find all required submittal items and supporting documents for 1) a large-scale energy system CUP application and 2) a collector substation CUP application, as outlined in the permit application guidelines. The large-scale solar energy system and collector substation are integral to one another and together comprise the Project in unincorporated Adams County, CO (note: PSCo (the utility and transmission line owner) will request a separate CUP to construct a utility-owned switching substation, which is also required for the Project). We have ensured that all materials submitted are accurate, complete, and in alignment with the requirements stipulated by the *Adams County Development Standards and Regulations*.

The Project site will be developed to support a photovoltaic facility with a nameplate generating capacity of approximately 355 megawatts (MW_{AC}), a 178 megawatt battery energy storage system, a 230 kV collector substation, and other associated supporting facilities. The Project is situated on approximately 2,659 acres. The Project is anticipated to generate enough clean renewable electricity to power roughly 70,000 single-family homes annually (source: SEIA).

The Project was one of 20 projects recently selected (from a pool of over 1,000 bids) by the Public Service Company of Colorado (PSCo) as part of its 2021 Electric Resource Plan and Clean Energy Plan and it will play a pivotal role in advancing the State of Colorado’s clean energy policy directive. Under a planned power purchase agreement with PSCo, the electricity generated from the Project will help replace energy produced from other conventional sources being retired, and help meet Colorado’s growing energy needs. In addition to providing clean energy, the Project will provide local and regional benefits, helping spur economic investment, position Adams County within one of the fastest growing employment sectors (source: USEER), and provide significant tax revenues. Tax revenue payments from the Project will support the Byers School District (SD 32), Rangeview Library District, Byers Fire District (District 9), North Kiowa Bijou Ground Water District, and Byers Park and Recreation District.



Novis Renewables anticipates investing between \$600 – 650M to construct the Project. In addition to substantial local spending during the construction period, the direct fiscal benefit in Adams County from annual operations over the initial 40-year life of the facility is anticipated to include almost \$64,000,000 in property tax payments. These economic development benefits are substantial and result from a low-impact development requiring minimal County and no school district services.

The CUP applications and all supporting information will be uploaded to the Adams County permit website for review. The applications were prepared and organized in accordance with the Adams County CUP Checklist as follows:

Submittal Items

- 1.0 Development Application Form and CUP Checklist
- 2.0 Application Fees
- 3.0 Written Explanation of the Project
- 4.0 Site Plan
- 5.0 Proof of Ownership
- 6.0 Proof of Water
- 7.0 Proof of Utilities
- 8.0 Legal Description
- 9.0 Statement of Taxes Paid
- 10.0 Trip Generation Analysis
- 11.0 Supplemental Information
 - 11.1 Neighborhood Meeting Summary
 - 11.2 Storm Drainage Study
- 12.0 References
- 13.0 Appendices
 - A Project Maps
 - B Vegetation Management Plan
 - C Decommissioning Plan
 - D FAA Coordination
 - E Referral Agency Outreach
 - F Wetland Delineation Report
 - G Wildlife Habitat Characterization and Site Reconnaissance
 - H Cultural Resources Summary Report
 - I Phase I ESA (full report)
 - J Support Letters from PSCo and Landowners
 - K Soils and Geology Report
 - L Greater Prairie Chicken Survey Report



Hanks Crossing is proud to partner with Adams County and we look forward to a successful long-term relationship.

If you have any questions or need additional information, please do not hesitate to contact our Project Manager, Paul Gascoigne, at 508.505.0890, by email at paul.gascoigne@novisrenew.com, or the address below.

Sincerely,

Thomas Leahy
Thomas Leahy
President

Novis Renewables, LLC
1 Bridge Street, Suite 11
Irvington, NY 10533

Hanks Crossing Energy Project Conditional Use Permit

Adams County, Colorado

June 14, 2024



Submitted by:
Hanks Crossing Energy, LLC
A wholly owned subsidiary of Novis Renewables, LLC



Prepared by:
Logan Simpson
213 Linden Street, Suite 300 Fort Collins, Colorado
80524



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1.0 Development Application Form and Conditional Use Permit Checklist



CONDITIONAL USE PERMIT

Conditional uses are those uses which are presumptively compatible with other land uses authorized or permitted in a zone district, but, if approved, will require more discretionary review than those uses which are authorized. In addition to meeting applicable performance standards, conditional uses may require the imposition of conditions to ensure the number and type of conditional uses and their location, design, and configuration are appropriate at a particular location.

Required Checklist Items

- Development Application Form (pg. 5)
- Written Explanation
- Site Plan
- Landscape Plan (Waived)
- Proof of Ownership (warranty deed or title policy)
- Proof of Water, Sewer Services, and Utilities
- Legal Description
- Statement of Taxes Paid
- Trip Generation Analysis

Supplemental items may be needed on a case-by-case basis. ***Email documentation will be required if supplemental items are deemed unnecessary.**

- Please contact the Planner of the Day (CEDD-POD@adcogov.org) to determine whether a Neighborhood Meeting is necessary.
- Please contact the Engineer of the Day (CEDD-ENG@adcogov.org) to determine whether a Level 1 Storm Drainage Study is necessary

If you are applying for any of the following applications, please contact the Planner of the Day:

- Solid waste transfer station
- Scrap tire recycling facility
- Inert fill

Fees Due When Application is Deemed Complete	
Conditional Use Permit	\$1,200 for Residential Uses; \$1,400 Non-Residential Uses (Additional Requests: \$300 per residential/ \$500 per non-residential)

Conditional Use - Guide to Development Application Submittal

All applications shall be submitted electronically to epermitcenter@adcogov.org. If the submittal is too large to email as an attachment, the application may be sent as an unlocked OneDrive link. Alternatively, the application may be delivered on a flash drive to the One-Stop Customer Service Center. All documents should be combined in a single PDF. Once a complete application has been received, fees will be invoiced and payable online at <https://permits.adcogov.org/CitizenAccess/>.

Written Explanation

- A clear and concise description of the proposal. Please include description of use, time frame, purpose of project, proposed improvements, and all other relevant details.

Site Plan

- A detailed drawing of existing and proposed improvements, including:
 - Streets, roads, and intersections
 - Driveways, access points, and parking areas
 - Existing and proposed structures, wells, and septic systems,
 - Easements, utility lines, and no build or hazardous areas
 - Scale, north arrow, and date of preparation
- Parking: must meet the quantity, dimensional standards and other requirements outlined in Section 4-15
- An Improvement Location Certificate or Survey may be required during the official review
- Elevations

Landscape Plan

- Landscaping must meet the requirements outlined in Section 4-19 of the Adams County Development Standards and Regulations
- Landscape plan must include:
 - Number, installation size, and location of each plant type
 - Landscape maintenance plan
 - Bufferyards: identify the uses of adjacent properties and incorporate the correct bufferyard between existing and proposed use

Proof of Ownership

- A deed may be found in the Office of the Clerk and Recorder.
- A title commitment is prepared by a professional title company.

Proof of Water/Sewer/Utilities

Water

- A written statement from the appropriate water district indicating that they will provide service to the property OR a copy of a current bill from the service provider.
- Well permit(s) information can be obtained from the Colorado State Division of Water Resources at (303) 866-3587.

Sewer

- A written statement from the appropriate sanitation district indicating that they will provide service to the property OR a copy of a current bill from the service provider.
- A written statement from Tri-County Health indicating the viability of obtaining Onsite Wastewater Treatment Systems.

Utilities (Gas, Electric, etc.)

- A written statement from the appropriate utility provider indicating that they will provide service to the property.
- Copy of a current bill from the service provider.

Legal Description

- Geographical description used to locate and identify a property.
- Visit <http://gisapp.adcogov.org/quicksearch/> to find the legal description for your property.

Statement of Taxes Paid

- All taxes on the subject property must be paid in full. Please contact the Adams County Treasurer's Office or visit ADCOTAX.COM

Trip Generation Analysis (TGA)

- This analysis should be conducted by a traffic engineer and should include total vehicle trips per day and peak hour volumes generated by the proposed development.
- A Traffic Impact Study may be required after the first review.

SUPPLEMENTAL:**Neighborhood Meeting Summary**

- Please refer to Section 2-01-02 of the Adams County Development Standards and Regulations for the specific requirements regarding time, location, and notice.
- A written summary shall be prepared including the materials submittal presented at the meeting, any issues identified at the meeting, and how those issues have been addressed.

Level 1 Storm Drainage Study

- If the proposed conditional use permit involves paving, construction of any structures, grading of property, outdoor storage of materials (gravel piles included) or otherwise increasing the impervious area of a site, a Level 1 Storm Drainage Study will be required.
- This plan should be prepared in accordance with the "Level 1 Storm Drainage Plan" criteria as defined in Appendix item B-3 of the Adams County Development Standards and Regulations. Most importantly, it needs to clearly identify a viable storm outfall location, and floodplain/floodway boundaries.



DEVELOPMENT APPLICATION FORM

APPLICANT

Name(s): Phone #:

Address:

City, State, Zip:

2nd Phone #: Email:

OWNER

(See CUP Narrative for additional Owners Contact Info)

Name(s): Phone #:

Address:

City, State, Zip:

2nd Phone #: Email:

TECHNICAL REPRESENTATIVE (Consultant, Engineer, Surveyor, Architect, etc.)

Name: Phone #:

Address:

City, State, Zip:

2nd Phone #: Email:

DESCRIPTION OF SITE

Address:

City, State, Zip:

Area (acres or square feet):

Tax Assessor Parcel Number

Existing Zoning:

Existing Land Use:

Proposed Land Use:

Have you attended a Conceptual Review? YES NO

If Yes, please list PRE#:

I hereby certify that I am making this application as owner of the above-described property or acting under the authority of the owner (attached authorization, if not owner). I am familiar with all pertinent requirements, procedures, and fees of the County. I understand that the Application Review Fee is non-refundable. All statements made on this form and additional application materials are true to the best of my knowledge and belief.

Name:

Date:

Owner's Printed Name

Name:

Owner's Signature

2.0 Application Fees

The application fee of \$1,400 will be submitted upon determination of a complete application by the Adams County Director.

3.0 Written Explanation of Project

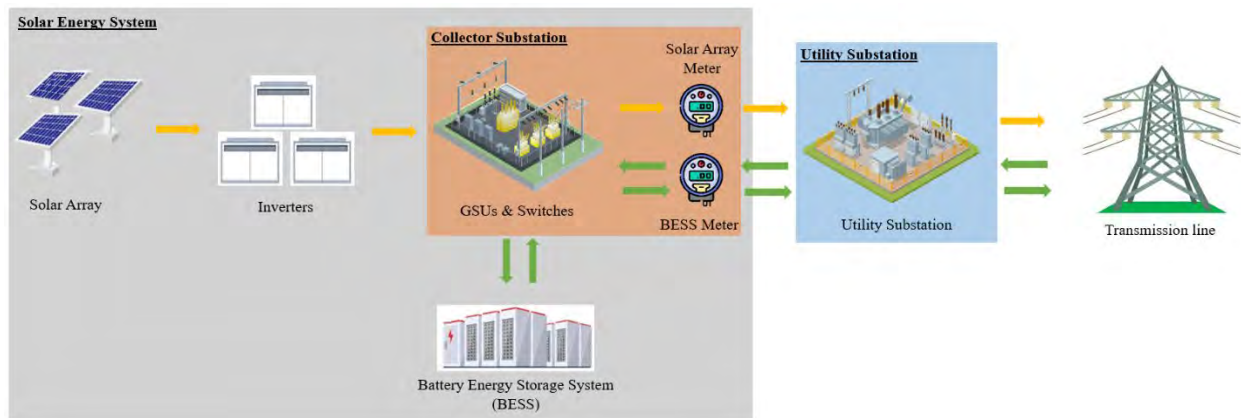
3.1 Project Overview

Hanks Crossing Energy, Limited Liability Company (“LLC”) (“Applicant”) is proposing to develop, own and operate a large-scale solar energy system and collector substation, known as the Hanks Crossing Energy Project (“Project”). The Project is in unincorporated Adams County, Colorado, approximately 13 miles northeast of Byers, Colorado (**Appendix A: Figure 1, Project Overview**). Primary access to the Project site is from Hanks Crossing Road, approximately five miles north of State Highway (“SH”) 36. The Project sits entirely on privately-owned land consisting of approximately 2,659 acres.

The Project consists of an approximately 355-megawatt (“MW”) photovoltaic (“PV”) system and 178 MW battery energy storage system (“BESS”) (collectively the “large-scale solar energy system”), along with internal access roads, inverters and transformer equipment, an electrical collection system, a collector substation, an operations and maintenance building, and other associated facilities.

The Project’s proposed and alternate collector substation locations are sited within the overall Project area and are adjacent to an existing high-voltage transmission corridor owned by the Public Service Company of Colorado (“PSCo”), facilitating immediate connection to the electrical grid. A second utility-owned substation will be developed, permitted, owned and operated by PSCo to provide switching capabilities to its existing high-voltage transmission system. PSCo’s utility substation, as shown in **Figure 1**, is not described in this application.

Figure 1. Utility-Scale Solar Schematic



The Applicant is applying for two parallel Conditional Use Permits (“CUPs”) – one for the large-scale solar energy system (illustrated in **Figure 1** in the light gray box) and one for the collector substation (in the light orange box). The large-scale solar energy system is the subject of this CUP. The Project collector substation is subject to a companion CUP application prepared by the Applicant and is only described in this application for context. The PSCo utility substation (the blue box in **Figure 1**) will be permitted, constructed, owned, and operated by PSCo under a separate CUP application to connect the utility-scale solar energy system and collector substation to PSCo’s high-voltage transmission line.

The Project was one of 20 projects (from a pool of over 1,000 bids) recently selected by PSCo as part of its 2021 Electric Resource Plan and Clean Energy Plan and will aid in implementing the State of

Colorado’s clean energy policy directive by providing significant new clean energy to customers and driving investment and economic development across the state. The Project will provide electricity to local Colorado communities, help meet growing energy demand with a clean, renewable resource, and provide jobs and significant economic benefits to Adams County while requiring minimal public services.

The Project site was selected based on a number of favorable factors that make it an ideal location for a large-scale solar energy system and collector substation including: 1) its rural location; 2) the interest and cooperation of the participating landowners; 3) its avoidance of sensitive natural resources; 4) the marginal productivity for dryland agriculture and unsuitability for irrigated agriculture; and 5) co-location near an existing transmission corridor, which minimizes the need for a lengthy transmission line to the point of interconnection.

The Applicant has thoroughly evaluated the environment and sensitive resources during siting and planning of the Project and is working closely with regulatory agencies and other stakeholders to ensure the Project is developed in a way that minimizes impacts to environmental and other local resources and services.

A conceptual review meeting was held on November 29, 2023, with representatives from the Adams County Planning Department to discuss requirements, standards, and procedures applicable to the Project and these are addressed in this Application. The following sections provide a detailed written explanation of the large-scale solar energy facility and satisfy applicable requirements of the Adams County Development Standards and Regulations (“Regulations”) (2020).

3.2 Applicant/Owner information

Hanks Crossing Energy, LLC is the Applicant and owner of the large-scale solar energy facility. Contact information for the main point of contact is provided below.

Applicant: Hanks Crossing Energy, LLC
1 Bridge Street, Suite 11
Irvington, New York 10533

Contact: Paul Gascoigne, Senior Manager – Site Acquisition & Strategy
Phone: 508.505.0890
Email: paul.gascoigne@norisrenew.com

Owner: Hanks Crossing Energy, LLC
1 Bridge Street, Suite 11
Irvington, New York 10533

3.2.1 Company Overview and Financial Capability

Hanks Crossing Energy, LLC is a wholly-owned subsidiary of Novis Renewables, LLC (“Novis”), whose corporate ownership has an established track record of renewable project development, ownership, and asset management in more than 20 countries worldwide. Novis, through its affiliate Novis Renewable Holdings, LLC and its parent companies, currently owns and/or operates 22 renewable energy projects (21 PV facilities and one wind energy project) in North America, totaling just over one gigawatt of power

generated. Novis also owns and operates a 6.6 MW BESS project that is connected directly to one of the PV sites mentioned below.

Novis was formed in 2020 as a joint venture between 50 percent owner Eni New Energy US Incorporated (“Inc.”) (an indirect subsidiary of Eni Sale and Purchase Agreement (“S.p.A.”), a leading global oil and gas corporation, active in more than 70 countries, and 50 percent owner Renantis North America, Inc. (a subsidiary of Renantis Renewables S.p.A., itself an indirect subsidiary of institutional investors advised by J.P. Morgan Asset Management). Novis was formed specifically for the development, construction, and financing of new solar PV, onshore wind, and energy storage projects in the United States (“U.S.”). The company is headquartered in Irvington, New York and employs approximately 40 team members across the U.S. The Novis project team members have an average of 15 years of project development experience. Several key team members are based in Colorado and possess local renewable project development experience.

Novis’ renewable energy portfolio is summarized below.

Projects in operation:

- Texas – Bluebell Solar Project: 150 MW*
- Texas – Corazon Solar Project: 263 MW *
- Texas – Brazoria County Solar Project: 263 MW*
- Texas – Kellam Solar Project: 81 MW*
- North Carolina Solar Project: 92 MW
- Massachusetts – 4 PV and BESS projects totaling: 23.5 MW
- Iowa Wind Farm: 30 MW
- Maryland – Solar Project: 18 MW
- New York State – Cornell Univ PV: 5 projects totaling 13.5 MW
- New York State – 5 projects totaling: 37.5 MW
- Virginia – Westmoreland PV: 30 MW

**Denotes projects owned by a direct parent company of Novis Renewables, LLC but developed, constructed and/or operated through the assistance of Novis personnel.*

Given the sizeable and robust balance sheets of Novis’s parent companies, Novis can combine balance sheet equity, tax equity, investor equity, and/or non-recourse debt. Novis and its parent companies have extensive experience raising both tax equity and debt project financing with numerous highly rated domestic and global investors and lenders. During construction, the Project likely will be financed with Novis and its parent companies’ robust balance sheets, with the possibility of a construction loan. During operations, the Project will likely be financed through tax equity.

3.3 Location, Property Address, and Legal Description

The large-scale solar facility is located in eastern unincorporated Adams County, Colorado, approximately 13 miles northeast of the Town of Byers. The large-scale solar energy facility can be accessed via Hanks Crossing Road approximately 5 miles north of SH 36. A Project vicinity map is provided in **Appendix A: Figure 1, Project Overview**.

Property Address: Off Hanks Crossing Road, Byers, Colorado (39.846583 -104.003939)

Legal Description: The legal description for the large-scale solar energy facility is provided under **Submittal Item 8.0: Legal Description.**

3.4 Zone District/ Land Use of Property

The large-scale solar energy facility will be located within the Agricultural-3 (“A-3”) zoning district (see **Appendix A: Figure 2. Project Zoning**). The purpose of the A-3 zoning district is to provide land primarily in holdings of at least 35 acres for dryland or irrigated farming, pasturage, or other related food production uses. The properties surrounding the large-scale solar energy facility are also zoned A-3. The Project area is composed predominately of cultivated crops (46 percent) consisting of wheat, and grassland/herbaceous rangeland (52 percent) (see **Appendix A: Figure 3. Landcover in the Project Area**).

The southwest corner of the Project boundary overlaps with approximately 13 acres of a Natural Resources Conservation Overlay (“NRCO”) District (**Appendix A: Figure 2. Project Zoning**). All large-scale solar energy facilities have been sited to completely avoid any disturbance within the NRCO district boundaries and comply with required setbacks for natural resources as outlined in the Regulations (Adams County 2020) (see **Submittal Item 4.0: Site Plan**).

The proposed PV and BESS facilities are classified as a large-scale solar energy system under the Regulations. Large-scale solar energy systems are allowed in the A-3 zone district as part of a Major Energy Facility pursuant to a CUP.

3.5 Assessor’s Tax Parcel Number

Parcels, street addresses, and ownership information can be found in **Table 1**. Parcel information is also indicated in **Appendix A: Figure 4. Project Context Map**.

Table 1. Ownership information within the Proposed Project Boundary

Project Parcel Number	Acres	Property Owner	Mailing Address
0173700000042	660	Raymond and Donna Morris	3305 Behrens Road, Byers, CO 80103
0173700000046	332		
0173700000045	334		
0180700000007	633		
0173700000041	319		
0173700000043	61	Lisa and Mark Beauprez	11780 Mimosa Road, Byers, CO 80103
0180700000005	320	James W Holden	7110 Hanks Crossing Road, Byers, CO 80103
Total Acres	2,659		

Source: Adams County Assessor 2024

Acronyms: CO - Colorado

3.6 Participating Owners and Interests

The Applicant has executed an exclusive Option to Purchase agreement with the participating landowners to ensure that site acquisition is secured prior to the initiation of construction. Documentation of proof of ownership for all properties in the Project area is included under **Submittal Item 5.0: Proof of Ownership**. Property ownership has also been confirmed through a title search. Letters of Project support from the landowners and PSCo (Project formerly referred to as “Deer Trail” have been provided under **Appendix L: Support Letters.**) Contact information for the participating landowners is provided below:

Raymond and Donna Morris
3305 Behrens Road
Byers, CO 80103
Phone: 719-250-3949
Email: raymondjmorris@yahoo.com

James Holden
7110 Hanks Crossing Road
Byers, CO 80103
Phone/Email: jimbo8810@gmail.com
303-886-1799

Lisa and Mark Beauprez
11780 Mimosa Road,
Byers, CO 80103
Phone/Email: lisab@bradburycompanies.com
303-822-5678

3.7 Large-Scale Solar Energy Facility Description

The Applicant is proposing to develop, own, and operate the large-scale solar energy facility, located in unincorporated Adams County approximately 13 miles northeast of Byers, CO (see **Appendix A: Figure 1**). The large-scale solar energy facility is part of the overall Project (solar facility and collector substation), which consists of approximately 2,659 acres of privately owned land located in the A-3 Zone District. In accordance with the Regulations, large-scale solar facilities are allowed in the A-3 zoning district pursuant to a CUP. The Project is adjacent to an existing 230/345 kilovolt (“kV”) high-voltage transmission corridor owned by PSCo, facilitating immediate connection to the electrical grid.

The large-scale solar energy site is composed predominately of cultivated croplands and grassland/rangeland (see **Appendix A: Figure 3.**). The site location was selected based on several factors, which make it an ideal location for a large-scale solar energy system, including:

1. The rural location is far from neighboring residences, with the closest non-participating landowner residence located approximately three miles from the Project;
2. The interest and cooperation of participating landowners;
3. Avoidance of, and the potential for, minimal conflicts with wildlife and other sensitive natural resources;
4. The site’s marginal productivity for dryland agriculture and unsuitability for irrigated agriculture; and

5. Proximity to PSCo's existing transmission system. Co-locating the large-scale solar energy facility and collector substation near an existing transmission corridor further limits potential for adverse impacts to wildlife and visual resources by minimizing the need for a lengthy transmission line to the point of interconnection.

The Project is comprised of 2,659 acres of private land. Within the Project area, approximately 2,205 acres will be utilized for the solar facilities based on preliminary design. The remaining acreage within the properties will not be utilized by the Project to accommodate wildlife corridors, avoidance of water resources and drainages, mineral access set-asides, and other required setbacks.

The large-scale solar energy facility as proposed is comprised of a 355 MW alternating current ("AC") solar PV system combined with a 4-hour AC-coupled 178 MW/ 712 MW-hours ("MWh") battery energy storage system ("BESS"). The aggregate system is designed to minimize inversion losses and maximize energy output. Proposed facilities will include the PV solar panels and tracking systems, inverters and transformer equipment, an operations and maintenance ("O&M") building, internal access roads, perimeter/security fencing, and an underground electrical collection system that will connect the electrical energy generated by the PV system to the collector substation and BESS (see **Submittal Item 4.0: Site Plan**). The Project will be designed to conform to all requirements of the fire code as currently adopted, including any fire break requirements.

The proposed Project will consist of approximately 793,904 PV modules rated at 655-watt (or higher) direct current (DC) each, subject to final design. The solar modules will be mounted on single axis trackers, which rotate slowly throughout the day to follow the sun and maximize energy capture. At a maximum tilt, the solar arrays will be no more than 20 feet high as measured from the highest grade below each solar panel and arranged in arrays running in a north-to-south orientation. PV modules will be mounted to installed piles for structural support.

Approximately 95 inverters are anticipated for the PV system based on preliminary design. These inverters will connect the solar arrays to the substation medium voltage bus, where the energy will be "stepped up" from 34.5kV to high voltage (230kV) electricity via main power transformers. The 34.5 kV collection cables linking the inverters to the collector substation will be buried underground.

The large-scale solar energy facility also includes construction and operation of a 178 MW BESS with a 4-hour duration (712 MWh), which will charge from the grid (and the ability to charge from the PV system), storing energy and discharging that energy later to provide electricity when needed by PSCo. The batteries will likely be lithium ion, but other battery chemistries may be considered for the Project. The battery cells will be housed in climate-controlled metal enclosures to maintain appropriate operating temperatures; these enclosures are typically a light color to optimize battery storage performance. The containers will each be equipped with individual fire suppression systems. BESS facilities will be controlled and monitored by trained technicians 24 hours a day, 7 days a week, and the system will be shut down if excess heat is detected beyond allowable limits. Auxiliary loads for the BESS, including the heating, ventilating, and air conditioning and fire suppression systems, will draw power either from the grid or from the local distribution system. The BESS will require a graveled area of approximately 10 acres with containers situated within the area based on best design practices for a Tier 1 battery system.

The Project will also include a single collector substation, which will be owned and operated by the Applicant, and will serve to gather the full power output generated from the PV facility as an integral part of the solar energy system. A separate CUP has been submitted for the Project substation in parallel with this application.

The Applicant will develop an Emergency Response Plan (“ERP”), which will outline potential hazards, response actions to emergency situations, and key emergency personnel and coordination to reduce the risk of wildfire, and other emergency events. The Applicant will work closely with the Byers Fire District to develop and review the ERP. Preliminary outreach and coordination has already been initiated.

The Project will include construction of an approximately 1,820 square foot O&M building located within the fenced perimeter, as shown on the Site Plan (**Submittal Item 4.0: Site Plan**). This building is anticipated to provide offices, a bathroom, kitchen, flex space, and a shop area for the operations staff to service the ongoing maintenance needs of the Project.

For safety and security, and consistent with recent Colorado Parks and Wildlife (“CPW”) recommendations for a nearby solar project, an 8-foot-tall smooth topped (e.g., no top barbed wire, use of round capped posts) chain-link fence will be installed around the perimeter of the Project area, and in accordance with minimum setback requirements (see **Submittal Item 4.0: Site Plan**). The Applicant will take proactive measures to regularly monitor the enclosed facility during operations to reduce the risk of unintended wildlife entrapment. CPW recommends monitoring of the Project area once per week to document any wildlife mortalities and submittal of an annual mortality report.

Primary access to the Project site is from Hanks Crossing Road, approximately five miles north of SH 36 (see **Appendix A: Figure 6**). Access gates located at entry points will be identified with appropriate signage and equipped with “Knox Box” style locks to allow for first responder access. Private access roads within the security fence will be located strategically throughout the PV arrays. Pathways leading to major equipment pad locations will be all-weather to facilitate year-round access and circulation for O&M. All roads will be designed in accordance with building codes and local fire district requirements, among other requirements. The Applicant will submit construction plans to the Adams County Development Review Engineering Division for the private driveway and access road improvements, subject to approval by the Byers Fire District.

Motion-activated Project lighting will likely be placed at the O&M building and BESS and will be designed to meet code requirements, while providing the necessary illumination for safety and security. Any proposed lighting will be designed to meet code requirements while providing the necessary illumination for safety and security. The lighting will be downward-facing and shielded to focus illumination on specific areas.

Geotechnical analysis and structural engineering will determine designs for the module racking, inverter, transformers, and any other pertinent equipment. Racking structures are anticipated to be supported by driven galvanized steel piles, embedded into the ground. Facilities related to the large-scale solar energy facility (including access roads) will be constructed in accordance with all industry standards and all applicable building codes and regulations.

A **Site Plan** (“Site Plan”) has been provided under **Submittal Item 4.0**, which provides an overview of the proposed layout. The Site Plan complies with all zoning district regulations and setbacks, subject to the

County approval of road vacations as recently coordinated with the Public Works Department (see Section 3.11). Additionally, the Site Plan has integrated a recommendation from CPW for a dedicated wildlife corridor and ensures that infrastructure is constructed in a consolidated manner whenever feasible. This approach is taken to minimize land disturbance and habitat fragmentation.

3.8 Construction Activities

Large-scale solar energy facility construction generally will include the following activities:

- Installation of stormwater and erosion control measures;
- Site grubbing and grading;
- Installation of fencing and roads;
- Construction of solar arrays, collection system, BESS, and collector substation;
- Testing and commissioning of facilities; and
- Reclamation/revegetation of disturbed areas.

The construction process will involve vegetation grubbing, mowing, and grading as necessary across the site. However, given that a significant portion of the site is presently utilized for crop production, these activities are anticipated to bring about minimal alterations to existing landcover and vegetation. Areas disturbed, but not surfaced with gravel, will be revegetated via reseeding with native grass seed.

During construction, the Project is expected to have a peak workforce of up to 500 workers. Construction traffic will consist of larger delivery vehicles bringing construction equipment and materials to the site, as well as daily truck trips associated with the construction workforce. A Trip Generation Analysis (“TGA”) estimating maximum daily traffic trips for the Project is included under **Submittal Item 11.0: Supplemental Materials** (Tetra Tech 2024a).

Construction is anticipated to occur over an approximately 18- to-24 month period, with anticipated completion in mid-2027, and will conclude after facility testing and commissioning and connection to PSCo’s new utility substation. This schedule includes completion of any required network upgrades to PSCo’s transmission system facilities based on a schedule to be developed separately by the utility. However, since the initial transmission system study by PSCo is not scheduled to begin until early 2025, the schedule could be delayed.

3.8.1 Dust Control

The construction contractor will be responsible for implementing dust control measures to ensure a safe environment during the construction phase. These measures will mitigate fugitive dust emissions during construction. Fugitive dust will be controlled by implementing the following measures as appropriate:

- 1) Reducing vehicle and equipment speeds on unpaved surfaces;
- 2) Periodic application of clean water to exposed disturbed surface areas or along Hanks Crossing Road, which is a soil/dirt road. Application of water will be via contracted water trucks.
- 3) Treating exposed soil surfaces with stabilizers such as polymers, lignin, or chemical binders to reduce dust generation by enhancing soil cohesion and preventing erosion; and
- 4) Reseeding bare soil areas to help stabilize the soil surface and reduce dust emissions through natural ground cover.

3.8.2 Vegetation Management and Landscape Screening Plan

To guide revegetation efforts and minimize wildfire risk at the site, a Preliminary Vegetation Management Plan has been developed and is included in **Appendix B**. This plan outlines the procedures for reclaiming disturbed sections of the site, implementing construction Best Management Practices (“BMPs”), and applying suitable weed control measures throughout the Project's construction, operation, and maintenance phases. It also outlines landscape design and methods for minimizing fire risk at the site, in accordance with the adopted fire code.

In addition to maintaining vegetation appropriate for the site, the Applicant is currently exploring methods to integrate pollinator habitat into the large-scale solar energy facility footprint. Such integration may modify the Preliminary Vegetation Management Plan per guidance from Project partners. This Plan will be finalized following decisions to pursue participation in agrivoltaics programs, and a Final Vegetation Management Plan will be provided to the County prior to construction.

Due to the remote location of the facility, absence of adjacent residences or businesses, and lack of water district service needs, requirements for a Landscape Screening Plan were waived at the conceptual review meeting on November 29, 2023.

3.9 Operation Activities

In general, solar facilities require minimal O&M activities. Once installed, the solar panels will operate continuously during daylight hours year-round. The operational phase is anticipated to last an initial 40 years, with the potential to extend the Project life an additional 40 years. During this phase, only monitoring and maintenance personnel will routinely access the large-scale solar energy site. Most routine day-to-day operations will require only two to three employees. The maintenance of onsite vegetation and weed control will be handled in accordance with the Preliminary Vegetation Management Plan (**Appendix B**). The Applicant will conduct routine landscape maintenance, ensuring that designated portions of the large-scale solar energy facility are consistently kept in good condition, including regular removal of weeds, trash, and debris. The tracking systems and BESS will both be monitored remotely, as well as by onsite personnel. In addition, O&M activities will require panel washing approximately twice per year. This typically involves hauling water via truck to the site to use for washing. Occasionally, major repairs or equipment replacements may require additional employees or contractors onsite.

3.10 Project Decommissioning

At the end of the large-scale solar energy facility's productive life, facilities will be dismantled and removed from the property and the land will be restored to the agreed upon vegetative cover and stabilized to minimize erosion. A Preliminary Decommissioning Plan has been included in **Appendix C**, which outlines the general process, timelines, and responsibilities for decommissioning the Project.

The Applicant is requesting Adam's County approval to allow the following facilities to remain in place at the end of the Project's life.

- Underground foundations and steel piles;
- Underground electrical cables and conduits; and
- Internal access roads.

3.11 Public Road Use

Primary access to the large-scale solar energy facility will occur via SH 36 and then north approximately five miles along Hanks Crossing Road, which is maintained by Adams County. Haul routes and road surface types are shown within **Figures 5 and 6 in Appendix A**. A TGA is included with this application in **Submittal item 10.0**. If alternate routes become necessary, the Applicant will coordinate with the Public Works Department.

The right-of-way (“ROW”) dedication of the 30-foot prescriptive right-by-use along Hanks Crossing Road, with an additional 10 feet for future construction and maintenance will be completed per recommendations from the County, as outlined in the conceptual review meeting and correspondence with the Public Works Department. These dedications will be completed prior to construction and documentation will be provided to the County upon completion.

Construction of the Project will occur during daylight hours over the 18-to-24 month construction period, which will commence in 2025, with an in-service date expected by the middle of 2027. During peak construction, it is estimated that approximately 500 personnel could be onsite or actively involved in an off-site capacity. The workforce is likely to arrive between 6:00AM and 7:00AM (“Peak AM Hour”) and leave between 4:00PM and 5:00PM (“Peak PM Hour”). A small percentage may come from lower-population towns such as Fort Morgan, Colorado. At peak construction, workers will generate 500 trips in the Peak AM Hours and 500 trips in the Peak PM Hours. In addition, the Project is expected to have 20 to 30 truck deliveries per day at the peak of construction, generating up to 60 additional one-way delivery vehicle trips per day. During operation, it is expected that normal activities will necessitate the presence of a limited number of personnel onsite.

There are no expected routine needs for oversized or overweight vehicles following construction, and the Applicant, in cooperation with construction contractors, will work with the County and Colorado Department of Transportation to agree upon necessary permits and maintenance needs.

During operations, it is expected that day-to-day operational and maintenance activities for the Project will necessitate the presence of two to three full-time personnel onsite. However, occasional circumstances may require up to 15 operational employees onsite, though such occurrences would be infrequent.

Access to the large-scale solar energy facility will utilize County roads. The Applicant will coordinate all County road use for the Project with the Public Works Department and will work closely with the County to minimize impacts to County roads. If the County determines that a road use agreement is necessary for the construction phase, the Applicant will enter into an agreement to address use of County roads. The agreement will outline responsibilities for assessing road conditions, and completing maintenance and repairs, among other County concerns, to ensure that potential impacts along Hanks Crossing Road during Project construction are mitigated.

3.12 Federal Aviation Administration Coordination

The Applicant has coordinated with the Federal Aviation Administration (“FAA”) to ensure that the large-scale solar energy facility does not adversely affect aviation operations. The FAA Notice of Proposed Construction was filed on January 16, 2024, resulting in a Determination of No Effect issued on January 22, 2024.

Additionally, a meeting was conducted with FAA coordinator, Steven Landry, on February 6, 2024. During this meeting it was confirmed that no further coordination with Denver International Airport is necessary, because the Airport District Office was informed of the request through the FAA screening tool submission. A glint and glare study was deemed unnecessary since no request was received from the Airport District Office following the FAA screening tool submittal. The Applicant is exempt from notifying the FAA of construction status due to its distance from the airport (approximately 32 miles). See **Appendix D: Federal Aviation Administration Coordination**.

3.13 Conformance with Zone District Regulations and Setbacks

The Applicant is working with the Public Works Department and has received approval for a variance from the Regulations for section line setbacks, as provided pursuant to Section 3-10-06-03-06 of the Adams County Development Standards (see **Appendix E**). The Applicant requested the following section line setback waivers:

- A 0-foot setback between Section 29 and 32, Township 2 South, Range 59 West, and Section 5, Township 3 South, Range 59 West;
- A 30-foot section line setback from Section 5 Township 3 South, Range 59;
- A 30-foot section line setback for proposed panels along the western boundary through the limits of the Project; and
- The Project will require the vacation of the ROW by Public Domain Resolution for the 30-foot strip along the north, west, and south sides of Section 32, Township 2 South, Range 59 West.

The Applicant is also working closely with the Public Works Department for approval of a road vacancy. The section line setback waiver and road vacancy will allow for additional use of land within the perimeter fencing of the large-scale solar energy facility site. Placing principal PV energy system infrastructure across the section line of contiguous sections owned by the same landowner maximizes the efficiency of the site layout and reduces the need to secure additional land for the Project. The Public Works Department has recommended that the Applicant proceed with submission of a formal Road Vacancy Application to the County for approval (see **Appendix E**). The current Site Plan has been designed based on the assumption that the requested Road Vacancy is approved, and the Applicant is open to a condition of approval that would require the Applicant to obtain a Road Vacation from to the County prior to construction.

Table 2 summarizes the required A-3 zoning district regulations and setbacks and indicates the Project's conformance or applicability with each requirement.

Table 2. Required Setbacks for Zone A-3 and Project Compliance

Regulatory Reference	Description of Setback	Applied to Project (Applicable/Not Applicable)
Setback and Dimensional Requirements for a Principal Structure		
3-10-06-03-01 Minimum Front Setback	The minimum front setback for a principal structure in an Agricultural-3 district shall be fifty (50) feet.	Applicable. Project BESS, collector substation, and O&M building will be located greater than 50' from front of property lines.
3-10-06-03-02 Minimum Side Corner Setback	The minimum side corner setback for a principal structure in an Agricultural-3 district shall be fifty (50) feet.	Applicable. Project BESS, collector substation, and O&M building will be located greater than 50' from corner of property lines.
3-10-06-03-03 Minimum Side Setback	The minimum side setback for a principal structure in an Agricultural-3 district shall be ten (10) feet, or one (1) per two (2) feet in height, whichever is greater.	Applicable. Project BESS, collector substation, and O&M building will be located greater than 35 feet from side of property lines (based on tallest proposed structure of approximately 70 ft).
3-10-06-03-04 Minimum Rear Setback	The minimum rear setback for a principal structure in an Agricultural-3 district shall be twenty (20) feet. If the rear property line fronts a public ROW where access is taken, the rear setback shall be fifty (50) feet.	Applicable. Project BESS, collector substation, and O&M building will be located greater than 20-ft from rear property lines.
3-10-06-03-05 Minimum ROW Setback	The minimum setback for a principal structure in an Agricultural-3 district from an arterial ROW shall be fifty (50) feet except a section line arterial ROW where the minimum setback shall be one-hundred-twenty (120) feet. The minimum setback from a collector or local road shall be fifty (50) feet.	Applicable. Proposed and alternate location Substation facilities are located at least 120-ft from section line arterial ROWs.
3-10-06-03-06 Minimum Setback from Section Line for All Structures	The minimum setback from a section line for a principal structure of agricultural building in an Agricultural-3 district shall be one-hundred-twenty (120) feet. Variations may be	Applicable. Proposed and alternate location Substation facilities are located at least 120-ft from section lines.

Regulatory Reference	Description of Setback	Applied to Project (Applicable/Not Applicable)
	permitted if the department of public works determines no additional ROW is required.	
Setback and Dimensional Requirements for Accessory Structures or Agricultural Buildings		
3-10-06-04-01 Minimum Front Setback	All accessory structures shall be set back at least ten (10) feet to the rear of the front structure line of the principal dwelling, or one hundred (100) feet from the front property line, whichever is less, if a principal dwelling already exists on site. The minimum front setback for a principal structure in an Agricultural-3 District shall be fifty (50) feet.	Applicable. No principle dwellings would be located within the large-scale solar facility project site. Accessory structures will be located at least 100-ft from the front property line (along Hanks Crossing Road).
3-10-06-04-02 Minimum Side Setback	The minimum side setback for accessory structures in an Agricultural-3 District shall be ten (10) feet, or one (1) foot per two (2) feet of height, whichever is greater.	Waiver requested. See description above.
3-10-06-04-03 Minimum Rear Setback	The minimum rear setback for accessory structures in an Agricultural-3 District shall be ten (10) feet. If the rear property line fronts a public ROW where access is taken, the rear setback shall be fifty (50) feet.	Waiver requested. See description above.
3-10-06-04-04 Minimum ROW Setback	The minimum setback for all accessory structures in an Agricultural-3 District from an arterial ROW shall be fifty (50) feet except a section line arterial ROW where the minimum setback shall be one-hundred-twenty (120) feet. The minimum setback from a collector or local road shall be fifty (50) feet.	Waiver requested. See description above.
3-10-06-04-05 Minimum Setback from Section Line for All Accessory Structures	The minimum setback from a section line for all accessory structures in an Agricultural-3 District shall be one-hundred-twenty (120) feet. Variations may be permitted if the Department of Public Works determines no additional ROW is required.	Waiver requested. See description above.

Source: Adams County 2020

3.14 Notifications

3.14.1 Neighborhood Meeting/Landowner Notifications

The Community and Economic Development Director conveyed via email to the Applicant on December 21, 2023 that a neighborhood meeting was not required for the Project. The determination was based

on the remoteness of the Project area and lack of residents in the area. In lieu of holding a neighborhood meeting, the Applicant mailed Project outreach letters to all landowners within one mile of the Project boundary via first class mail on February 2, 2024. The letters provided background information on the Project, contact information, and location maps and solicited landowner comments, questions, and concerns. The list of landowners within one mile of the Project area was obtained from the Adams County Clerk's Office. Supporting materials and information regarding the landowner notifications have been provided under **Submittal Item 11: Supplemental Materials**.

To date, the Applicant has not received any feedback from landowners expressing concerns regarding the construction or operation of the Project. One landowner did respond and confirmed receipt of the letter.

3.14.2 Referral Agency Outreach

The Applicant has proactively contacted the following organizations and agencies that may be impacted by the Project:

- Adams County Sheriff's Office;
- Byers Fire District;
- CORE Electric;
- Deer Trail School District;
- Deer Trail Conservation District;
- Adams County Conservation District;
- Morgan County Rural Electric Association;
- Arapahoe County Public Works;
- Colorado Parks and Wildlife ("CPW");
- U.S. Fish and Wildlife Service ("USFWS").

On February 2, 2024, Project information letters were distributed via email and first-class mail, which provided background information on the Project, contact information, location maps, and solicited comments, questions, and concerns from the representatives contacted. Supporting materials and information regarding referral agency outreach have been provided under **Appendix E: Referral Agency Outreach**.

The Deer Trail School District provided feedback regarding a concern for the existing road conditions along Hanks Crossing Road and a request for the Applicant to coordinate road maintenance activities with the County. As discussed under Section 3.1.9.1, the Applicant will coordinate all Project-related road use with the County and will execute a road use agreement for construction activities, if necessary, to ensure that road maintenance related to Project activity is addressed and to minimize impacts to local traffic.

As of the date of this application submittal, the Applicant has not received any additional direct feedback expressing concerns regarding the Project.

3.14.3 Public Notifications

In accordance with Sections 2-01-06-01 of the Regulations, notifications will be sent out to residents and owners of record of all real property located within a minimum of 500 feet of the Project area. The written notices will be mailed at least 15 days prior to the first public hearing date concerning the application and will include the date, time, place, and purpose of the public hearing(s).

3.14.4 Mineral Rights

The Applicant has been engaged in active negotiations with mineral rights holders affected by the proposed large-scale solar energy facility and will enter into surface use agreements, as appropriate, to ensure adequate access to mineral resources. Notice will be sent out to notify mineral owners of record 30 days prior to the date scheduled for a public hearing by certified mail, return receipt requested. Certification of mailings will be sent to the County prior to the first scheduled hearing.

3.15 Environmental Resource Impact Summary

As a consultant for the Applicant, Tetra Tech conducted pre-construction baseline surveys to assess the environmental conditions at the Project site and prepared the resource summaries in the following sections.

3.15.1 Waterbodies and Wetlands

Wetland and other waters of the U.S. ("WOTUS") surveys were conducted on July 18 and 19, October 19, November 30, and December 19, 2023, to identify potential wetlands and other WOTUS that may present within the Project area. One wetland feature, six waterbodies (ponds), and one intermittent stream (Little Muddy Creek) were identified within the Project area. There are no other major streams or traditionally navigable waters found in the Project area (Tetra Tech 2024b).

The only wetland identified is in the northwest portion of the Project area and is associated with a vegetated swale. The wetland is fed from ephemeral flows draining northwest between two ponds and was likely formed from high rainfall during the past year (Tetra Tech 2024c).

Six ponds, all identified as stock ponds, totaling 1.56 acres were identified in the northern portion of the Project area. All six are associated with vegetated swales that either drain west to Muddy Creek or drain east to Little Muddy Creek. None of the six ponds had constructed outlets for downstream flow but featured indistinct spillways or overflow channels (Tetra Tech 2024c).

Little Muddy Creek flows through the southeastern portion of the Project area. Within the Project area, Little Muddy Creek is an intermittent stream draining north with an ordinary high-water mark varying from 3- to 8-feet-wide and no associated fringe wetland. Although Little Muddy Creek has been heavily modified along its course due to historic farming activities, it likely maintains a surface water connection downstream to Muddy Creek, which drains north to Bijou Creek, which drains to the South Platte River (Tetra Tech 2024c). No Project infrastructure is planned in the vicinity of Little Muddy Creek (stormwater basins only, outside of a 100-foot buffer); therefore, there will be no impacts to this stream.

To the extent practicable, the large-scale solar energy facility has been sited to avoid impacts to wetlands and other WOTUS. For regulated water resources that cannot be avoided, Novis will

coordinate with the U.S. Army Corps of Engineers (“USACE”) regarding compliance with applicable regulations, including permitting requirements under Section 404 and Section 401 of the Clean Water Act. See **Appendix F, Wetland Delineation Report**.

3.15.2 Floodplains

Federal Emergency Management Agency (“FEMA”) Flood Insurance Rate Map data were reviewed to determine whether 100-year (1 percent annual chance flood hazard) or 500-year (0.2 percent annual chance flood hazard) floodplains are present in the Project area. A review of FEMA-mapped floodplains determined there is one Zone A (100-year) floodplain associated with Muddy Creek that intersects the very southwestern corner of the Project area (FEMA 2020). No Project infrastructure is planned within the floodplain; therefore, there will be no impacts to floodplains.

3.15.3 Wildlife Habitat

A desktop review of wildlife habitat and field surveys of biological resources were conducted within the Project area in 2023, provided in **Appendix G, Wildlife Habitat Characterization and Site Reconnaissance**. Queries of the USFWS Information for Planning and Consultation online tool, the CPW All Species Activity Mapping (“SAM”) data, and CPW High Priority Habitats (“HPH”) data was conducted to obtain a list of special status species with potential to occur in suitable habitat within the Project area (USFWS 2023 and 2024a, CPW 2023). The results of the queries identified the following federally and state-listed species with potential to occur in suitable habitat within the Project area:

- Gray wolf (*Canis lupus*) – Federally endangered, State endangered
- Preble’s meadow jumping mouse (*Zapus hudsonius preblei*)- Federally threatened, State threatened
- Tricolored bat (*Perimyotis subflavus*)- Proposed Federally endangered (overall range)
- Piping plover (*Charadrius melodus*)- Federally threatened, State threatened
- Burrowing owl (*Athene cunicularia*)- State threatened (breeding range)
- Whooping crane (*Grus americana*)- Federally endangered, State endangered
- Pallid sturgeon (*Scaphirhynchus albus*)- Federally endangered
- Monarch butterfly (*Danaus plexippus*) – Federal candidate for listing
- Ute ladies’-tresses (*Spiranthes diluvialis*)- Federally threatened
- Western prairie fringed orchid (*Plantathera praeclara*)- Federally threatened

In addition, the CPW SAM database and HPH data identified the following species of special concern, big game species, and species protected by the Bald and Golden Eagle Protection Act (“BGEPA”) with the potential to occur in suitable habitat within the Project area:

- Bald eagle (*Haliaeetus leucocephalus*)- State Species of Special Concern, BGEPA (winter range)
- Black-tailed prairie dog (*Cynomys ludovicianus*) – State Species of Special Concern (overall range, high potential for colony occurrence)
- Ferruginous hawk (*Buteo regalis*) – State Species of Special Concern (breeding range)
- Golden eagle (*Aquila chrysaetos*)- BGEPA (breeding range)
- Long-billed curlew (*Numenius americanus*) – State Species of Special Concern (breeding range)
- Mountain plover (*Charadrius montanus*) – State Species of Special Concern (breeding range)
- Mule deer (*Odocoileus hemionus*) – Big Game Species
- Pronghorn (*Antilocapra americana*) – Big Game Species

- White-tailed deer (*Odocoileus virginianus*) – Big Game Species

Based on the desktop analysis of land cover data, aerial imagery, range maps, and observations during the field survey, the following federally and state listed or protected species may occur within the Project area: bald eagle, golden eagle, burrowing owl, and monarch butterfly.

The nearest known bald eagle nest is located approximately 19 miles west of the Project area along Kiowa Creek, and no bald or golden eagles or potential eagle nests have been observed within 0.5-mile of the Project area. The Project area lacks large, open waterbodies, large trees, or cliff faces that would provide suitable nesting habitat for bald or golden eagles; however, due to a nearby small reservoir (Bramkamp Reservoir), as well as the observation of active prairie dog colonies within the Project area, bald and golden eagles have a moderate likelihood of foraging within the Project area (Tetra Tech 2024d).

Potential burrowing owl signs (whitewash, pellets, and feather spots) were observed in several black-tailed prairie dog colonies within the Project area during field surveys (Tetra Tech 2024d). Given the observation of burrowing owl signs and the presence of active black-tailed prairie dog colonies, burrowing owls have a high likelihood of occurrence within the Project area.

Monarch butterflies were observed during the July 2023 field survey in proximity to milkweed plants, which are present throughout the grassland/herbaceous land cover within the Project area (Tetra Tech 2024d). Therefore, the likelihood of the species occurring within the Project area is high.

Based on review of available desktop data and the field surveys, there is potentially suitable nesting habitat within the Project area for the following CPW Species of Special Concern: ferruginous hawk, long-billed curlew, and mountain plover. In addition, several active and potentially active black-tailed prairie dog colonies were observed within the Project area during the field surveys (Tetra Tech 2024d).

Mapped game species habitat within the Project area includes overall range, concentration areas, and winter range for mule deer, pronghorn, and white-tailed deer. In addition, a mule deer winter concentration area (a CPW HPH) is located along the easternmost portion of the Project area. Pronghorn and mule deer were observed within or near the Project area during field surveys (Tetra Tech 2024d). Based on observations and habitat, mule deer, pronghorn, and white-tailed deer all have a high likelihood of occurrence within the Project area.

While limited raptor nesting habitat is present within the Project area and 1-mile area around the Project area, one active Swainson's hawk (*Buteo swainsoni*) nest and one inactive stick nest were observed in small trees in the Project area during the field surveys (Tetra Tech 2024d).

The Applicant provided Project introduction letters to USFWS and CPW in January 2024 seeking feedback on the potential for special status species to occur within the Project area. The USFWS responded that they had "no concerns with the Project resulting in impacts to species listed as candidate, proposed, threatened, or endangered" (USFWS 2024b). Based on initial coordination with CPW, the Applicant has incorporated a wildlife corridor into the Project design to facilitate the movement of wildlife, including big game, across the Project area (Tetra Tech 2024e). Also, at CPW's request the Applicant conducted greater prairie-chicken lek surveys in April 2024 (see **Appendix L**). No individuals or leks were observed during surveys (Tetra Tech 2024d). The Applicant will continue to coordinate with CPW

as needed prior to construction to address potential impacts to sensitive wildlife species. See **Appendix E, Referral Agency Outreach**.

Based on coordination with CPW, and in consideration of CPW's *Best Management Practices for Solar Development* (CPW 2021), the Applicant has incorporated "wildlife-friendly" fencing into the Project design and may utilize native pollinator-friendly seed mixes during revegetation of the Project. In addition, if construction occurs within the migratory bird nesting season in Colorado (April 1 to August 31), nest surveys will be conducted prior to planned construction activities and appropriate avoidance buffers will be implemented for active nests based on CPW's *Recommended Buffer Zones and Seasonal Restrictions for Colorado Raptors* guidance document (CPW 2020). This will include focused burrowing owl surveys prior to construction within prairie dog colonies and other areas of potential burrowing owl habitat within the Project area during the burrowing owl active season (March 15 to October 31).

3.15.4 Cultural Resources

A qualified professional archaeologist conducted a site file search for the Project area and 1-mile buffer through the Colorado Historic Society Office of Archaeology and Historical Preservation ("OAH") Colorado Cultural Resource Online Database ("COMPASS") on December 14, 2023. Eight cultural resource sites were identified within a 1-mile buffer of the Project area; however, none occur within the Project area. All eight resources were unevaluated for listing on the National Register of Historic Places ("NRHP"). There are no anticipated impacts to previously recorded resources identified within the Project area or a 1-mile buffer (COMPASS 2023).

Although there are no documented eligible resources within the Project area, undocumented cultural resources may be present. Therefore, the Applicant will prepare a Project-specific, Unanticipated Discoveries Plan prior to the start of construction to have procedures in place for unexpected finds, human remains, and other archaeological findings. See **Appendix H, Cultural Resources Report**.

3.15.5 Agricultural Production

The dominant land cover types within the Project area are grassland/herbaceous (approximately 52 percent) and cultivated crops (approximately 46 percent). The primary crop observed in the Project area is wheat (*Triticum* sp.). The grassland/herbaceous land cover is used primarily for cattle grazing and is dominated by needle-and-thread grass (*Hesperostipa comata*) with some kochia (*Bassia scoparia*), Russian thistle (*Salsola* sp.), and sand sagebrush (*Artemisia filifolia*) (Tetra Tech 2024d). Cattle troughs and excavated cattle ponds are scattered throughout the Project area, as seen on aerial photographs.

The Project will remove approximately 1,250 acres from agricultural production for the life of the Project but will not result in the permanent conversion of farmland. As outlined in the Preliminary Decommissioning Plan (**Appendix C**), aboveground Project infrastructure will be removed at the end of the Project's useful life and the site will be reasonably restored to preconstruction condition. This will allow the Project area to be reutilized for agriculture following final site reclamation, if desired by the landowner.

3.16 Conformance with Adams County Conditional Use Permit Criteria (2-02-09-06)

3.16.1 The conditional use is permitted in the applicable zone district. (2-02-09-06:1)

The Project is located on privately owned properties located within the A-3 zoning district and designated for agricultural use. According to the Regulations, a large-scale solar energy system falls under the category of Major Energy Facilities and is permitted through a CUP. The Project's location is compatible with adjacent land uses and benefits from its proximity to the existing PSCo transmission line, making it an ideal location for a solar energy facility. The Applicant will design and construct the facility in a manner to be compatible with the surrounding area, ensuring that areas beyond the Project boundary remain unaffected.

3.16.2 The conditional use is consistent with the purposes of these standards and regulations. (2-02-09-06:2)

The Project will be designed and constructed in accordance with all applicable zoning and building code requirements, and will remain in compliance with the requirements and conditions of the CUP issued by Adams County. The Project meets the minimum lot size, setback, and height requirements.

3.16.3 Compliance with performance standards. (2-02-09-06:3)

The Applicant will ensure that all design requirements and performance standards are met, as applicable under Chapter 4-11-02-06 of the Regulations, as follows:

3.16.3.1 Site Plan

A Site Plan has been included with this application under **Submittal Item 4.0**. The Site Plan includes all required information, as specified under Section 4-11-02-06-01 of the Regulations (2020).

3.16.3.2 Location

The Project is in the A-3 zoning district. All Project facilities will be designed and located in conformance with the A-3 zoning district regulations and setbacks, as demonstrated under **Section 3.13, Table 2**.

3.16.3.3 Maximum Height

At a maximum tilt, the solar arrays will not exceed 20 feet in height, as measured from the highest grade below each solar panel. Panels will be arranged in arrays with a north-to-south orientation.

3.16.3.4 Signage

The Applicant will ensure that clearly visible warning signs are placed on the fence, barrier, or facility perimeter to inform individuals of potential voltage hazards. No commercial signage will be installed at the site.

3.16.3.5 Security

The large-scale solar energy facility will be enclosed by an 8-foot-tall smooth-topped wire security fence. Fencing materials and design will observe National Electric Safety Code requirements and consider recommendations from CPW's guidance to the greatest extent practicable to minimize risks to wildlife. Access to the site will be limited to secured entrance gates. Only operations personnel and other owner-approved parties will have access to the site.

3.16.3.6 Landscape Requirements

Due to the remote location of the large-scale solar energy facility, absence of adjacent residences or businesses, and the lack of water district service resources, requirements for a Landscape Screening Plan were waived at the conceptual review meeting. A low-growing native seed mix will be used to revegetate areas disturbed during construction. The Applicant will carefully manage the vegetation at the large-scale solar energy facility. Monitoring and controlling noxious weeds and undesirable plant species will be critical to maintaining healthy vegetation onsite. A Preliminary Vegetation Management Plan has been included with this application in **Appendix B**. The Plan details the existing site conditions, revegetation specifications, and BMPs for topsoil salvage and storage, erosion control, seedbed preparation, seeding, maintenance and monitoring, and weed management for surface-disturbing activities related to the pre-construction, construction, and post-construction phases of the Project. Additionally, the Applicant is exploring the option to integrate pollinator habitat into the Project footprint, which would include a mix of regional native grass and wildflower species appropriate for the location.

3.16.3.7 Fire Code

The large-scale solar energy facility will be designed and constructed to meet all requirements of the currently adopted fire code. The Applicant engaged with the Byers Fire Protection District prior to the CUP application and will continue to coordinate and incorporate feedback (**Appendix E**) into the Project design.

Vegetation management within the Project site will prioritize fuels breaks, fuel reduction, the establishment of native species, and the control of non-native and invasive species. These will reduce the wildfire risk associated with the Project. A Preliminary Vegetation Management Plan (**Appendix B**) specific to the site has been developed outlining the measures and BMPs that will be followed at the facility to maintain minimum levels of vegetation on the perimeter of the facility. The Preliminary Vegetation Management Plan will comply with applicable fire regulations adopted by the Byers Fire Protection District.

Wildfire hazard mitigation measures will be included in the ERP to reduce the risk of fire from Project construction and operation. Coordination with the Byers Fire District is currently underway. The Applicant will work closely with the Fire Protection District to develop the Plan, which will be reviewed for Project activities and efforts to reduce the risk of wildfire.

3.16.3.8 Lighting

Motion-activated lighting will likely be limited to the substation, BESS, and O&M facility and will be designed to meet code requirements, while providing the necessary illumination for safety and security. Large-scale solar energy facility lighting will be downward-facing and shielded to focus illumination on specific areas. If illumination is needed at the main access gate or other access points, it will be implemented accordingly.

3.16.3.9 Stormwater/Erosion Mitigation Plans

Adams County and FEMA mapping show that a regulated 100-year floodplain overlaps the southwest corner of the Project boundary by approximately 13 acres. However, large-scale solar energy facility infrastructure, fencing, and grading will avoid the floodplain, as shown on the Site Plan (**Submittal Item 4.0**); therefore, a Floodplain Use Permit is not anticipated to be required. Additionally, the large-scale

solar energy facility site is not in an MS4 Permit area. All erosion and sediment control will be achieved through the application of BMPs.

A Stormwater and Erosion Mitigation Plan will be submitted to the County prior to construction, which will also be required by the Colorado Department of Public Health and Environment as part of the large-scale solar energy facility's General Construction Permit. The Plan will outline the BMPs used to prevent or contain erosion under the solar panel drip line and to manage stormwater runoff. The Applicant will be responsible for installation and maintenance of erosion and sediment control BMPs and ensuring that its contractor adheres to County regulations regarding discharges.

The Project involves installation of more than 3,000 square feet of impervious surfaces at the site. A Storm Drainage Study has been developed for the Project, in accordance with Chapter 9 of the Adams County Development Review Manual, as detailed under **Submittal Item 11.2**, and incorporated into the Site Plan under **Submittal Item 4.0**.

The Applicant will obtain an early grade reading (onsite Grading and Drainage) Permit prior to the issuance of any building permits and will submit a grading plan to the County prior to construction.

3.16.3.10 Wildlife Corridors

The large-scale solar energy facility location was selected due to its probability of having low impacts to sensitive natural resources and facilities were sited within the property to minimize impacts to wildlife and habitat. The Applicant has completed a suite of environmental studies at the Project location and has incorporated the results of those studies into the site design (see **Appendix G: Wildlife Habitat Characterization and Site Reconnaissance** and **Appendix F: Wetland Delineation Report**). In addition, the Applicant consulted with CPW to obtain recommendations for the Project site and to obtain feedback on the site's ecological function (**Appendix E: Referral Agency Outreach**). Based on input from CPW, the Applicant has integrated a wildlife corridor into the Site Plan (**Submittal Item 4.0**). Numerous factors were considered, including habitat value, habitat connectivity, natural features, wildlife movement patterns, and site design requirements. The wildlife corridor will help minimize and mitigate potential movement barriers that may be created through large-scale solar energy facility development and construction.

3.16.3.11 Decommissioning

A Preliminary Decommissioning Plan is included in **Appendix C**, which outlines the process and procedures for decommissioning of the Project in accordance with Section 4-10-02-06-01 (11[a-c]) of the Regulations. Decommissioning will be done in a manner to ensure the safe, efficient, and environmentally responsible removal of Project facilities at the end of the Project's operational life and will ensure that the property is reasonably restored and stabilized. All decommissioning activities will be conducted in accordance with applicable local, state, and federal regulations.

3.16.4 Compatibility with Surrounding Area. (2-02-09-06:4)

The large-scale solar facility has been properly sited and planned and will be implemented to coexist harmoniously with existing land uses, including agriculture, offering economic and environmental benefits to the local communities and the County.

The Project area and surrounding properties are designated within the A-3 zoning district. The proposed Project will utilize more than 320 acres, which classifies it as a large-scale solar system. Large-scale solar systems are an allowed use in the A-3 district pursuant to a CUP. The site is surrounded by large, 320-acre minimum parcels with no rural residences and the site is not near any urban areas or residential subdivisions. There are seven non-participating landowners within 1-mile of the Project site boundary (see **Appendix A: Figure 5**). The closest non-participating residence is located approximately 2.8-miles from the Project area. There are two residential buildings located within the Project site, both owned by the same participating landowner.

Construction and operation of the large-scale solar energy facility will not impact or prohibit existing land uses in the site vicinity. Market demand for other uses is very low. Following decommissioning and reclamation of the large-scale solar energy facility, the property could be utilized for agricultural purposes again.

During construction, there will be a temporary increase in traffic along Hanks Crossing Road, which may impact residents in the area. However, construction activities will be short-term (18 - 24 months). During long-term operations, it is estimated that the total routine vehicle trips per day for the Project will not exceed a maximum of sixteen, with eight trips generated in the morning and eight trips in the evening hours, based on a conservative, worst-case scenario (Tetra Tech 2024a). Given the low number of routine operational trips generated, impacts to the local traffic network will be negligible. A TGA has been prepared for the Project and included under **Submittal Item 10.0**.

During operations, only monitoring and maintenance personnel will routinely visit the large-scale solar energy facility. The Applicant anticipates a peak of 15 employees onsite concurrently. While the TGA used a daily trip estimate based on a conservative, worst-case scenario, most day-to-day operations will require two to three employees. Operational activities will occur during normal working daytime hours. Panel washings may occur biannually. Occasionally, emergency repairs may be required and could occur outside of normal business hours, but those would be infrequent and temporary.

During the construction phase, the construction contractor will utilize appropriate dust control measures to minimize fugitive dust, primarily through the application of clean water using water trucks. Post-construction, disturbed areas will be revegetated with native grass species, including under the solar arrays. Noxious weeds will be controlled in accordance with the Preliminary Vegetation Management Plan (**Appendix B**). This comprehensive approach will mitigate fugitive dust generation and soil erosion risks throughout the Project's operation. The use of native species also aligns with sustainability initiatives set forth by the Applicant and Adams County. In addition, the Preliminary Vegetation Management Plan (**Appendix B**) includes measures to ensure the proper maintenance of vegetation onsite and to minimize fire hazards.

The PV modules are designed to absorb light for the generation of electricity; thus, the large-scale solar energy facility is not expected to create or pose threats related to glare. In addition, PV and BESS facilities do not generate the dust, noise, fumes, smoke, odors, or other nuisances typically associated with traditional energy generation facilities. The large-scale solar energy facility will have minimal impact on the surrounding residents or environment.

The large-scale solar energy facility will not contribute to light pollution because there will be limited motion-activated lighting during nighttime hours. The BESS, collector substation, and O&M building (and

access points) will have lighting capabilities in case emergency nighttime maintenance is required. However, under normal conditions these facilities will not be illuminated during nighttime hours.

Adams County Development Standard 4-16-03 establishes a maximum daytime noise level limit of 80 dB(A) and a maximum nighttime noise level limit of 75 dB(A) measured at the property line in agricultural zones. No noise-sensitive land uses occur within 2.8 miles of the property. Unmitigated hourly equivalent operational noise levels are estimated to be as follows:

- Sound levels for typical PV inverters are approximately 80 to 85 dB(A) at 1 meter from each PV inverter. All inverters in the Site Plan are located a minimum of 120 feet from property lines, with noise attenuating to 40 to 45 dB(A), therefore PV inverters would comply with the standard.
- BESS will be located in the northwest portion of the project area near the Project substation over one-half mile from Hanks Crossing Road. Tonal sound levels for battery storage is approximately 70 to 92 dB(A) at 1 meter from each BESS unit due to fans and cooling systems. BESS in the Site Plan are located a minimum of 200 feet from property lines with noise attenuating to up to 62 dB(A).

Based on the preceding analysis, operational noise levels are anticipated to remain below maximum permissible County noise levels at the property line. Furthermore, the distance of 0.6 miles from the BESS and collector substation to Hanks Crossing Road (the nearest public ROW) and 2.8 miles to the nearest non-participating residence reduces noise to a negligible level. Noise mitigation is not recommended at this time.

The conditional use will not result in excessive traffic generation, vibration, dust, glare, heat, smoke, fumes, gas, odors, or night-time hours of operation.

3.16.5 The Application and Conditional Use Permit addresses all off-site impacts. (2-02-09-06:5)

The large-scale solar energy facility will not produce significant off-site impacts. During normal operations, the facility will not produce any pollution, glare, emissions, or heavy traffic. Off-site impacts during the construction phase primarily will be due to construction traffic, which will last between 18 and 24 months, depending on procurement of permits and final construction plans. During peak construction periods, up to 500 personnel will be onsite during working hours. The Applicant will require the construction contractor to route traffic in a manner that will minimize disturbance to typical traffic patterns. Dust control measures will be implemented, including the use of water trucks that will spray the site and Hanks Crossing Road.

A TGA has been completed for the Project and is provided under **Submittal Item 10.0**. Traffic will increase for a short period of time during the construction phase. However, these impacts will be short-term and temporary. During operations, it is estimated that two to three O&M personnel will be onsite daily. The facility will generate less than 20 vehicle trips per day (Tetra Tech 2024a).

The Applicant has been in coordination with the Public Works Department to discuss potential impacts to County roads during the Project's construction phase. If the County determines that a road use agreement is necessary for the Project's construction phase, the Applicant will enter into an agreement to address Project use, maintenance, and repair of County roads. The Plan will outline responsibilities for assessing road conditions, and completing maintenance and repairs to ensure that potential impacts

related to Project use along Hanks Crossing Road during construction are mitigated. It is not anticipated that a road use agreement will be necessary during the Project’s operational phase due to the minimal increase in traffic volume along Hanks Crossing Road.

The Applicant has coordinated with the FAA and received a Determination of No Effect. The large-scale solar energy facility will not pose risks to regional aviation operations or air space.

While having very little off-site impacts or effects within the County, the large-scale solar energy facility will provide numerous economic benefits to the County and local communities over the course of construction and operations. During the construction phase, the Applicant anticipates a peak workforce of approximately 500 temporary workers, many of which would be anticipated to be hired locally and regionally. For the operation of the large-scale solar energy facility, two to three employees are anticipated to be hired to maintain the property and facility.

Tax benefits to the State of Colorado, Adams County, and the Scientific and Cultural Facilities District will come in the form of sales and property taxes. A one-time payment based on the capital of the Project to the state, County, and district has been approximated and presented in **Table 3**. Property tax payments to Adams County will occur during the 40-year lifespan of the Project (**Table 3**). Given the current tax laws, the Applicant expects to pay approximately \$64,000,000 in property taxes to Adams County over the life of the Project (**Table 4**). Tax revenue payments to support the Byers School District (School District 32), Rangeview Library District, Byers Fire District (District 9), North Kiowa Bijou Ground Water District, and Byers Park & Recreation District provide a significant boost as well, especially because the Project does not require their services, nor affect their functionality. See **Figure 7, Special Districts near the Project**.

Table 3. One-Time Tax Payments to Adams County from the Project

Sales and Use Tax Beneficiary	Tax Amount
Colorado State	\$10,368,754
Adams County	\$2,643,016
Scientific and Cultural Facilities District	\$355,791
Total	\$13,367,561

Source: Hanks Crossing 2024

Table 4. Anticipated Property Tax Payments to Adams County during Project Lifespan

Year	Projected Property Tax Payment	Rounded Values
Year 1	\$841,542	\$840,000
Year 2	\$840,966	\$840,000
Year 3	\$840,282	\$840,000
Year 4	\$839,490	\$840,000
Year 5	\$838,554	\$840,000

Year	Projected Property Tax Payment	Rounded Values
Year 6	\$837,402	\$840,000
Year 7	\$836,033	\$840,000
Year 8	\$834,557	\$830,000
Year 9	\$833,045	\$830,000
Year 10	\$831,533	\$830,000
Year 11	\$830,093	\$830,000
Year 12	\$828,833	\$830,000
Year 13	\$827,609	\$830,000
Year 14	\$826,420	\$830,000
Year 15	\$825,304	\$830,000
Year 16	\$1,687,139	\$1,690,000
Year 17	\$1,743,171	\$1,740,000
Year 18	\$1,759,196	\$1,760,000
Year 19	\$1,760,654	\$1,760,000
Year 20	\$1,815,024	\$1,820,000
Year 21	\$1,800,331	\$1,800,000
Year 22	\$1,883,080	\$1,880,000
Year 23	\$1,911,673	\$1,910,000
Year 24	\$1,939,881	\$1,940,000
Year 25	\$1,967,773	\$1,970,000
Year 26	\$1,995,975	\$2,000,000
Year 27	\$2,024,373	\$2,020,000
Year 28	\$2,052,733	\$2,050,000
Year 29	\$2,080,804	\$2,080,000
Year 30	\$2,108,670	\$2,110,000
Year 31	\$2,136,424	\$2,140,000
Year 32	\$2,164,165	\$2,160,000
Year 33	\$2,191,751	\$2,190,000
Year 34	\$2,219,030	\$2,220,000
Year 35	\$2,245,969	\$2,250,000
Year 36	\$2,272,535	\$2,270,000

Year	Projected Property Tax Payment	Rounded Values
Year 37	\$2,298,691	\$2,300,000
Year 38	\$2,324,398	\$2,320,000
Year 39	\$2,349,204	\$2,350,000
Year 40	\$2,373,466	\$2,370,000
Total:	\$63,617,769	\$63,620,000

Source: Hanks Crossing 2024

3.16.6 The site is suitable. (2-02-09-06:6)

The Applicant has considered the environment and sensitive resources during siting and planning for the large-scale solar energy facility and is working closely with regulatory agencies and other stakeholders to ensure that the facility is developed in a manner that minimizes impacts to environmental and local resources.

A suite of environmental studies and surveys has been completed for the Project site. A site investigation was conducted to identify the presence of wetlands (**Appendix F**), and habitat for threatened, endangered, and sensitive wildlife species (**Appendix G**). A cultural desktop review was completed to identify any previously recorded cultural resources (**Appendix H**). An environmental impact summary for the proposed Project has been provided in **Section 3.15**.

Land within the site has already been modified by historic agricultural use. Several vegetated swales are present and one intermittent stream feature, Little Muddy Creek, is located within the Project area. This water resource will be avoided by at least 100 feet and will not be impacted by the large-scale solar energy facility construction. To the extent practicable, the proposed facilities have been sited to avoid impacts to wetlands and other WOTUS. For regulated water resources that cannot be avoided, the Applicant will coordinate with the USACE regarding compliance with applicable regulations, including permitting requirements under Section 404 and Section 401 of the Clean Water Act. The results of the wetlands investigations are documented in **Appendix F**.

The presence of cultivated crops throughout the large-scale solar energy site has likely limited the biological diversity of the site. No federally listed species or USFWS-designated critical habitats are present within the large-scale solar energy facility site. The monarch butterfly, a federal candidate species, may occur if milkweed is present onsite and the species was documented during field surveys. However, most of the site is under current agricultural production, limiting the amount of suitable monarch habitat. The use of a native seed mix for revegetation and control of invasive plants and noxious weeds in accordance with the Vegetation Management Plan (**Appendix B**) within the solar facility will help to further minimize potential impacts to this species.

Several active prairie dog colonies were identified during field surveys within the proposed large-scale solar energy facility and signs of burrowing owl, a state-listed species, were observed. Two raptor nests were observed on the site: one unidentified raptor and one Swainson’s hawk nest. If construction occurs during the migratory bird nesting season, the Applicant will adhere to BMPs to minimize impacts to

burrowing owl and other migratory birds and raptors. Nest surveys will be conducted prior to planned construction activities during the breeding season (in Colorado April 1 to August 31), and appropriate avoidance buffers will be implemented for active nests based on CPW's *Recommended Buffer Zones and Seasonal Restrictions for Colorado Raptors* guidance document (2020). This includes focused burrowing owl surveys prior to construction within prairie dog colonies and other areas of potential burrowing owl habitat within the Project area during the burrowing owl active season (March 15 to October 31).

CPW mapped big game habitat is present within the site. The Applicant is working with CPW and has incorporated a significant wildlife corridor into the larger Project design based on CPW's request. The Applicant will continue to coordinate with CPW as needed prior to construction to address and minimize potential impacts to wildlife species of conservation concern.

Overall, due to the lack of significant or unique wildlife habitat within the site and implementation of the Applicant-proposed mitigation measures, development and use of the site for a large-scale solar energy facility will not be expected to result in any significant conflicts with Federal or State listed species, State species of conservation concern, other wildlife species or their habitats. The results of the biological survey are documented in **Appendix G**.

As a consultant for the Applicant, Tetra Tech conducted a records search for cultural resources through the Colorado OAHP COMPASS online database on December 14, 2023. There are no NRHP listed properties located within the Project site. Historic General Land Office records and historic U.S. Geological Survey topographic maps also were reviewed to identify historic features documented within the Project area. Cultural resource sites were identified within a 1-mile buffer of the Project area; however, none occur within the Project area. The Project will have no impact to previously recorded resources identified within the Project area or a 1-mile buffer. The Applicant will prepare a Project-specific Unanticipated Discoveries Plan prior to the start of construction to have procedures in place for unexpected finds, human remains, and other archaeological findings (See **Appendix H**).

A Phase I Environmental Site Assessment ("ESA") was conducted for the Project site (see **Appendix I**). The ESA did not identify any recognized environmental conditions ("RECs"), historical RECs, and/or controlled RECs within the proposed large-scale solar energy facility (Tetra Tech 2024f).

A review of aerial imagery since 1985 indicates the properties have not been cultivated for irrigated agriculture and are inconsistently utilized for dryland agriculture. The primary use is rangeland. The Project is not located within designated Important Farmlands and there are no other resources mapped in the vicinity of the site (NRCS 2023). The site is relatively flat, and soils have low to moderate susceptibility of erosion (Tetra Tech 2024b).

3.16.7 Convenient and functional use of the site. (2-02-09-06:7)

A Site Plan for the Project is included with this submittal package under **Submittal Item 4.0**. The Site Plan has been developed to maximize energy output while applying the most efficient and economic use of the Project site and to minimize surface disturbance to the greatest extent practicable.

The Project will not require any formal parking areas. The Applicant specifically designed the solar facilities to maximize the available flat land located on the Project site, including the provision of internal roads that provide access for O&M. A galvanized and or coated chain link fence will be installed around the Project at approximately eight feet in height.

To minimize dust generation and weed establishment and spread, the Project site will be revegetated following construction using a native seed mix. No additional landscape treatment is proposed, which will be in keeping with the existing character of the area.

There are eight closed oil and gas wells on the subject parcels and numerous other abandoned and plugged wells on the surrounding parcels (CECMC 2024). All oil and gas wells and associated access setbacks have been delineated on the Site Plan (**Submittal Item 4.0**).

The Site Plan (**Submittal Item 4.0**) shows the locations of all structures, proposed structures, components, water wells, linear distances between components, and setback distances.

3.16.8 Services are available and adequate. (2-02-09-06:8)

Access to the site will utilize the County road system, specifically Hanks Crossing Road. However, due to the short-term duration of construction at the Project location, impacts to County roads are not expected. The Applicant will work with Adams County to maintain or repair any rutting or other damage to Hanks Crossing Road resulting from construction of the Project and will work with the County to restore the road to its original condition.

If the County determines that a County road use agreement is necessary for the Project's construction phase, the Applicant will enter into an agreement to address use of county roads. The agreement will outline responsibilities for assessing road conditions and completing maintenance and repairs, among other County concerns, to ensure that potential impacts related to Project use along Hanks Crossing Road during construction are mitigated. Road use during operations will be minimal.

The large-scale solar energy facility will adhere to all applicable setback requirements from Hanks Crossing Road and will meet or exceed all setback footages. ROW dedication surveys will be completed per guidance from the conceptual review meeting. These dedications reflect comments received from Adams County regarding necessary ROW dedications and can be provided prior to commencement of construction.

Law enforcement services for the Project area are provided by the Adam's County Sheriff's Office. Fire Protection is provided by the Byers Fire Protection District Number 9. Due to the temporary duration of construction and minimal operational staffing requirements, neither construction nor long-term operations activities for the Project are anticipated to result in an increase in the level of need for emergency response provider services. The Project will not result in changes to, or an increased need for, education or health services in Adams County.

The large-scale solar energy facility may utilize an onsite water supply. Potable water will be brought to the site during the construction and operations phases of the Project. Water for dust control during construction and operations (fire prevention and O&M building) will come from a combination of permitted onsite well sources and off-site resources that will be trucked in as needed. During operations, water tanks within the Project area will be maintained for Project and Fire District uses. Well water will be used to replenish the tanks and will be supplemented with off-site resources, as needed.

It is expected that natural rain and snow will provide for much of the solar panel washing during the operational phase of the Project. If additional solar panel washing by maintenance personnel is needed

to ensure optimal power generation, water will likely be obtained through a commercial vendor that will deliver water to the site by truck or sourced from groundwater via onsite wells.

The Applicant will own the Project land and will seek to convert some or all existing well permits for commercial/industrial use to support the operational needs of the Project. The Applicant will work closely with the Division of Water Resources and all interested parties to complete any change of use authorization(s). Until the Project commences construction, the current owners and well permit holders intend to continue using the wells beneficially for ongoing agricultural and residential purposes. The Applicant is open to a condition of approval that any applications needed for well permit conversions to secure water for the Project will be filed prior to construction. The Project is not dependent on onsite sources and can proceed with water provided through commercial sources.

Permanent sanitary facilities and a septic system may be required for facility operations. If a septic system is needed, the Applicant will obtain an On-Site Wastewater Treatment System Permit from the Adams County Health Department (see **Submittal Item 6**). Portable sanitary facilities will be provided during construction of the Project. Electricity for the O&M building and other auxiliary power needs will be provided by Morgan County Electric Cooperative (see **Submittal Item 7**).

The Project will be built mostly on the existing ground surface and site grading will be minimized to the greatest extent practicable, thus reducing the potential for dust generation. The site grading will also be designed to preserve the pre-development drainage pattern as much as possible, although drainage patterns previously have been modified by historic agricultural use of the properties. No significant changes to the drainage patterns are anticipated. The Applicant has prepared a Storm Drainage Study to assess the potential risks of flooding, erosion, and impacts to water quality, provided under **Submittal Item 11.2**. A Stormwater Drainage Plan and a Construction Stormwater Discharge Permit will be obtained for the site and provided to the County prior to construction.

Vegetation on the site will be restored to low growing native grasses and forbs to increase biodiversity. A 10-foot area free of brush will be maintained around the arrays for fire safety. A Preliminary Vegetation Management Plan (**Appendix B**) demonstrating how the Project will be maintained in a condition that complies with applicable fire regulations adopted by the Byers Fire Protection District is included with this application.

3.17 Terms of Conditional Use Permit

3.17.1 Permit Term

The Applicant seeks a CUP that will be in effect for the life of the Project, which is anticipated to last an initial 40 years following the development and construction phases, with the potential to extend the Project life an additional 40 years after re-powering, followed by decommissioning and reclamation. Accordingly, the Applicant requests that County staff recommend, and the Board of County Commissioners (“Board”) issue the Permit “for the life of the Project” without a definitive expiration date. Under this scenario, the Permit term would commence on the date of issuance, run through the entire operational life of the Project, and expire upon completion of all activities and actions required under the final Decommissioning Plan. It is common for development permits issued for large-scale renewable energy projects to last for the life of the facility without a definitive expiration date, and

there is nothing in the Regulations that prohibits the Board from doing so in this instance. The Applicant also understands—based on recent communications with the County—that the County has in fact issued CUPs without an expiration date. Finally, issuing the CUP for the entire life of the Project will protect the Applicant’s significant financial and property interests and ensure that the Project will remain operational to further Colorado’s clean energy directive; deliver clean, reliable, and low-cost energy to surrounding communities; and provide significant economic benefits to Adams County.

Alternatively, if the Board deems it necessary to include an expiration date, the Applicant requests that the Permit expire 85 years after the date of issuance, unless the Permit is extended or renewed. The 85-year term would cover the anticipated life of the Project, described above, including construction, operation (initial period plus repowering), and decommissioning. The Board (and many other counties in Colorado) regularly issues CUPs that remain in effect for multiple decades. An 85-year CUP term is warranted in this instance based on the identified lifespan of the Project and anticipated and significant capital outlays and expenditures associated with both the Project and infrastructure tied to the Project. And again, there is nothing in the Regulations that limits the duration of a CUP.

3.17.2 Building Permit Requirement

Pursuant to Section 2-02-09-09 of the Regulations, Applicant understands the CUP will include a one-year deadline to obtain a building permit for the Project. As explained below—as well as in recent correspondence with the County and during a meeting between the Applicant and County representatives on June 3, 2024—the Applicant likely will not be in a position to apply for and obtain a building permit within that 12-month period.

As discussed during the June 3 meeting, there are compelling reasons why (a) Applicant needs to obtain a CUP for the Project now, and (b) there may be a multi-year lag between CUP issuance and commencement of construction. As to the former, the Project was one of 20 projects (out of more than 1,000 bids) selected by the Public Service Company of Colorado (“PSCo”) as part of its 2021 Electric Resource Plan and Clean Energy Plan, and it will play a pivotal role in advancing the State of Colorado’s clean energy policy directive. Applicant currently is negotiating a Power Purchase Agreement (“PPA”) with PSCo, and will eventually negotiate a Large Generator Interconnection Agreement (“LGIA”) after PSCo has completed certain transmission system studies. To protect and ensure the Project’s continued inclusion in the Clean Energy Plan, and to facilitate negotiations with and fulfill contractual obligations to PSCo, the Applicant seeks to obtain a CUP for the Project at this time. If the Applicant does not obtain a CUP now - or if it obtains a permit and it subsequently lapses because a building permit has not been obtained and/or one or more extensions are denied - then Applicant risks losing its significant financial investments in the Project.

Regarding the potential delay between CUP issuance and Project construction, PSCo (as noted above) needs to perform interconnection studies to evaluate transmission upgrades needed before the Project can be constructed and connected to PSCo’s system; the initial study is not scheduled to begin until early 2025 and could take up to one year to complete. Following completion of the studies, certain interconnection and transmission upgrades may be needed before Applicant can commence construction on the Project. Although Applicant and PSCo are working to accomplish the development of the Project as expeditiously as possible, it could take five or more years to complete the entire process. For these reasons, Applicant may not be in a position to obtain a building permit for several years.

Again, Applicant understands that it nevertheless will need to work with the County to satisfy the building permit requirement in a way that complies with the Regulations and the CUP, and it believes it can do so if some flexibility can be built into the process. If, as expected, Applicant is not in a position to obtain a building permit within a one-year period, it will timely apply for an extension of the building permit deadline (i.e., will seek an extension at least 30 days before the deadline). Depending on where things stand in terms of Project development and PSCo's interconnection studies and upgrades, among other things, the extension request could be for up to an additional five (5) years to obtain a building permit.

As discussed during the June 3, 2024, meeting with the County, a multi-year extension is permitted under the Regulations and can be granted by the Board. In the extension request, Applicant will provide support for the requested extension and length of such extension and will demonstrate that it has maintained a continuous good faith effort in commencing the Project and that conditions near the Project site, the County's regulations, and the Adams County Comprehensive Plan have not changed so as to render the original CUP findings erroneous. Finally, and also as discussed during the June 3 meeting, Applicant requests that the Staff Recommendations to the Board on the CUP indicate that a multi-year extension of the building permit requirement is expected and has been discussed between Applicant and the County and recommend in writing that such an extension be granted upon proper request, which would be contingent upon Applicant demonstrating that it has maintained a continuous good faith effort in commencing the Project and that conditions near the Project site, the County's regulations, and the Comprehensive Plan have not changed so as to render the original CUP findings erroneous.

3.17.3 Anticipated Schedule for Project Development and Commencement

Regardless of the issued CUP term and building permit deadline, Applicant will continue to develop and advance the Project and be able to demonstrate good faith efforts to commence, construct, and operate the Project. Such activities and efforts - which support the above requests - include: continued project engineering and design, collection and analysis of onsite insolation data, supporting the completion of PSCo's transmission interconnection studies, negotiation and execution of an Interconnection Agreement with PSCo, negotiation and execution of a PPA with PSCo, Project underwriting and financing activities, and continued environmental and site diligence.

As noted above, Applicant is agreeable to reasonable CUP conditions that require continued progress towards commencement, construction, and operation of the Project and periodic reporting to the County regarding the same.

4.0 Site Plan

HANKS CROSSING ENERGY, LLC

HANKS CROSSING ENERGY PROJECT

CONDITIONAL USE PERMIT

ADAMS COUNTY,

COLORADO

SYSTEM DESCRIPTION	
POI LIMIT (MW AC)	355
DC:AC RATIO	TBD
PANEL WATTAGE (W)	TBD
PANEL ORIENTATION	1P PORTRAIT
PITCH (FT)	20.58
GCR	38%
MODULE	TSM-655DEG21C.20
MODULE DIMENSIONS (IN)	93.86 x 51.30 x 1.38
N-S TABLE GAP (NON-ROAD) (FT)	10
STRING LENGTH	28
TOTAL STRINGS	30,109
STRING ORIENTATIONS	3,2,1
INVERTER	SG4400UD-US
INVERTER COUNT	95
PIERS	TBD
ROAD WIDTH (FT)	20
SECURITY FENCING (LF)	107800
FENCED AREA (PV) (ACRES)	2205
LOD AREA (ACRES)	2398

DRAWING INDEX	
SHEET NO.	DRAWING TITLE
C000	COVER SHEET
C100	OVERALL EXISTING CONDITIONS
C101	EXISTING CONDITIONS SHEET 1 OF 3
C102	EXISTING CONDITIONS SHEET 2 OF 3
C103	EXISTING CONDITIONS SHEET 3 OF 3
C200	OVERALL DEVELOPMENT PLAN
C201	DEVELOPMENT PLAN SHEET 1 OF 3
C202	DEVELOPMENT PLAN SHEET 2 OF 3
C203	DEVELOPMENT PLAN SHEET 3 OF 3
C301	INVERTER & TRACKER FDN DETAILS
C302	WIRE MANAGEMENT DETAILS
C303	BESS FDN & EQUIPMENT SLAB DETAILS
C400	GENERAL DETAILS SHEET

DEVELOPER:

HANKS CROSSING ENERGY, LLC
 ONE BRIDGE STREET, SUITE 11
 IRVINGTON, NY 10533
 (508) 505-0890

PROJECT ENGINEER:

MIKE SHORT
 4101 COX ROAD, SUITE 100
 GLEN ALLEN, VA 23060
 (804) 290-4321

GENERAL NOTES:

- ALTA SURVEY COMPLETED BY ENCOMPASS ON 4/24/2024.
- TOPOGRAPHY WAS SOURCED VIA GIS.
- WETLANDS / PONDS ON SITE ARE EXPECTED TO BE IMPACTED. APPROPRIATE PERMITTING WITH THE USACE IS IN PROCESS AT THE TIME OF THIS PLANSET DEVELOPMENT.
- OIL/GAS WELLS SHOWN ON SITE WERE NOT FOUND DURING THE ALTA AND BOUNDARY SURVEY. THE LOCATIONS WERE SOURCED VIA GIS AND RESPECTED BY THE DESIGN IN CASE FURTHER INVESTIGATION REVEALS THEY DO EXIST. IF THEY ARE FOUND TO EXIST AT A LATER DATE, ANOTHER SURVEY WILL BE PERFORMED AND THE DESIGN WILL BE EDITED IN ACCORDANCE WITH THE SURVEY DATA.
- VERTICAL AND HORIZONTAL DATUM IS NAD83 COLORADO STATE PLANES, NORTH ZONE, US-FOOT, C083-NF.
- THE PROPOSED UTILITY SUBSTATION LOCATIONS ARE SHOWN ON THIS PLANSET BUT THEY ARE NOT INCLUDED IN THE SCOPE OF THIS CUP SUBMITTAL.
- BASINS AND INFLOW CHANNELS ARE SHOWN HEREIN AS CONCEPTUAL IN NATURE TO ACCOUNT FOR DRAINAGE AREA AND LOW POINT IDENTIFICATION. BASINS SHALL BE DESIGNATED FURTHER TO SECTION 9-04 OF THE ADAMS COUNTY "STORMWATER DRAINAGE DESIGN AND STORMWATER QUALITY CONTROL REGULATIONS", DATED DECEMBER 8, 2020.
- AREAS TO BE GRADED, AND THE EXTENT OF GRADING, WILL BE DETERMINED AT LATER DESIGN STAGES.
- THE PROPOSED TECHNICAL INFORMATION AND EQUIPMENT HEREIN IS PRELIMINARY ONLY. APPLICANT WILL FINALIZE SPECIFICATIONS AT TIME OF PROCUREMENT BASED ON BEST-IN-CLASS (I.E. TIER 1) STANDARDS.

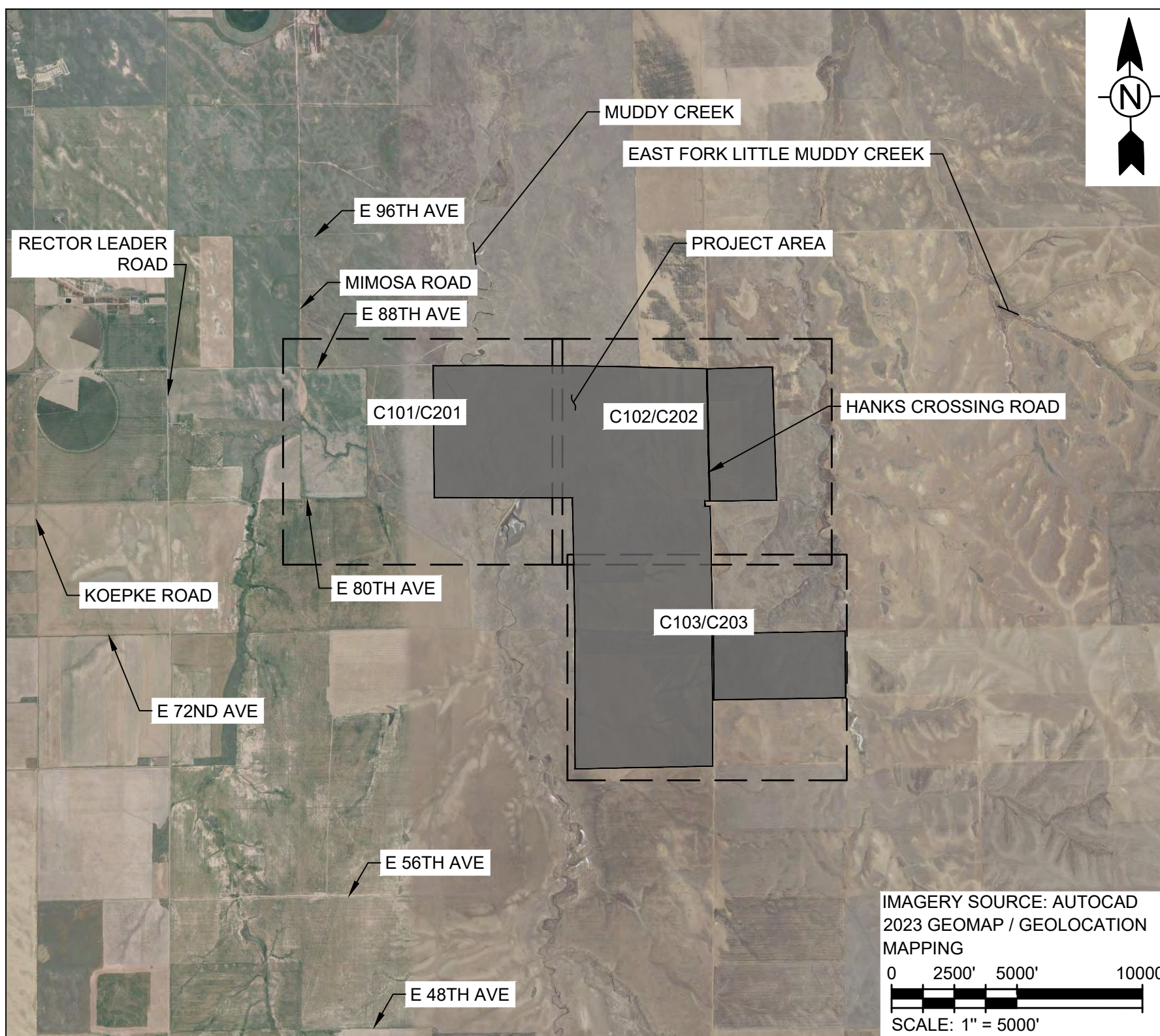
STANDARDS:

- PROJECT WILL FOLLOW THE ADAMS COUNTY ORDINANCE AND REGULATIONS.
- STORMWATER MANAGEMENT WILL FOLLOW ORDINANCE NO. 11 OF THE ADAMS COUNTY CODE AND CHAPTER 9 OF THE ADAMS COUNTY STANDARDS AND DEVELOPMENT REGULATIONS.
- PROJECT WILL FOLLOW THE COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT CONSTRUCTION GENERAL PERMIT.
- PUBLIC IMPROVEMENTS SHALL CONFORM TO ADAMS COUNTY STANDARDS AND SPECIFICATIONS AND LATEST EDITION OF COLORADO DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS.

INDEX OF PUBLIC UTILITIES:

PUBLIC SERVICE COMPANY OF COLORADO (PSCo)
 1800 LARIMER ST., F1 5
 DENVER, CO 80202
 (303) 285-6921

MORGAN COUNTY RURAL ELECTRIC ASSOCIATION
 734 BARLOW ROAD P.O. BOX 738
 FORT MORGAN, COLORADO 80701
 (970) 867-5688



VICINITY MAP
 PROJECT COORDINATES
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 LONG: -104.003939

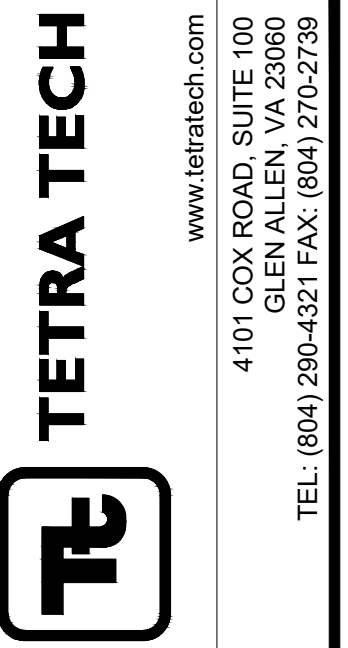
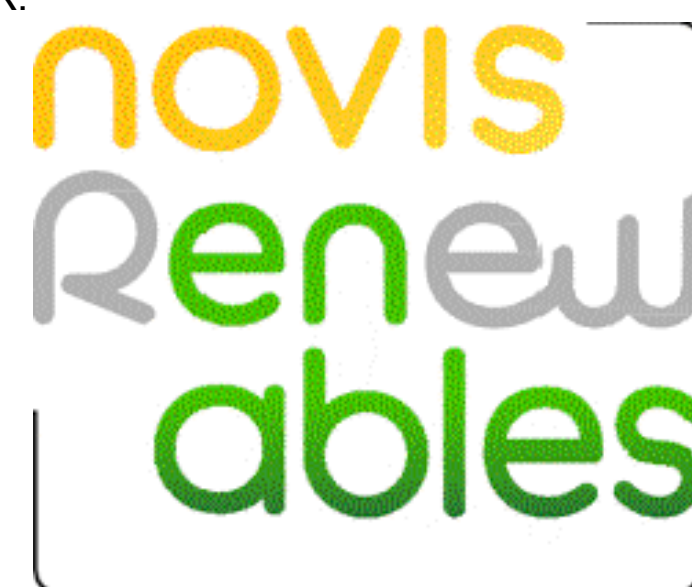
PREPARED BY:



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4104 COX ROAD - SUITE 100, GLEN ALLEN, VA 23060
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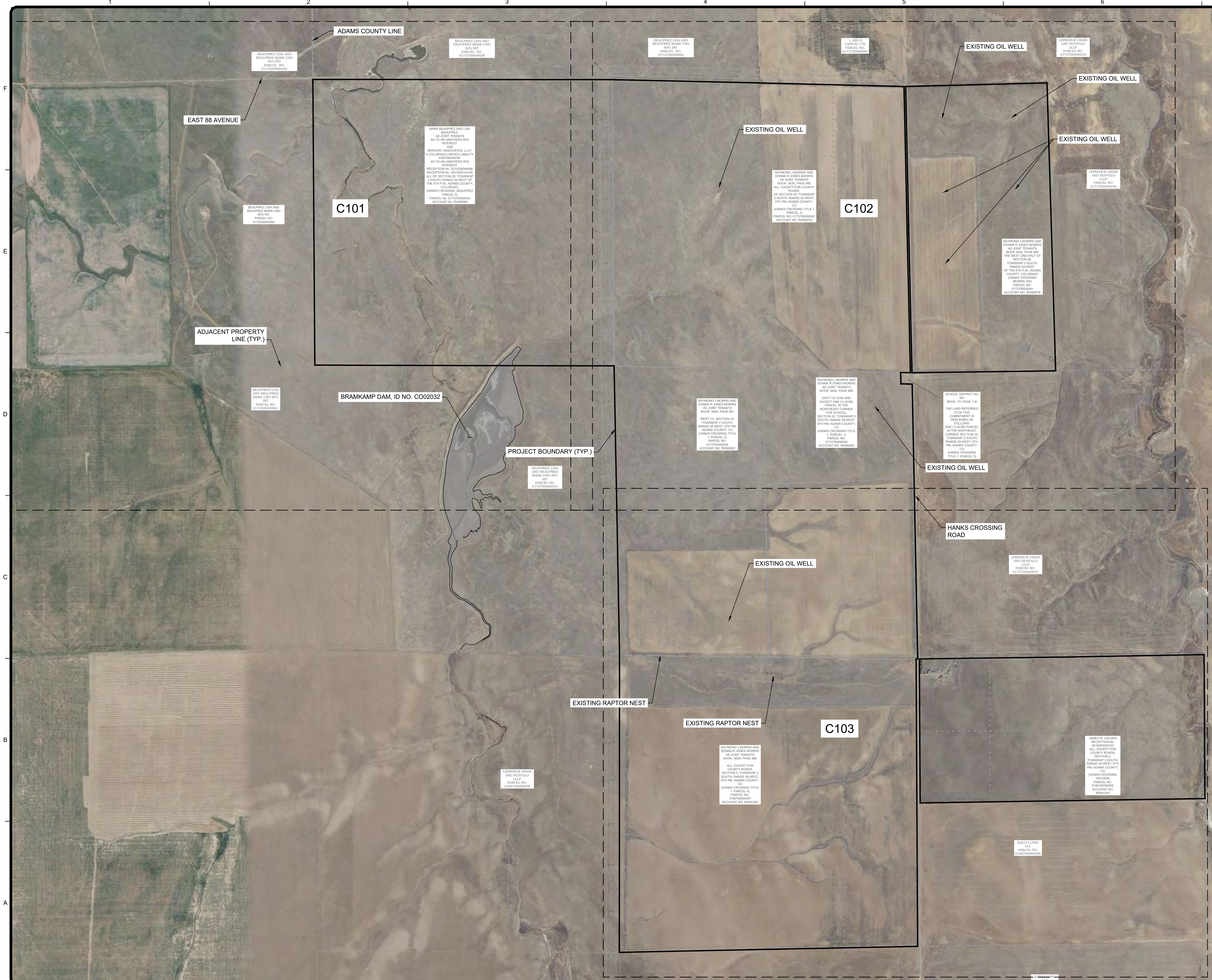
BY	DATE	DESCRIPTION
TT	06/07/24	CUP SUBMITTAL

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 ADAMS COUNTY, COLORADO
 HANKS CROSSING ENERGY, LLC
 COVER SHEET

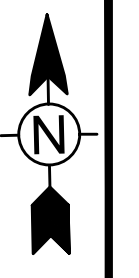
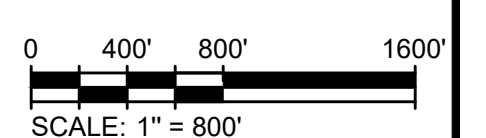
PROJ:	194-1265-0010
DESN:	M.SHORT
DRWN:	J.ZEIGLER
CHKD:	M.HARE

C000

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- LEGEND:**
- EXISTING BUILDING
 - EXISTING 10' CONTOUR
 - EXISTING 2' CONTOUR
 - PROJECT BOUNDARY
 - EXISTING PROPERTY LINE
 - EXISTING ADJACENT PROPERTY LINE
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 - EXISTING EASEMENT
 - EXISTING 100 YEAR FLOODPLAIN
 - EXISTING STREAM
 - EXISTING DITCH
 - EXISTING WETLAND
 - EXISTING WATERBODY



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BY	TT	

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ADAMS COUNTY, COLORADO
HANKS CROSSING ENERGY, LLC

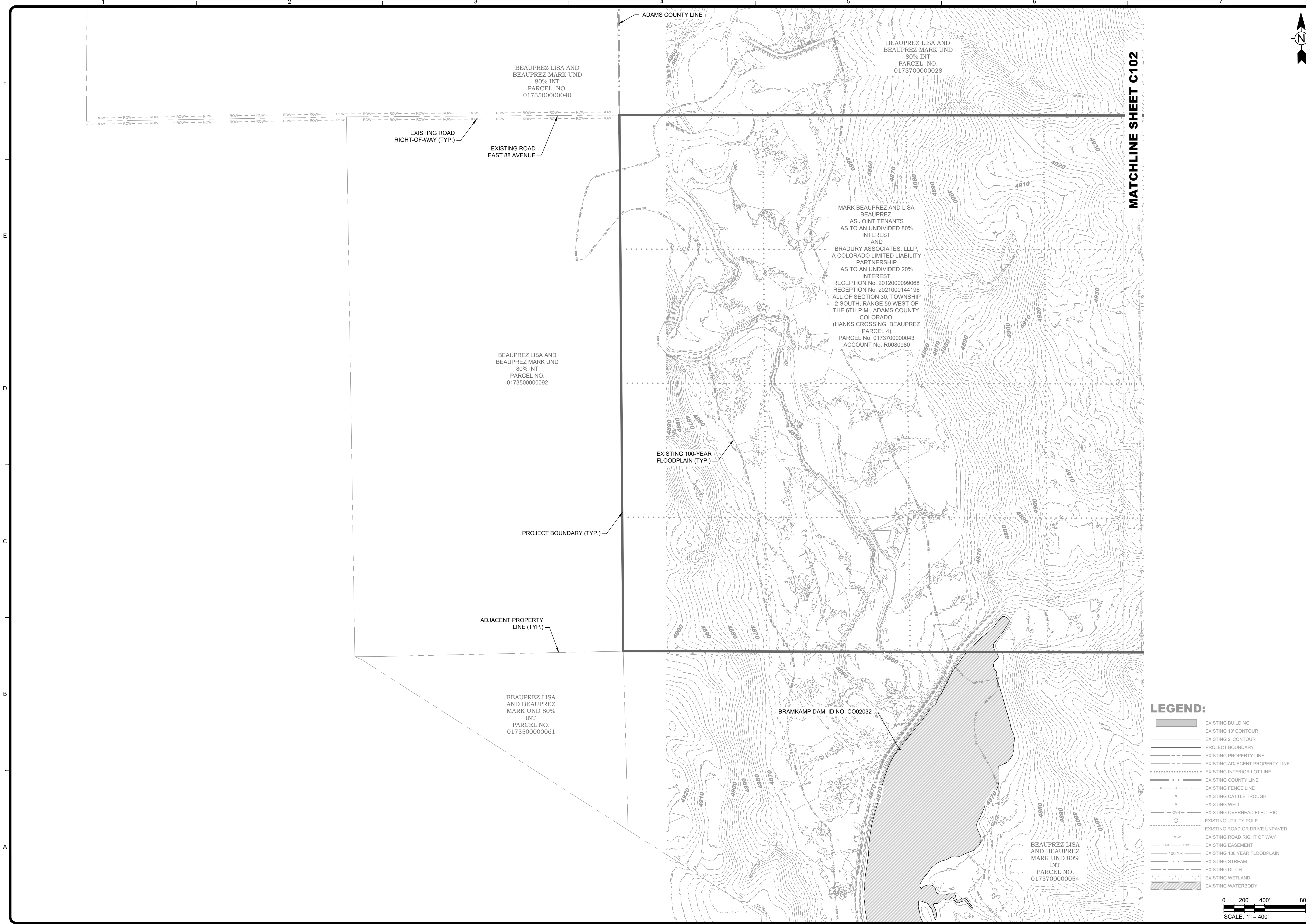
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PROJ: 194-1265-0010
DESN: M.SHORT
DRWN: J.ZEIGLER
CHKD: M.HARE

C100

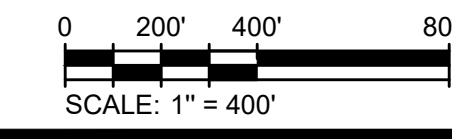
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HANKS CROSSING ENERGY, LLC
 ADAMS COUNTY, COLORADO
 HANKS CROSSING ENERGY, LLC

EXISTING CONDITIONS
SHEET 1 OF 3

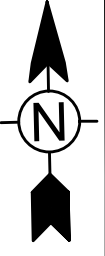
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DRWN:	J.ZEIGLER
CHKD:	M.HARE

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BY	TT	

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ADAMS COUNTY, COLORADO
HANKS CROSSING ENERGY, LLC
**EXISTING CONDITIONS
SHEET 2 OF 3**

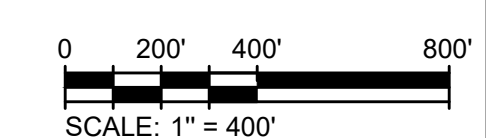
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DESN: M.SHORT
DRWN: J.ZEIGLER
CHKD: M.HARE

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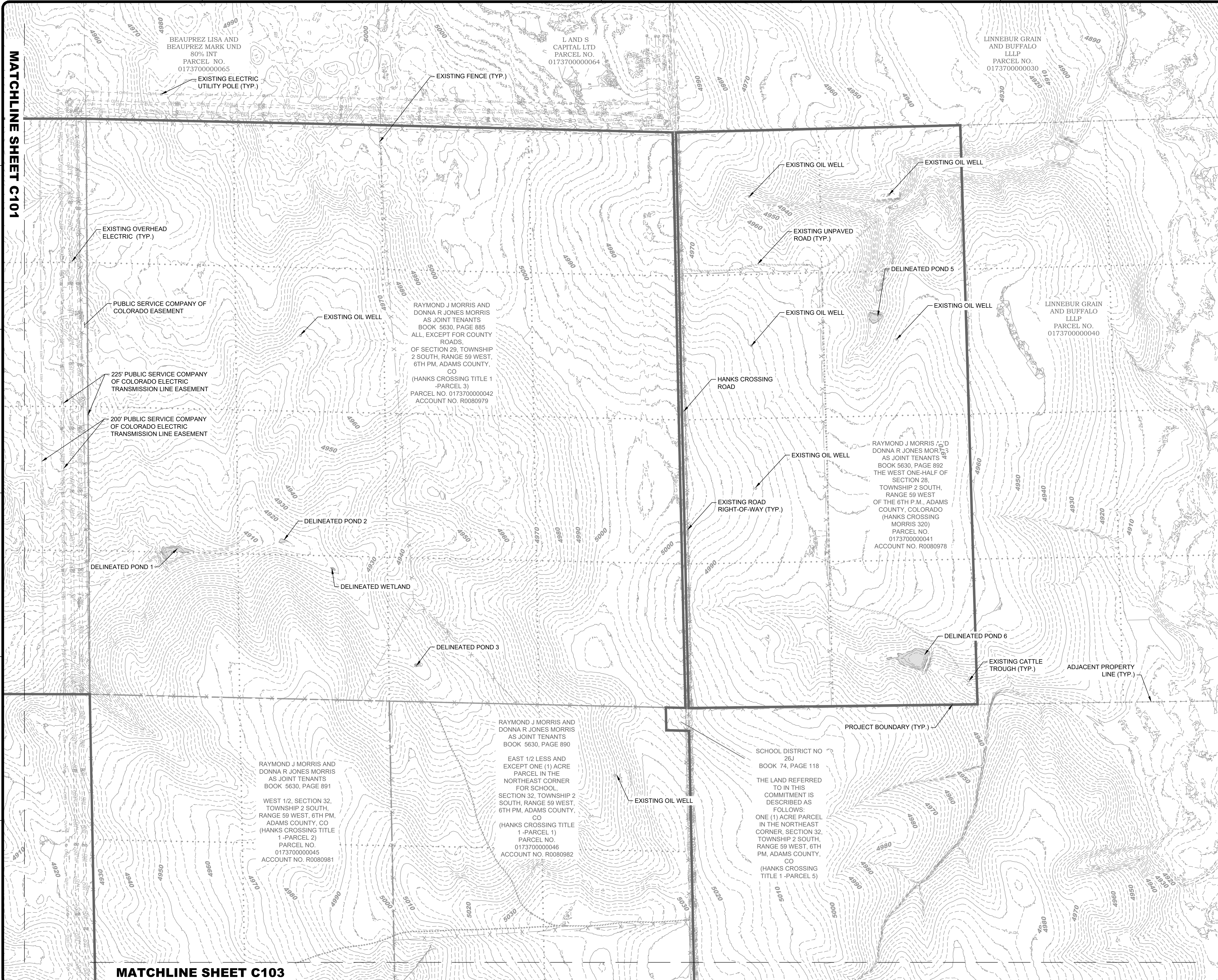
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CAPITAL LTD
PARCEL NO.
0173700000064

LINNEBUR GRAIN
AND BUFFALO
LLP
PARCEL NO.
0173700000030

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DONNA R JONES MORRIS
AS JOINT TENANTS
BOOK 5630, PAGE 885
ALL, EXCEPT FOR COUNTY
ROADS,
OF SECTION 29, TOWNSHIP
2 SOUTH, RANGE 59 WEST,
6TH PM, ADAMS COUNTY,
CO
(HANKS CROSSING TITLE 1
- PARCEL 3)
PARCEL NO. 0173700000042
ACCOUNT NO. R0080979

RAYMOND J MORRIS AND
DONNA R JONES MORRIS
AS JOINT TENANTS
BOOK 5630, PAGE 892
THE WEST ONE-HALF OF
SECTION 28,
TOWNSHIP 2 SOUTH,
RANGE 59 WEST
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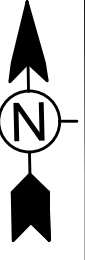
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DONNA R JONES MORRIS
AS JOINT TENANTS
BOOK 5630, PAGE 891
WEST 1/2, SECTION 32,
TOWNSHIP 2 SOUTH,
RANGE 59 WEST, 6TH PM,
ADAMS COUNTY, CO
(HANKS CROSSING TITLE
1 - PARCEL 2)
PARCEL NO.
0173700000045
ACCOUNT NO. R0080981

RAYMOND J MORRIS AND
DONNA R JONES MORRIS
AS JOINT TENANTS
BOOK 5630, PAGE 890
EAST 1/2 LESS AND
EXCEPT ONE (1) ACRE
PARCEL IN THE
NORTHEAST CORNER
FOR SCHOOL
SECTION 32, TOWNSHIP 2
SOUTH, RANGE 59 WEST,
6TH PM, ADAMS COUNTY,
CO
(HANKS CROSSING TITLE
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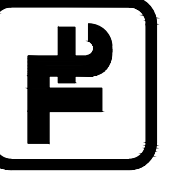
SCHOOL DISTRICT NO
26J
BOOK 74, PAGE 118
THE LAND REFERRED
TO IN THIS
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ONE (1) ACRE PARCEL
IN THE NORTHEAST
CORNER, SECTION 32,
TOWNSHIP 2 SOUTH,
RANGE 59 WEST, 6TH
PM, ADAMS COUNTY,
CO
(HANKS CROSSING
TITLE 1 - PARCEL 5)

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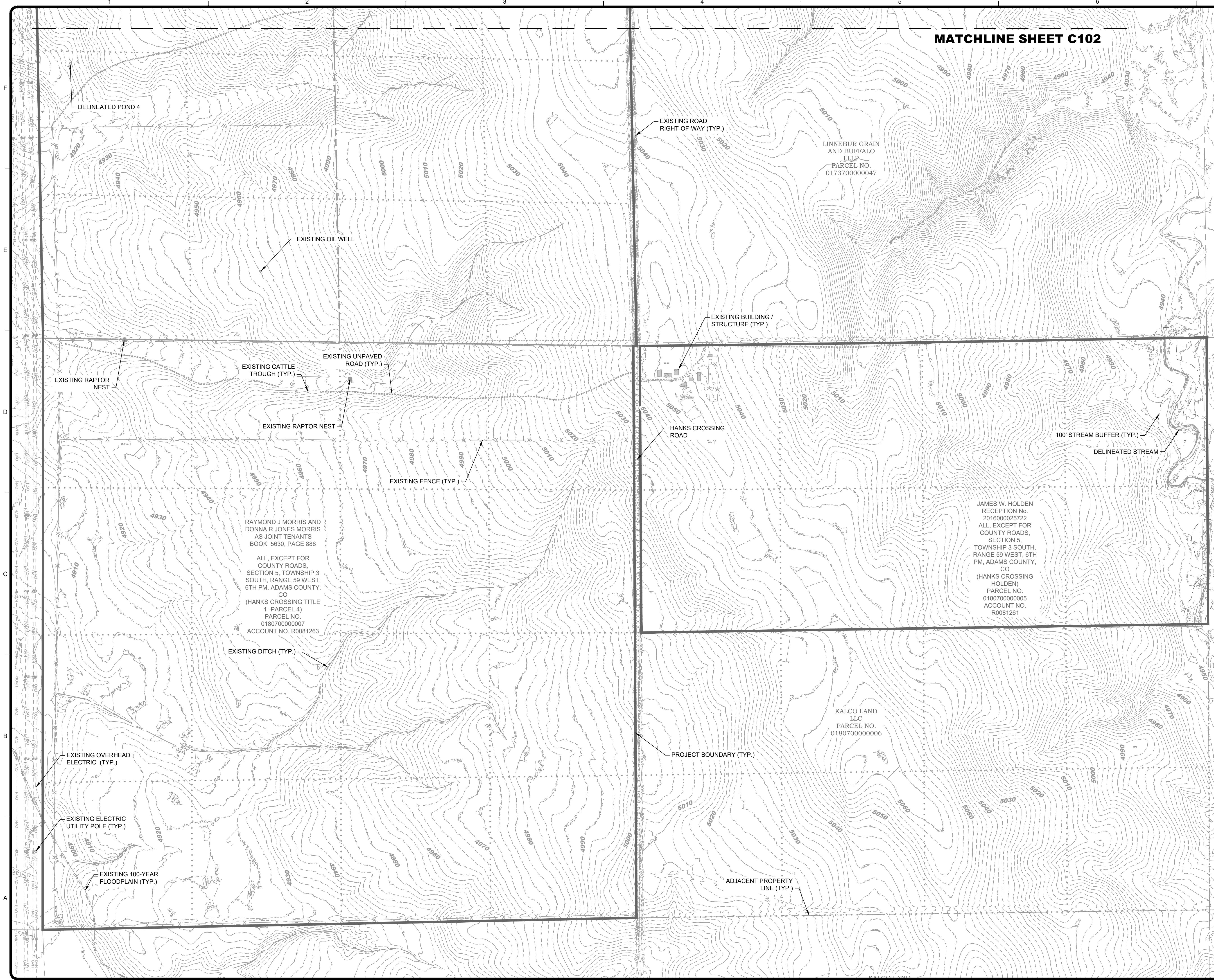
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HANKS CROSSING ENERGY, LLC
ADAMS COUNTY, COLORADO
HANKS CROSSING ENERGY, LLC
EXISTING CONDITIONS
SHEET 3 OF 3

PROJ: 194-1265-0010
DESN: M.SHORT
DRWN: J.ZEIGLER
CHKD: M.HARE

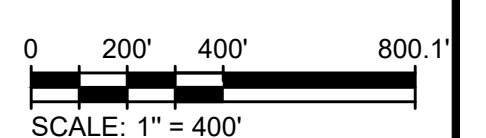
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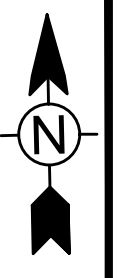
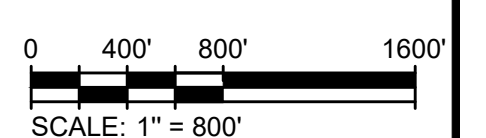
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- EXISTING STREAM
- EXISTING DITCH
- EXISTING WETLAND
- EXISTING WATERBODY
- 50' WELL BUFFER
- PARCEL SETBACK (SETBACKS VARIES)
- SECTION LINE SETBACK (SETBACKS VARIES)
- WILDLIFE CORRIDOR BOUNDARY
- PROPOSED BASINS
- PROPOSED SOLAR ARRAYS
- PROPOSED ROAD EDGE
- PROPOSED INVERTER
- PROPOSED LIMIT OF DISTURBANCE
- PROPOSED FENCELINE
- PROPOSED STORMWATER PIPE
- PROPOSED BUILDING
- PROPOSED TEMPORARY TOPSOIL STOCKPILE



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BY	TT	

HANKS CROSSING ENERGY, LLC
ADAMS COUNTY, COLORADO
HANKS CROSSING ENERGY, LLC

OVERALL DEVELOPMENT PLAN

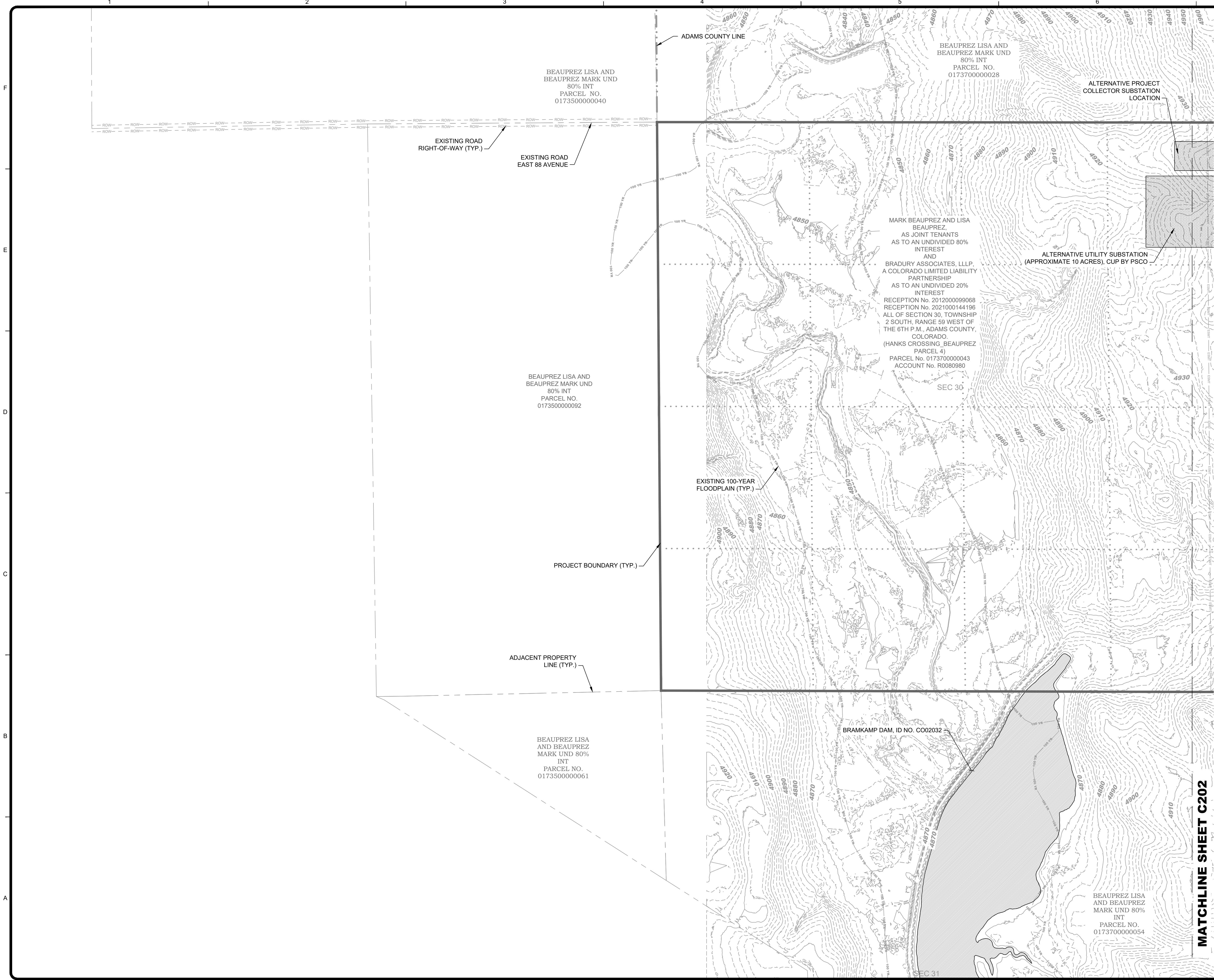
PROJ: 194-1265-0010
DES: M.SHORT
DRWN: J.ZEIGLER
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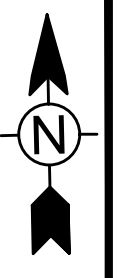
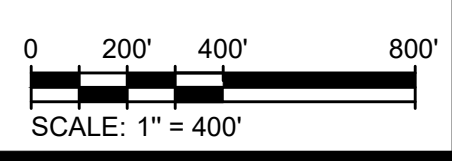
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HANKS CROSSING ENERGY, LLC
ADAMS COUNTY, COLORADO
HANKS CROSSING ENERGY, LLC

DEVELOPMENT PLAN
SHEET 1 OF 3

PROJ:	194-1265-0010
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DRWN:	J.ZEIGLER
CHKD:	M.HARE

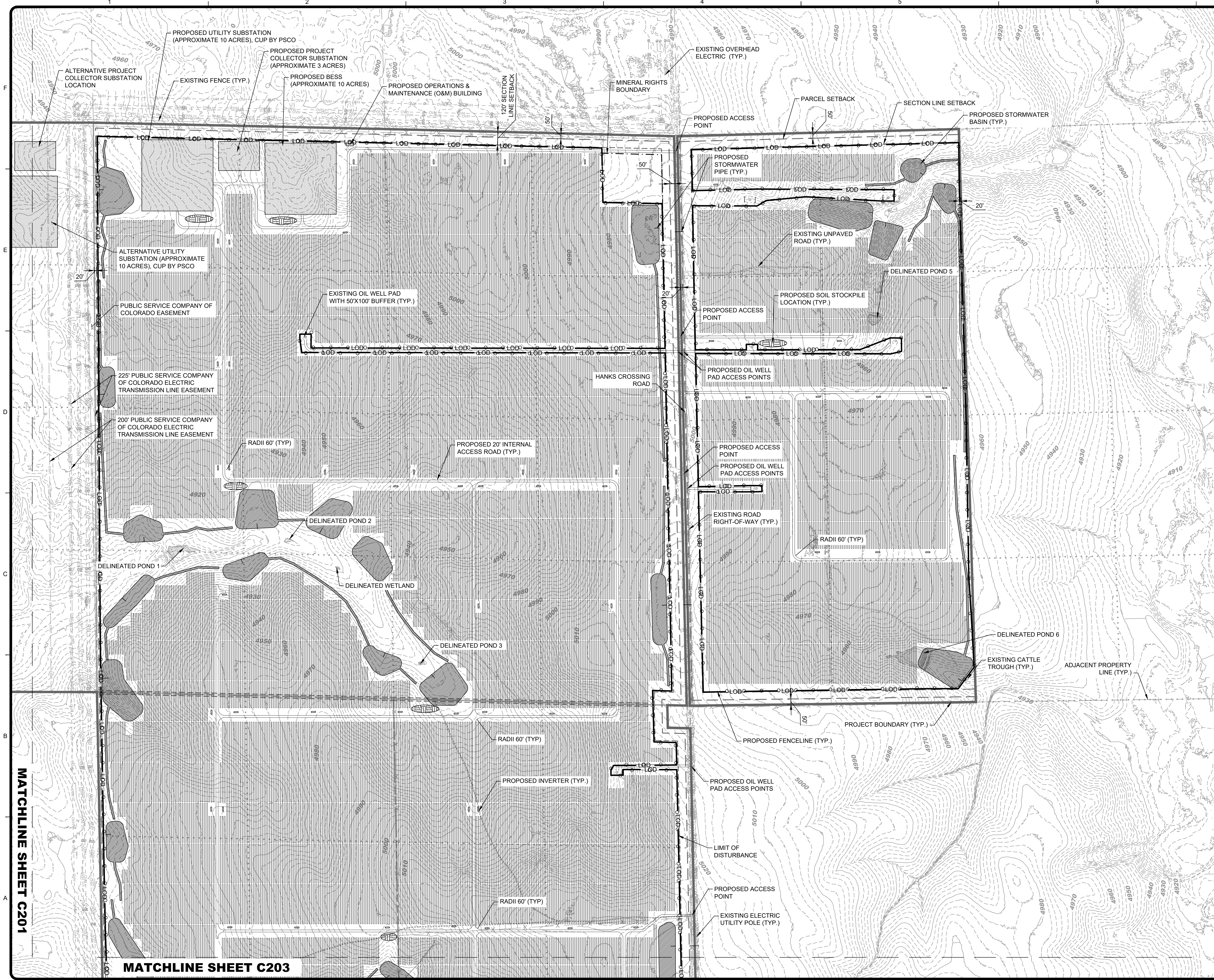
C201

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6/12/2024 1:49:25 PM - C:\AD\ACDC\DCS\TETRA TECH\INC\194-1265-0010 HANKS CROSSING\PROJECT FILES\CIVIL\194-1265-0010-C202.DWG - ZEIGLER, JUSTIN

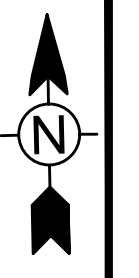
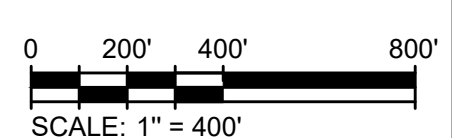
MATCHLINE SHEET C201

MATCHLINE SHEET C203



LEGEND:

- EXISTING BUILDING
- EXISTING 10' CONTOUR
- EXISTING 2' CONTOUR
- PROJECT BOUNDARY
- EXISTING PROPERTY LINE
- EXISTING ADJACENT PROPERTY LINE
- EXISTING INTERIOR LOT LINE
- EXISTING COUNTY LINE
- EXISTING FENCE LINE
- EXISTING CATTLE TROUGH
- EXISTING WELL
- EXISTING OVERHEAD ELECTRIC
- EXISTING UTILITY POLE
- EXISTING ROAD OR DRIVE UNPAVED
- EXISTING ROAD RIGHT OF WAY
- ESMT
- EXISTING EASEMENT
- EXISTING MINERAL RIGHTS BOUNDARY
- EXISTING 100 YEAR FLOODPLAIN
- EXISTING STREAM
- EXISTING DITCH
- EXISTING WETLAND
- EXISTING WATERBODY
- 50' WELL BUFFER
- PARCEL SETBACK (SETBACKS VARIES)
- SECTION LINE SETBACK (SETBACKS VARIES)
- WILDLIFE CORRIDOR BOUNDARY
- PROPOSED BASINS
- PROPOSED SOLAR ARRAYS
- PROPOSED ROAD EDGE
- PROPOSED INVERTER
- PROPOSED LIMIT OF DISTURBANCE
- PROPOSED FENCELINE
- PROPOSED STORMWATER PIPE
- PROPOSED BUILDING
- PROPOSED TEMPORARY TOPSOIL STOCKPILE



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PRELIMINARY

novis
Renew
ables

BY	DATE	DESCRIPTION
TT	06/07/24	CUP SUBMITTAL

HANKS CROSSING ENERGY, LLC
ADAMS COUNTY, COLORADO

HANKS CROSSING ENERGY, LLC

DEVELOPMENT PLAN
SHEET 2 OF 3

PROJ:	194-1265-0010
DESN:	M.SHORT
DRWN:	J.ZEIGLER
CHKD:	M.HARE

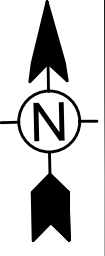
C202

Copyright: Tetra Tech

Bar Measures 1 inch, otherwise drawing not to scale

6/14/2024 10:50:33 AM - C:\ADACDCS\TETRA TECH INC\194-1265-0010\HANKS CROSSING\PROJECT FILES\CIVIL\194-1265-0010-C203.DWG - ZEIGLER, JUSTIN

MATCHLINE SHEET C202



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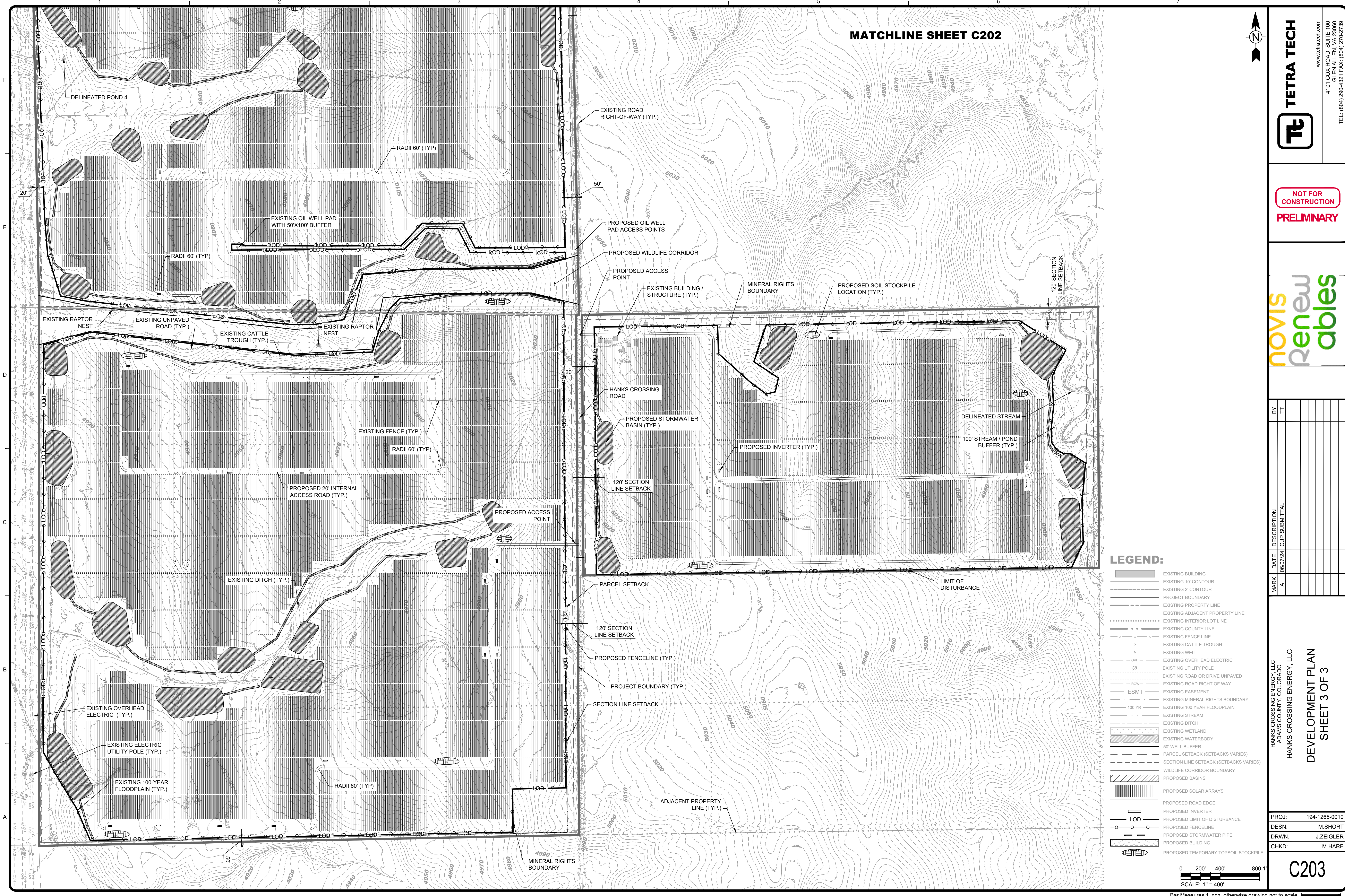
MARK	DATE	DESCRIPTION
A	06/07/24	CIP SUBMITTAL
BY	TT	

HANKS CROSSING ENERGY, LLC
ADAMS COUNTY, COLORADO
HANKS CROSSING ENERGY, LLC
DEVELOPMENT PLAN
SHEET 3 OF 3

PROJ: 194-1265-0010
DESN: M.SHORT
DRWN: J.ZEIGLER
CHKD: M.HARE

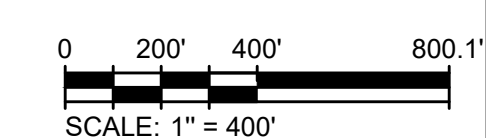
C203

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LEGEND:

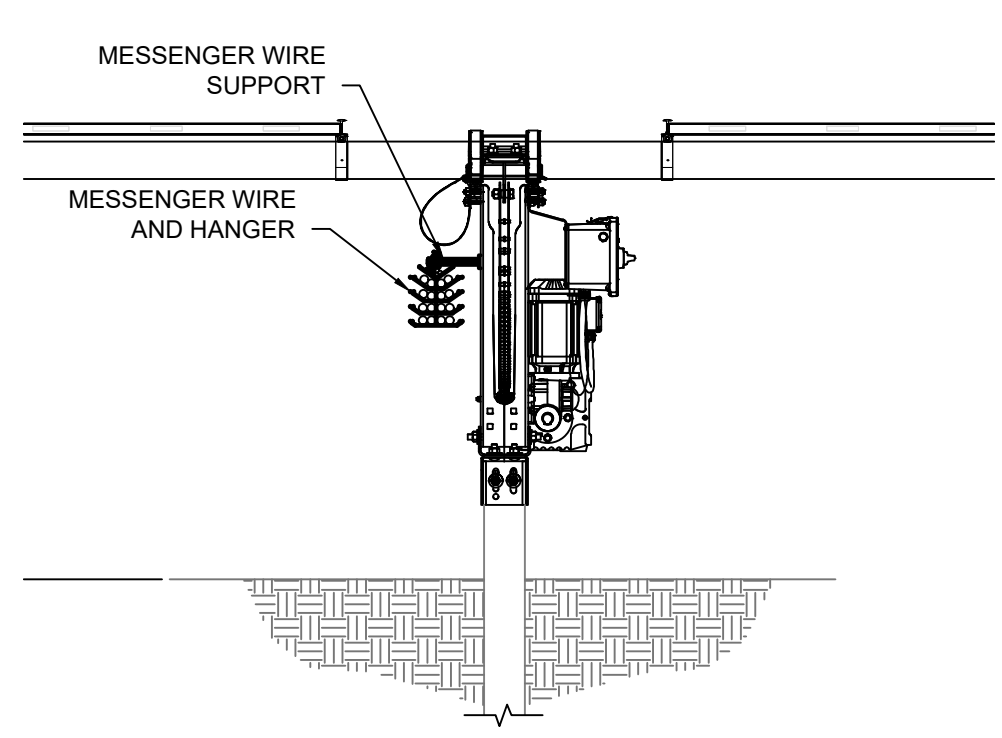
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- EXISTING 10' CONTOUR
- EXISTING 2' CONTOUR
- PROJECT BOUNDARY
- EXISTING PROPERTY LINE
- EXISTING ADJACENT PROPERTY LINE
- EXISTING INTERIOR LOT LINE
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- EXISTING FENCE LINE
- EXISTING CATTLE TROUGH
- EXISTING WELL
- EXISTING OVERHEAD ELECTRIC
- EXISTING UTILITY POLE
- EXISTING ROAD OR DRIVE UNPAVED
- EXISTING ROAD RIGHT OF WAY
- EXISTING EASEMENT
- EXISTING MINERAL RIGHTS BOUNDARY
- EXISTING 100 YEAR FLOODPLAIN
- EXISTING STREAM
- EXISTING DITCH
- EXISTING WETLAND
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- PARCEL SETBACK (SETBACKS VARIES)
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- WILDLIFE CORRIDOR BOUNDARY
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- PROPOSED INVERTER
- PROPOSED LIMIT OF DISTURBANCE
- PROPOSED FENCELINE
- PROPOSED STORMWATER PIPE
- PROPOSED BUILDING
- PROPOSED TEMPORARY TOPSOIL STOCKPILE



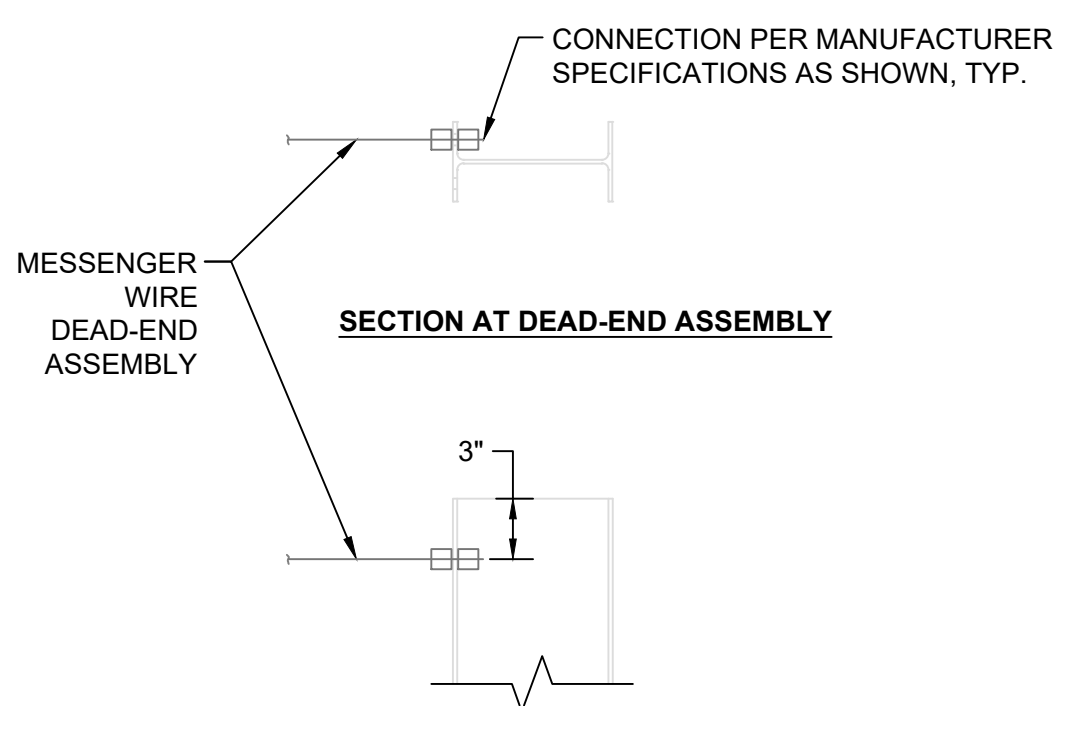
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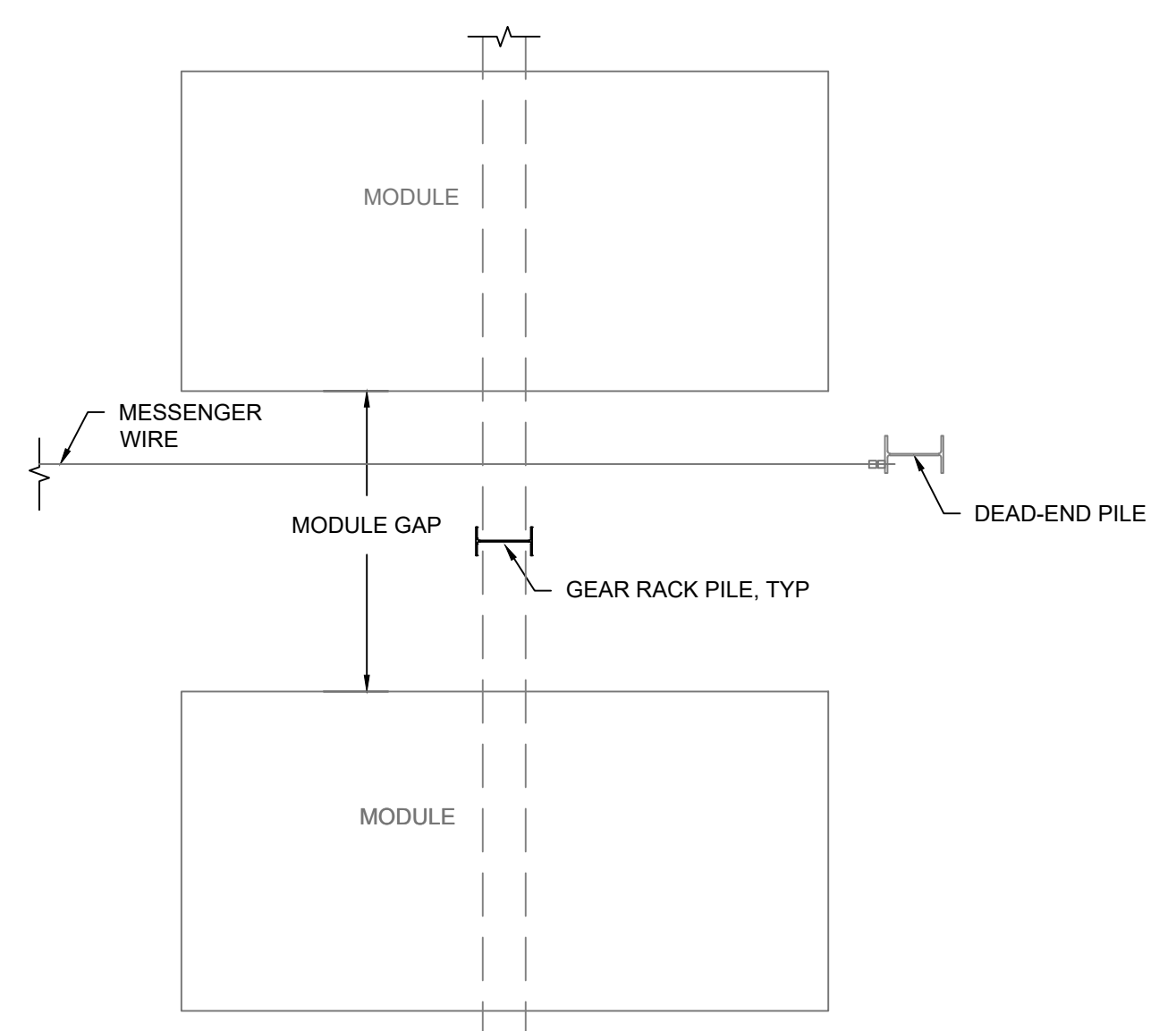
DIMENSIONS	
K	TO BE DETERMINED
L	TO BE DETERMINED



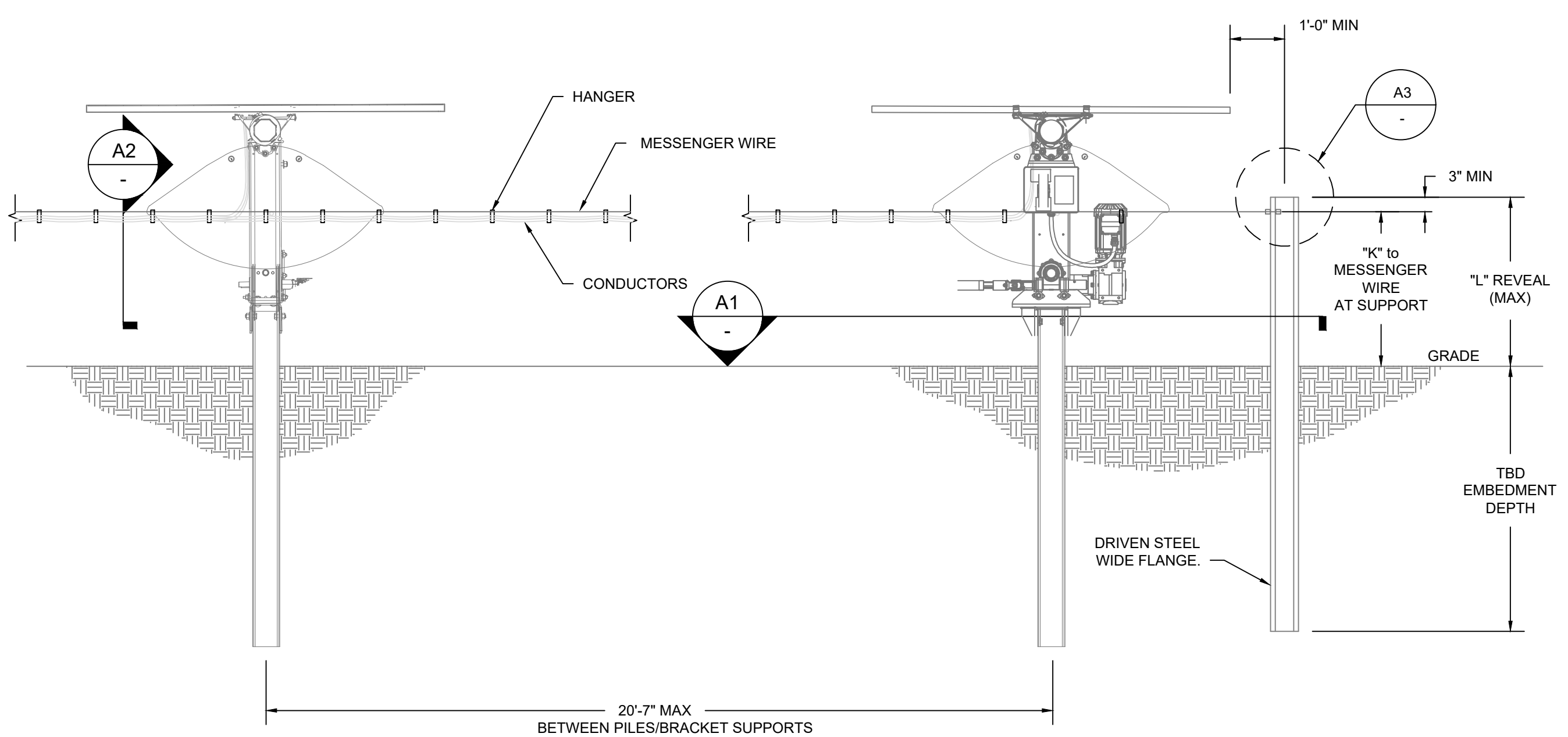
A2 SECTION
SCALE: NTS



A3 DEAD-END ASSEMBLY CONNECTION
SCALE: NTS



A1 PRELIMINARY E-W DEAD-END PILE LOCATION PLAN
SCALE: NTS



A PRELIMINARY E-W MESSENGER WIRE AND HANGER DEAD-END PILE FOUNDATION
SCALE: NTS



NOT FOR CONSTRUCTION
PRELIMINARY



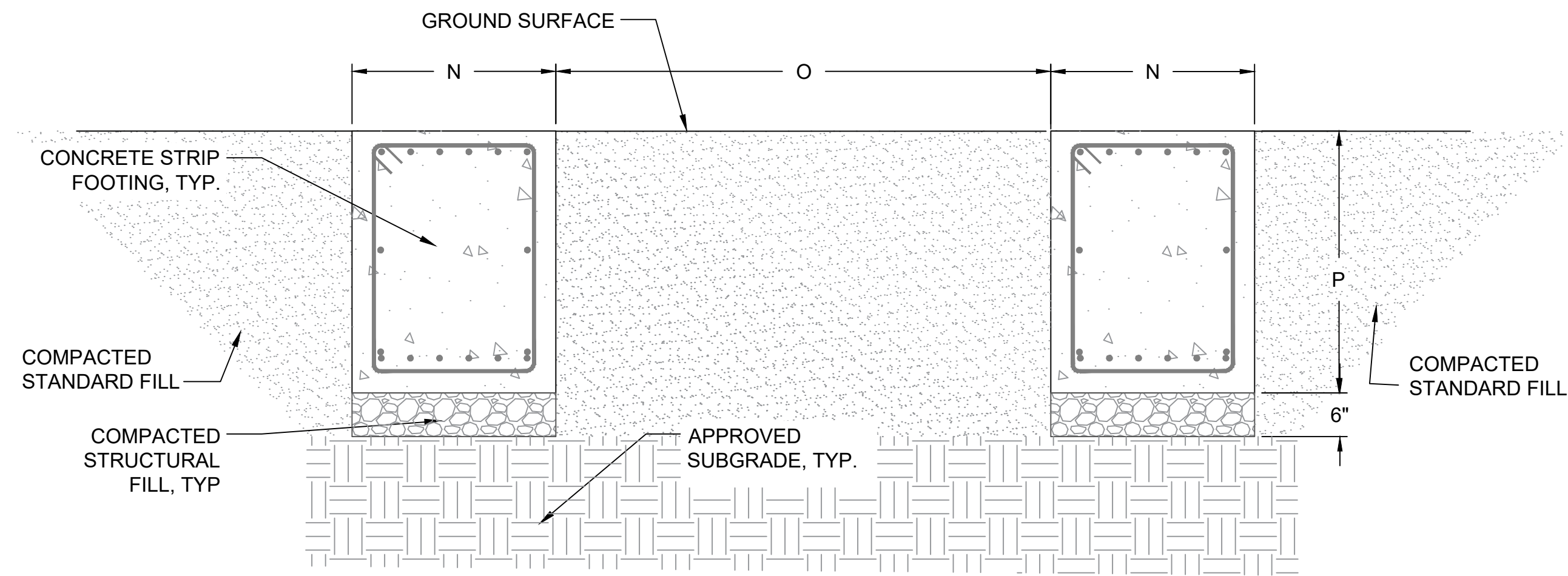
MARK	DATE	DESCRIPTION
A	06/07/24	CJP SUBMITTAL
TT		

HANKS CROSSING ENERGY, LLC
ADAMS COUNTY, COLORADO
HANKS CROSSING ENERGY, LLC
WIRE MANAGEMENT DETAILS

PROJ:	194-1265-0010
DESN:	G.FREEMAN
DRWN:	G.FREEMAN
CHKD:	S.ERNST/D.JOLIVET

C302

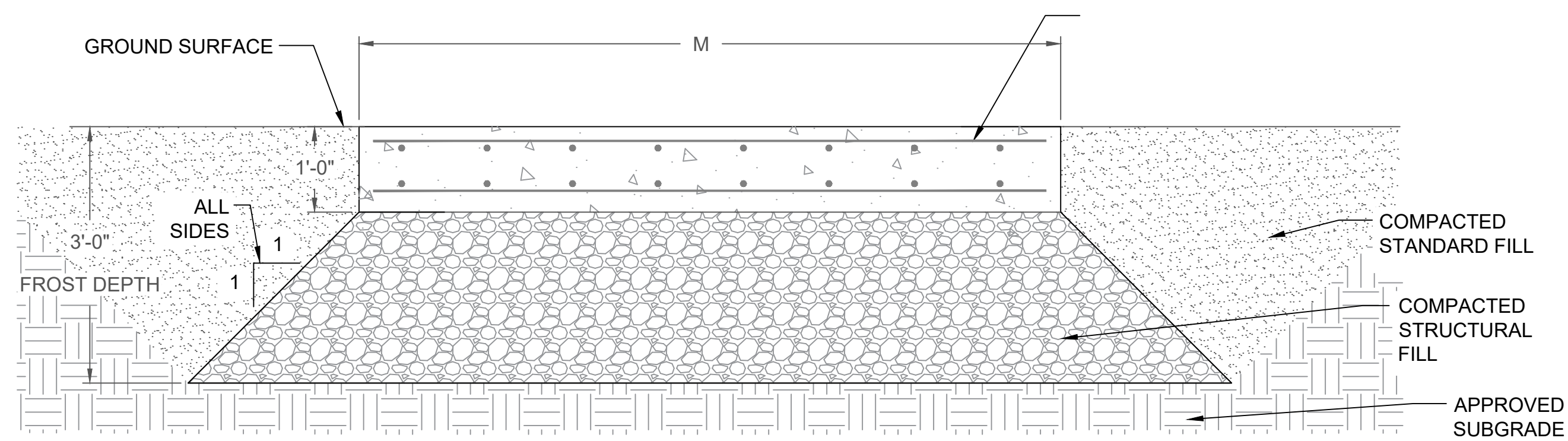
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NOTES:

1. IF THE NATIVE SOILS ARE FOUND TO BE OF SUFFICIENT STIFFNESS, NARROWER TRENCHES MAY BE EXCAVATED PRIOR TO FORMING/CASTING OF SUPPORT BEAMS

A BESS STRIP FOUNDATION
SCALE: NTS

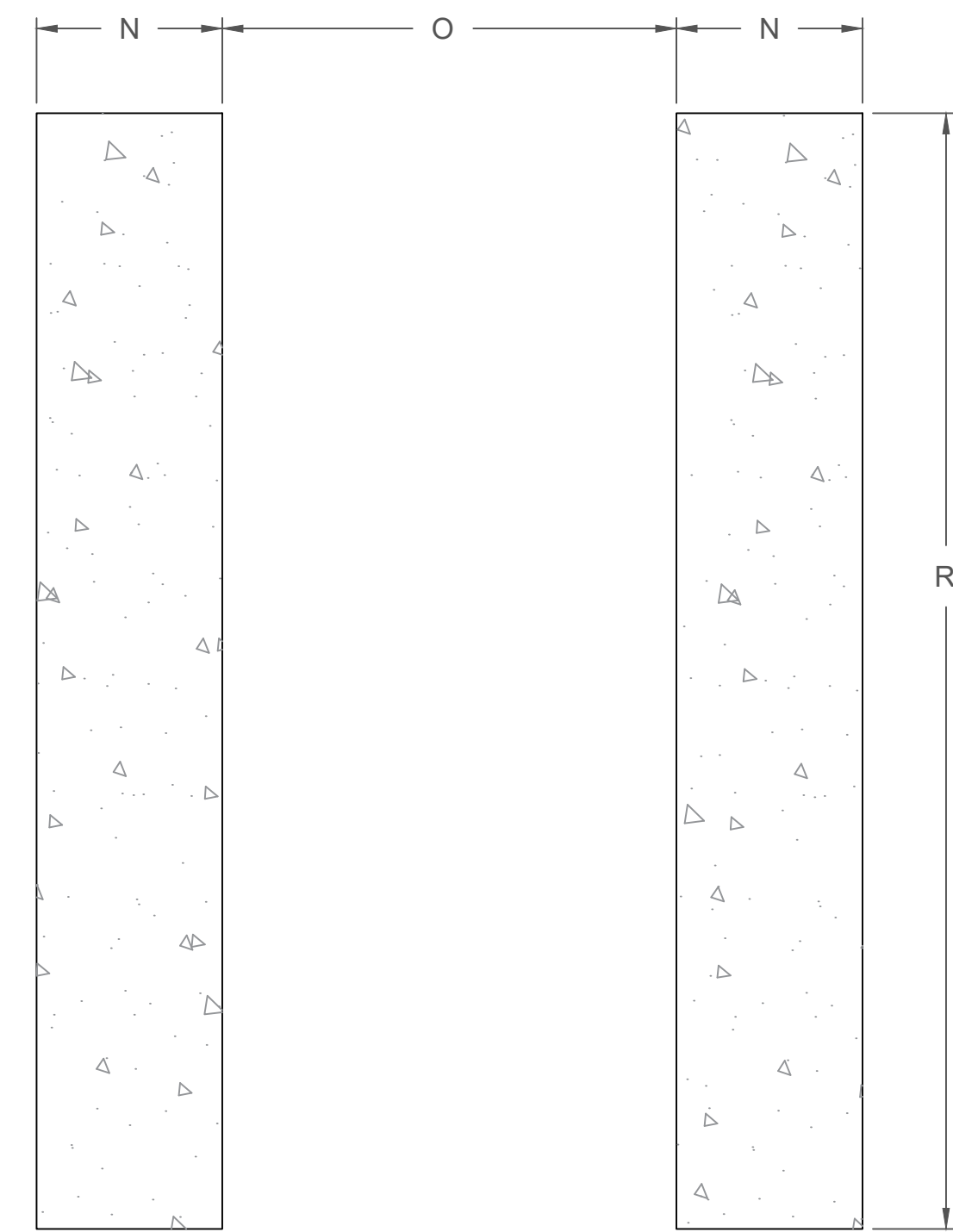


B ELECTRICAL EQUIPMENT SLAB ON GRADE
SCALE: NTS

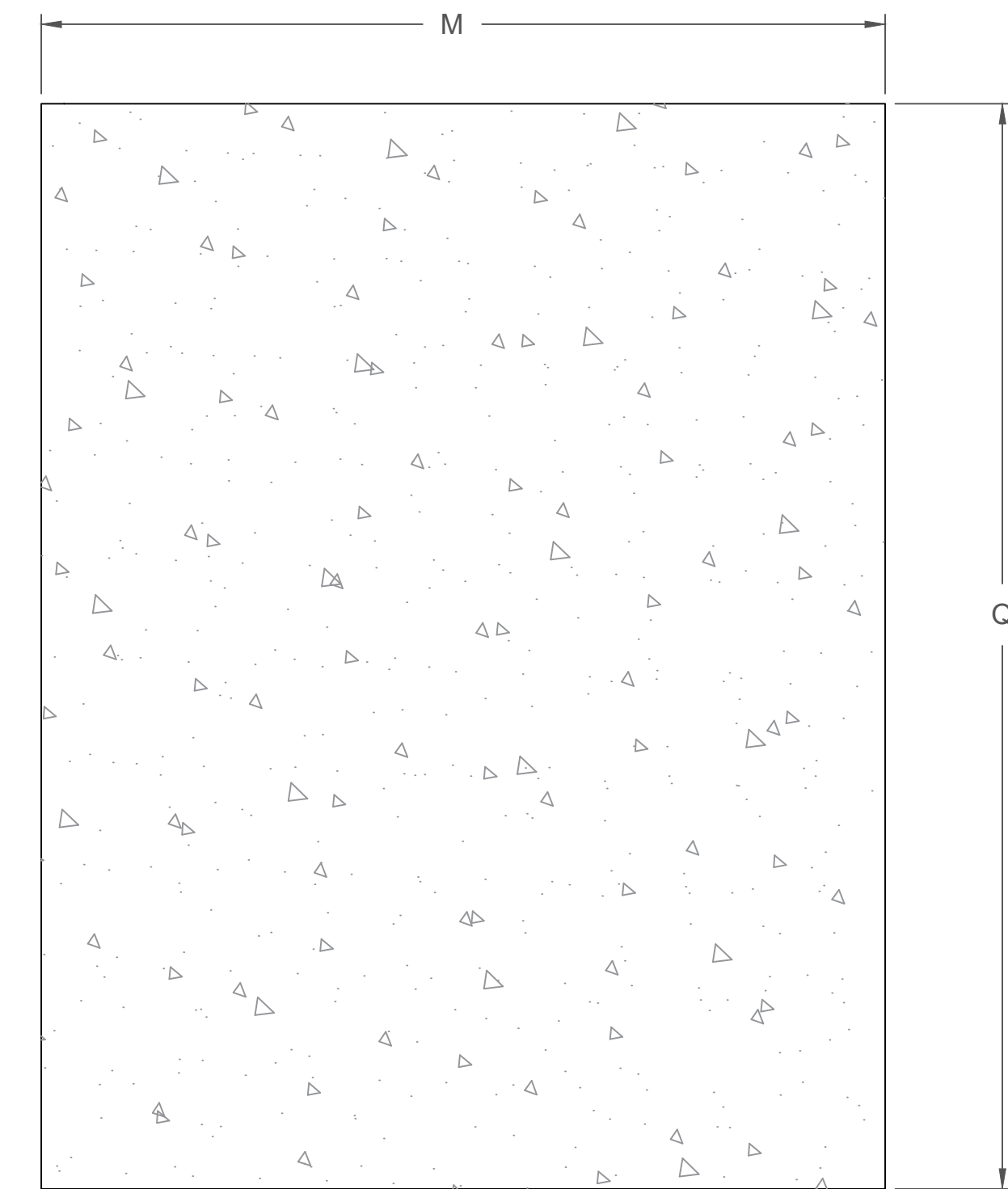
DIMENSIONS	
M	VARIABLE BASED ON EQUIPMENT SUPPORTED
N	MIN 18"
O	VARIABLE BASED ON EQUIPMENT SUPPORTED
P	MIN 36"
Q	VARIABLE BASED ON EQUIPMENT SUPPORTED
R	VARIABLE BASED ON EQUIPMENT SUPPORTED

NOTES:

1. FOUNDATION MINIMUM DIMENSIONS ARE BASED ON THE RECOMMENDATION OF THE GEOTECHNICAL REPORT PRODUCED FOR HANKS CROSSING ENERGY, LLC BY G2 CONSULTING GROUP ON FEB 14, 2024.
2. FOUNDATIONS ARE BASED TO BE CONFIRMED THRU STRUCTURAL DESIGN CALCULATIONS BASED ON THE RECOMMENDATIONS FOUND IN THE GEOTECHNICAL REPORT PRODUCED FOR HANKS CROSSING ENERGY, LLC BY G2 CONSULTING GROUP ON FEB 14, 2024.



1 ELECTRICAL EQUIPMENT SLAB ON GRADE (PLAN VIEW)
SCALE: NTS



2 ELECTRICAL EQUIPMENT SLAB ON GRADE (PLAN VIEW)
SCALE: NTS



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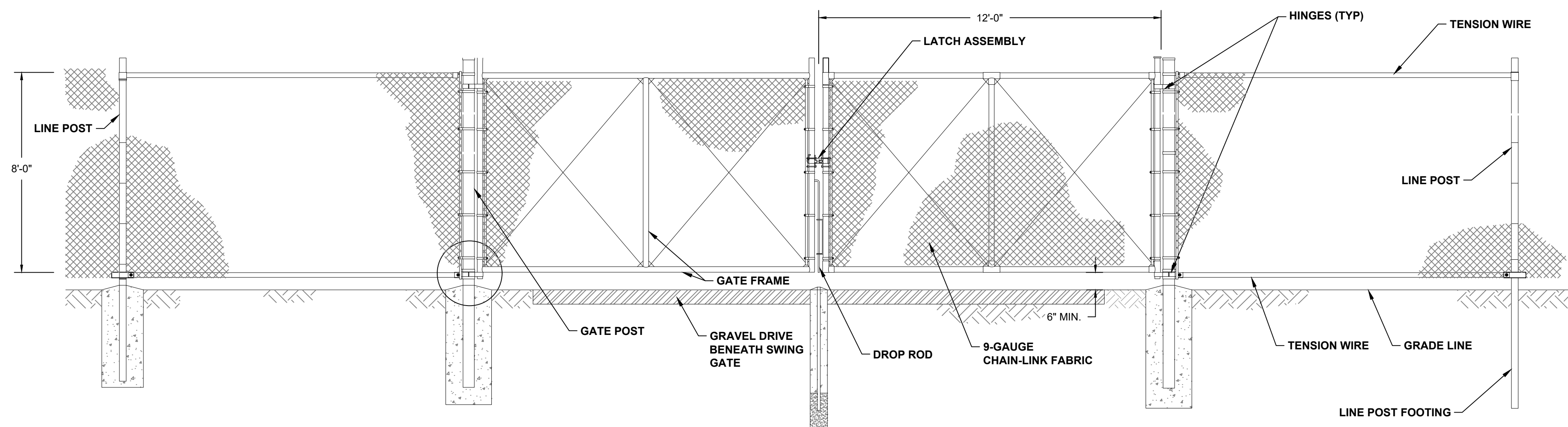
MARK	DATE	DESCRIPTION	BY	TT
A	06/07/24	CIP SUBMITTAL		

HANKS CROSSING ENERGY, LLC
ADAMS COUNTY, COLORADO
HANKS CROSSING ENERGY, LLC
BESS FDN & EQUIPMENT SLAB DETAILS

PROJ: 194-1265-0010
DESN: G.FREEMAN
DRWN: G.FREEMAN
CHKD: S.ERNST/D.JOLIVET

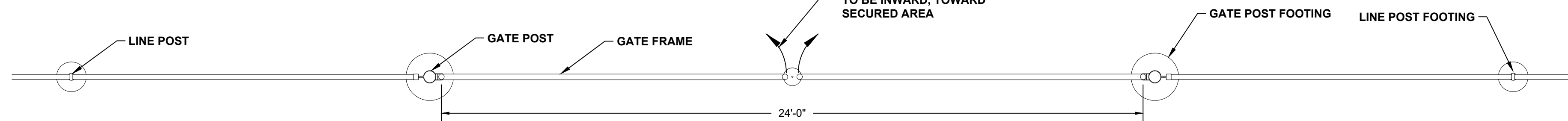
C303

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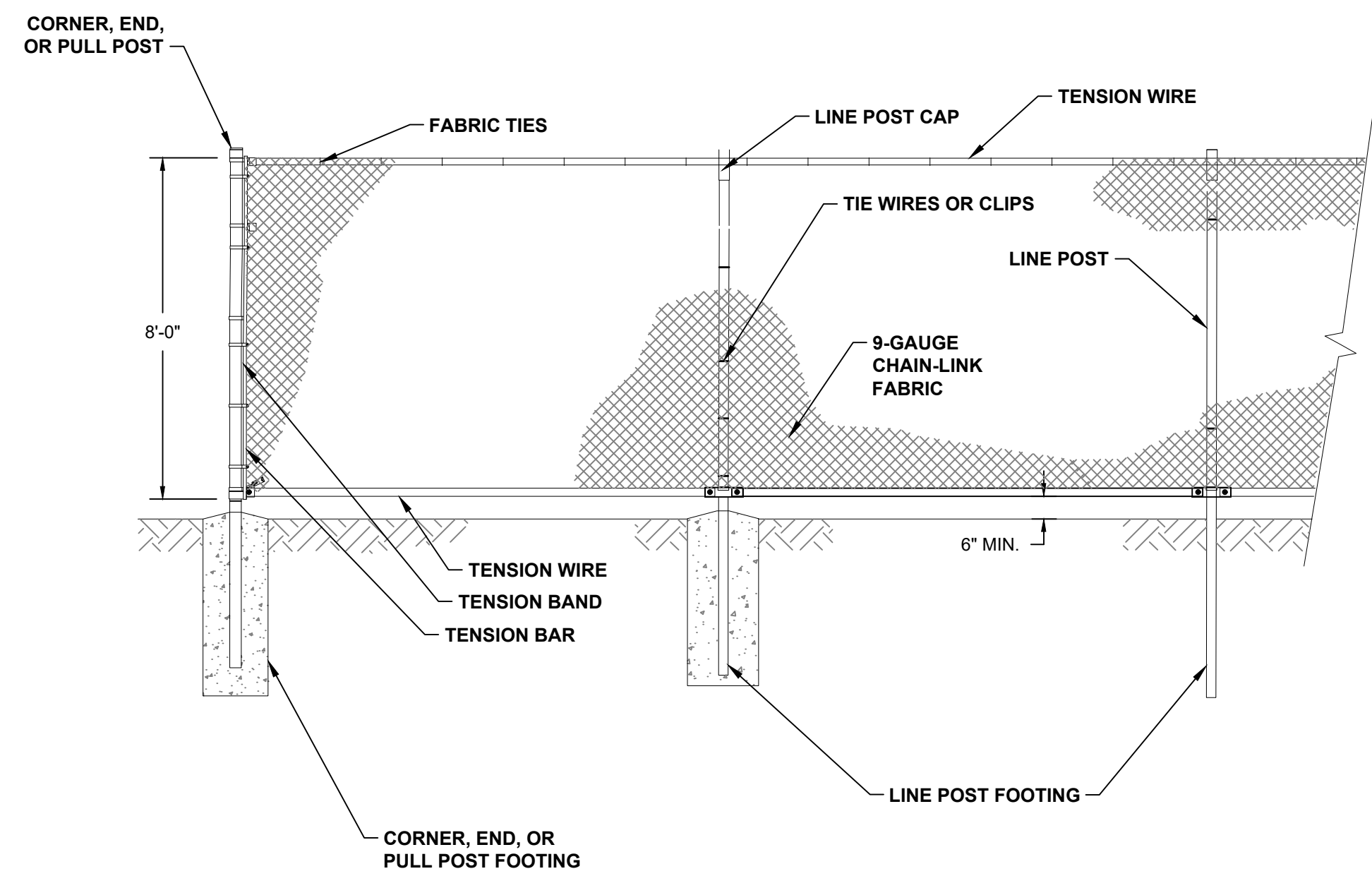


ELEVATION SCALE:
N.T.S.

DIRECTION OF GATE SWING TO BE INWARD, TOWARD SECURED AREA



PLAN VIEW SCALE:
N.T.S.



TYPICAL PERIMETER FENCE SCALE:
N.T.S.

FENCE & GATE NOTES:

1. PROPOSED FENCE DESIGN IS BASED ON CPW RECOMMENDATION.
2. SIZE AND DIMENSIONS OF THE FENCE AND GATE COMPONENTS SHOWN HEREON SHALL BE IN ACCORDANCE WITH THE CHAIN-LINK FENCE MANUFACTURER SPECIFICATIONS UNLESS OTHERWISE NOTED ON THIS DRAWING.
3. GROUNDING AND BONDING OF THE SECURITY FENCE SYSTEM SHALL BE IN ACCORDANCE WITH THE NATIONAL ELECTRIC CODE (NEC), NESC, PROJECT GROUNDING STUDY OR APPLICABLE STATE AND LOCAL CODE REQUIREMENTS.
4. INSTALL WIRE TIES, RAILS, POSTS, AND BRACES ON THE SECURE SIDE OF THE FENCE ALIGNMENT. PLACE CHAIN-LINK FABRIC ON THE OPPOSITE SIDE OF THE SECURE AREA.
5. DESIGN AND INSTALL GATE, LINE, CORNER, END, AND PULL POST CONCRETE FOOTINGS, AS REQUIRED, PER APPLICABLE CODES AND CHAIN-LINK FENCE MANUFACTURER SPECIFICATIONS AND RECOMMENDATIONS.
6. TOP SELVAGES TO BE TWISTED, BOTTOM SELVAGES TO BE KNUCKLED.
7. SIGNAGE SHALL BE AS REQUIRED BY CODE WITH DETAILS INCLUDING FACILITY NAME, OWNER, AND CONTACT PHONE NUMBER.
8. REQUIRED NEC SIGNAGE WILL BE POSTED ON PERIMETER FENCE AND GATES.
9. THE MAIN ENTRANCE SHALL HAVE A 12' DOUBLE SWING GATE.



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MARK	DATE	DESCRIPTION
A	06/07/24	CIP SUBMITTAL

HANKS CROSSING ENERGY, LLC
ADAMS COUNTY, COLORADO
HANKS CROSSING ENERGY, LLC
GENERAL DETAILS

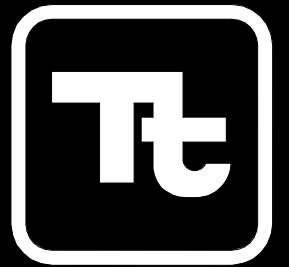
PROJ:	194-1265-0010
DESN:	M.SHORT
DRWN:	J.ZEIGLER
CHKD:	M.HARE

C400

HANKS CROSSING ENERGY, LLC

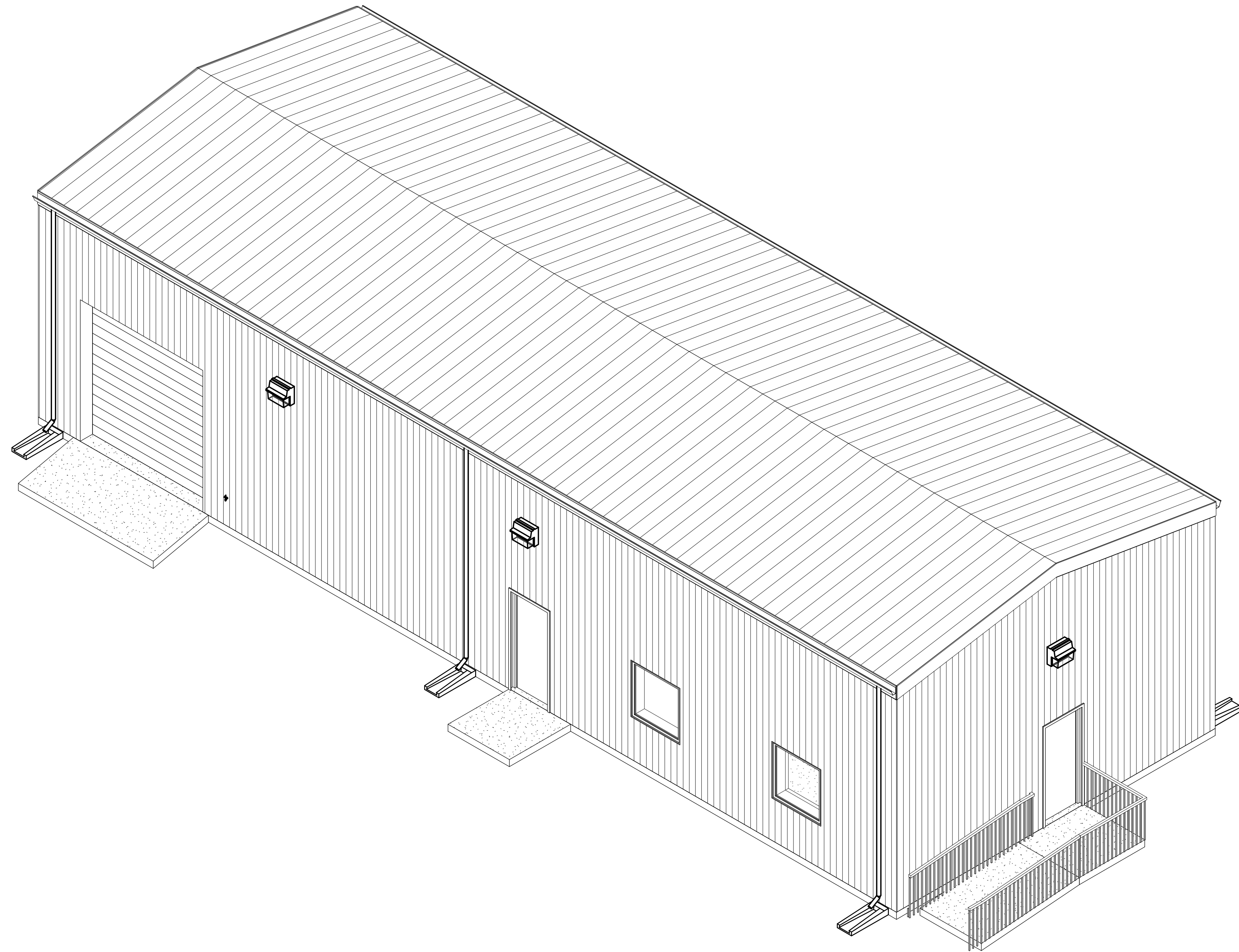
HANK'S CROSSING ENERGY PROJECT - OPERATIONS AND MAINTENANCE BUILDING

240 CONTINENTAL DRIVE, SUITE 200
NEWARK, DE 19713
TEL: (302) 738-7551 FAX: (302) 454-5980



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PROJECT LOCATION:

HANKS CROSSING ROAD
ADAMS COUNTY, CO

CLIENT INFORMATION:

HANKS CROSSING ENERGY,
LLC, A WHOLLY-OWNED
SUBSIDIARY OF NOVUS
RENEWABLES, LLC

Tt PROJECT No.:

213-67639-24001

CLIENT PROJECT No.:

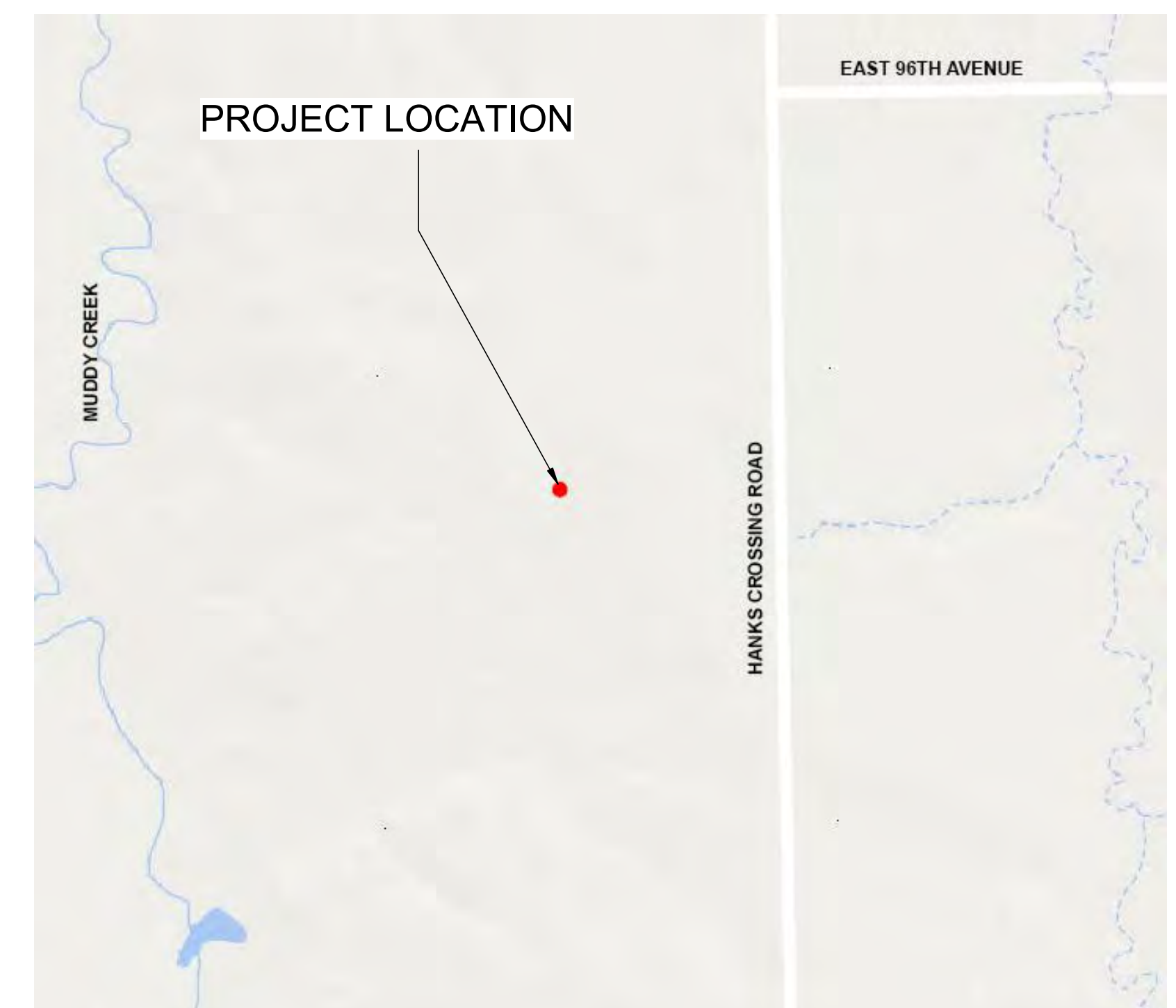
PROJECT DESCRIPTION / NOTES:

CONCEPTUAL DESIGN FOR PROJECT PERMIT (CUP)

ISSUED:

Project Status - NOT FOR CONSTRUCTION - Issue Date

VICINITY MAP:



GENERAL NOTES - ACCESSORY MOUNTING HEIGHTS

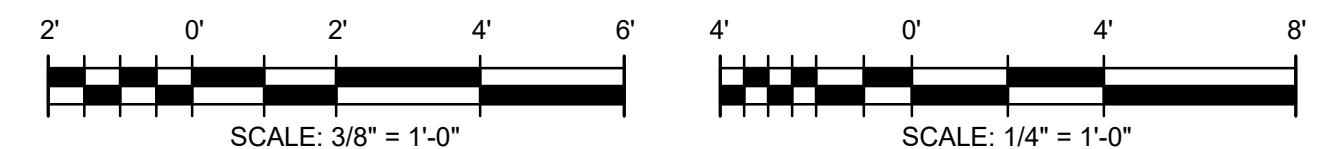
- IT IS THE INTENT OF THE DESIGN THAT ALL ITEMS SHOWN MOUNTED AT TYPICAL HEIGHTS FOR COMPLIANCE WITH GOVERNING AUTHORITY OF ADAAG, ABA, AND/OR ANSI 117.1 CURRENT EDITIONS
- THE PURPOSE OF THIS SHEET IS TO ILLUSTRATE TYPICAL MOUNTING HEIGHTS AND CLEARANCES - WHERE APPLICABLE - CAUTION: THIS SHEET MAY ILLUSTRATE ITEMS OR CONFIGURATIONS WHICH DO NOT OCCUR AS PART OF THE WORK. REFER TO PLANS, ELEVATIONS, SECTIONS AND SCHEDULES TO DETERMINE WHICH ITEMS AND CONFIGURATIONS APPLY TO THE WORK OF THIS PROJECT.
- PROVIDE IN-WALL BLOCKING AS REQUIRED FOR ALL SURFACE MOUNTED ACCESSORIES.

ANNOTATION CALLOUTS/ DRAWING SYMBOLS

- ◆ 1 A101 INTERIOR ELEVATION
- ◆ 1 A101 EXTERIOR ELEVATION
- ◆ X X-XXX SECTION
- ◆ X X-XXX PLAN, BLOW-UP DETAIL
- ◆ X X-XXX PLATE NUMBER WHERE SECTION/DETAIL IS DRAWN
- 1 SPOT ELEVATION
- 1 SHEET KEYNOTE
- ▬ P6 WALL TYPE
- ⊗ K1 KITCHEN APPLIANCE
- ⊗ EQ-00 TOILET ACCESSORY
- ⊗ W3638 CASEWORK TYPE
- ⊗ 101 DOOR NUMBER
- ⊗ 1i WINDOW TYPE
- Room Name 000 ROOM NAME / NUMBER / AREA
- 150 SF
- △ 1 REVISION TAG
- 1 VIEW NAME SCALE: 1/8" = 1'-0"
- VIEW TITLE FOR ALL VIEWS BEING REFERENCED (SECTIONS, DETAILS, ENLARGED PLANS, ELEVATIONS, ETC.)
- 1 VIEW NAME SCALE: 1/8" = 1'-0"
- VIEW TITLE FOR PLANS
- ⊕ NORTH ARROW
- ⊕ GRID / COLUMN LINE DESIGNATOR
- 0 4 8 16 GRAPHIC SCALE SCALE: 1/8" = 1'-0"

MATERIAL HATCH LEGEND

	CONCRETE		STEEL
	CMU		RIGID INSULATION
	GROUT		ACOUSTICAL TILE
	WOOD STUDS, BLOCKING		BATT INSULATION
	EARTHWORK		GRAVEL



Bar measures 1 inch, otherwise drawing is not to scale

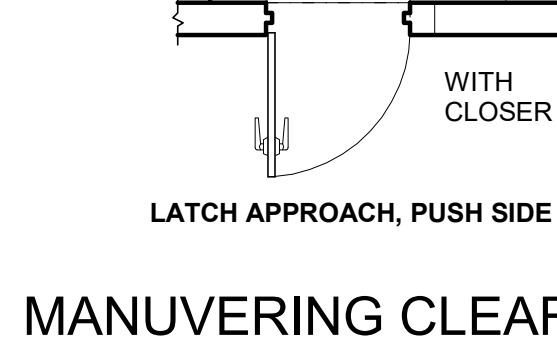
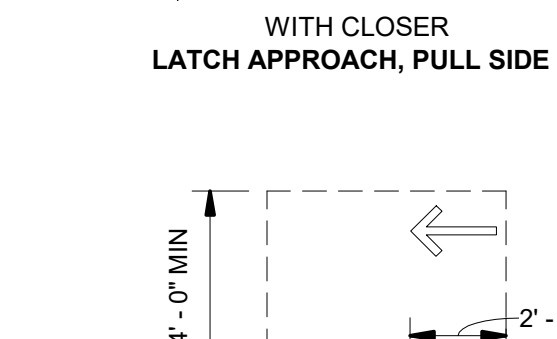
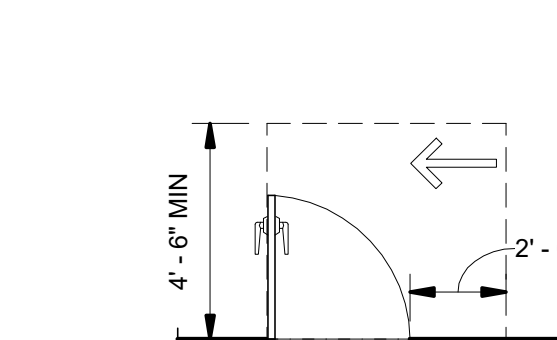
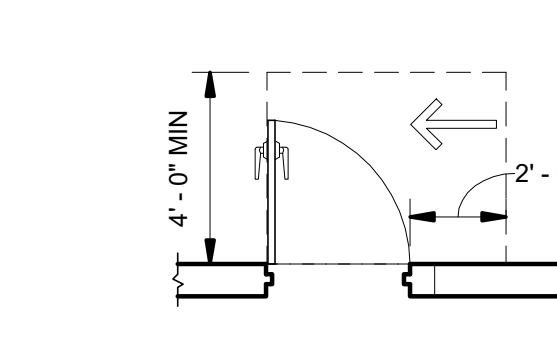
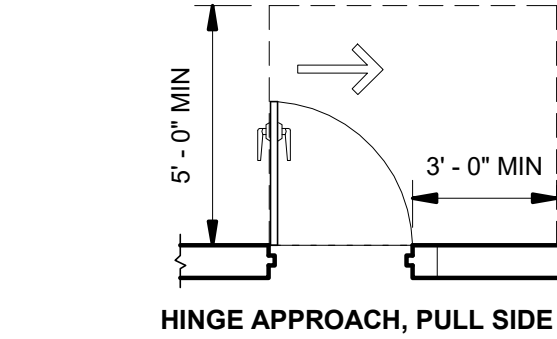
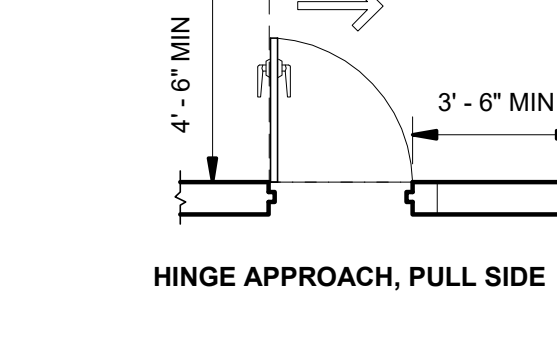
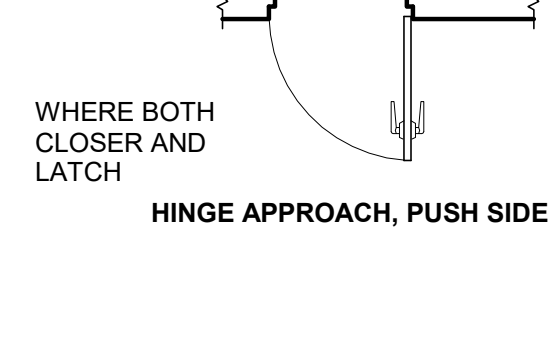
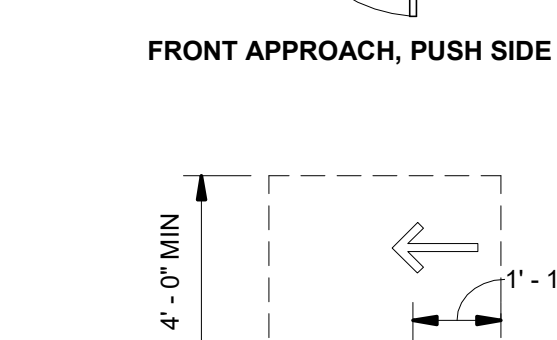
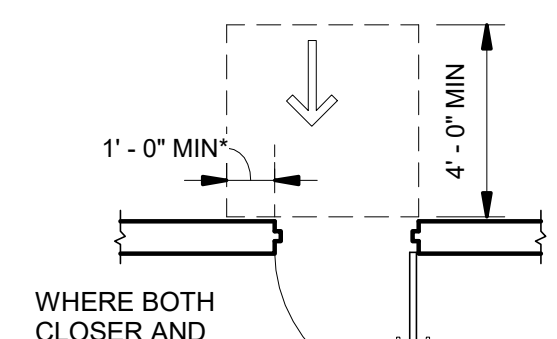
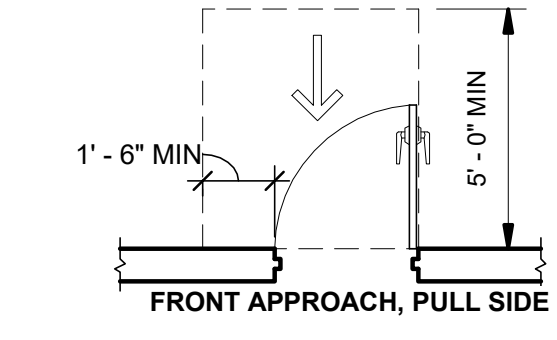
Project Status
NOT FOR CONSTRUCTION

MARK	DATE	DESCRIPTION

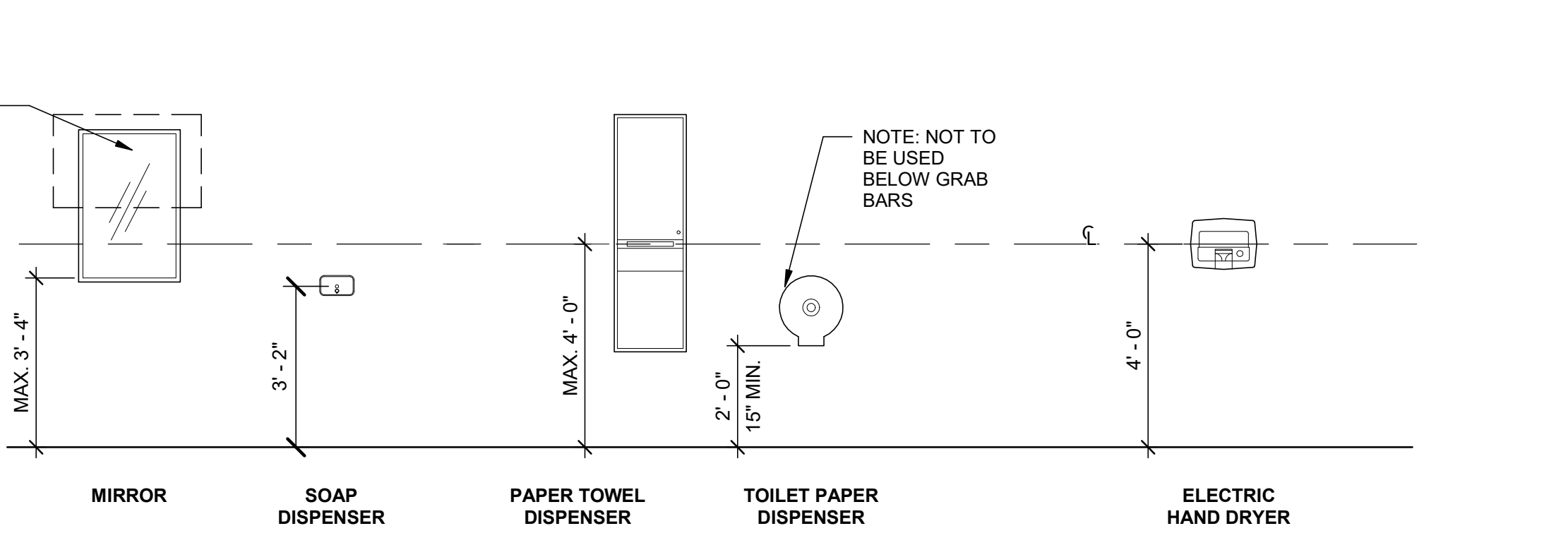
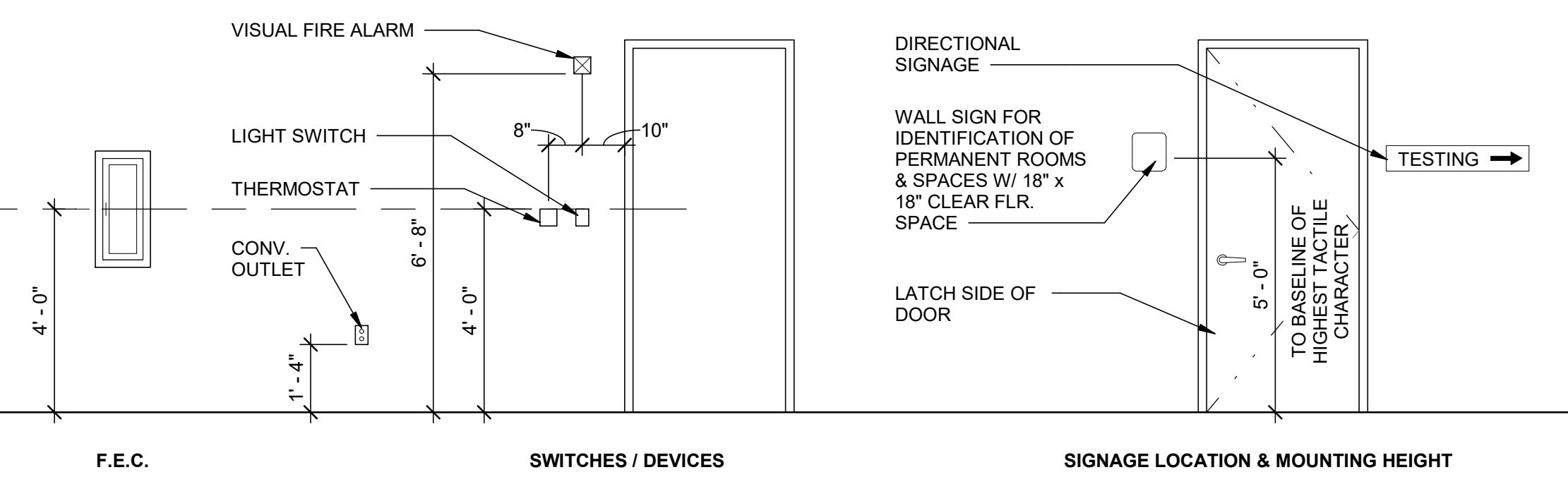
HANKS CROSSING ENERGY, LLC
HANK'S CROSSING ENERGY PROJECT - OPERATIONS AND MAINTENANCE BUILDING
ARCHITECTURAL STANDARDS

PROJ:	213-67839-24001
DESN:	LD
DRWN:	BE
CHKD:	LD

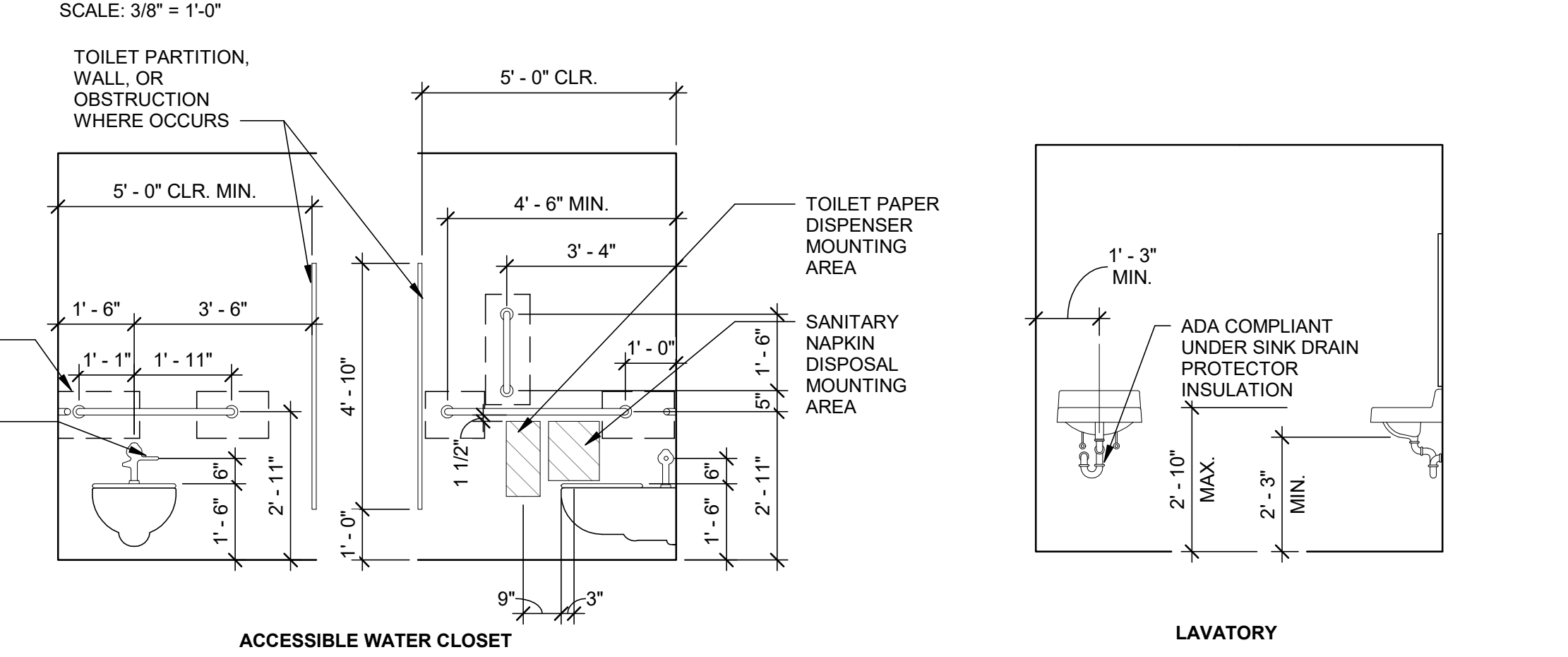
A-002



MANEUVERING CLEARANCE
SCALE: 1/4" = 1'-0"



TOILET ACCESSORIES, DEVICES, AND EQUIPMENT MOUNTING HEIGHT



MOUNTING HEIGHTS
SCALE: 3/8" = 1'-0"

BUILDING CODE AND LIFE SAFETY ANALYSIS

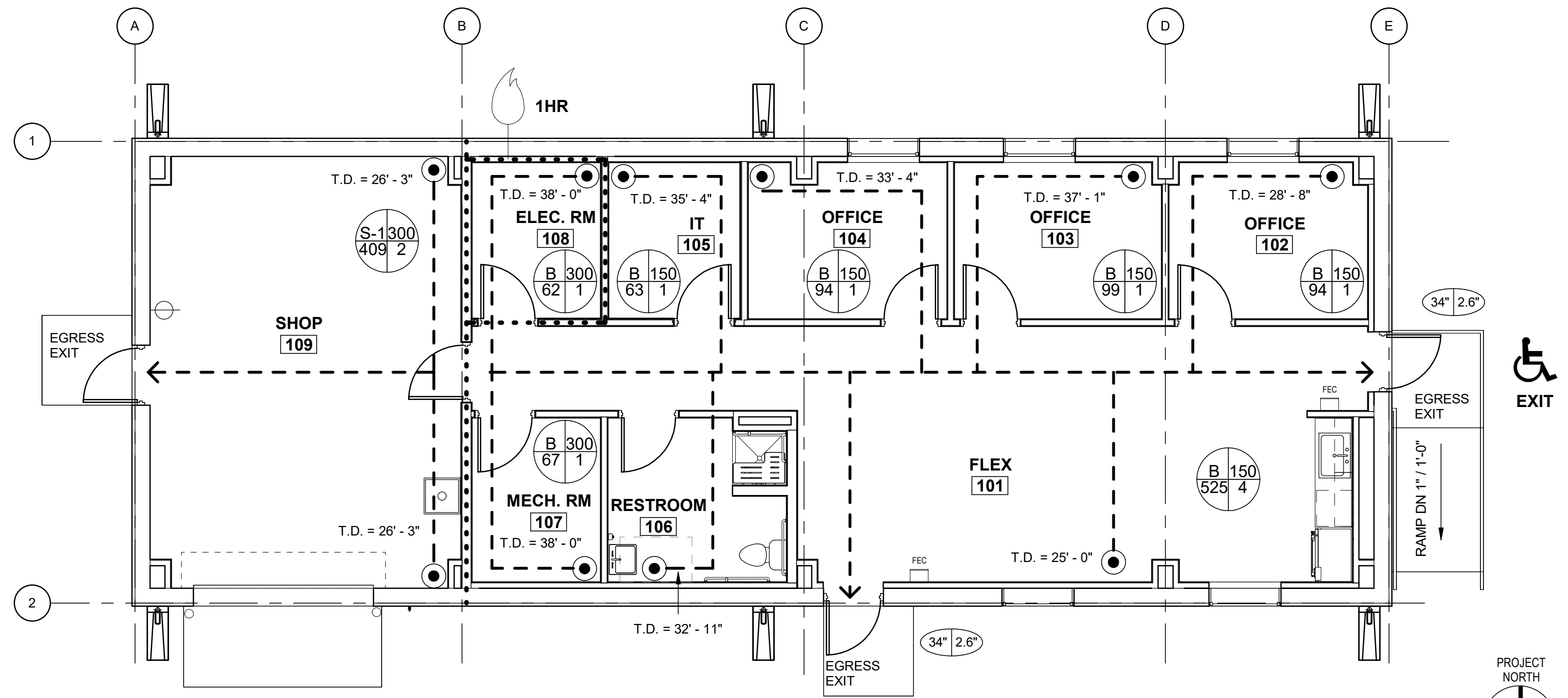
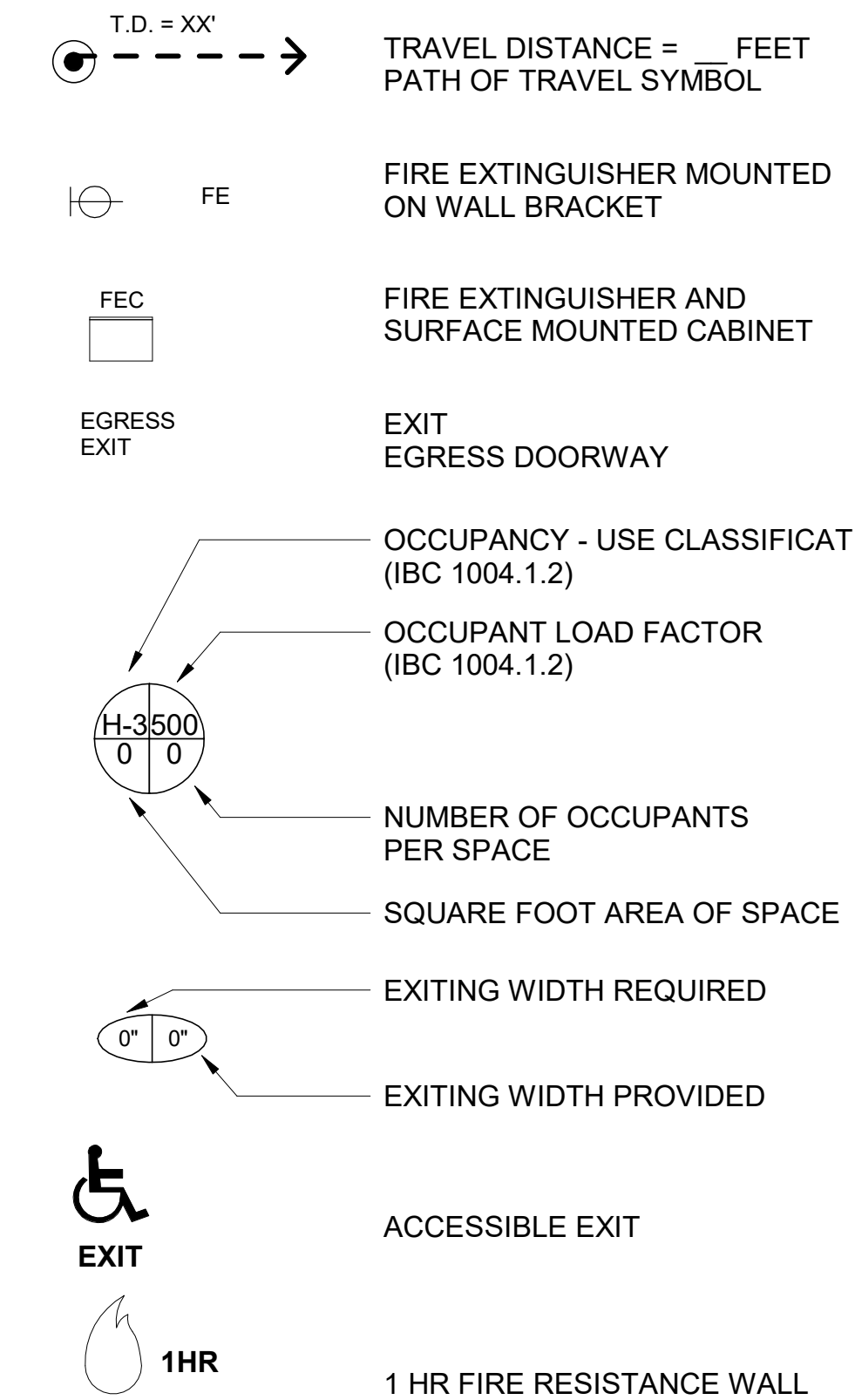
APPLICABLE BUILDING CODES

LIFE SAFETY LEGEND

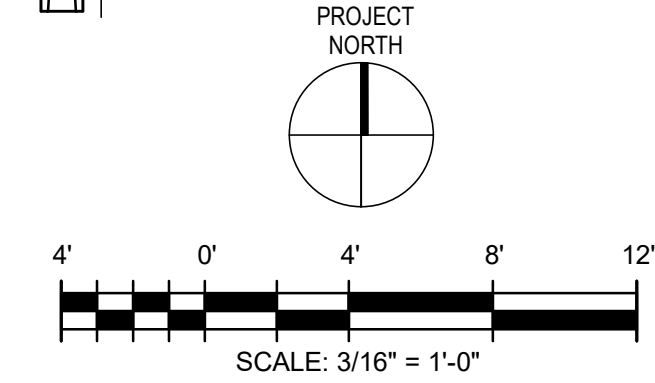
SUMMARY		
THE 1820SF OPERATIONS AND MAINTENANCE, PRE-ENGINEERED METAL BUILDING, IS CLASSIFIED AS BUSINESS (B) FOR THE OFFICE, FLEX, IT, MECHANICAL, AND ELECTRICAL AREAS. THE BUILDING PROGRAM INCLUDES A SHOP ROOM WITH AN ELECTRIC POWERED OVERHEAD DOOR. THE HIGHER HAZARD SHOP AREA IS CLASSIFIED AS STORAGE (S-1) AND IS SEPARATED BY A 1-HOUR FIREWALL FROM THE BUSINESS (B) LAYOUT. THE ELECTRICAL ROOM IS ALSO A 1-HOUR RATED SPACE. BUILDING MATERIALS INCLUDE INSULATED METAL WALL PANEL, STANDING SEAM METAL ROOF, ALUMINUM WINDOWS AND A DOWNSPOUT AND GUTTER SYSTEM. PER THE ADAMS COUNTY, COLORADO BUILDING CODE (IBC 2021), THE EXTERIOR WALLS HAVE AN R-VALUE OF R13 + R14CI. THE ROOF HAS AN R-VALUE OF R30CI AND THE WALLS BELOW GRADE ARE R7.5CI.	(IBC 304.1)	
SPECIAL REQUIREMENTS BASED ON OCCUPANCY	N/A	
GENERAL BUILDING LIMITATIONS		
USE GROUP B	(IBC TABLE 503)	
NUMBER OF STORIES PERMITTED	3 STORIES	(IBC TABLE 504.4)
PLANNED BUILDING STORIES	1 STORIES	
TOTAL AREA PERMITTED	23,000 SF	(IBC TABLE 506.2)
PLANNED BUILDING AREA	1,820 SF	
BUILDING HEIGHT PERMITTED	55 FT	(IBC TABLE 504.3)
PLANNED BUILDING HEIGHT	18'-2"	
SEPARATION OF OCCUPANCIES	1 HR	(NFPA 101 - 8.7.1.1)
INCIDENTAL USE	N/A	(IBC 509)
TYPE OF CONSTRUCTION		
TYPE "IB" NON-COMBUSTIBLE	(IBC 601)	
FIRE-RESISTANT CONSTRUCTION		
BUILDING ELEMENTS - FIRE-RESISTANCE RATING	(IBC TABLE 601)	
PRIMARY STRUCTURAL FRAMING	0 HR	
BEARING WALLS - EXTERIOR	0 HR	
BEARING WALLS - INTERIOR	0 HR	
NON-BEARING WALLS AND PARTITIONS - INTERIOR	0 HR	
FLOOR CONSTRUCTION AND ASS. SECONDARY	0 HR	
ROOF CONSTRUCTION AND ASS. SECONDARY	0 HR	
FIRE SEPARATION DISTANCE	X > 30 FT	(IBC TABLE 705.5)
MAX AREA OF EXTERIOR OPENINGS	NOT REQUIRED	(IBC TABLE 705.8)
FIRE WALLS	N/A	(IBC TABLE 706.4)
FIRE BARRIERS	1 HR.	(NFPA 101 - 8.7.1.1)
FIRE PARTITIONS	N/A	(IBC 708)
SMOKE BARRIERS	N/A	(IBC 709)
SMOKE PARTITIONS	N/A	(IBC 710)
SHAFT ENCLOSURES	N/A	(IBC 713.4)
INTERIOR WALL & CEILING FINISHES - EXITS	CLASS A	(IBC TABLE 803.13)
INTERIOR WALL & CEILING FINISHES - CORRIDORS	CLASS B	(IBC TABLE 803.13)
INTERIOR WALL & CEILING FINISHES - ROOMS	CLASS C	(IBC TABLE 803.13)
FLOOR FINISHES	CLASS II	(IBC 804)
FIRE PROTECTION SYSTEMS		
AUTOMATIC SPRINKLER SYSTEM	N/A	(IBC 903.2)
STANDPIPE SYSTEM	N/A	(IBC 905.3, NFPA 14)
FIRE EXTINGUISHERS	CLASS A, 4A-60B-C	(IBC 906.3, NFPA 10)
FIRE ALARM & DETECTION SYSTEM	REQUIRED, PROVIDED MANUAL	(IBC 907.2.2, NFPA 101)
MEANS OF EGRESS / EXITS		
REQUIRED EXIT WIDTH / OCCUPANTS - DOORS, OTHER (#OCC. X.2 INCHES)	2.6 INCHES	(IBC 1005)
ACCESSIBLE MEANS OF EGRESS	2 REQUIRED / 3 PROVIDED	(IBC 1009)
MAX. COMMON PATH OF EGRESS	100 FEET	(IBC TABLE 1006.2.1)
MAX. EXIT ACCESS TRAVEL DISTANCE	200 FEET	(IBC TABLE 1017.2)
CORRIDOR FIRE-RESISTANCE RATING	1 HR	(IBC TABLE 1020.1)
MIN. CORRIDOR WIDTH	44 INCHES	(IBC TABLE 1020.2)
MAX. CORRIDOR DEAD END	50 FEET	(IBC 1020.4)
EXITS	2 REQUIRED / 3 PROVIDED	(IBC TABLE 1006.3.3)
PLUMBING FIXTURES		
WATER CLOSETS	1 REQUIRED / 1 PROVIDED	(IBC TABLE 2902.1)
LAVATORIES	1 REQUIRED / 1 PROVIDED	(IBC TABLE 2902.1)

OCCUPANCY SCHEDULE				
ROOM NO	ROOM NAME	AREA	OCC. LOAD FACTOR	OCC. LOAD
101	FLEX	525 SF	B= 1/150	4
102	OFFICE	94 SF	B= 1/150	1
103	OFFICE	99 SF	B= 1/150	1
104	OFFICE	94 SF	B= 1/150	1
105	IT	63 SF	B= 1/150	1
107	MECH. RM	65 SF	B=1/300	1
108	ELEC. RM	62 SF	B=1/300	1
109	SHOP	409 SF	S-1 = 1/300	2
TOTAL:		1412 SF		12

OCCUPANCY SCHEDULE				
ROOM NO	ROOM NAME	AREA	OCC. LOAD FACTOR	OCC. LOAD
101	FLEX	525 SF	B= 1/150	4
102	OFFICE	94 SF	B= 1/150	1
103	OFFICE	99 SF	B= 1/150	1
104	OFFICE	94 SF	B= 1/150	1
105	IT	63 SF	B= 1/150	1
107	MECH. RM	65 SF	B=1/300	1
108	ELEC. RM	62 SF	B=1/300	1
109	SHOP	409 SF	S-1 = 1/300	2
TOTAL:		1412 SF		12



1 LIFE SAFETY PLAN
A-003 SCALE: 3/16" = 1'-0"



TETRA TECH
www.tetra.tech.com
240 CONTINENTAL DRIVE, SUITE 200
NEWARK, DE 19713
TEL: (302) 738-7551 FAX: (302) 454-9590

Project Status
NOT FOR CONSTRUCTION

BY	DATE	DESCRIPTION

HANKS CROSSING ENERGY, LLC
HANKS CROSSING ENERGY PROJECT -
OPERATIONS AND MAINTENANCE BUILDING
ARCHITECTURAL CODE REVIEW

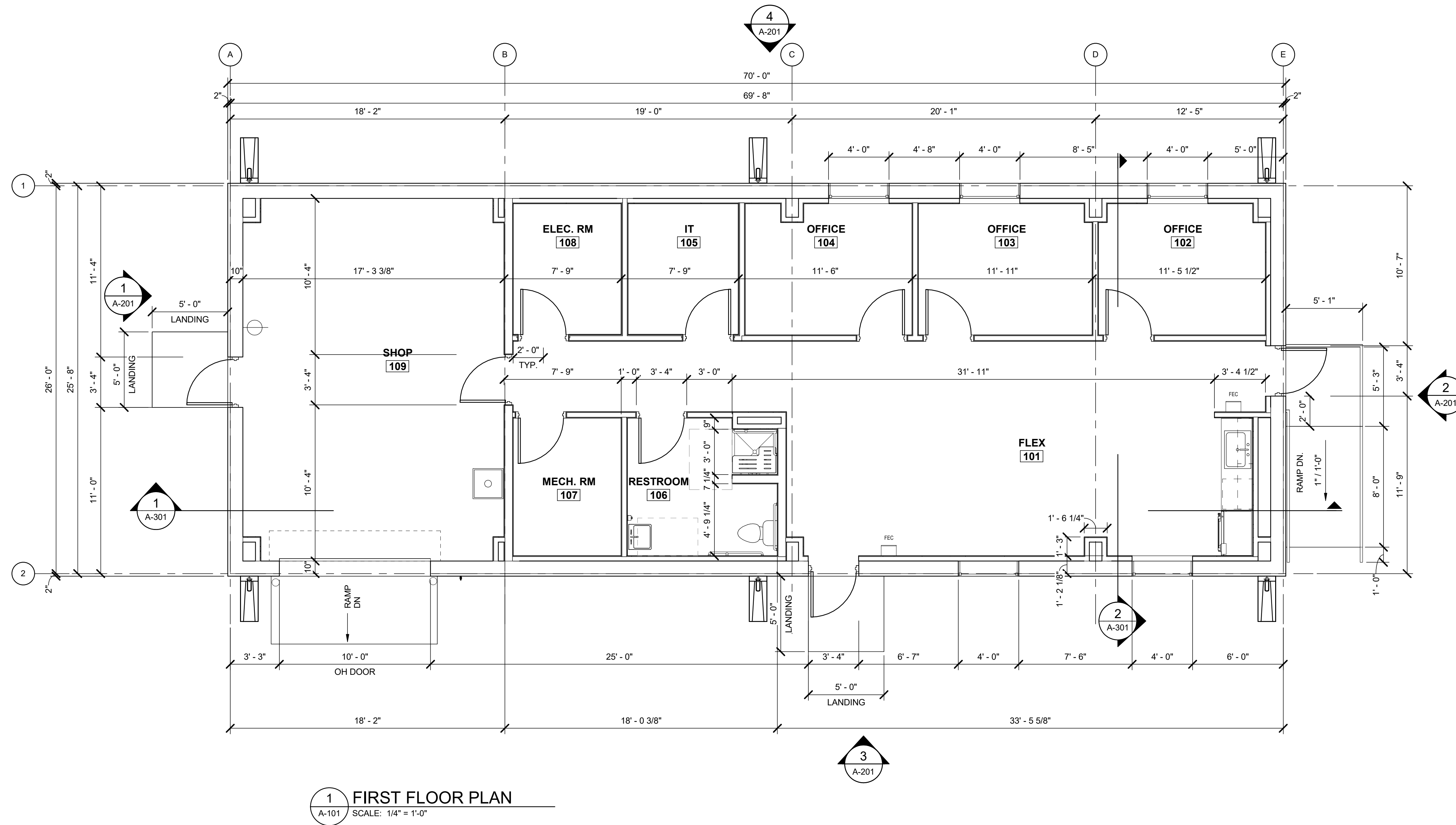
PROJ: 213-67639-24001
DESN: LD
DRWN: BE
CHKD: LD

A-003

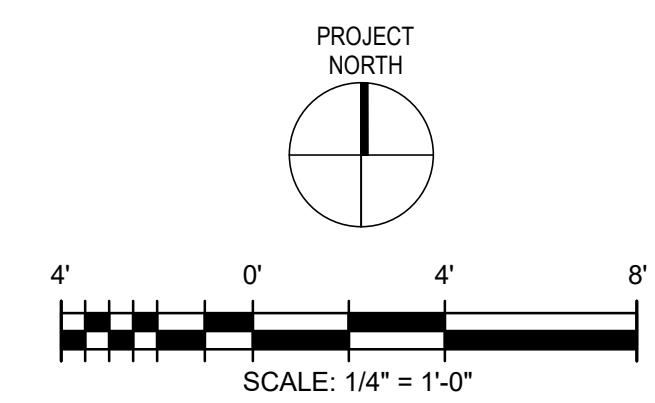
6/12/2024 10:21:30 AM C:\Users\TATYANA.MOURAD\Documents\NOVIS_MODEL_TATYANA.MOURAD.rvt

GENERAL NOTES - FLOOR PLAN

- REFER TO SHEETS A-001 AND A-002 FOR GENERAL NOTES, SYMBOLS, LEGENDS AND STANDARDS AND TYPICAL MOUNTING HEIGHTS.



1 FIRST FLOOR PLAN
 A-101 SCALE: 1/4" = 1'-0"



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 240 CONTINENTAL DRIVE, SUITE 200
 NEWARK, DE 19713
 TEL: (907) 798-7551 FAX: (302) 454-9980

Project Status
 NOT FOR CONSTRUCTION

MARK	DATE	DESCRIPTION

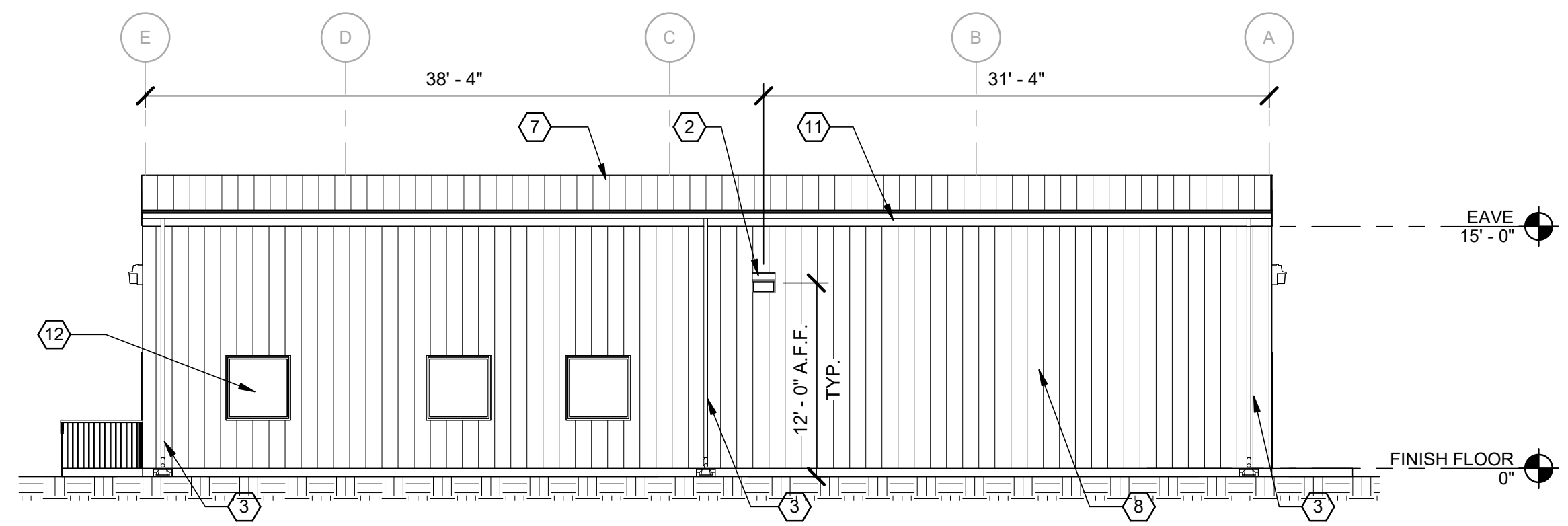
HANKS CROSSING ENERGY, LLC
 HANK'S CROSSING ENERGY PROJECT -
 OPERATIONS AND MAINTENANCE BUILDING
ARCHITECTURAL FLOOR PLAN

PROJ:	213-67639-24001
DESN:	LD
DRWN:	BE
CHKD:	LD

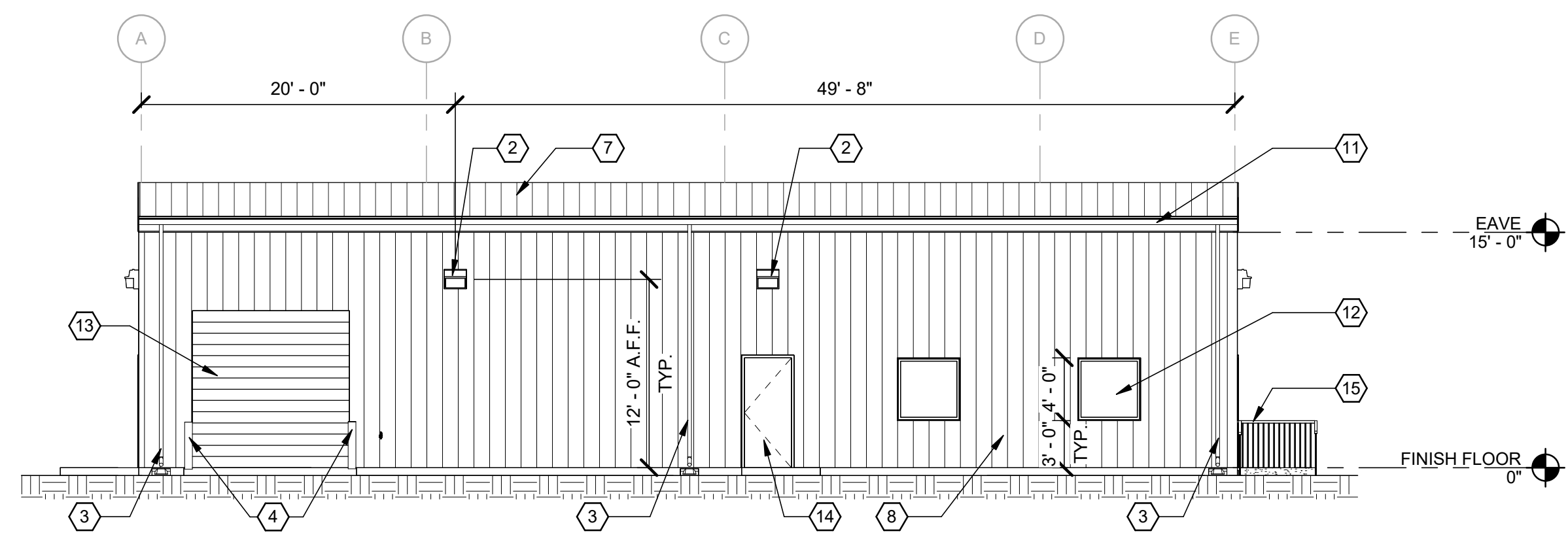
A-101

Copyright: Tetra Tech

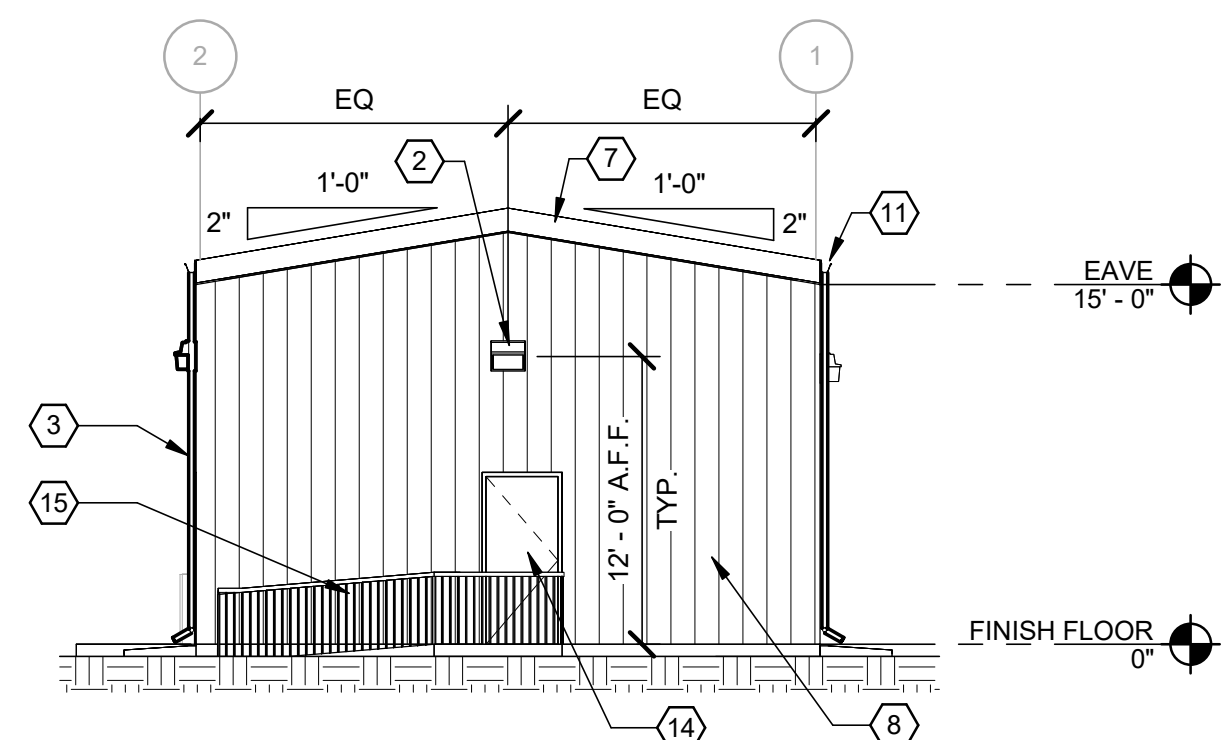
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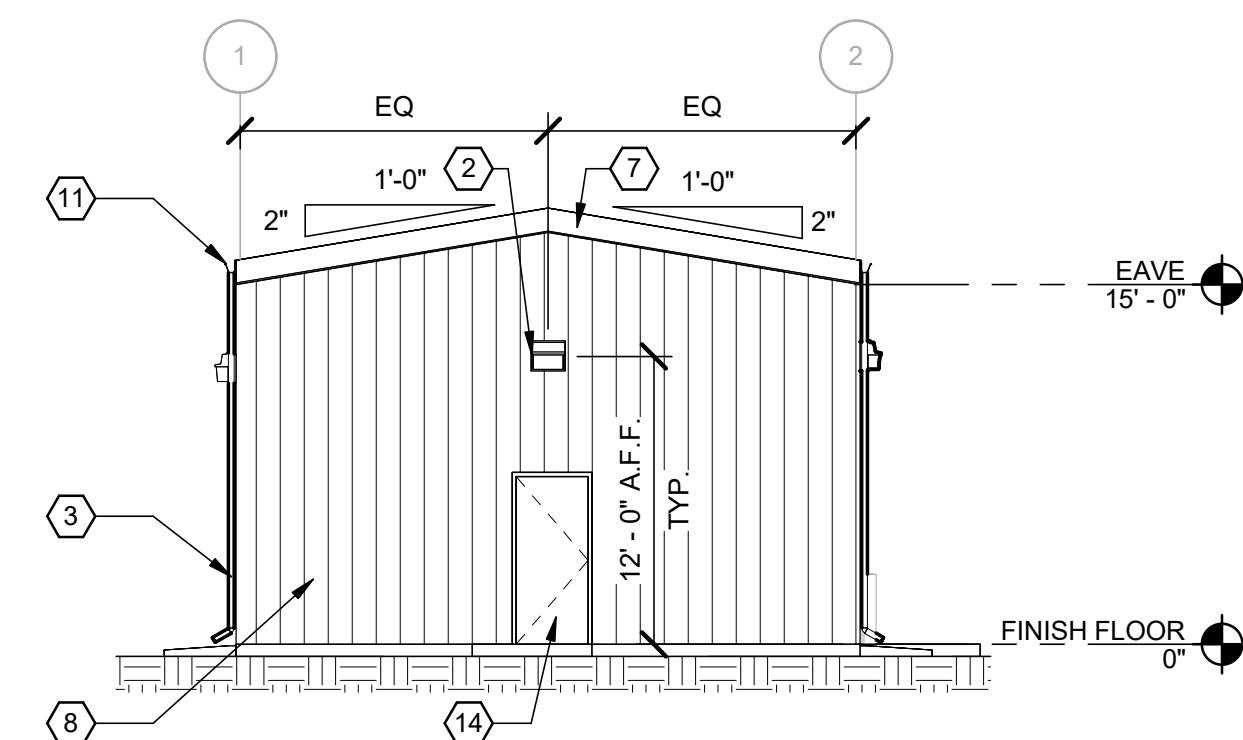
4 NORTH ELEVATION
A-201 SCALE: 1/8" = 1'-0"



3 SOUTH ELEVATION
A-201 SCALE: 1/8" = 1'-0"



2 EAST ELEVATION
A-201 SCALE: 1/8" = 1'-0"



1 WEST ELEVATION
A-201 SCALE: 1/8" = 1'-0"

KEYNOTES

- 2 PROVIDE NEW LED WALL PACK
- 3 PRE-FINISHED METAL DOWNSPOUT - DOWNSPOUTS TO TERMINATE AT CONCRETE SPLASH BLOCK
- 4 PROVIDE 6" DIA. CONC. FILLED SCH 40 PIPE BOLLARD; HDPE YELLOW PLASTIC COVER
- 7 PRE-FINISHED METAL ROOF PANEL
- 8 PRE-FINISHED METAL WALL PANEL
- 11 PRE-FINISHED GUTTER
- 12 1" INSULATED GLASS WINDOW
- 13 PRE-FINISHED INSULATED OVERHEAD COILING DOOR
- 14 INSULATED PAINTED HOLLOW METAL DOOR AND FRAME
- 15 PAINTED GUARDRAIL/HANDRAIL

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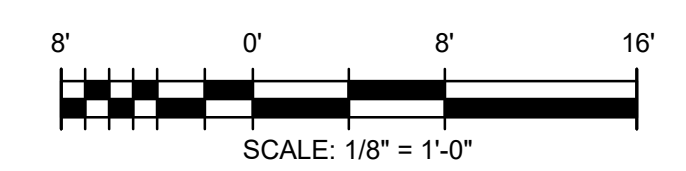
Project Status
NOT FOR CONSTRUCTION

MARK	DATE	DESCRIPTION	BY

HANKS CROSSING ENERGY, LLC
HANK'S CROSSING ENERGY PROJECT - OPERATIONS AND MAINTENANCE BUILDING
EXTERIOR ELEVATIONS

PROJ:	213-67639-24001
DESN:	LD
DRWN:	BE
CHKD:	LD

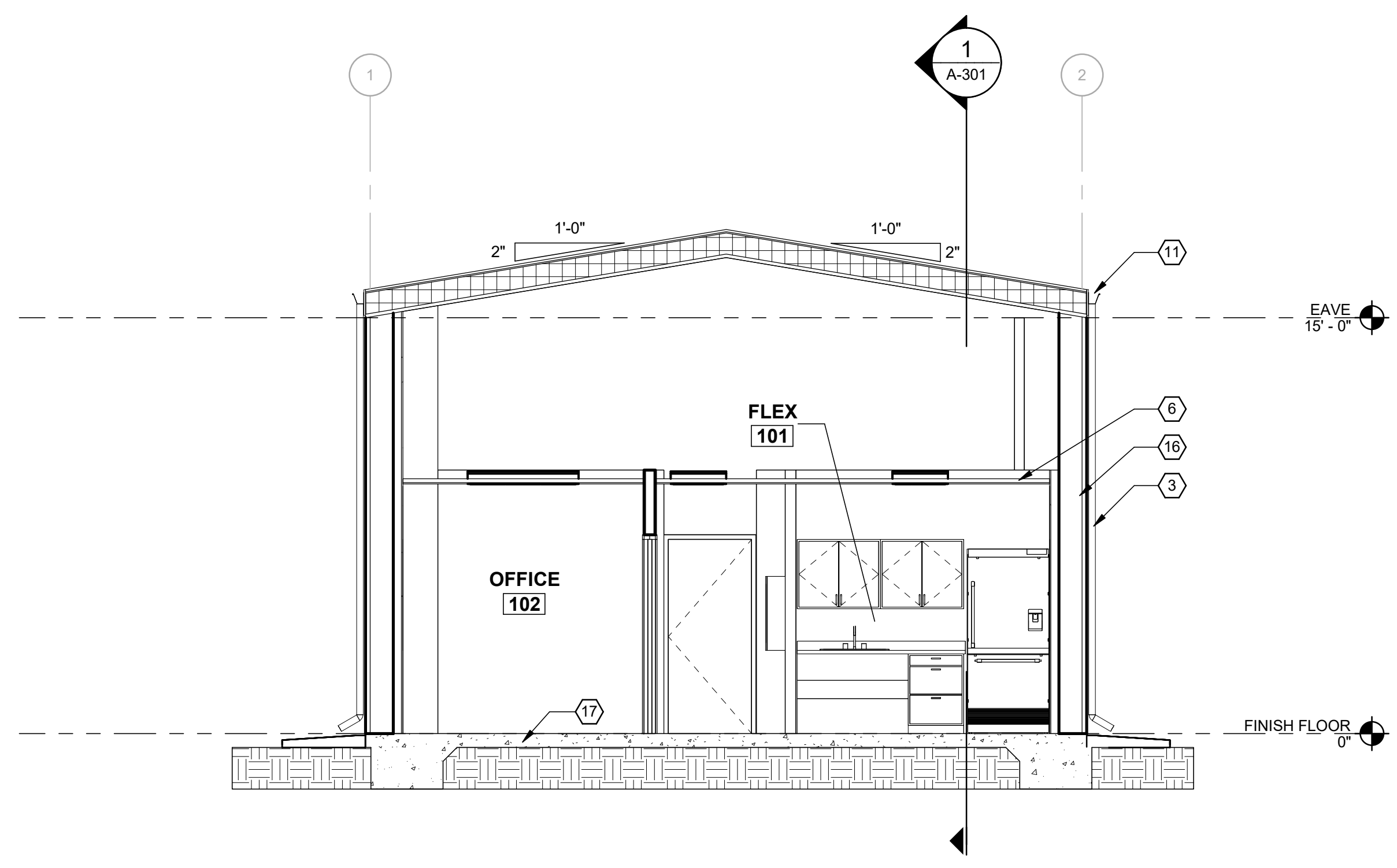
A-201



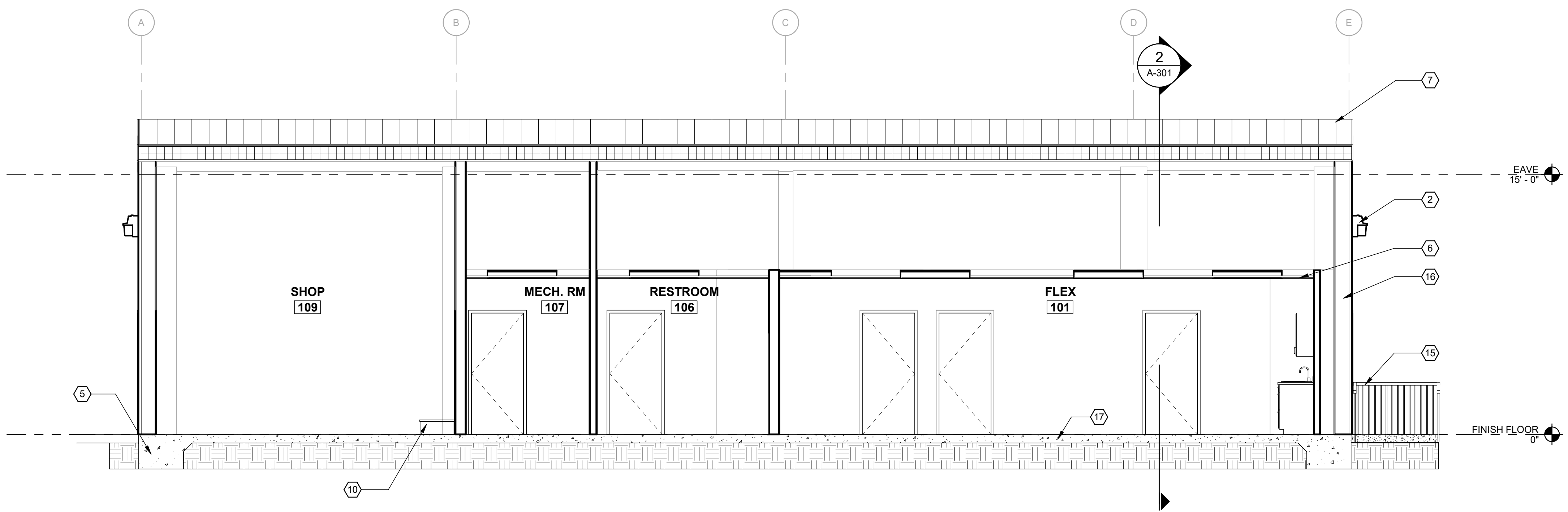
Bar measures 1 inch, otherwise drawing is not to scale

1 2 3 4 5 6 7

F
E
D
C
B
A



2 BUILDING SECTION
A-301 SCALE: 1/4" = 1'-0"



1 BUILDING SECTION
A-301 SCALE: 1/4" = 1'-0"

- KEYNOTES**
- 2 PROVIDE NEW LED WALL PACK
 - 3 PRE-FINISHED METAL DOWNSPOUT - DOWNSPOUTS TO TERMINATE AT CONCRETE SPLASH BLOCK
 - 5 BUILDING FOUNDATION
 - 6 CEILING
 - 7 PRE-FINISHED METAL ROOF PANEL
 - 10 PROVIDE NEW 24"X24" MOLDED-STONE MOP SERVICE BASIN - PROVIDE BOTH HOT AND COLD WATER SUPPLY AND DRAIN
 - 11 PRE-FINISHED GUTTER
 - 15 PAINTED GUARDRAIL/HANDRAIL
 - 16 WALL
 - 17 SLAB

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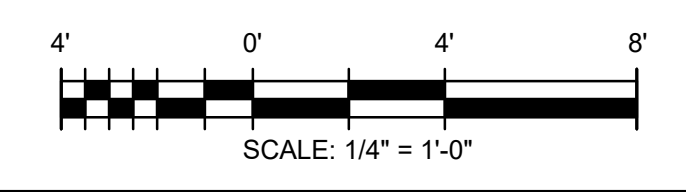
Project Status
NOT FOR CONSTRUCTION

BY	MARK	DATE	DESCRIPTION

HANKS CROSSING ENERGY, LLC
HANK'S CROSSING ENERGY PROJECT - OPERATIONS AND MAINTENANCE BUILDING
ARCHITECTURAL BUILDING SECTIONS

PROJ:	213-67639-24001
DESN:	LD
DRWN:	BE
CHKD:	LD

A-301



Bar measures 1 inch, otherwise drawing is not to scale

5.0 Proof of Ownership



COMMITMENT FOR TITLE INSURANCE

ISSUED BY

AMTRUST TITLE INSURANCE COMPANY

NOTICE

IMPORTANT—READ CAREFULLY: THIS COMMITMENT IS AN OFFER TO ISSUE ONE OR MORE TITLE INSURANCE POLICIES. ALL CLAIMS OR REMEDIES SOUGHT AGAINST THE COMPANY INVOLVING THE CONTENT OF THIS COMMITMENT OR THE POLICY MUST BE BASED SOLELY IN CONTRACT.

THIS COMMITMENT IS NOT AN ABSTRACT OF TITLE, REPORT OF THE CONDITION OF TITLE, LEGAL OPINION, OPINION OF TITLE, OR OTHER REPRESENTATION OF THE STATUS OF TITLE. THE PROCEDURES USED BY THE COMPANY TO DETERMINE INSURABILITY OF THE TITLE, INCLUDING ANY SEARCH AND EXAMINATION, ARE PROPRIETARY TO THE COMPANY, WERE PERFORMED SOLELY FOR THE BENEFIT OF THE COMPANY, AND CREATE NO EXTRACONTRACTUAL LIABILITY TO ANY PERSON, INCLUDING A PROPOSED INSURED.

THE COMPANY’S OBLIGATION UNDER THIS COMMITMENT IS TO ISSUE A POLICY TO A PROPOSED INSURED IDENTIFIED IN SCHEDULE A IN ACCORDANCE WITH THE TERMS AND PROVISIONS OF THIS COMMITMENT. THE COMPANY HAS NO LIABILITY OR OBLIGATION INVOLVING THE CONTENT OF THIS COMMITMENT TO ANY OTHER PERSON.

COMMITMENT TO ISSUE POLICY

Subject to the Notice; Schedule B, Part I—Requirements; Schedule B, Part II—Exceptions; and the Commitment Conditions, AmTrust Title Insurance Company, a New York corporation (the “Company”), commits to issue the Policy according to the terms and provisions of this Commitment. This Commitment is effective as of the Commitment Date shown in Schedule A for each Policy described in Schedule A, only when the Company has entered in Schedule A both the specified dollar amount as the Proposed Policy Amount and the name of the Proposed Insured.

If all of the Schedule B, Part I—Requirements have not been met within six (6) months after the Commitment Date, this Commitment terminates and the Company’s liability and obligation end.

Issued through the Office of:

Authorized Signatory

Company Name

City, State



By:

President

Attest:

Secretary

File No. FN-46309-CO

This page is only a part of a 2016 ALTA® Commitment for Title Insurance issued by AmTrust Title Insurance Company. This Commitment is not valid without the Notice; the Commitment to Issue Policy; the Commitment Conditions; Schedule A; Schedule B, Part I—Requirements; [and] Schedule B, Part II—Exceptions; and a counter-signature by the Company or its issuing agent that may be in electronic form.

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AMERICAN
LAND TITLE
ASSOCIATION



ISSUED BY AMTRUST TITLE INSURANCE COMPANY**Transaction Identification Data, for which the Company assumes no liability as set forth in Commitment Condition 5.e.:**Issuing Agent:
Issuing Office:Issuing Office's ALTA® Registry ID:
Loan ID Number:
Commitment Number:
Issuing Office File Number: FN-46309-CO
Property Address: 111 TBD, Denver, CO 80229**SCHEDULE A**

1. **Commitment Date:** March 1, 2023 at 8:00AM
2. **Policy to be issued:**
 - a. 2021 ALTA® Owner's Policy
Proposed Insured:
Proposed Amount of Insurance:
The estate or interest to be insured: As set forth in Schedule A, Item 3
 - b. 2006 ALTA Loan Policy
Proposed Insured:
Proposed Policy Amount:
3. **The estate or interest in the Land described or referred to in this Commitment is:**
4. **The title is, at the Commitment Date, vested in:**

PARCEL 1:
[RAYMOND J MORRIS AND DONNA R JONES MORRIS AS JOINT TENNANT'S](#)

PARCEL 2:
[RAYMOND J MORRIS AND DONNA R JONES MORRIS AS JOINT TENNANT'S](#)

PARCEL 3:
[RAYMOND J MORRIS AND DONNA R JONES MORRIS AS JOINT TENNANT'S](#)

PARCEL 4:
[RAYMOND J MORRIS AND DONNA R JONES MORRIS AS JOINT TENNANT'S](#)

PARCEL 5:
[SCHOOL DISTRICT NO 26J, 350 SECOND AVE, DEER TRAIL, CO 80105](#)

This page is only a part of a 2021 ALTA Commitment for Title Insurance issued by AmTrust Title Insurance Company. This Commitment is not valid without the Notice; the Commitment to Issue Policy; the Commitment Conditions; Schedule A; Schedule B, Part I—Requirements; Schedule B, Part II—Exceptions; and a counter-signature by the Company or its issuing agent that may be in electronic form.

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File No. FN-46309-CO
Schedule A Page 1 of 2



5. The Land is described as follows:

See **Exhibit A – Legal Description**

AmTrust Title Insurance Company

By: , its agent

By: _____
Authorized Signatory

This page is only a part of a 2021 ALTA Commitment for Title Insurance issued by AmTrust Title Insurance Company. This Commitment is not valid without the Notice; the Commitment to Issue Policy; the Commitment Conditions; Schedule A; Schedule B, Part I—Requirements; Schedule B, Part II—Exceptions; and a counter-signature by the Company or its issuing agent that may be in electronic form.

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File No. FN-46309-CO
Schedule A Page 2 of 2



ISSUED BY AMTRUST TITLE INSURANCE COMPANY

EXHIBIT A – LEGAL DESCRIPTION

PARCEL 1:

THE LAND REFERRED TO IN THIS COMMITMENT IS DESCRIBED AS FOLLOWS:

EAST 1/2 LESS AND EXCEPT ONE (1) ACRE PARCEL IN THE NORTHEAST CORNER FOR SCHOOL, SECTION 32, TOWNSHIP 2 SOUTH, RANGE 59 WEST, 6TH PM, ADAMS COUNTY, CO

PARCEL TAX ID NUMBER: R0080982

PARCEL2:

WEST 1/2, SECTION 32, TOWNSHIP 2 SOUTH, RANGE 59 WEST, ADAMS COUNTY, CO

PARCEL TAX ID NUMBER: R0080891

PARCEL 3:

THE LAND REFERRED TO IN THIS COMMITMENT IS DESCRIBED AS FOLLOWS:

ALL, EXCEPT FOR COUNTY ROADS, OF SECTION 29, TOWNSHIP 2 SOUTH, RANGE 59 WEST, 6TH PM, ADAMS COUNTY, CO

PARCEL TAX ID NUMBER: R0080979

PARCEL 4:

THE LAND REFERRED TO IN THIS COMMITMENT IS DESCRIBED AS FOLLOWS:

ALL, EXCEPT FOR COUNTY ROADS, OF SECTION 5, TOWNSHIP 3 SOUTH, RANGE 59 WEST, 6TH PM. ADAMS COUNTY, CO

PARCEL TAX ID NUMBER: R0081263

PARCEL 5:

THE LAND REFERRED TO IN THIS COMMITMENT IS DESCRIBED AS FOLLOWS:

ONE (1) ACRE PARCEL IN THE NORTHEAST CORNER, SECTION 32, TOWNSHIP 2 SOUTH, RANGE 59 WEST, 6TH PM, ADAMS COUNTY, CO

PARCEL TAX ID NUMBER: R0080987

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File No. FN-46309-CO
Exhibit A Page 1 of 1



ISSUED BY AMTRUST TITLE INSURANCE COMPANY**SCHEDULE B, PART I – Requirements**

All of the following Requirements must be met:

1. Instruments necessary to create the estate or interest to be insured must be properly executed, delivered and duly filed for record.
2. Pay the full consideration to, or for the account of, the grantors or mortgagors.
3. Pay all taxes, charges, assessments, levied and assessed against subject premises, which are due and payable.
4. Satisfactory evidence should be had that improvements and/or repairs or alterations thereto are completed that contractor, sub-contractors, labor and materialmen are all paid; and have released of record all liens or notice of intent to perfect a lien for labor material.

NOTE: The Company reserves the right to make any additional requirements and/or exceptions to this commitment and any subsequent Endorsements thereto upon review of all required documents or in otherwise ascertaining further details of the transaction.

5. Payment, transfer and final reading for water, sewer and storm water charges, currently assessed against the subject property.

NOTE: The subject property may lie within an area where local Ordinances/Municipal Codes allow unpaid water/ sewer charges to become a lien on the real property.

NOTE: Some municipalities REQUIRE the title company to arrange the transfer of service from buyer to seller. NOTE: It is highly recommended that seller provide specific account numbers for municipalities that handle the billings for these services.

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File No. FN-46309-CO
Schedule B-I Page 1 of 1



ISSUED BY AMTRUST TITLE INSURANCE COMPANY**SCHEDULE B, PART II – Exceptions**

Some historical land records contain Discriminatory Covenants that are illegal and unenforceable by law. This Commitment and the Policy treat any Discriminatory Covenant in a document referenced in Schedule B as if each Discriminatory Covenant is redacted, repudiated, removed, and not republished or recirculated. Only the remaining provisions of the document will be excepted from coverage

The Policy will not insure against loss or damage resulting from the terms and provisions of any lease or easement identified in Schedule A, and will include the following Exceptions unless cleared to the satisfaction of the Company:

STANDARD EXCEPTIONS

1. Defects, liens, encumbrances, adverse claims or other matters, if any, created, first appearing in the public records or attaching subsequent to the Effective Date but prior to the date the proposed Insured acquires for value of record the estate or interest or mortgage thereon covered by this Commitment.
2. Any lien, or right to a lien, for services, labor or materials, imposed by law and not shown by the public records.
3. Any encroachment, encumbrance, violation, or adverse circumstance affecting the title including discrepancies, conflicts in boundary lines, shortages in area, or any other facts that would be disclosed by an accurate and complete land survey of the land, and that are not shown in the public records.
4. Rights of parties in actual possession of all or any part of the premises, including, but not limited to, easements, claims of easements or encumbrances that are not shown in the public records.
5. The lien of real estate taxes or assessments imposed on the title by a governmental authority that are not shown as existing liens in the records of any taxing authority that levies taxes or assessments on real property or in the public records.
6. Any mineral or mineral rights leased, granted or retained by current or prior owners.
7. Subject to rights of tenants in possession, as tenants only, under unrecorded leases.

SPECIAL EXCEPTIONS**FN-46309-CO**

8. Taxes and assessments for the year(s) 2022 and thereafter, which are not yet due and payable, plus any penalties and interest which may accrue. (Affects Parcel 1, 2, 3, 4 and 5)
9. Subject to a Memorandum of Option Agreement by and between Raymond J Morris and Donna R Jones Morris, as Owner, and Novis Renewables LLC, as Optionee, dated December 22, 2022, recorded January 10, 2023, [Instrument No. 2023-000001387](#), Adams County, Colorado. (Affects Parcel 1, 2, 3, 4)
11. Subject to a Surface Owner's Agreement by and between Raymond J Morris, a single man, and Blanche Benham Morris a widow to Champlin Petroleum Company, dated December 7, 1984, recorded December 28, 1984, [Volume 2951, Page 253](#), Adams County, Colorado. (Affects Parcel 3)

This page is only a part of a 2021 ALTA Commitment for Title Insurance issued by AmTrust Title Insurance Company This Commitment is not valid without the Notice; the Commitment to Issue Policy; the Commitment Conditions; Schedule A; Schedule B, Part I—Requirements; Schedule B, Part II—Exceptions; and a counter-signature by the Company or its issuing agent that may be in electronic form.

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File No. FN-46309-CO
Schedule B-II Page 1 of 2



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File No. FN-46309-CO
Schedule B-II Page 2 of 2





AmTrust Title
5599 San Felipe • 6th Floor
Houston, TX 77056
(p) 832.764.8550
(f) 866.582.8138

PRIVACY POLICY NOTICE

Title V of the Gramm-Leach-Bliley Act (GLBA) generally prohibits any financial institution, directly or through its affiliates, from sharing nonpublic personal information about you with a nonaffiliated third party unless the institution provides YOU with a notice of its privacy policies and practices, such as the type of information that it collects about you and the categories of persons or entities to whom it may be disclosed. In compliance with the GLBA, we are providing you with this document, which notifies you of the privacy policies and practices of .

We may collect nonpublic personal information about you from the following sources:

- Information we receive from you such as on applications or other forms.
- Information about your transactions we secure from our files, or from our affiliates or others.
- Information we receive from a consumer reporting agency.
- Information that we receive from others involved in your transaction, such as the real estate agent or lender.

Unless it is specifically stated otherwise in an amended Privacy Policy Notice, no additional nonpublic personal information will be collected about you.

We may disclose any of the above information that we collect about our customers or former customers to our affiliates or to nonaffiliated third parties as permitted by law.

We also may disclose this information about our customers or former customers to the following types of nonaffiliated companies that perform marketing services on our behalf or with whom we have Joint Marketing Agreements:

- Financial service providers such as companies engaged in banking, consumer finance, securities and insurance.
- Non-financial companies such as envelope stuffers and other fulfillment service providers.

WE DO NOT DISCLOSE ANY NONPUBLIC PERSONAL INFORMATION ABOUT YOU WITH ANYONE FOR ANY PURPOSE THAT IS NOT SPECIFICALLY PERMITTED BY LAW.

We restrict access to non-public personal information about you to those employees who need to know that information in order to provide products or services to you. We maintain physical, electronic, and procedural safeguards that comply with federal regulations to guard your nonpublic personal information.

COMMITMENT CONDITIONS**1. DEFINITIONS**

- (a) "Knowledge" or "Known": Actual or imputed knowledge, but not constructive notice imparted by the Public Records.
- (b) "Land": The land described in Schedule A and affixed improvements that by law constitute real property. The term "Land" does not include any property beyond the lines of the area described in Schedule A, nor any right, title, interest, estate, or easement in abutting streets, roads, avenues, alleys, lanes, ways, or waterways, but this does not modify or limit the extent that a right of access to and from the Land is to be insured by the Policy.
- (c) "Mortgage": A mortgage, deed of trust, or other security instrument, including one evidenced by electronic means authorized by law.
- (d) "Policy": Each contract of title insurance, in a form adopted by the American Land Title Association, issued or to be issued by the Company pursuant to this Commitment.
- (e) "Proposed Insured": Each person identified in Schedule A as the Proposed Insured of each Policy to be issued pursuant to this Commitment.
- (f) "Proposed Policy Amount": Each dollar amount specified in Schedule A as the Proposed Policy Amount of each Policy to be issued pursuant to this Commitment.
- (g) "Public Records": Records established under state statutes at the Commitment Date for the purpose of imparting constructive notice of matters relating to real property to purchasers for value and without Knowledge.
- (h) "Title": The estate or interest described in Schedule A.

2. If all of the Schedule B, Part I—Requirements have not been met within the time period specified in the Commitment to Issue Policy, this Commitment terminates and the Company's liability and obligation end.

3. The Company's liability and obligation is limited by and this Commitment is not valid without:

- (a) the Notice;
- (b) the Commitment to Issue Policy;
- (c) the Commitment Conditions;
- (d) Schedule A;
- (e) Schedule B, Part I—Requirements; and
- (f) Schedule B, Part II—Exceptions; and
- (g) a counter-signature by the Company or its issuing agent that may be in electronic form.

4. COMPANY'S RIGHT TO AMEND

The Company may amend this Commitment at any time. If the Company amends this Commitment to add a defect, lien, encumbrance, adverse claim, or other matter recorded in the Public Records prior to the Commitment Date, any liability of the Company is limited by Commitment Condition 5. The Company shall not be liable for any other amendment to this Commitment.

5. LIMITATIONS OF LIABILITY

- (a) The Company's liability under Commitment Condition 4 is limited to the Proposed Insured's actual expense incurred in the interval between the Company's delivery to the Proposed Insured of the Commitment and the delivery of the amended Commitment, resulting from the Proposed Insured's good faith reliance to:
 - (i) comply with the Schedule B, Part I—Requirements;
 - (ii) eliminate, with the Company's written consent, any Schedule B, Part II—Exceptions; or
 - (iii) acquire the Title or create the Mortgage covered by this Commitment.

File No. FN-46309-CO

This page is only a part of a 2016 ALTA® Commitment for Title Insurance issued by AmTrust Title Insurance Company. This Commitment is not valid without the Notice; the Commitment to Issue Policy; the Commitment Conditions; Schedule A; Schedule B, Part I—Requirements; [and] Schedule B, Part II—Exceptions; and a counter-signature by the Company or its issuing agent that may be in electronic form.

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- (b) The Company shall not be liable under Commitment Condition 5(a) if the Proposed Insured requested the amendment or had Knowledge of the matter and did not notify the Company about it in writing.
- (c) The Company will only have liability under Commitment Condition 4 if the Proposed Insured would not have incurred the expense had the Commitment included the added matter when the Commitment was first delivered to the Proposed Insured.
- (d) The Company's liability shall not exceed the lesser of the Proposed Insured's actual expense incurred in good faith and described in Commitment Conditions 5(a)(i) through 5(a)(iii) or the Proposed Policy Amount.
- (e) The Company shall not be liable for the content of the Transaction Identification Data, if any.
- (f) In no event shall the Company be obligated to issue the Policy referred to in this Commitment unless all of the Schedule B, Part I—Requirements have been met to the satisfaction of the Company.
- (g) In any event, the Company's liability is limited by the terms and provisions of the Policy.

6. LIABILITY OF THE COMPANY MUST BE BASED ON THIS COMMITMENT

- (a) Only a Proposed Insured identified in Schedule A, and no other person, may make a claim under this Commitment.
- (b) Any claim must be based in contract and must be restricted solely to the terms and provisions of this Commitment.
- (c) Until the Policy is issued, this Commitment, as last revised, is the exclusive and entire agreement between the parties with respect to the subject matter of this Commitment and supersedes all prior commitment negotiations, representations, and proposals of any kind, whether written or oral, express or implied, relating to the subject matter of this Commitment.
- (d) The deletion or modification of any Schedule B, Part II—Exception does not constitute an agreement or obligation to provide coverage beyond the terms and provisions of this Commitment or the Policy.
- (e) Any amendment or endorsement to this Commitment must be in writing and authenticated by a person authorized by the Company.
- (f) When the Policy is issued, all liability and obligation under this Commitment will end and the Company's only liability will be under the Policy.

7. IF THIS COMMITMENT HAS BEEN ISSUED BY AN ISSUING AGENT

The issuing agent is the Company's agent only for the limited purpose of issuing title insurance commitments and policies. The issuing agent is not the Company's agent for the purpose of providing closing or settlement services.

8. PRO-FORMA POLICY

The Company may provide, at the request of a Proposed Insured, a pro-forma policy illustrating the coverage that the Company may provide. A pro-forma policy neither reflects the status of Title at the time that the pro-forma policy is delivered to a Proposed Insured, nor is it a commitment to insure.

9. ARBITRATION

The Policy contains an arbitration clause. All arbitrable matters when the Proposed Policy Amount is \$2,000,000 or less shall be arbitrated at the option of either the Company or the Proposed Insured as the exclusive remedy of the parties. A Proposed Insured may review a copy of the arbitration rules at <http://www.alta.org/arbitration>.

File No. FN-46309-CO

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PRIVACY NOTICE

AmTrust Title Insurance Company and its majority-owned subsidiary companies that provide title insurance, technology, and transaction services to the real estate and mortgage industries (collectively, "AMT", "our" or "we") respect and are committed to protecting your privacy. This Privacy Notice lets you know how and for what purposes your Personal Information (as defined herein) is being collected, processed and used by AMT. We pledge that we will take reasonable steps to ensure that your Personal Information will only be used in ways that are in compliance with this Privacy Notice.

This Privacy Notice is only in effect for any generic information and Personal Information collected and/or owned by AMT, including collection through any AMT website and any online features, services and/or programs offered by AMT (collectively, the "Website"). This Privacy Notice is not applicable to any other web pages, mobile applications, social media sites, email lists, generic information or Personal Information collected and/or owned by any entity other than AMT.

Collection and Use of Information

The types of personal information AMT collects may include, among other things (collectively, "Personal Information"): (1) contact information (e.g., name, address, phone number, email address); (2) demographic information (e.g., date of birth, gender marital status); (3) Internet protocol (or IP) address or device ID/UDID; (4) social security number (SSN), student ID (SIN), driver's license, passport, and other government ID numbers; (5) financial account information; and (6) information related to offenses or criminal convictions.

In the course of our business, we may collect Personal Information about you from the following sources:

- Applications or other forms we receive from you or your authorized representative;
- Information we receive from you through the Website;
- Information about your transactions with or services performed by us, our affiliates, or others; and
- From consumer or other reporting agencies and public records maintained by governmental entities that we either obtain directly from those entities, or from our affiliates or others.

Information collected by AMT is used for three main purposes:

- To provide products and services to you or one or more third party service providers (collectively, "Third Parties") who are obtaining services on your behalf or in connection with a transaction involving you.
- To improve our products and services that we perform for you or for Third Parties.
- To communicate with you and to inform you about AMT's, AMT's affiliates and third parties' products and services.

Additional Ways that Information is Collected Through the Website

Browser Log Files. Our servers automatically log each visitor to the Website and collect and record certain information about each visitor. This information may include IP address, browser language, browser type, operating system, domain names, browsing history (including time spent at a domain, time and date of your visit), referring/exit web pages and URLs, and number of clicks. The domain name and IP address reveal nothing personal about the user other than the IP address from which the user has accessed the Website.

Cookies. From time to time, AMT or other third parties may send a "cookie" to your computer. A cookie is a small piece of data that is sent to your Internet browser from a web server and stored on your computer's hard drive and that can be re-sent to the serving website on subsequent visits. A cookie, by itself, cannot read other data from your hard disk or read other cookie files already on your computer. A cookie, by itself, does not damage your system. We, our advertisers and other third parties may use cookies to identify and keep track of, among other things, those areas of the Website and third party websites that you have visited in the past in order to enhance your next visit to the Website. You can choose whether or not to accept cookies by changing the settings of your Internet browser, but some functionality of the Website may be impaired or not function as intended. See the Third Party Opt Out section below.

Web Beacons. Some of our web pages and electronic communications may contain images, which may or may not be visible to you, known as Web Beacons (sometimes referred to as "clear gifs"). Web Beacons collect only limited information that includes a cookie number; time and date of a page view; and a description of the page on which the Web Beacon resides. We may also carry Web Beacons placed by third party advertisers. These Web Beacons do not carry any Personal Information and are only used to track usage of the Website and activities

associated with the Website. See the **Third Party Opt Out** section below.

Unique Identifier. We may assign you a unique internal identifier to help keep track of your future visits. We may use this information to gather aggregate demographic information about our visitors, and we may use it to personalize the information you see on the Website and some of the electronic communications you receive from us. We keep this information for our internal use, and this information is not shared with others.

Third Party Opt Out. Although we do not presently, in the future we may allow third-party companies to serve advertisements and/or collect certain anonymous information when you visit the Website. These companies may use non-personally identifiable information (e.g., click stream information, browser type, time and date, subject of advertisements clicked or scrolled over) during your visits to the Website in order to provide advertisements about products and services likely to be of greater interest to you. These companies typically use a cookie or third party Web Beacon to collect this information, as further described above. Through these technologies, the third party may have access to and use non-personalized information about your online usage activity.

You can opt-out of online behavioral services through any one of the ways described below. After you opt-out, you may continue to receive advertisements, but those advertisements will no longer be as relevant to you.

- You can opt-out via the Network Advertising Initiative industry opt-out at <http://www.networkadvertising.org/>.

- You can opt-out via the Consumer Choice Page at www.aboutads.info.

- For those in the U.K., you can opt-out via the IAB UK's industry opt-out at www.youronlinechoices.com.

- You can configure your web browser (Chrome, Firefox, Internet Explorer, Safari, etc.) to delete and/or control the use of cookies. More information can be found in the Help system of your browser. Note: If you opt-out as described above, you should not delete your cookies. If you delete your cookies, you will need to opt-out again.

When Information Is Disclosed by AMT

We may provide your Personal Information (excluding information we receive from consumer or other credit reporting agencies) to various individuals and companies, as permitted by law, without obtaining your prior authorization. Such laws do not allow consumers to

restrict these disclosures. Disclosures may include, without limitation, the following:

- To agents, brokers, representatives, or others to provide you with services you have requested, and to enable us to detect or prevent criminal activity, fraud, material misrepresentation, or nondisclosure in connection with an insurance transaction;

- To third-party contractors or service providers who provide services or perform marketing services or other functions on our behalf;

- To law enforcement or other governmental authority in connection with an investigation, or civil or criminal subpoenas or court orders; and/or

- To lenders, lien holders, judgment creditors, or other parties claiming an encumbrance or an interest in title whose claim or interest must be determined, settled, paid or released prior to a title or escrow closing.

In addition to the other times when we might disclose information about you, we might also disclose information when required by law or in the good-faith belief that such disclosure is necessary to: (1) comply with a legal process or applicable laws; (2) enforce this Privacy Notice; (3) respond to claims that any materials, documents, images, graphics, logos, designs, audio, video and any other information provided by you violates the rights of third parties; or (4) protect the rights, property or personal safety of AMT, its users or the public.

We maintain reasonable safeguards to keep the Personal Information that is disclosed to us secure. We provide Personal Information and non-Personal Information to our subsidiaries, affiliated companies, and other businesses or persons for the purposes of processing such information on our behalf and promoting the services of our trusted business partners, some or all of which may store your information on servers outside of the United States. We require that these parties agree to process such information in compliance with our Privacy Notice or in a similar, industry-standard manner, and we use reasonable efforts to limit their use of such information and to use other appropriate confidentiality and security measures. The use of your information by one of our trusted business partners may be subject to that party's own

Privacy Notice. We do not, however, disclose information we collect from consumer or credit reporting agencies with our affiliates or others without your consent, in conformity with applicable law, unless such disclosure is otherwise permitted by law.

We also reserve the right to disclose Personal Information and/or non-Personal Information to take precautions against liability, investigate and defend against any third-party claims or allegations, assist government enforcement agencies, protect the security or integrity of the Website, and protect the rights, property, or personal safety of AMT, our users or others.

We reserve the right to transfer your Personal Information, as well as any other information, in connection with the sale or other disposition of all or part of the AMT business and/or assets. We also cannot make any representations regarding the use or transfer of your Personal Information or other information that we may have in the event of our bankruptcy, reorganization, insolvency, receivership or an assignment for the benefit of creditors, and you expressly agree and consent to the use and/or transfer of your Personal Information or other information in connection with a sale or transfer of some or all of our assets in any of the above described proceedings. Furthermore, we cannot and will not be responsible for any breach of security by any third parties or for any actions of any third parties that receive any of the information that is disclosed to us.

Information from Children

We do not collect Personal Information from any person that we know to be under the age of thirteen (13). Specifically, the Website is not intended or designed to attract children under the age of thirteen (13). You affirm that you are either more than 18 years of age, or an emancipated minor, or possess legal parental or guardian consent, and are fully able and competent to enter into the terms, conditions, obligations, affirmations, representations, and warranties set forth in this Privacy Notice, and to abide by and comply with this Privacy Notice. In any case, you affirm that you are over the age of 13, as **THE WEBSITE IS NOT INTENDED FOR CHILDREN UNDER 13 THAT ARE UNACCOMPANIED BY HIS OR HER PARENT OR LEGAL GUARDIAN.**

Parents should be aware that AMT's Privacy Notice will govern our use of Personal Information, but also that information that is voluntarily given by children – or others – in email exchanges, bulletin boards or the like may be used by other parties to generate unsolicited communications. AMT encourages all parents to instruct their children in the safe and responsible use of their Personal Information while using the Internet.

Privacy Outside the Website

The Website may contain various links to other websites, including links to various third party service providers. AMT is not and cannot be responsible for the privacy

practices or the content of any of those other websites. Other than under agreements with certain reputable organizations and companies, and except for third party service providers whose services either we use or you voluntarily elect to utilize, we do not share any of the Personal Information that you provide to us with any of the websites to which the Website links, although we may share aggregate, non-Personal Information with those other third parties. Please check with those websites in order to determine their privacy policies and your rights under them.

European Union Users

If you are a citizen of the European Union, please note that we may transfer your Personal Information outside the European Union for use for any of the purposes described in this Privacy Notice. By providing AMT with your Personal Information, you consent to both our collection and such transfer of your Personal Information in accordance with this Privacy Notice.

Choices with Your Personal Information

Whether you submit Personal Information to AMT is entirely up to you. You may decide not to submit Personal Information, in which case AMT may not be able to provide certain services or products to you.

You may choose to prevent AMT from disclosing or using your Personal Information under certain circumstances ("opt out"). You may opt out of any disclosure or use of your Personal Information for purposes that are incompatible with the purpose(s) for which it was originally collected or for which you subsequently gave authorization by notifying us by one of the methods at the end of this Privacy Notice. Furthermore, even where your Personal Information is to be disclosed and used in accordance with the stated purposes in this Privacy Notice, you may elect to opt out of such disclosure to and use by a third party that is not acting as an agent of AMT. As described above, there are some uses from which you cannot opt-out.

Please note that opting out of the disclosure and use of your Personal Information as a prospective employee may prevent you from being hired as an employee by AMT to the extent that provision of your Personal Information is required to apply for an open position.

If AMT collects Personal Information from you, such information will not be disclosed or used by AMT for purposes that are incompatible with the purpose(s) for which it was originally collected or for which you subsequently gave authorization unless you affirmatively consent to such disclosure and use.

You may opt out of online behavioral advertising by following the instructions set forth above under the above section "Additional Ways That Information Is Collected Through the Website," subsection "Third Party Opt Out."

Access and Correction

To access your Personal Information in the possession of AMT and correct inaccuracies of that information in our records, please contact us in the manner specified at the end of this Privacy Notice. We ask individuals to identify themselves and the information requested to be accessed and amended before processing such requests, and we may decline to process requests in limited circumstances as permitted by applicable privacy legislation.

Your California Privacy Rights

Under California's "Shine the Light" law, California residents who provide certain personally identifiable information in connection with obtaining products or services for personal, family or household use are entitled to request and obtain from us once a calendar year information about the customer information we shared, if any, with other businesses for their own direct marketing uses. If applicable, this information would include the categories of customer information and the names and addresses of those businesses with which we shared customer information for the immediately prior calendar year (e.g., requests made in 2013 will receive information regarding 2012 sharing activities).

To obtain this information on behalf of AMT, please send an email message to underwriting@amtrusttitlegroup.com with "Request for California Privacy Information" in the subject line and in the body of your message. We will provide the requested information to you at your email address in response.

Please be aware that not all information sharing is covered by the "Shine the Light" requirements and only information on covered sharing will be included in our response.

Additionally, because we may collect your Personal Information from time to time, California's Online Privacy Protection Act requires us to disclose how we respond to "do not track" requests and other similar mechanisms. Currently, our policy is that we do not recognize "do not track" requests from Internet browsers and similar devices.

Your Consent to This Privacy Notice

By submitting Personal Information to AMT, you consent to the collection and use of information by us as specified above or as we otherwise see fit, in compliance with this Privacy Notice, unless you inform us otherwise by means of the procedure identified below. If we decide to change this Privacy Notice, we will make an effort to post those changes on the Website. Each time we collect information from you following any amendment of this Privacy Notice will signify your assent to and acceptance of its revised terms for all previously collected information and information collected from you in the future. We may use comments, information or feedback that you may submit in any manner that we may choose without notice or compensation to you.

If you have additional questions or comments, please let us know by sending your comments or requests to:

AmTrust Title Insurance Company

59 Maiden Lane, 43rd Floor

New York, New York 10038

855.449.0620

Email: underwriting@amtrusttitlegroup.com

RECORDING REQUESTED BY AND
WHEN RECORDED PLEASE RETURN TO:

Novis Renewables, LLC

Attn: Contract Administration

1 Bridge Street, Suite 11

Irvington, NY 10533

MEMORANDUM OF OPTION AGREEMENT

THIS MEMORANDUM OF OPTION AGREEMENT (the "Memorandum") is made as of December 22, 2022, by and between Raymond J. Morris and Donna R. Jones Morris, husband and wife ("Owner"), and Novis Renewables, LLC and/or its assigns, a Delaware limited liability company ("Optionee").

RECITALS

A. Owner is the owner of the real property located in Adams County, Colorado, more particularly described in Exhibit A attached hereto (the "Property").

B. Pursuant to that certain Option Agreement, dated as of December 22, 2022 (the "Agreement"), Owner has granted Optionee the exclusive right and option to purchase the Property.

C. The parties are executing and recording this Memorandum so that third parties shall have notice of Optionee's exclusive option to purchase the Property, and of the rights and obligations of Owner and Optionee under the Agreement.

AGREEMENT

NOW, THEREFORE, in consideration of the Agreement and for other good and valuable consideration, receipt of which is hereby acknowledged, the parties agree as follows:

1. Owner has granted to Optionee an exclusive option to purchase the Property and, upon the exercise of the option, Owner agrees to sell the Property to Optionee in accordance with the terms and provisions of the Agreement.

2. The Agreement provides for an Option Period of one (1) year commencing upon the effective date of the Agreement set forth above, extendable for up to four (4) additional years.

3. During the Option Period, Owner has granted to Optionee the non-exclusive right and easement to enter upon the Property to perform all effort and labor necessary to carry out tests, inspections, surveys and investigations that Optionee deems necessary or advisable to assess the feasibility of the Facilities, all as more particularly set forth in the Agreement.

4. All of the terms, conditions and agreements contained within the Agreement are fully incorporated herein by reference as if fully set forth herein. This Memorandum is not intended to change

the terms of the Agreement and, in the event of a conflict between the terms and conditions of this Memorandum and the Agreement, the terms and conditions of the Agreement shall control. All capitalized terms not defined herein shall have the meaning set forth in the Agreement.

5. This Memorandum shall be governed by the laws of Colorado.

6. The parties agree that this Memorandum may be executed in multiple counterparts which, when signed by all parties, shall constitute a binding agreement.

IN WITNESS WHEREOF, the parties have executed this Memorandum as of the date first written above.

OWNER:

Raymond J. Morris and Donna R. Jones Morris,
Husband and Wife

By: Raymond J. Morris

Name: RAYMOND J. MORRIS

By: Donna R. Jones Morris

Name: Donna R. Jones Morris

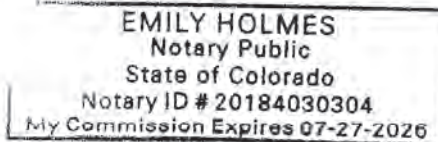
STATE OF COLORADO)
 Arapahoe : ss
COUNTY OF ~~ADAMS~~)

The foregoing instrument was executed before me on December 21, 2022, by Raymond J. Morris.

Emily J. Holmes
NOTARY PUBLIC
Residing at: Independent Financial

My Commission Expires:

07/27/2026



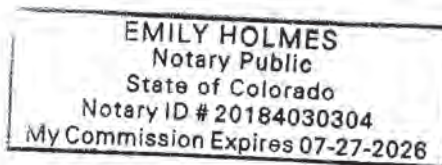
STATE OF COLORADO)
 Arapahoe : ss
COUNTY OF ~~ADAMS~~)

The foregoing instrument was executed before me on December 21, 2022 by Donna R. Jones Morris.

Emily J. Holmes
NOTARY PUBLIC
Residing at: Independent Financial

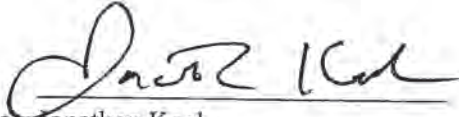
My Commission Expires:

07/27/2026



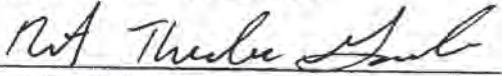
OPTIONEE:

Novis Renewables, LLC,
a Delaware limited liability company

By: 
Name: Jonathan Koch
Title: President

STATE OF NEW YORK)
 : ss
COUNTY OF WESTCHESTER)

The foregoing instrument was executed before me on January 5, 2023, by
Jonathan Koch as President of Novis Renewables, LLC.


NOTARY PUBLIC
Residing at: Irvington, NY

My Commission Expires:

February 3, 2024

ROBERT THEODORE GAMBO
Notary Public, State of New York
No. 02GA6403881
Qualified in Westchester County
Commission Expires February 3, 2024

EXHIBIT A

Legal Description of Property

The land includes up to approximately 1,959 acres of land in Adams County, Colorado as indicated below.

- 1) Parcel No. 0173700000042
Approx. 659.8 acres
SECT,TWN,RNG:29-2-59 DESC: ALL EXC CO RD 659/80A

- 2) Parcel No. 0173700000045
Approx. 334 acres
SECT,TWN,RNG:32-2-59 DESC: W2 334/70A

- 3) Parcel No. 0173700000046
Approx. 332.2 acres
SECT,TWN,RNG:32-2-59 DESC: E2 EXC 1A FOR SCHOOL 332/20A

- 4) Parcel No. 0180700000007
Approx. 632.8 acres
SECT,TWN,RNG:5-3-59 DESC: ALL EXC CO RD 632/80A



COMMITMENT FOR TITLE INSURANCE

ISSUED BY

AMTRUST TITLE INSURANCE COMPANY

NOTICE

IMPORTANT—READ CAREFULLY: THIS COMMITMENT IS AN OFFER TO ISSUE ONE OR MORE TITLE INSURANCE POLICIES. ALL CLAIMS OR REMEDIES SOUGHT AGAINST THE COMPANY INVOLVING THE CONTENT OF THIS COMMITMENT OR THE POLICY MUST BE BASED SOLELY IN CONTRACT.

THIS COMMITMENT IS NOT AN ABSTRACT OF TITLE, REPORT OF THE CONDITION OF TITLE, LEGAL OPINION, OPINION OF TITLE, OR OTHER REPRESENTATION OF THE STATUS OF TITLE. THE PROCEDURES USED BY THE COMPANY TO DETERMINE INSURABILITY OF THE TITLE, INCLUDING ANY SEARCH AND EXAMINATION, ARE PROPRIETARY TO THE COMPANY, WERE PERFORMED SOLELY FOR THE BENEFIT OF THE COMPANY, AND CREATE NO EXTRACTIONAL LIABILITY TO ANY PERSON, INCLUDING A PROPOSED INSURED.

THE COMPANY’S OBLIGATION UNDER THIS COMMITMENT IS TO ISSUE A POLICY TO A PROPOSED INSURED IDENTIFIED IN SCHEDULE A IN ACCORDANCE WITH THE TERMS AND PROVISIONS OF THIS COMMITMENT. THE COMPANY HAS NO LIABILITY OR OBLIGATION INVOLVING THE CONTENT OF THIS COMMITMENT TO ANY OTHER PERSON.

COMMITMENT TO ISSUE POLICY

Subject to the Notice; Schedule B, Part I—Requirements; Schedule B, Part II—Exceptions; and the Commitment Conditions, AmTrust Title Insurance Company, a New York corporation (the “Company”), commits to issue the Policy according to the terms and provisions of this Commitment. This Commitment is effective as of the Commitment Date shown in Schedule A for each Policy described in Schedule A, only when the Company has entered in Schedule A both the specified dollar amount as the Proposed Amount of Insurance and the name of the Proposed Insured.

If all of the Schedule B, Part I—Requirements have not been met within 6 months after the Commitment Date, this Commitment terminates and the Company’s liability and obligation end.

Issued through the Office of:

Authorized Signatory

Company Name

City, State



By:
President

Attest:
Secretary

ALTA 7-1-21 Comm

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File No. FN-46309-CO



ISSUED BY AMTRUST TITLE INSURANCE COMPANY**Transaction Identification Data, for which the Company assumes no liability as set forth in Commitment Condition 5.e.:**

Issuing Agent: First Nationwide Title Agency LLC
 Issuing Office: 220 East 42nd Street
 24th Floor
 New York, NY 10017

Issuing Office's ALTA® Registry ID:
 Loan ID Number:
 Commitment Number:
 Issuing Office File Number: FN-46309-CO-1
 Property Address: Deer Trail Solar - Parcel No. R0080978, Denver, CO 80229

SCHEDULE A

1. **Commitment Date:** September 28, 2023 at 8:00AM
 2. **Policy to be issued:**
 - a. 2021 ALTA® Owner's Policy
 Proposed Insured: Deer Trail Solar
 Proposed Amount of Insurance:
 The estate or interest to be insured: As set forth in Schedule A, Item 3
 - b. 2021 ALTA® Loan Policy
 Proposed Insured: Deer Trail Solar
 Proposed Amount of Insurance:
 The estate or interest to be insured: As set forth in Schedule A, Item 3
 3. **The estate or interest in the Land described or referred to in this Commitment is:**
 Fee
 4. **The title is, at the Commitment Date, vested in:**
 PARCELS 1, 3 AND 4: [LISA BEAUPREZ AND MARK BEAUPREZ AS TO AN UNDIVIDED 80% INTEREST AND BRADURY ASSOCIATES, LLP, A COLORADO LIMITED LIABILITY LIMITED PARTNERSHIP AS TO AN UNDIVIDED 20% INTEREST.](#)
 PARCEL 2: [L AND S CAPITAL LTD](#)
 5. **The Land is described as follows:**
 See **Exhibit A – Legal Description**
- AmTrust Title Insurance Company**
By: First Nationwide Title Agency LLC, its agent

This page is only a part of a 2021 ALTA Commitment for Title Insurance issued by AmTrust Title Insurance Company. This Commitment is not valid without the Notice; the Commitment to Issue Policy; the Commitment Conditions; Schedule A; Schedule B, Part I—Requirements; Schedule B, Part II—Exceptions; and a counter-signature by the Company or its issuing agent that may be in electronic form.

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File No. FN-46309-CO-1
 Schedule A Page 1 of 2





By: _____
Authorized Signatory

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File No. FN-46309-CO-1
Schedule A Page 2 of 2



ISSUED BY AMTRUST TITLE INSURANCE COMPANY

EXHIBIT A – LEGAL DESCRIPTION

PARCEL 1:

ALL OF SECTION 19, TOWNSHIP 2 SOUTH, RANGE 59 WEST OF THE 6TH P.M., ADAMS COUNTY, COLORADO.
PARCEL ID: R0080969

PARCEL 2

329.70 ACRES BEING THE EAST HALF SECTION 20, TOWNSHIP 2 SOUTH, RANGE 59 WEST OF THE 6TH P.M.,
ADAMS COUNTY, COLORADO.
PARCEL ID: R0108398

PARCEL 3

329.70 ACRES BEING THE WEST HALF SECTION 20, TOWNSHIP 2 SOUTH, RANGE 59 WEST OF THE 6TH P.M.,
ADAMS COUNTY, COLORADO.
PARCEL ID: R0108400

PARCEL 4

ALL OF SECTION 30, TOWNSHIP 2 SOUTH, RANGE 59 WEST OF THE 6TH P.M., ADAMS COUNTY, COLORADO.
PARCEL ID: R0080980

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File No. FN-46309-CO-1
Exhibit A Page 1 of 1



ISSUED BY AMTRUST TITLE INSURANCE COMPANY

SCHEDULE B, PART I – Requirements

All of the following Requirements must be met:

1. Instruments necessary to create the estate or interest to be insured must be properly executed, delivered and duly filed for record.
2. Pay the full consideration to, or for the account of, the grantors or mortgagors.
3. Pay all taxes, charges, assessments, levied and assessed against subject premises, which are due and payable.
4. Satisfactory evidence should be had that improvements and/or repairs or alterations thereto are completed that contractor, sub-contractors, labor and materialmen are all paid; and have released of record all liens or notice of intent to perfect a lien for labor material.

NOTE: The Company reserves the right to make any additional requirements and/or exceptions to this commitment and any subsequent Endorsements thereto upon review of all required documents or in otherwise ascertaining further details of the transaction.

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File No. FN-46309-CO-1
Schedule B-I Page 1 of 1



ISSUED BY AMTRUST TITLE INSURANCE COMPANY**SCHEDULE B, PART II – Exceptions**

Some historical land records contain Discriminatory Covenants that are illegal and unenforceable by law. This Commitment and the Policy treat any Discriminatory Covenant in a document referenced in Schedule B as if each Discriminatory Covenant is redacted, repudiated, removed, and not republished or recirculated. Only the remaining provisions of the document will be excepted from coverage

The Policy will not insure against loss or damage resulting from the terms and provisions of any lease or easement identified in Schedule A, and will include the following Exceptions unless cleared to the satisfaction of the Company:

STANDARD EXCEPTIONS

1. Rights or claims of parties in possession not shown by the public records.
2. Easements, or claims of easements, not shown by the public records.
3. Encroachments, overlaps, boundary line disputes, or other matters which would be disclosed by an accurate survey and inspection of the subject property.
4. Any lien, or right to a lien, for services, labor, or material hereto or hereafter furnished, imposed by law and not shown by the public records.
5. Taxes or special assessments which are not shown as existing liens by the public records.
6. Unpatented mining claims, reservations or exceptions in patents or in acts authorizing the issuance thereof.
7. Water rights, claims or title to water.

SPECIAL EXCEPTIONS**FN-46309-CO-2**

8. Electric Transmission Line Easement by Thomas H. Bradbury to Public Service Company of Colorado recorded on September 10, 2010 as instrument number [2010-60651](#). (Affects Parcel 1, 3, and 4)
9. Taxes and assessments for the year(s) 2022 are paid. 2023 are not yet due or payable. (Affects Parcel 1, 2, 3 and 4)

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File No. FN-46309-CO-1
Schedule B-II Page 1 of 1



COMMITMENT CONDITIONS**1. DEFINITIONS**

- a. "Discriminatory Covenant": Any covenant, condition, restriction, or limitation that is unenforceable under applicable law because it illegally discriminates against a class of individuals based on personal characteristics such as race, color, religion, sex, sexual orientation, gender identity, familial status, disability, national origin, or other legally protected class.
- b. "Knowledge" or "Known": Actual knowledge or actual notice, but not constructive notice imparted by the Public Records.
- c. "Land": The land described in Item 5 of Schedule A and improvements located on that land that by State law constitute real property. The term "Land" does not include any property beyond that described in Schedule A, nor any right, title, interest, estate, or easement in any abutting street, road, avenue, alley, lane, right-of-way, body of water, or waterway, but does not modify or limit the extent that a right of access to and from the Land is to be insured by the Policy.
- d. "Mortgage": A mortgage, deed of trust, trust deed, security deed, or other real property security instrument, including one evidenced by electronic means authorized by law.
- e. "Policy": Each contract of title insurance, in a form adopted by the American Land Title Association, issued or to be issued by the Company pursuant to this Commitment.
- f. "Proposed Amount of Insurance": Each dollar amount specified in Schedule A as the Proposed Amount of Insurance of each Policy to be issued pursuant to this Commitment.
- g. "Proposed Insured": Each person identified in Schedule A as the Proposed Insured of each Policy to be issued pursuant to this Commitment.
- h. "Public Records": The recording or filing system established under State statutes in effect at the Commitment Date under which a document must be recorded or filed to impart constructive notice of matters relating to the Title to a purchaser for value without Knowledge. The term "Public Records" does not include any other recording or filing system, including any pertaining to environmental remediation or protection, planning, permitting, zoning, licensing, building, health, public safety, or national security matters.
- i. "State": The state or commonwealth of the United States within whose exterior boundaries the Land is located. The term "State" also includes the District of Columbia, the Commonwealth of Puerto Rico, the U.S. Virgin Islands, and Guam.
- j. "Title": The estate or interest in the Land identified in Item 3 of Schedule A.

2. If all of the Schedule B, Part I—Requirements have not been met within the time period specified in the Commitment to Issue Policy, this Commitment terminates and the Company's liability and obligation end.

3. The Company's liability and obligation is limited by and this Commitment is not valid without:

- a. the Notice;
- b. the Commitment to Issue Policy;
- c. the Commitment Conditions;
- d. Schedule A;
- e. Schedule B, Part I—Requirements;
- f. Schedule B, Part II—Exceptions; and
- g. a counter-signature by the Company or its issuing agent that may be in electronic form.

4. COMPANY'S RIGHT TO AMEND

The Company may amend this Commitment at any time. If the Company amends this Commitment to add a defect, lien, encumbrance, adverse claim, or other matter recorded in the Public Records prior to the

ALTA 7-1-21 Comm

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Commitment Date, any liability of the Company is limited by Commitment Condition 5. The Company is not liable for any other amendment to this Commitment.

5. LIMITATIONS OF LIABILITY

- a. The Company's liability under Commitment Condition 4 is limited to the Proposed Insured's actual expense incurred in the interval between the Company's delivery to the Proposed Insured of the Commitment and the delivery of the amended Commitment, resulting from the Proposed Insured's good faith reliance to:
 - i. comply with the Schedule B, Part I—Requirements;
 - ii. eliminate, with the Company's written consent, any Schedule B, Part II—Exceptions; or
 - iii. acquire the Title or create the Mortgage covered by this Commitment.
- b. The Company is not liable under Commitment Condition 5.a. if the Proposed Insured requested the amendment or had Knowledge of the matter and did not notify the Company about it in writing.
- c. The Company is only liable under Commitment Condition 4 if the Proposed Insured would not have incurred the expense had the Commitment included the added matter when the Commitment was first delivered to the Proposed Insured.
- d. The Company's liability does not exceed the lesser of the Proposed Insured's actual expense incurred in good faith and described in Commitment Condition 5.a. or the Proposed Amount of Insurance.
- e. The Company is not liable for the content of the Transaction Identification Data, if any.
- f. The Company is not obligated to issue the Policy referred to in this Commitment unless all of the Schedule B, Part I—Requirements have been met to the satisfaction of the Company.
- g. The Company's liability is further limited by the terms and provisions of the Policy to be issued to the Proposed Insured.

6. LIABILITY OF THE COMPANY MUST BE BASED ON THIS COMMITMENT; CHOICE OF LAW AND CHOICE OF FORUM

- a. Only a Proposed Insured identified in Schedule A, and no other person, may make a claim under this Commitment.
- b. Any claim must be based in contract under the State law of the State where the Land is located and is restricted to the terms and provisions of this Commitment. Any litigation or other proceeding brought by the Proposed Insured against the Company must be filed only in a State or federal court having jurisdiction.
- c. This Commitment, as last revised, is the exclusive and entire agreement between the parties with respect to the subject matter of this Commitment and supersedes all prior commitment negotiations, representations, and proposals of any kind, whether written or oral, express or implied, relating to the subject matter of this Commitment.
- d. The deletion or modification of any Schedule B, Part II—Exception does not constitute an agreement or obligation to provide coverage beyond the terms and provisions of this Commitment or the Policy.
- e. Any amendment or endorsement to this Commitment must be in writing and authenticated by a person authorized by the Company.
- f. When the Policy is issued, all liability and obligation under this Commitment will end and the Company's only liability will be under the Policy.

7. IF THIS COMMITMENT IS ISSUED BY AN ISSUING AGENT

The issuing agent is the Company's agent only for the limited purpose of issuing title insurance commitments and policies. The issuing agent is not the Company's agent for closing, settlement, escrow, or any other purpose.

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- 8. PRO-FORMA POLICY**
The Company may provide, at the request of a Proposed Insured, a pro-forma policy illustrating the coverage that the Company may provide. A pro-forma policy neither reflects the status of Title at the time that the pro-forma policy is delivered to a Proposed Insured, nor is it a commitment to insure.
- 9. CLAIMS PROCEDURES**
This Commitment incorporates by reference all Conditions for making a claim in the Policy to be issued to the Proposed Insured. Commitment Condition 9 does not modify the limitations of liability in Commitment Conditions 5 and 6.
- 10. CLASS ACTION**
ALL CLAIMS AND DISPUTES ARISING OUT OF OR RELATING TO THIS COMMITMENT, INCLUDING ANY SERVICE OR OTHER MATTER IN CONNECTION WITH ISSUING THIS COMMITMENT, ANY BREACH OF A COMMITMENT PROVISION, OR ANY OTHER CLAIM OR DISPUTE ARISING OUT OF OR RELATING TO THE TRANSACTION GIVING RISE TO THIS COMMITMENT, MUST BE BROUGHT IN AN INDIVIDUAL CAPACITY. NO PARTY MAY SERVE AS PLAINTIFF, CLASS MEMBER, OR PARTICIPANT IN ANY CLASS OR REPRESENTATIVE PROCEEDING. ANY POLICY ISSUED PURSUANT TO THIS COMMITMENT WILL CONTAIN A CLASS ACTION CONDITION.
- 11. ARBITRATION**
The Policy contains an arbitration clause. All arbitrable matters when the Proposed Amount of Insurance is \$2,000,000 or less may be arbitrated at the election of either the Company or the Proposed Insured as the exclusive remedy of the parties. A Proposed Insured may review a copy of the arbitration rules at <http://www.alta.org/arbitration>.

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File No. FN-46309-CO



PRIVACY NOTICE

AmTrust Title Insurance Company and its majority-owned subsidiary companies that provide title insurance, technology, and transaction services to the real estate and mortgage industries (collectively, "AMT", "our" or "we") respect and are committed to protecting your privacy. This Privacy Notice lets you know how and for what purposes your Personal Information (as defined herein) is being collected, processed and used by AMT. We pledge that we will take reasonable steps to ensure that your Personal Information will only be used in ways that are in compliance with this Privacy Notice.

This Privacy Notice is only in effect for any generic information and Personal Information collected and/or owned by AMT, including collection through any AMT website and any online features, services and/or programs offered by AMT (collectively, the "Website"). This Privacy Notice is not applicable to any other web pages, mobile applications, social media sites, email lists, generic information or Personal Information collected and/or owned by any entity other than AMT.

Collection and Use of Information

The types of personal information AMT collects may include, among other things (collectively, "Personal Information"): (1) contact information (e.g., name, address, phone number, email address); (2) demographic information (e.g., date of birth, gender marital status); (3) Internet protocol (or IP) address or device ID/UDID; (4) social security number (SSN), student ID (SIN), driver's license, passport, and other government ID numbers; (5) financial account information; and (6) information related to offenses or criminal convictions.

In the course of our business, we may collect Personal Information about you from the following sources:

- Applications or other forms we receive from you or your authorized representative;
- Information we receive from you through the Website;
- Information about your transactions with or services performed by us, our affiliates, or others; and
- From consumer or other reporting agencies and public records maintained by governmental entities that we either obtain directly from those entities, or from our affiliates or others.

Information collected by AMT is used for three main purposes:

- To provide products and services to you or one or more third party service providers (collectively, "Third Parties") who are obtaining services on your behalf or in connection with a transaction involving you.
- To improve our products and services that we perform for you or for Third Parties.
- To communicate with you and to inform you about AMT's, AMT's affiliates and third parties' products and services.

Additional Ways that Information is Collected Through the Website

Browser Log Files. Our servers automatically log each visitor to the Website and collect and record certain information about each visitor. This information may include IP address, browser language, browser type, operating system, domain names, browsing history (including time spent at a domain, time and date of your visit), referring/exit web pages and URLs, and number of clicks. The domain name and IP address reveal nothing personal about the user other than the IP address from which the user has accessed the Website.

Cookies. From time to time, AMT or other third parties may send a "cookie" to your computer. A cookie is a small piece of data that is sent to your Internet browser from a web server and stored on your computer's hard drive and that can be re-sent to the serving website on subsequent visits. A cookie, by itself, cannot read other data from your hard disk or read other cookie files already on your computer. A cookie, by itself, does not damage your system. We, our advertisers and other third parties may use cookies to identify and keep track of, among other things, those areas of the Website and third party websites that you have visited in the past in order to enhance your next visit to the Website. You can choose whether or not

to accept cookies by changing the settings of your Internet browser, but some functionality of the Website may be impaired or not function as intended. See the Third Party Opt Out section below.

Web Beacons. Some of our web pages and electronic communications may contain images, which may or may not be visible to you, known as Web Beacons (sometimes referred to as "clear gifs"). Web Beacons collect only limited information that includes a cookie number; time and date of a page view; and a description of the page on which the Web Beacon resides. We may also carry Web Beacons placed by third party advertisers. These Web Beacons do not carry any Personal Information and are only used to track usage of the Website and activities associated with the Website. See the **Third Party Opt Out** section below.

Unique Identifier. We may assign you a unique internal identifier to help keep track of your future visits. We may use this information to gather aggregate demographic information about our visitors, and we may use it to personalize the information you see on the Website and some of the electronic communications you receive from us. We keep this information for our internal use, and this information is not shared with others.

Third Party Opt Out. Although we do not presently, in the future we may allow third-party companies to serve advertisements and/or collect certain anonymous information when you visit the Website. These companies may use non-personally identifiable information (e.g., click stream information, browser type, time and date, subject of advertisements clicked or scrolled over) during your visits to the Website in order to provide advertisements about products and services likely to be of greater interest to you. These companies typically use a cookie or third party Web Beacon to collect this information, as further described above. Through these technologies, the third party may have access to and use non-personalized information about your online usage activity.

You can opt-out of online behavioral services through any one of the ways described below. After you opt-out, you may continue to receive advertisements, but those advertisements will no longer be as relevant to you.

- You can opt-out via the Network Advertising Initiative industry opt-out at <http://www.networkadvertising.org/>.
- You can opt-out via the Consumer Choice Page at www.aboutads.info.
- For those in the U.K., you can opt-out via the IAB UK's industry opt-out at www.youronlinechoices.com.
- You can configure your web browser (Chrome, Firefox, Internet Explorer, Safari, etc.) to delete and/or control the use of cookies. More information can be found in the Help system of your browser. Note: If you opt-out as described above, you should not delete your cookies. If you delete your cookies, you will need to opt-out again.

When Information Is Disclosed by AMT

We may provide your Personal Information (excluding information we receive from consumer or other credit reporting agencies) to various individuals and companies, as permitted by law, without obtaining your prior authorization. Such laws do not allow consumers to restrict these disclosures. Disclosures may include, without limitation, the following:

- To agents, brokers, representatives, or others to provide you with services you have requested, and to enable us to detect or prevent criminal activity, fraud, material misrepresentation, or nondisclosure in connection with an insurance transaction;
- To third-party contractors or service providers who provide services or perform marketing services or other functions on our behalf;
- To law enforcement or other governmental authority in connection with an investigation, or civil or criminal subpoenas or court orders; and/or
- To lenders, lien holders, judgment creditors, or other parties claiming an encumbrance or an interest in title whose claim or interest must be determined, settled, paid or released prior to a title or escrow closing.

In addition to the other times when we might disclose information about you, we might also disclose information when required by law or in the good-faith belief that such disclosure is necessary to: (1) comply with a legal process or applicable

laws; (2) enforce this Privacy Notice; (3) respond to claims that any materials, documents, images, graphics, logos, designs, audio, video and any other information provided by you violates the rights of third parties; or (4) protect the rights, property or personal safety of AMT, its users or the public.

We maintain reasonable safeguards to keep the Personal Information that is disclosed to us secure. We provide Personal Information and non-Personal Information to our subsidiaries, affiliated companies, and other businesses or persons for the purposes of processing such information on our behalf and promoting the services of our trusted business partners, some or all of which may store your information on servers outside of the United States. We require that these parties agree to process such information in compliance with our Privacy Notice or in a similar, industry-standard manner, and we use reasonable efforts to limit their use of such information and to use other appropriate confidentiality and security measures. The use of your information by one of our trusted business partners may be subject to that party's own

Privacy Notice. We do not, however, disclose information we collect from consumer or credit reporting agencies with our affiliates or others without your consent, in conformity with applicable law, unless such disclosure is otherwise permitted by law.

We also reserve the right to disclose Personal Information and/or non-Personal Information to take precautions against liability, investigate and defend against any third-party claims or allegations, assist government enforcement agencies, protect the security or integrity of the Website, and protect the rights, property, or personal safety of AMT, our users or others.

We reserve the right to transfer your Personal Information, as well as any other information, in connection with the sale or other disposition of all or part of the AMT business and/or assets. We also cannot make any representations regarding the use or transfer of your Personal Information or other information that we may have in the event of our bankruptcy, reorganization, insolvency, receivership or an assignment for the benefit of creditors, and you expressly agree and consent to the use and/or transfer of your Personal Information or other information in connection with a sale or transfer of some or all of our assets in any of the above described proceedings. Furthermore, we cannot and will not be responsible for any breach of security by any third parties or for any actions of any third parties that receive any of the information that is disclosed to us.

Information from Children

We do not collect Personal Information from any person that we know to be under the age of thirteen (13). Specifically, the Website is not intended or designed to attract children under the age of thirteen (13). You affirm that you are either more than 18 years of age, or an emancipated minor, or possess legal parental or guardian consent, and are fully able and competent to enter into the terms, conditions, obligations, affirmations, representations, and warranties set forth in this Privacy Notice, and to abide by and comply with this Privacy Notice. In any case, you affirm that you are over the age of 13, as **THE WEBSITE IS NOT INTENDED FOR CHILDREN UNDER 13 THAT ARE UNACCOMPANIED BY HIS OR HER PARENT OR LEGAL GUARDIAN.**

Parents should be aware that AMT's Privacy Notice will govern our use of Personal Information, but also that information that is voluntarily given by children – or others – in email exchanges, bulletin boards or the like may be used by other parties to generate unsolicited communications. AMT encourages all parents to instruct their children in the safe and responsible use of their Personal Information while using the Internet.

Privacy Outside the Website

The Website may contain various links to other websites, including links to various third party service providers. AMT is not and cannot be responsible for the privacy practices or the content of any of those other websites. Other than under agreements with certain reputable organizations and companies, and except for third party service providers whose services either we use or you voluntarily elect to utilize, we do not share any of the Personal Information that you provide to us with any of the websites to which the Website links, although we may share aggregate, non-Personal Information with those other third parties. Please check with those websites in order to determine their privacy policies and your rights under them.

European Union Users

If you are a citizen of the European Union, please note that we may transfer your Personal Information outside the European Union for use for any of the purposes described in this Privacy Notice. By providing AMT with your Personal Information, you consent to both our collection and such transfer of your Personal Information in accordance with this Privacy Notice.

Choices with Your Personal Information

Whether you submit Personal Information to AMT is entirely up to you. You may decide not to submit Personal Information, in which case AMT may not be able to provide certain services or products to you.

You may choose to prevent AMT from disclosing or using your Personal Information under certain circumstances (“opt out”). You may opt out of any disclosure or use of your Personal Information for purposes that are incompatible with the purpose(s) for which it was originally collected or for which you subsequently gave authorization by notifying us by one of the methods at the end of this Privacy Notice. Furthermore, even where your Personal Information is to be disclosed and used in accordance with the stated purposes in this Privacy Notice, you may elect to opt out of such disclosure to and use by a third party that is not acting as an agent of AMT. As described above, there are some uses from which you cannot opt-out.

Please note that opting out of the disclosure and use of your Personal Information as a prospective employee may prevent you from being hired as an employee by AMT to the extent that provision of your Personal Information is required to apply for an open position.

If AMT collects Personal Information from you, such information will not be disclosed or used by AMT for purposes that are incompatible with the purpose(s) for which it was originally collected or for which you subsequently gave authorization unless you affirmatively consent to such disclosure and use.

You may opt out of online behavioral advertising by following the instructions set forth above under the above section “Additional Ways That Information Is Collected Through the Website,” subsection “Third Party Opt Out.”

Access and Correction

To access your Personal Information in the possession of AMT and correct inaccuracies of that information in our records, please contact us in the manner specified at the end of this Privacy Notice. We ask individuals to identify themselves and the information requested to be accessed and amended before processing such requests, and we may decline to process requests in limited circumstances as permitted by applicable privacy legislation.

Your California Privacy Rights

Under California’s “Shine the Light” law, California residents who provide certain personally identifiable information in connection with obtaining products or services for personal, family or household use are entitled to request and obtain from us once a calendar year information about the customer information we shared, if any, with other businesses for their own direct marketing uses. If applicable, this information would include the categories of customer information and the names and addresses of those businesses with which we shared customer information for the immediately prior calendar year (e.g., requests made in 2013 will receive information regarding 2012 sharing activities).

To obtain this information on behalf of AMT, please send an email message to underwriting@amtrusttitlegroup.com with “Request for California Privacy Information” in the subject line and in the body of your message. We will provide the requested information to you at your email address in response.

Please be aware that not all information sharing is covered by the “Shine the Light” requirements and only information on covered sharing will be included in our response.

Additionally, because we may collect your Personal Information from time to time, California’s Online Privacy Protection Act requires us to disclose how we respond to “do not track” requests and other similar mechanisms. Currently, our policy is that we do not recognize “do not track” requests from Internet browsers and similar devices.

Your Consent to This Privacy Notice

By submitting Personal Information to AMT, you consent to the collection and use of information by us as specified above or as we otherwise see fit, in compliance with this Privacy Notice, unless you inform us otherwise by means of the procedure identified below. If we decide to change this Privacy Notice, we will make an effort to post those changes on the Website. Each time we collect information from you following any amendment of this Privacy Notice will signify your assent to and acceptance of its revised terms for all previously collected information and information collected from you in the future. We may use comments, information or feedback that you may submit in any manner that we may choose without notice or compensation to you.

If you have additional questions or comments, please let us know by sending your comments or requests to:

AmTrust Title Insurance Company

59 Maiden Lane, 43rd Floor

New York, New York 10038

855.449.0620

Email: underwriting@amtrusttitlegroup.com

PRIVACY POLICY NOTICE

Title V of the Gramm-Leach-Bliley Act (GLBA) generally prohibits any financial institution, directly or through its affiliates, from sharing nonpublic personal information about you with a nonaffiliated third party unless the institution provides YOU with a notice of its privacy policies and practices, such as the type of information that it collects about you and the categories of persons or entities to whom it may be disclosed. In compliance with the GLBA, we are providing you with this document, which notifies you of the privacy policies and practices of First Nationwide Title Agency LLC.

We may collect nonpublic personal information about you from the following sources:

- Information we receive from you such as on applications or other forms.
- Information about your transactions we secure from our files, or from our affiliates or others.
- Information we receive from a consumer reporting agency.
- Information that we receive from others involved in your transaction, such as the real estate agent or lender.

Unless it is specifically stated otherwise in an amended Privacy Policy Notice, no additional nonpublic personal information will be collected about you.

We may disclose any of the above information that we collect about our customers or former customers to our affiliates or to nonaffiliated third parties as permitted by law.

We also may disclose this information about our customers or former customers to the following types of nonaffiliated companies that perform marketing services on our behalf or with whom we have Joint Marketing Agreements:

- Financial service providers such as companies engaged in banking, consumer finance, securities and insurance.
- Non-financial companies such as envelope stuffers and other fulfillment service providers.

WE DO NOT DISCLOSE ANY NONPUBLIC PERSONAL INFORMATION ABOUT YOU WITH ANYONE FOR ANY PURPOSE THAT IS NOT SPECIFICALLY PERMITTED BY LAW.

We restrict access to non-public personal information about you to those employees who need to know that information in order to provide products or services to you. We maintain physical, electronic, and procedural safeguards that comply with federal regulations to guard your nonpublic personal information.

RECORDING REQUESTED BY AND
WHEN RECORDED PLEASE RETURN TO:

Novis Renewables, LLC

Attn: Site Administration

1 Bridge Street, Suite 11

Irvington, NY 10533

MEMORANDUM OF OPTION AGREEMENT

THIS MEMORANDUM OF OPTION AGREEMENT (the “**Memorandum**”) is made as of December 13, 2023, by and between **Bradbury Associates, LLLP**, a Colorado Limited Liability Limited Partnership and Mark Beauprez and Lisa Beauprez (collectively, “**Owner**”), and **Novis Renewables, LLC** and/or its assigns, a Delaware limited liability company (“**Optionee**”).

RECITALS

A. Owner is the owner of the real property located in **Adams** County, Colorado that includes a 61 acre parcel that is more particularly depicted in Exhibit A attached hereto. The 61 acre parcel shall be referred to herein as the “**Property**.”

B. Pursuant to that certain Option Agreement, dated as of December 13, 2023 (the “**Agreement**”), Owner has granted Optionee the exclusive right and option to purchase between ten (10) and forty (40) contiguous acres within the Property (the “**Optioned Property**”).

C. The parties are executing and recording this Memorandum so that third parties shall have notice of Optionee’s exclusive option to purchase the Optioned Property, and of the rights and obligations of Owner and Optionee under the Agreement.

AGREEMENT

NOW, THEREFORE, in consideration of the Agreement and for other good and valuable consideration, receipt of which is hereby acknowledged, the parties agree as follows:

1. Owner has granted to Optionee an exclusive option to purchase the Optioned Property and, upon the exercise of the option, Owner agrees to sell the Optioned Property to Optionee in accordance with the terms and provisions of the Agreement.

2. The Agreement provides for an Option Period of two (2) years commencing upon the effective date of the Agreement set forth above.

3. During the Option Period, Owner has granted to Optionee the non-exclusive right and easement to enter upon the Property to perform all effort and labor necessary to carry out tests, inspections, surveys and investigations that Optionee deems necessary or advisable to assess the feasibility of the Facilities, all as more particularly set forth in the Agreement.

4. All of the terms, conditions and agreements contained within the Agreement are fully incorporated herein by reference as if fully set forth herein. This Memorandum is not intended to change the terms of the Agreement and, in the event of a conflict between the terms and conditions of this Memorandum and the Agreement, the terms and conditions of the Agreement shall control. All capitalized terms not defined herein shall have the meaning set forth in the Agreement.

5. This Memorandum shall be governed by the laws of Colorado.

6. The parties agree that this Memorandum may be executed in multiple counterparts which, when signed by all parties, shall constitute a binding agreement.

OWNER:

Mark Beauprez

Mark Beauprez

Lisa Beauprez

Lisa Beauprez

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

STATE OF Colorado)
: SS
COUNTY OF Arapahoe)

The foregoing instrument was acknowledged before me on 12-13-23, by Mark Beauprez

Christina Knisley
NOTARY PUBLIC
Residing at: Deer Trail, CO

My Commission Expires:

6-15-26

CHRISTINA KNISLEY
Notary Public
State of Colorado
Notary ID # 20184025131
My Commission Expires 06-15-2026

STATE OF Colorado)
: SS
COUNTY OF Arapahoe)

The foregoing instrument was acknowledged before me on 12-13-23, by Lisa Beauprez

Christina Knisley
NOTARY PUBLIC
Residing at: Deer Trail, CO

My Commission Expires:

6-15-26

CHRISTINA KNISLEY
Notary Public
State of Colorado
Notary ID # 20184025131
My Commission Expires 06-15-2026

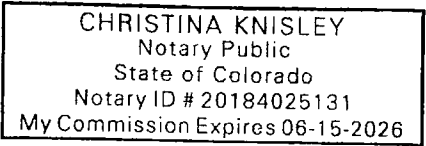
IN WITNESS WHEREOF, the parties have executed this Memorandum as of the date first written above.

OWNER:

Bradbury Associates, LLLP,
a Limited Liability Limited Partnership

By: Lisa Beauprez
Name: Lisa Beauprez
Title: General Partner

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.



STATE OF Colorado)
 : ss
COUNTY OF Arapahoe)

The foregoing instrument was acknowledged before me on 12-13-23, by LISA Beauprez as General Partner of Bradbury Associates, LLLP


Christina Knisley
NOTARY PUBLIC
Residing at: Deer Trail, CO

My Commission Expires:

6-15-26

OPTIONEE:

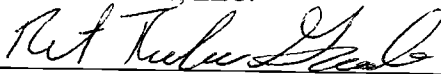
NOVIS RENEWABLES, LLC,
a Delaware limited liability company

By: 
Name: Thomas Leahy
Title: President

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

STATE OF New York)
 : ss
COUNTY OF Westchester)

The foregoing instrument was acknowledged before me on January 17, 2024 by
Thomas Leahy as President of Novis Renewables, LLC.


NOTARY PUBLIC
Residing at: Irvington, NY

My Commission Expires:

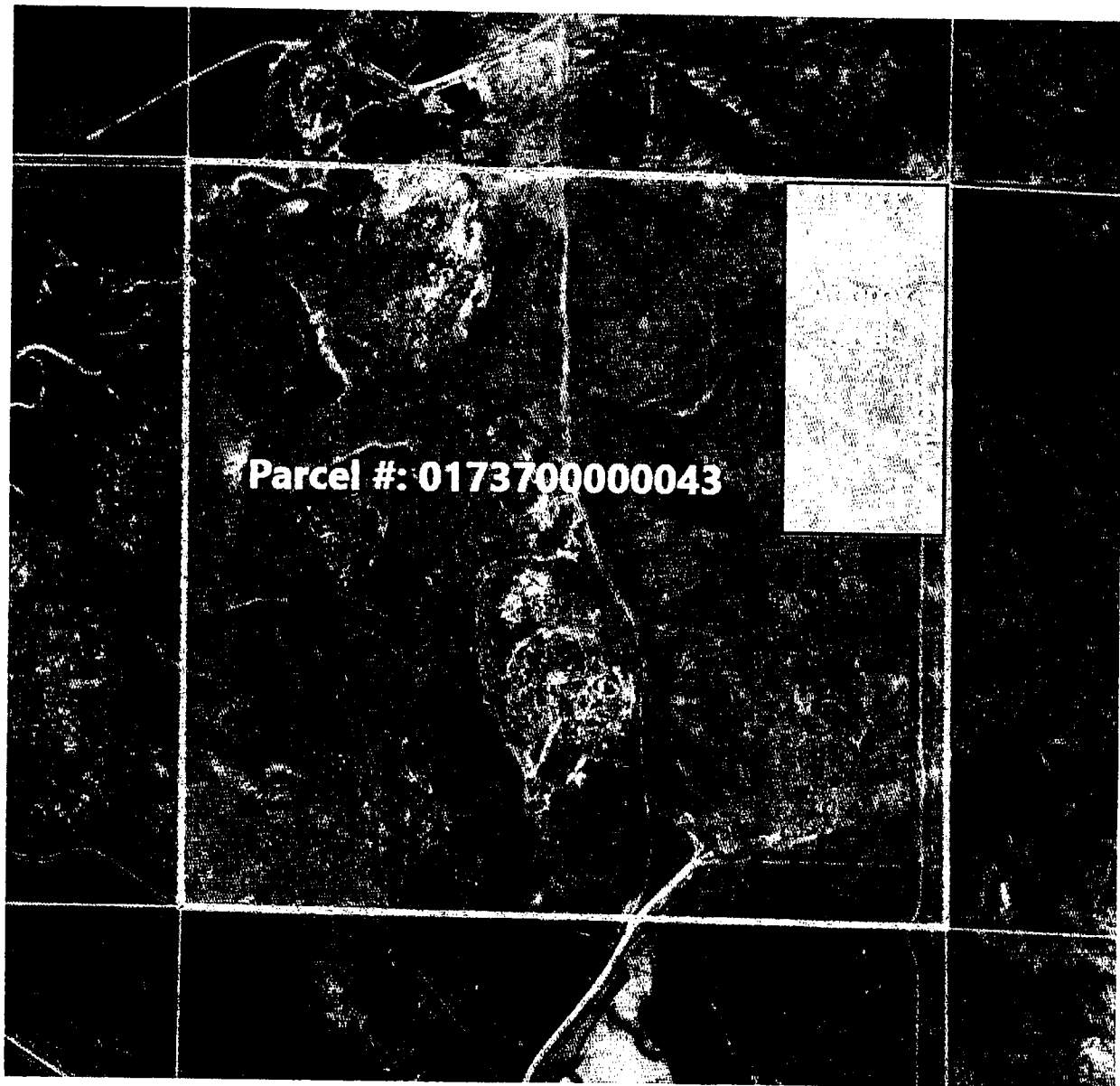
February 3, 2024

ROBERT THEODORE GAMBO
Notary Public, State of New York
No. 02GA6403881
Qualified in Westchester County
Commission Expires February 3, 2024

Exhibit A

Legal Description of Property

The Option applies to the 61 acre parcel depicted herein which is a part of Adams County, Colorado Assessor parcel number: 0173700000043 (SECT,TWN,RNG:30-2-59 DESC: ALL 668/10A). If exercised, Optionee shall designate ten (10) to forty (40) acres of land out of the approximately 61 acres on or before the expiration of the Option Term for purchase.





COMMITMENT FOR TITLE INSURANCE

ISSUED BY

**AMTRUST TITLE INSURANCE COMPANY
NOTICE**

IMPORTANT—READ CAREFULLY: THIS COMMITMENT IS AN OFFER TO ISSUE ONE OR MORE TITLE INSURANCE POLICIES. ALL CLAIMS OR REMEDIES SOUGHT AGAINST THE COMPANY INVOLVING THE CONTENT OF THIS COMMITMENT OR THE POLICY MUST BE BASED SOLELY IN CONTRACT.

THIS COMMITMENT IS NOT AN ABSTRACT OF TITLE, REPORT OF THE CONDITION OF TITLE, LEGAL OPINION, OPINION OF TITLE, OR OTHER REPRESENTATION OF THE STATUS OF TITLE. THE PROCEDURES USED BY THE COMPANY TO DETERMINE INSURABILITY OF THE TITLE, INCLUDING ANY SEARCH AND EXAMINATION, ARE PROPRIETARY TO THE COMPANY, WERE PERFORMED SOLELY FOR THE BENEFIT OF THE COMPANY, AND CREATE NO EXTRACTIONAL LIABILITY TO ANY PERSON, INCLUDING A PROPOSED INSURED.

THE COMPANY’S OBLIGATION UNDER THIS COMMITMENT IS TO ISSUE A POLICY TO A PROPOSED INSURED IDENTIFIED IN SCHEDULE A IN ACCORDANCE WITH THE TERMS AND PROVISIONS OF THIS COMMITMENT. THE COMPANY HAS NO LIABILITY OR OBLIGATION INVOLVING THE CONTENT OF THIS COMMITMENT TO ANY OTHER PERSON.

COMMITMENT TO ISSUE POLICY

Subject to the Notice; Schedule B, Part I—Requirements; Schedule B, Part II—Exceptions; and the Commitment Conditions, AmTrust Title Insurance Company, a New York corporation (the “Company”), commits to issue the Policy according to the terms and provisions of this Commitment. This Commitment is effective as of the Commitment Date shown in Schedule A for each Policy described in Schedule A, only when the Company has entered in Schedule A both the specified dollar amount as the Proposed Amount of Insurance and the name of the Proposed Insured.

If all of the Schedule B, Part I—Requirements have not been met within 6 months after the Commitment Date, this Commitment terminates and the Company’s liability and obligation end.

Issued through the Office of:

Authorized Signatory

Company Name

City, State



By:

President

Attest:

Secretary

ALTA 7-1-21 Comm

This page is only a part of a 2021 ALTA Commitment for Title Insurance issued by AmTrust Title Insurance Company. This Commitment is not valid without the Notice; the Commitment to Issue Policy; the Commitment Conditions; Schedule A; Schedule B, Part I—Requirements; Schedule B, Part II—Exceptions; and a counter-signature by the Company or its issuing agent that may be in electronic form.

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ISSUED BY AMTRUST TITLE INSURANCE COMPANY

Transaction Identification Data for reference only:

Issuing Agent:
Issuing Office:

ALTA Universal ID:
Loan ID Number:
Commitment Number:
Issuing Office File Number: FN-46309-CO-3
Property Address: Deer Trail Solar, Denver, CO 80229

SCHEDULE A

1. **Commitment Date:** December 28, 2023 at 8:00AM
2. **Policy to be issued:**
 - a. ALTA Owner's Policy (6-17-06)
Proposed Insured: TBD
Proposed Policy Amount:
 - b. ALTA Loan Policy (6-17-06)
Proposed Insured: TBD
Proposed Policy Amount: \$1.00
3. **The estate or interest in the Land described or referred to in this Commitment is:**
4. **The title is, at the Commitment Date, vested in:**
[JAMES W. HOLDEN](#)
5. **The Land is described as follows:**
See **Exhibit A**

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File No. FN-46309-CO-3
Schedule A Page 1 of 1



ISSUED BY AMTRUST TITLE INSURANCE COMPANY

EXHIBIT A

A PARCEL OF LAND LOCATED WITHIN THE NORTH ONE-HALF OF SECTION 4, TOWNSHIP 3 SOUTH, RANGE 59 WEST OF THE 6TH P.M., BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT THE NORTHWEST CORNER OF SAID SECTION 4; THENCE NORTH 89° 36' 55" EAST ALONG THE NORTH LINE OF SAID SECTION 4 A DISTANCE OF 1320 FEET; THENCE SOUTH 00° 00' 00" EAST, PARALLEL WITH THE WEST LINE OF SAID SECTION 4, A DISTANCE OF 1320 FEET; THENCE SOUTH 89° 36' 55" WEST, PARALLEL WITH THE NORTH LINE OF SAID SECTION 4, A DISTANCE OF 1320 FEET TO INTERSECT WITH THE WEST LINE OF SAID SECTION 4; THENCE NORTH 00° 00' 00" EAST, ALONG THE WEST LINE OF SAID SECTION 4, A DISTANCE OF 1320 FEET TO THE POINT OF BEGINNING, COUNTY OF ADAMS, STATE OF COLORADO.

AND THE NORTH ONE-HALF OF SECTION 4, TOWNSHIP 3 SOUTH, RANGE 59 WEST OF THE 6TH P.M., EXCEPT THE FOLLOWING DESCRIBED PARCEL:

BEGINNING AT THE NORTHWEST CORNER OF SAID SECTION 4; THENCE NORTH 89° 36' 55" EAST, ALONG THE NORTH LINE OF SAID SECTION 4, A DISTANCE OF 1320 FEET; THENCE SOUTH 00° 00' 00" EAST, PARALLEL WITH THE WEST LINE OF SAID SECTION 4, A DISTANCE OF 1320 FEET; THENCE SOUTH 89° 36' 55" WEST, PARALLEL WITH THE NORTH LINE OF SAID SECTION 4, A DISTANCE OF 1320 FEET TO INTERSECT WITH THE WEST LINE OF SAID SECTION 4; THENCE NORTH 00° 00' 00" EAST, ALONG THE WEST LINE OF SAID SECTION 4, A DISTANCE OF 1320 FEET TO THE POINT OF BEGINNING, COUNTY OF ADAMS, STATE OF COLORADO.

APN NO: R0081261

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File No. FN-46309-CO-3
Exhibit A Page 1 of 1



ISSUED BY AMTRUST TITLE INSURANCE COMPANY
SCHEDULE B – PART I
Requirements

All of the following Requirements must be met:

1. Instruments necessary to create the estate or interest to be insured must be properly executed, delivered and duly filed for record.
2. Pay the full consideration to, or for the account of, the grantors or mortgagors.
3. Pay all taxes, charges, assessments, levied and assessed against subject premises, which are due and payable.
4. Satisfactory evidence should be had that improvements and/or repairs or alterations thereto are completed that contractor, sub-contractors, labor and materialmen are all paid; and have released of record all liens or notice of intent to perfect a lien for labor material.

NOTE: The Company reserves the right to make any additional requirements and/or exceptions to this commitment and any subsequent Endorsements thereto upon review of all required documents or in otherwise ascertaining further details of the transaction.

5. Payment, transfer and final reading for water, sewer and storm water charges, currently assessed against the subject property.

NOTE: The subject property may lie within an area where local Ordinances/Municipal Codes allow unpaid water/ sewer charges to become a lien on the real property.

NOTE: Some municipalities REQUIRE the title company to arrange the transfer of service from buyer to seller. NOTE: It is highly recommended that seller provide specific account numbers for municipalities that handle the billings for these services.

6. Deed of Trust Security Agreement, Assignment of Rents and Fixture Filing form James W. Holden to Mortgage Solutions Financial, LLC, and the Public Trustee of Adams County, Colorado, by instrument dated March 31, 2016, recorded on 06/04/2016 in/under/as Instrument No. [2016000025723](#), public records of Adams County, Colorado.

Assignment of Deed of Trust form Mortgage Solutions Financial to U. S. Bank National Association, as Custodian/Trustee for Federal Agricultural Mortgage Corporation Programs, by instrument dated April 04, 2016, recorded on 06/14/2016 in/under/as Instrument No. [2016000046556](#), public records of Adams County, Colorado.

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File No. FN-46309-CO-3
Schedule B-I Page 1 of 1



ISSUED BY AMTRUST TITLE INSURANCE COMPANY**SCHEDULE B – PART II****Exceptions**

THIS COMMITMENT DOES NOT REPUBLISH ANY COVENANT, CONDITION, RESTRICTION, OR LIMITATION CONTAINED IN ANY DOCUMENT REFERRED TO IN THIS COMMITMENT TO THE EXTENT THAT THE SPECIFIC COVENANT, CONDITION, RESTRICTION, OR LIMITATION VIOLATES STATE OR FEDERAL LAW BASED ON RACE, COLOR, RELIGION, SEX, SEXUAL ORIENTATION, GENDER IDENTITY, HANDICAP, FAMILIAL STATUS, OR NATIONAL ORIGIN.

The Policy will not insure against loss or damage resulting from the terms and provisions of any lease or easement identified in Schedule A, and will include the following Exceptions unless cleared to the satisfaction of the Company:

STANDARD EXCEPTIONS

1. Defects, liens, encumbrances, adverse claims or other matters, if any, created, first appearing in the public records or attaching subsequent to the Effective Date but prior to the date the proposed Insured acquires for value of record the estate or interest or mortgage thereon covered by this Commitment.
2. Any lien, or right to a lien, for services, labor or materials, imposed by law and not shown by the public records.
3. Any encroachment, encumbrance, violation, or adverse circumstance affecting the title including discrepancies, conflicts in boundary lines, shortages in area, or any other facts that would be disclosed by an accurate and complete land survey of the land, and that are not shown in the public records.
4. Rights of parties in actual possession of all or any part of the premises, including, but not limited to, easements, claims of easements or encumbrances that are not shown in the public records.
5. The lien of real estate taxes or assessments imposed on the title by a governmental authority that are not shown as existing liens in the records of any taxing authority that levies taxes or assessments on real property or in the public records.
6. Minerals of whatsoever kind, subsurface and surface substances, including but not limited to coal, lignite, oil, gas, uranium, clay, rock, sand and gravel in, on, under and that may be produced from the Land, together with all rights, privileges, and immunities relating thereto, whether or not appearing in the Public Records or listed in Schedule B. The Company makes no representation as to the present ownership of any such interests. There may be leases, grants, exceptions or reservations of interests that are not listed.
7. Subject to rights of tenants in possession, as tenants only, under unrecorded leases.

SPECIAL EXCEPTIONS**FN-46309-CO**

8. Patent from The United States of America to George S. Wallace by instrument dated January 17, 1914, recorded on 01/17/1914 in/under/as [Instrument No. 010123](#), public records of Adams County, Colorado.

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File No. FN-46309-CO-3
Schedule B-II Page 1 of 2



9. Oil Gas, and Other Minerals Contained in the Warranty Deed form Raymond J. Morris to Garold C. Middlemist and Geraldine K. Middlemist by instrument dated September 12, 1994, recorded on 09/19/1994 in/under/as [Instrument No. 1994030017690](#), public records of Adams County, Colorado.

10. Oil Gas, and Other Minerals Contained in the Quit Claim Deed form Garold C. Middlemist and Geraldine K. Middlemist to Gary Ayers and Aimee Ayers-Revera by instrument dated March 17, 2005, recorded on 04/04/2005 in/under/as Instrument [No. 2005000344090](#), public records of Adams County, Colorado.

11. Taxes currently due and payable in 2023

PID Number: R0081261

Tax Payment Status: Due

Total Amount Assessed: \$39,080

Amount Due: \$3,097.20

Delinquent Tax Amount: N/A

Delinquent Tax Remarks: N/A

No Delinquent Tax Claims

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File No. FN-46309-CO-3
Schedule B-II Page 2 of 2



PRIVACY POLICY NOTICE

Title V of the Gramm-Leach-Bliley Act (GLBA) generally prohibits any financial institution, directly or through its affiliates, from sharing nonpublic personal information about you with a nonaffiliated third party unless the institution provides YOU with a notice of its privacy policies and practices, such as the type of information that it collects about you and the categories of persons or entities to whom it may be disclosed. In compliance with the GLBA, we are providing you with this document, which notifies you of the privacy policies and practices of .

We may collect nonpublic personal information about you from the following sources:

- Information we receive from you such as on applications or other forms.
- Information about your transactions we secure from our files, or from our affiliates or others.
- Information we receive from a consumer reporting agency.
- Information that we receive from others involved in your transaction, such as the real estate agent or lender.

Unless it is specifically stated otherwise in an amended Privacy Policy Notice, no additional nonpublic personal information will be collected about you.

We may disclose any of the above information that we collect about our customers or former customers to our affiliates or to nonaffiliated third parties as permitted by law.

We also may disclose this information about our customers or former customers to the following types of nonaffiliated companies that perform marketing services on our behalf or with whom we have Joint Marketing Agreements:

- Financial service providers such as companies engaged in banking, consumer finance, securities and insurance.
- Non-financial companies such as envelope stuffers and other fulfillment service providers.

WE DO NOT DISCLOSE ANY NONPUBLIC PERSONAL INFORMATION ABOUT YOU WITH ANYONE FOR ANY PURPOSE THAT IS NOT SPECIFICALLY PERMITTED BY LAW.

We restrict access to non-public personal information about you to those employees who need to know that information in order to provide products or services to you. We maintain physical, electronic, and procedural safeguards that comply with federal regulations to guard your nonpublic personal information.

COMMITMENT CONDITIONS**1. DEFINITIONS**

- a. "Discriminatory Covenant": Any covenant, condition, restriction, or limitation that is unenforceable under applicable law because it illegally discriminates against a class of individuals based on personal characteristics such as race, color, religion, sex, sexual orientation, gender identity, familial status, disability, national origin, or other legally protected class.
- b. "Knowledge" or "Known": Actual knowledge or actual notice, but not constructive notice imparted by the Public Records.
- c. "Land": The land described in Item 5 of Schedule A and improvements located on that land that by State law constitute real property. The term "Land" does not include any property beyond that described in Schedule A, nor any right, title, interest, estate, or easement in any abutting street, road, avenue, alley, lane, right-of-way, body of water, or waterway, but does not modify or limit the extent that a right of access to and from the Land is to be insured by the Policy.
- d. "Mortgage": A mortgage, deed of trust, trust deed, security deed, or other real property security instrument, including one evidenced by electronic means authorized by law.
- e. "Policy": Each contract of title insurance, in a form adopted by the American Land Title Association, issued or to be issued by the Company pursuant to this Commitment.
- f. "Proposed Amount of Insurance": Each dollar amount specified in Schedule A as the Proposed Amount of Insurance of each Policy to be issued pursuant to this Commitment.
- g. "Proposed Insured": Each person identified in Schedule A as the Proposed Insured of each Policy to be issued pursuant to this Commitment.
- h. "Public Records": The recording or filing system established under State statutes in effect at the Commitment Date under which a document must be recorded or filed to impart constructive notice of matters relating to the Title to a purchaser for value without Knowledge. The term "Public Records" does not include any other recording or filing system, including any pertaining to environmental remediation or protection, planning, permitting, zoning, licensing, building, health, public safety, or national security matters.
- i. "State": The state or commonwealth of the United States within whose exterior boundaries the Land is located. The term "State" also includes the District of Columbia, the Commonwealth of Puerto Rico, the U.S. Virgin Islands, and Guam.
- j. "Title": The estate or interest in the Land identified in Item 3 of Schedule A.

2. If all of the Schedule B, Part I—Requirements have not been met within the time period specified in the Commitment to Issue Policy, this Commitment terminates and the Company's liability and obligation end.

3. The Company's liability and obligation is limited by and this Commitment is not valid without:

- a. the Notice;
- b. the Commitment to Issue Policy;
- c. the Commitment Conditions;
- d. Schedule A;
- e. Schedule B, Part I—Requirements;
- f. Schedule B, Part II—Exceptions; and
- g. a counter-signature by the Company or its issuing agent that may be in electronic form.

4. COMPANY'S RIGHT TO AMEND

The Company may amend this Commitment at any time. If the Company amends this Commitment to add a defect, lien, encumbrance, adverse claim, or other matter recorded in the Public Records prior to the

ALTA 7-1-21 Comm

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Commitment Date, any liability of the Company is limited by Commitment Condition 5. The Company is not liable for any other amendment to this Commitment.

5. LIMITATIONS OF LIABILITY

- a. The Company's liability under Commitment Condition 4 is limited to the Proposed Insured's actual expense incurred in the interval between the Company's delivery to the Proposed Insured of the Commitment and the delivery of the amended Commitment, resulting from the Proposed Insured's good faith reliance to:
 - i. comply with the Schedule B, Part I—Requirements;
 - ii. eliminate, with the Company's written consent, any Schedule B, Part II—Exceptions; or
 - iii. acquire the Title or create the Mortgage covered by this Commitment.
- b. The Company is not liable under Commitment Condition 5.a. if the Proposed Insured requested the amendment or had Knowledge of the matter and did not notify the Company about it in writing.
- c. The Company is only liable under Commitment Condition 4 if the Proposed Insured would not have incurred the expense had the Commitment included the added matter when the Commitment was first delivered to the Proposed Insured.
- d. The Company's liability does not exceed the lesser of the Proposed Insured's actual expense incurred in good faith and described in Commitment Condition 5.a. or the Proposed Amount of Insurance.
- e. The Company is not liable for the content of the Transaction Identification Data, if any.
- f. The Company is not obligated to issue the Policy referred to in this Commitment unless all of the Schedule B, Part I—Requirements have been met to the satisfaction of the Company.
- g. The Company's liability is further limited by the terms and provisions of the Policy to be issued to the Proposed Insured.

6. LIABILITY OF THE COMPANY MUST BE BASED ON THIS COMMITMENT; CHOICE OF LAW AND CHOICE OF FORUM

- a. Only a Proposed Insured identified in Schedule A, and no other person, may make a claim under this Commitment.
- b. Any claim must be based in contract under the State law of the State where the Land is located and is restricted to the terms and provisions of this Commitment. Any litigation or other proceeding brought by the Proposed Insured against the Company must be filed only in a State or federal court having jurisdiction.
- c. This Commitment, as last revised, is the exclusive and entire agreement between the parties with respect to the subject matter of this Commitment and supersedes all prior commitment negotiations, representations, and proposals of any kind, whether written or oral, express or implied, relating to the subject matter of this Commitment.
- d. The deletion or modification of any Schedule B, Part II—Exception does not constitute an agreement or obligation to provide coverage beyond the terms and provisions of this Commitment or the Policy.
- e. Any amendment or endorsement to this Commitment must be in writing and authenticated by a person authorized by the Company.
- f. When the Policy is issued, all liability and obligation under this Commitment will end and the Company's only liability will be under the Policy.

7. IF THIS COMMITMENT IS ISSUED BY AN ISSUING AGENT

The issuing agent is the Company's agent only for the limited purpose of issuing title insurance commitments and policies. The issuing agent is not the Company's agent for closing, settlement, escrow, or any other purpose.

ALTA 7-1-21 Comm

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- 8. PRO-FORMA POLICY**
The Company may provide, at the request of a Proposed Insured, a pro-forma policy illustrating the coverage that the Company may provide. A pro-forma policy neither reflects the status of Title at the time that the pro-forma policy is delivered to a Proposed Insured, nor is it a commitment to insure.
- 9. CLAIMS PROCEDURES**
This Commitment incorporates by reference all Conditions for making a claim in the Policy to be issued to the Proposed Insured. Commitment Condition 9 does not modify the limitations of liability in Commitment Conditions 5 and 6.
- 10. CLASS ACTION**
ALL CLAIMS AND DISPUTES ARISING OUT OF OR RELATING TO THIS COMMITMENT, INCLUDING ANY SERVICE OR OTHER MATTER IN CONNECTION WITH ISSUING THIS COMMITMENT, ANY BREACH OF A COMMITMENT PROVISION, OR ANY OTHER CLAIM OR DISPUTE ARISING OUT OF OR RELATING TO THE TRANSACTION GIVING RISE TO THIS COMMITMENT, MUST BE BROUGHT IN AN INDIVIDUAL CAPACITY. NO PARTY MAY SERVE AS PLAINTIFF, CLASS MEMBER, OR PARTICIPANT IN ANY CLASS OR REPRESENTATIVE PROCEEDING. ANY POLICY ISSUED PURSUANT TO THIS COMMITMENT WILL CONTAIN A CLASS ACTION CONDITION.
- 11. ARBITRATION**
The Policy contains an arbitration clause. All arbitrable matters when the Proposed Amount of Insurance is \$2,000,000 or less may be arbitrated at the election of either the Company or the Proposed Insured as the exclusive remedy of the parties. A Proposed Insured may review a copy of the arbitration rules at <http://www.alta.org/arbitration>.

ALTA 7-1-21 Comm

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File No. FN-46309-CO-3



PRIVACY NOTICE

AmTrust Title Insurance Company and its majority-owned subsidiary companies that provide title insurance, technology, and transaction services to the real estate and mortgage industries (collectively, "AMT", "our" or "we") respect and are committed to protecting your privacy. This Privacy Notice lets you know how and for what purposes your Personal Information (as defined herein) is being collected, processed and used by AMT. We pledge that we will take reasonable steps to ensure that your Personal Information will only be used in ways that are in compliance with this Privacy Notice.

This Privacy Notice is only in effect for any generic information and Personal Information collected and/or owned by AMT, including collection through any AMT website and any online features, services and/or programs offered by AMT (collectively, the "Website"). This Privacy Notice is not applicable to any other web pages, mobile applications, social media sites, email lists, generic information or Personal Information collected and/or owned by any entity other than AMT.

Collection and Use of Information

The types of personal information AMT collects may include, among other things (collectively, "Personal Information"): (1) contact information (e.g., name, address, phone number, email address); (2) demographic information (e.g., date of birth, gender marital status); (3) Internet protocol (or IP) address or device ID/UDID; (4) social security number (SSN), student ID (SIN), driver's license, passport, and other government ID numbers; (5) financial account information; and (6) information related to offenses or criminal convictions.

In the course of our business, we may collect Personal Information about you from the following sources:

- Applications or other forms we receive from you or your authorized representative;
- Information we receive from you through the Website;
- Information about your transactions with or services performed by us, our affiliates, or others; and
- From consumer or other reporting agencies and public records maintained by governmental entities that we either obtain directly from those entities, or from our affiliates or others.

Information collected by AMT is used for three main purposes:

- To provide products and services to you or one or more third party service providers (collectively, "Third Parties") who are obtaining services on your behalf or in connection with a transaction involving you.
- To improve our products and services that we perform for you or for Third Parties.
- To communicate with you and to inform you about AMT's, AMT's affiliates and third parties' products and services.

Additional Ways that Information is Collected Through the Website

Browser Log Files. Our servers automatically log each visitor to the Website and collect and record certain information about each visitor. This information may include IP address, browser language, browser type, operating system, domain names, browsing history (including time spent at a domain, time and date of your visit), referring/exit web pages and URLs, and number of clicks. The domain name and IP address reveal nothing personal about the user other than the IP address from which the user has accessed the Website.

Cookies. From time to time, AMT or other third parties may send a "cookie" to your computer. A cookie is a small piece of data that is sent to your Internet browser from a web server and stored on your computer's hard drive and that can be re-sent to the serving website on subsequent visits. A cookie, by itself, cannot read other data from your hard disk or read other cookie files already on your computer. A cookie, by itself, does not damage your system. We, our advertisers and other third parties may use cookies to identify and keep track of, among other things, those areas of the Website and third party websites that you have visited in the past in order to enhance your next visit to the Website. You can choose whether or not

to accept cookies by changing the settings of your Internet browser, but some functionality of the Website may be impaired or not function as intended. See the Third Party Opt Out section below.

Web Beacons. Some of our web pages and electronic communications may contain images, which may or may not be visible to you, known as Web Beacons (sometimes referred to as "clear gifs"). Web Beacons collect only limited information that includes a cookie number; time and date of a page view; and a description of the page on which the Web Beacon resides. We may also carry Web Beacons placed by third party advertisers. These Web Beacons do not carry any Personal Information and are only used to track usage of the Website and activities associated with the Website. See the **Third Party Opt Out** section below.

Unique Identifier. We may assign you a unique internal identifier to help keep track of your future visits. We may use this information to gather aggregate demographic information about our visitors, and we may use it to personalize the information you see on the Website and some of the electronic communications you receive from us. We keep this information for our internal use, and this information is not shared with others.

Third Party Opt Out. Although we do not presently, in the future we may allow third-party companies to serve advertisements and/or collect certain anonymous information when you visit the Website. These companies may use non-personally identifiable information (e.g., click stream information, browser type, time and date, subject of advertisements clicked or scrolled over) during your visits to the Website in order to provide advertisements about products and services likely to be of greater interest to you. These companies typically use a cookie or third party Web Beacon to collect this information, as further described above. Through these technologies, the third party may have access to and use non-personalized information about your online usage activity.

You can opt-out of online behavioral services through any one of the ways described below. After you opt-out, you may continue to receive advertisements, but those advertisements will no longer be as relevant to you.

- You can opt-out via the Network Advertising Initiative industry opt-out at <http://www.networkadvertising.org/>.

- You can opt-out via the Consumer Choice Page at www.aboutads.info.

- For those in the U.K., you can opt-out via the IAB UK's industry opt-out at www.youronlinechoices.com.

- You can configure your web browser (Chrome, Firefox, Internet Explorer, Safari, etc.) to delete and/or control the use of cookies. More information can be found in the Help system of your browser. Note: If you opt-out as described above, you should not delete your cookies. If you delete your cookies, you will need to opt-out again.

When Information Is Disclosed by AMT

We may provide your Personal Information (excluding information we receive from consumer or other credit reporting agencies) to various individuals and companies, as permitted by law, without obtaining your prior authorization. Such laws do not allow consumers to restrict these disclosures. Disclosures may include, without limitation, the following:

- To agents, brokers, representatives, or others to provide you with services you have requested, and to enable us to detect or prevent criminal activity, fraud, material misrepresentation, or nondisclosure in connection with an insurance transaction;

- To third-party contractors or service providers who provide services or perform marketing services or other functions on our behalf;

- To law enforcement or other governmental authority in connection with an investigation, or civil or criminal subpoenas or court orders; and/or

- To lenders, lien holders, judgment creditors, or other parties claiming an encumbrance or an interest in title whose claim or interest must be determined, settled, paid or released prior to a title or escrow closing.

In addition to the other times when we might disclose information about you, we might also disclose information when required by law or in the good-faith belief that such disclosure is necessary to: (1) comply with a legal process or applicable

laws; (2) enforce this Privacy Notice; (3) respond to claims that any materials, documents, images, graphics, logos, designs, audio, video and any other information provided by you violates the rights of third parties; or (4) protect the rights, property or personal safety of AMT, its users or the public.

We maintain reasonable safeguards to keep the Personal Information that is disclosed to us secure. We provide Personal Information and non-Personal Information to our subsidiaries, affiliated companies, and other businesses or persons for the purposes of processing such information on our behalf and promoting the services of our trusted business partners, some or all of which may store your information on servers outside of the United States. We require that these parties agree to process such information in compliance with our Privacy Notice or in a similar, industry-standard manner, and we use reasonable efforts to limit their use of such information and to use other appropriate confidentiality and security measures. The use of your information by one of our trusted business partners may be subject to that party's own

Privacy Notice. We do not, however, disclose information we collect from consumer or credit reporting agencies with our affiliates or others without your consent, in conformity with applicable law, unless such disclosure is otherwise permitted by law.

We also reserve the right to disclose Personal Information and/or non-Personal Information to take precautions against liability, investigate and defend against any third-party claims or allegations, assist government enforcement agencies, protect the security or integrity of the Website, and protect the rights, property, or personal safety of AMT, our users or others.

We reserve the right to transfer your Personal Information, as well as any other information, in connection with the sale or other disposition of all or part of the AMT business and/or assets. We also cannot make any representations regarding the use or transfer of your Personal Information or other information that we may have in the event of our bankruptcy, reorganization, insolvency, receivership or an assignment for the benefit of creditors, and you expressly agree and consent to the use and/or transfer of your Personal Information or other information in connection with a sale or transfer of some or all of our assets in any of the above described proceedings. Furthermore, we cannot and will not be responsible for any breach of security by any third parties or for any actions of any third parties that receive any of the information that is disclosed to us.

Information from Children

We do not collect Personal Information from any person that we know to be under the age of thirteen (13). Specifically, the Website is not intended or designed to attract children under the age of thirteen (13). You affirm that you are either more than 18 years of age, or an emancipated minor, or possess legal parental or guardian consent, and are fully able and competent to enter into the terms, conditions, obligations, affirmations, representations, and warranties set forth in this Privacy Notice, and to abide by and comply with this Privacy Notice. In any case, you affirm that you are over the age of 13, as **THE WEBSITE IS NOT INTENDED FOR CHILDREN UNDER 13 THAT ARE UNACCOMPANIED BY HIS OR HER PARENT OR LEGAL GUARDIAN.**

Parents should be aware that AMT's Privacy Notice will govern our use of Personal Information, but also that information that is voluntarily given by children – or others – in email exchanges, bulletin boards or the like may be used by other parties to generate unsolicited communications. AMT encourages all parents to instruct their children in the safe and responsible use of their Personal Information while using the Internet.

Privacy Outside the Website

The Website may contain various links to other websites, including links to various third party service providers. AMT is not and cannot be responsible for the privacy practices or the content of any of those other websites. Other than under agreements with certain reputable organizations and companies, and except for third party service providers whose services either we use or you voluntarily elect to utilize, we do not share any of the Personal Information that you provide to us with any of the websites to which the Website links, although we may share aggregate, non-Personal Information with those other third parties. Please check with those websites in order to determine their privacy policies and your rights under them.

European Union Users

If you are a citizen of the European Union, please note that we may transfer your Personal Information outside the European Union for use for any of the purposes described in this Privacy Notice. By providing AMT with your Personal Information, you consent to both our collection and such transfer of your Personal Information in accordance with this Privacy Notice.

Choices with Your Personal Information

Whether you submit Personal Information to AMT is entirely up to you. You may decide not to submit Personal Information, in which case AMT may not be able to provide certain services or products to you.

You may choose to prevent AMT from disclosing or using your Personal Information under certain circumstances (“opt out”). You may opt out of any disclosure or use of your Personal Information for purposes that are incompatible with the purpose(s) for which it was originally collected or for which you subsequently gave authorization by notifying us by one of the methods at the end of this Privacy Notice. Furthermore, even where your Personal Information is to be disclosed and used in accordance with the stated purposes in this Privacy Notice, you may elect to opt out of such disclosure to and use by a third party that is not acting as an agent of AMT. As described above, there are some uses from which you cannot opt-out.

Please note that opting out of the disclosure and use of your Personal Information as a prospective employee may prevent you from being hired as an employee by AMT to the extent that provision of your Personal Information is required to apply for an open position.

If AMT collects Personal Information from you, such information will not be disclosed or used by AMT for purposes that are incompatible with the purpose(s) for which it was originally collected or for which you subsequently gave authorization unless you affirmatively consent to such disclosure and use.

You may opt out of online behavioral advertising by following the instructions set forth above under the above section “Additional Ways That Information Is Collected Through the Website,” subsection “Third Party Opt Out.”

Access and Correction

To access your Personal Information in the possession of AMT and correct inaccuracies of that information in our records, please contact us in the manner specified at the end of this Privacy Notice. We ask individuals to identify themselves and the information requested to be accessed and amended before processing such requests, and we may decline to process requests in limited circumstances as permitted by applicable privacy legislation.

Your California Privacy Rights

Under California’s “Shine the Light” law, California residents who provide certain personally identifiable information in connection with obtaining products or services for personal, family or household use are entitled to request and obtain from us once a calendar year information about the customer information we shared, if any, with other businesses for their own direct marketing uses. If applicable, this information would include the categories of customer information and the names and addresses of those businesses with which we shared customer information for the immediately prior calendar year (e.g., requests made in 2013 will receive information regarding 2012 sharing activities).

To obtain this information on behalf of AMT, please send an email message to underwriting@amtrusttitlegroup.com with “Request for California Privacy Information” in the subject line and in the body of your message. We will provide the requested information to you at your email address in response.

Please be aware that not all information sharing is covered by the “Shine the Light” requirements and only information on covered sharing will be included in our response.

Additionally, because we may collect your Personal Information from time to time, California’s Online Privacy Protection Act requires us to disclose how we respond to “do not track” requests and other similar mechanisms. Currently, our policy is that we do not recognize “do not track” requests from Internet browsers and similar devices.

Your Consent to This Privacy Notice

By submitting Personal Information to AMT, you consent to the collection and use of information by us as specified above or as we otherwise see fit, in compliance with this Privacy Notice, unless you inform us otherwise by means of the procedure identified below. If we decide to change this Privacy Notice, we will make an effort to post those changes on the Website. Each time we collect information from you following any amendment of this Privacy Notice will signify your assent to and acceptance of its revised terms for all previously collected information and information collected from you in the future. We may use comments, information or feedback that you may submit in any manner that we may choose without notice or compensation to you.

If you have additional questions or comments, please let us know by sending your comments or requests to:

AmTrust Title Insurance Company

59 Maiden Lane, 43rd Floor

New York, New York 10038

855.449.0620

Email: underwriting@amtrusttitlegroup.com

RECORDING REQUESTED BY AND
WHEN RECORDED PLEASE RETURN TO:

Novis Renewables, LLC

Attn: Contract Administration

1 Bridge Street, Suite 11

Irvington, NY 10533

MEMORANDUM OF OPTION AGREEMENT

THIS MEMORANDUM OF OPTION AGREEMENT (the “**Memorandum**”) is made as of March 27th, 2024, by and between **James W. Holden**, an individual (“**Owner**”), and **Novis Renewables, LLC** and/or its assigns, a Delaware limited liability company (“**Optionee**”). Owner and Optionee are collectively referred to herein as the “**Parties.**”

RECITALS

A. Owner is the owner of the real property located in Adams County, Colorado, more particularly described in **Exhibit A** attached hereto (the “**Property**”).

B. Pursuant to that certain Option Agreement, dated as of March 27th, 2024 (the “**Agreement**”), Owner has granted Optionee the exclusive right and option to purchase the Property.

C. The Parties are executing and recording this Memorandum so that third parties shall have notice of Optionee’s exclusive option to purchase the Property, and of the rights and obligations of Owner and Optionee under the Agreement.

AGREEMENT

NOW, THEREFORE, in consideration of the Agreement and for other good and valuable consideration, receipt of which is hereby acknowledged, the Parties agree as follows:

1. Owner has granted to Optionee an exclusive option to purchase the Property and, upon the exercise of the option, Owner shall sell and Optionee shall buy the Property in accordance with the terms and provisions of the Agreement.

2. The Agreement provides for an Option Term of one (1) year commencing upon the effective date of the Agreement set forth above, extendable for up to four (4) additional years in accordance with the terms of the Agreement.

3. For the duration of the Agreement, Owner has granted Optionee a license to enter upon the Property to perform all effort and labor necessary to carry out tests, inspections, surveys and investigations that Optionee deems necessary or advisable to assess the feasibility of the Facilities, all as more particularly set forth in the Agreement.

4. All of the terms, conditions and agreements contained within the Agreement are fully incorporated herein by reference as if fully set forth herein. This Memorandum is not intended to change the terms of the Agreement and, in the event of a conflict between the terms and conditions of this Memorandum and the Agreement, the terms and conditions of the Agreement shall control. All capitalized terms not defined herein shall have the meaning set forth in the Agreement.

5. This Memorandum shall be governed by the laws of Colorado.

6. The Parties agree that this Memorandum may be executed in multiple counterparts which, when signed by all Parties, shall constitute a binding agreement.

IN WITNESS WHEREOF, the Parties have executed this Memorandum as of the date first written above.

OWNER:

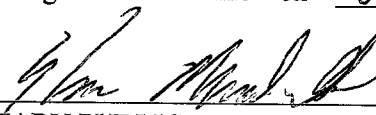
James W. Holden,
an individual



A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

STATE OF COLORADO)
 : ss
COUNTY OF ADAMS)

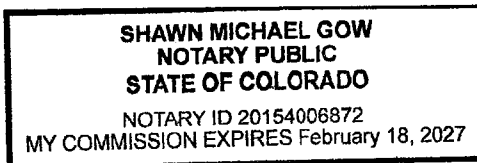
The foregoing instrument was acknowledged before me on 26 MARCH 2024 by
JAMES W HOLDEN



NOTARY PUBLIC
Residing at: 965 S 1ST ST BENNETT CO 80102


My Commission Expires:

02/10/2027



OPTIONEE:


NOVIS RENEWABLES, LLC,
a Delaware limited liability company

By: 
Name: Thomas Leahy
Title: President

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

STATE OF New York)
) : ss
COUNTY OF Westchester)

The foregoing instrument was acknowledged before me on April 16, 2024 by Thomas Leahy as President of Novis Renewables, LLC.


NOTARY PUBLIC
Residing at: Irvington, NY

My Commission Expires:

February 3, 2028

ROBERT THEODORE GAMBO
Notary Public, State of New York
No. 02GA6403881
Qualified in Westchester County
Commission Expires February 3, 2028

Exhibit A

Legal Description of Property

Exhibit "A"

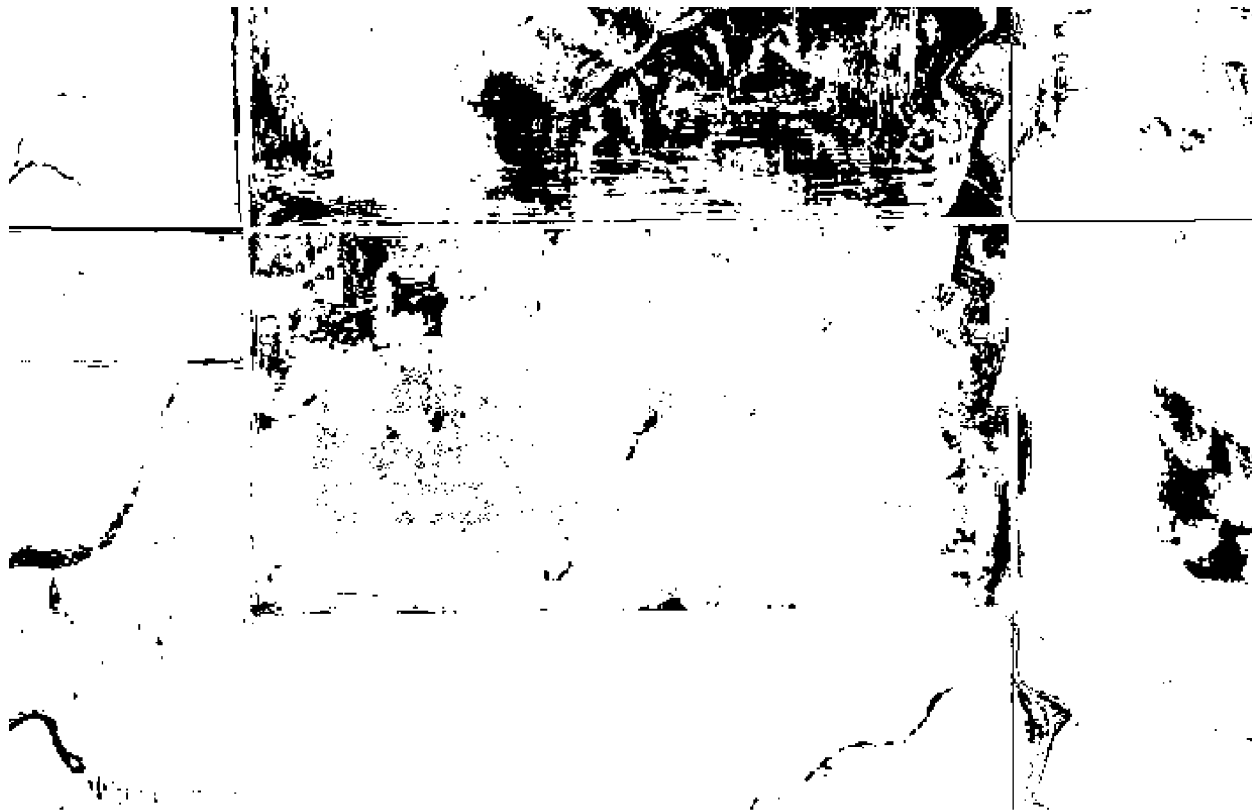
A PARCEL OF LAND LOCATED WITHIN THE NORTH ONE-HALF OF SECTION 4, TOWNSHIP 3 SOUTH, RANGE 59 WEST OF THE 6TH P.M., BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT THE NORTHWEST CORNER OF SAID SECTION 4; THENCE NORTH 89° 36' 55" EAST ALONG THE NORTH LINE OF SAID SECTION 4 A DISTANCE OF 1320 FEET; THENCE SOUTH 00° 00' 00" EAST, PARALLEL WITH THE WEST LINE OF SAID SECTION 4, A DISTANCE OF 1320 FEET; THENCE SOUTH 89° 36' 55" WEST, PARALLEL WITH THE NORTH LINE OF SAID SECTION 4, A DISTANCE OF 1320 FEET TO INTERSECT WITH THE WEST LINE OF SAID SECTION 4; THENCE NORTH 00° 00' 00" EAST, ALONG THE WEST LINE OF SAID SECTION 4, A DISTANCE OF 1320 FEET TO THE POINT OF BEGINNING, COUNTY OF ADAMS, STATE OF COLORADO.

AND

THE NORTH ONE-HALF OF SECTION 4, TOWNSHIP 3 SOUTH, RANGE 59 WEST OF THE 6TH P.M., EXCEPT THE FOLLOWING DESCRIBED PARCEL:

BEGINNING AT THE NORTHWEST CORNER OF SAID SECTION 4; THENCE NORTH 89° 36' 55" EAST, ALONG THE NORTH LINE OF SAID SECTION 4, A DISTANCE OF 1320 FEET; THENCE SOUTH 00° 00' 00" EAST, PARALLEL WITH THE WEST LINE OF SAID SECTION 4, A DISTANCE OF 1320 FEET; THENCE SOUTH 89° 36' 55" WEST, PARALLEL WITH THE NORTH LINE OF SAID SECTION 4, A DISTANCE OF 1320 FEET TO INTERSECT WITH THE WEST LINE OF SAID SECTION 4; THENCE NORTH 00° 00' 00" EAST, ALONG THE WEST LINE OF SAID SECTION 4, A DISTANCE OF 1320 FEET TO THE POINT OF BEGINNING, COUNTY OF ADAMS, STATE OF COLORADO.



6.0 Proof of Water

6.1 Water

The Applicant will own the Project land and water rights, and will seek to convert some or all existing well permits for commercial/industrial use to support the operational needs of the Project. The Applicant will work closely with the Division of Water Resources and all interested parties to complete any change of use authorization(s).

Water for dust control during construction and for fire prevention during operations will come from a combination of permitted onsite well sources and off-site resources that will be trucked in as needed. During operations, water tanks within the Project area will be maintained for Project and Fire District uses. Well water will be used to replenish the tanks and supplemented with off-site resources as needed.

Until the Project commences construction, the current owners and well permit holders intend to continue using the wells beneficially for ongoing agricultural and residential purposes.

The Applicant is open to a condition of approval that any applications needed for well permit conversions to secure water for the Project will be filed prior to construction.

Paul Gascoigne

From: Franco - DNR, Ivan <ivan.franco@state.co.us>
Sent: Friday, October 27, 2023 2:12 PM
To: Paul Gascoigne
Subject: Re: Status of Well Permits: Adams County, CO

Paul,

Please see my responses below:

Well Identification:

1)

Receipt = 3671341B Permit valid - Issued for watering of livestock on range and pasture - replaces well 298856 - completed into the laramie-fox hills aquifer

Permit = 298856--A

2)

Receipt = 3666660 Permit valid - Issued for watering of livestock on range and pasture - replaces well 137266 - completed into the laramie-fox hills aquifer

Permit = 137266--A

3)

Receipt = 9001613 Permit valid (although likely not inexistence given age) - stock use - claimed to be completed to 50 feet

Permit = 12233-

4)

Receipt = 9000228 Permit valid (although likely not inexistence given age) - stock use - claimed to be completed to 50 feet

Permit = 1347-

5)

Receipt = 3645815B Permit valid - Issued for watering of livestock on range and pasture - replaces well 283277 - completed into the laramie-fox hills aquifer

Permit = 283277--A

6)

Receipt = 3650600 Permit valid - Issued for watering of livestock on range and pasture - completed into the laramie-fox hills aquifer

Permit = 285887-

7)

Receipt = 3693833 Permit valid - Issued for watering of livestock on range and pasture - completed into the laramie-fox hills aquifer - replaces 17762

Permit = 315417-

8)

Receipt = 9002301 Replaced by well 35417

Permit = 17762-

9)

Receipt = 3693834 Permit valid - Issued for watering of livestock on range and pasture - replaces well 93026 - completed into the laramie-fox hills aquifer

Permit = 93026--A

10)

Receipt = 9001013 Permit valid (although likely not inexistence given age) - stock use - claimed to be completed to 72 feet

Permit = 7923-

Ivan Franco, P.E.
Water Resources Engineer



P 303.866.3581 X Ext. 8243
1313 Sherman Street, Room 818, Denver, CO 80203
ivan.franco@state.co.us / www.water.state.co.us

On Thu, Oct 26, 2023 at 12:30 PM Paul Gascoigne <paul.gascoigne@novisrenew.com> wrote:

Hello Ivan,

Thanks for your time today. As discussed, below is information on the 10 well locations that showed up on the CWCB / DWR website. I would appreciate any information you can provide on these wells in terms of their status.

Please let me know if you have any questions.

Best,

Paul

Well Identification:

1)

Receipt = 3671341B

Permit = 298856--A

2)

Receipt = 3666660

Permit = 137266--A

3)

Receipt = 9001613

Permit = 12233-

4)

Receipt = 9000228

Permit = 1347-

5)

Receipt = 3645815B

Permit = 283277--A

6)

Receipt = 3650600

Permit = 285887-

7)

Receipt = 3693833

Permit = 315417-

8)

Receipt = 9002301

Permit = 17762-

9)

Receipt = 3693834

Permit = 93026--A

10)

Receipt = 9001013

Permit = 7923-





Paul Gascoigne

Sr. Mgr., Site Acquisition & Strategy

m +1 (508) 505-0890

e paul.gascoigne@novisrenew.com

Novis Renewables, LLC

One Bridge Street, Suite 11

Irvington, NY 10533

www.novisrenewables.com

6.2 Proof of Sewer

A letter from Adam's County Health Department has been provided under **Submittal Item 6**.

From: [Sara Stribley](#)
To: [Julie Capp](#)
Subject: FW: Request Will-Serve Letter
Date: Wednesday, May 8, 2024 11:46:22 AM

Julie –

Will you save the email below to the Hanks Crossing Project folder. This is the information to include for the septic system “will serve” letter that is required as a submittal item!

Thanks,

Sara Stribley

Logan Simpson
C 970.231.9026

From: Paul Gascoigne <paul.gascoigne@novisrenew.com>
Sent: Friday, April 26, 2024 3:48 PM
To: Sara Stribley <sstribley@logansimpson.com>
Subject: FW: Request Will-Serve Letter

CAUTION: This email originated from outside the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Caution! This message was sent from outside your organization.

[Allow sender](#) | [Block sender](#)

Hi Sara,

Please see the attached/below from the Health Department for Adams County.

Thanks!

Paul Gascoigne
Sr. Mgr., Site Acquisition & Strategy
Novis Renewables
508.505.0890
paul.gascoigne@novisrenew.com

From: Jeffrey K. McCarron <JMcCarron@adcogov.org>
Sent: Friday, April 26, 2024 3:46 PM
To: Paul Gascoigne <paul.gascoigne@novisrenew.com>
Subject: RE: Request Will-Serve Letter

04/07/2023

Re: Adams County Community and Economic Development department Project Number: PRE2023-0069.

Dear Paul Gascoigne,

Adams County Health Department (ACHD) has received communication that you intend to construct an Onsite Wastewater Treatment System (OWTS) for a proposed solar farm maintenance building at Parcel 0173700000042, owned by Raymond and Donna Morris.

ACHD will issue a permit for a new installation of an OWTS, provided that the proposed design meets all applicable requirements set forth in ACHD Regulation O-22, pursuant to Title 25-10-101, et seq. Colorado Revised Statutes and the Colorado Department of Public Health and Environment Water Quality Control Commission On-Site Wastewater Treatment System Regulation #43, 5 CCR-1002-43.

Requirements from regulation O-22 that may be applicable to the septic system installation include (but are not limited to):

- A proposed septic system design,
- A soil test report near the proposed soil treatment area,
- Minimum horizontal setback distances between OWTS components and health impact features, as noted in table 6 of regulation O-22,
- A site visit performed by ACHD to determine the suitability of the site and of the proposed design, and
- A permit fee to be paid by the applicant to ACHD.

ACHD does not guarantee that permits or any other authorizations applicable to this property will be issued by other entities.

Sincerely,

Jeff

Jeff McCarron
Environmental Health Specialist IV, Water Program
ADAMS COUNTY, COLORADO
7190 Colorado Blvd, Commerce City, CO 80022
O: 720.340.7215 | Main: | jmccarron@adcogov.org
www.adamscountyhealthdepartment.org

To responsibly serve the Adams County community with integrity and innovation

From: Paul Gascoigne <paul.gascoigne@novisrenew.com>
Sent: Friday, April 26, 2024 3:31 PM
To: Jeffrey K. McCarron <JMccarron@adcogov.org>
Subject: Request Will-Serve Letter

You don't often get email from paul.gascoigne@novisrenew.com. [Learn why this is important](#)

Please be cautious: This email was sent from outside Adams County

Hello Jeff,

Thanks for your time today. As discussed, our company is proposing a large-scale solar project in Adams County. As part of our CUP application, the planning department has asked that we provide a letter indicating the viability of an on-site wastewater treatment system. I would appreciate if you could provide me with a letter indicating this is possible.

For reference, the project is referred to by the Adams County Community & Economic Development Department as Project Number: PRE2023-00069.

The subject parcel for reference is Parcel Number: 017370000042, owned by Raymond and Donna Morris.

Please let me know if you have any questions.

Best regards,
Paul



Paul Gascoigne
Sr. Mgr., Site Acquisition & Strategy

m +1 (508) 505-0890
e paul.gascoigne@novisrenew.com

Novis Renewables, LLC
One Bridge Street, Suite 11

Irvington, NY 10533
www.novisrenewables.com

7.0 Proof of Utilities (Gas, Electric, etc.)



Morgan County Rural Electric Association

734 Barlow Road · P.O. Box 738 · Fort Morgan, Colorado 80701
(970) 867-5688 · FAX: (970) 867-3277 · e-mail: customerservice@mcrea.org


A Touchstone Energy® Cooperative
The power of human connections®

May 13, 2024

Novis Renewables, LLC
One Bridge Street, Suite 11
Irvington, NY 10533

**RE: Certification of Electric Power
Sec 29, T02S, R59W
Novis Renewables, LLC**

This letter is in regard to a request to provide certification to the Adams County Planning and Zoning Commission, that we can provide sufficient electric power for Novis Renewables, LLC in Section 29, Township 02 South, Range 59 West.

Morgan County REA presently has electric distribution lines near this property, and will be able to provide electric service to the proposed site.

We hope this letter will suffice. If we can be of any further assistance, please feel free to contact the office.

Sincerely,

Brent Kliesen
Field Engineer
Morgan County REA
734 Barlow Road
PO Box 738
Fort Morgan, CO 80701
970-867-5688 (Office)

8.0 Legal Description

The legal description for the large-scale solar energy facility is provided in **Table 5**.

Table 5. Legal Description of the Project

Parcel Number	Legal Description	Tax ID	Approximate Acreage
0173700000046	East 1/2 less and except one (1) acre parcel in the northeast corner for school, Section 32, Township 2 South, Range 59 West, 6th PM, Adams County, CO	R0080982	332
0173700000045	Parcel 2: West 1/2, Section 32, Township 2 South, Range 59 West, Adams County, CO	R0080891	334
0173700000042	All, except for county roads, of Section 29, Township 2 South, Range 59 West, 6th PM, Adams County, CO	R0080979	660
0180700000007	All, except for county roads, of Section 5, Township 3 South, Range 59 West, 6th PM. Adams County, CO	R0081263	633
0173700000041	Section, Township, Range: 28-2-59. Description: West 2 319/30A	R0080978	320
0180700000005	Section, Township, Range: 4-3-59. Description: North 2 320A	R0081261	320
0173700000043	Section, Township, Range: 30-2-59. Description: All 668/10A	R0080980	60

Source: Adams County Assessor 2024

Acronyms: PM – Prime Meridian, RNG – Range, SECT – Section, TWN – Township.

9.0 Statement of Taxes Paid



TREASURER & PUBLIC TRUSTEE
ADAMS COUNTY, COLORADO
Certificate Of Taxes Due

Account Number R0080978
 Parcel 0173700000041
 Assessed To
 MORRIS RAYMOND J AND
 C/O: MORRIS DONNA R JONES
 3305 BEHRENS RD
 BYERS, CO 80103

Certificate Number 2023-237298
 Order Number
 Vendor ID
 PAUL E GASCOIGNE
 2237 E CAMINO WAY SALT LAKE CITY, UT 84121

Legal Description	Situs Address
SECT,TWN,RNG:28-2-59 DESC: W2 319/30A	0

Year	Tax	Interest	Fees	Payments	Balance
Tax Charge					
2022	\$441.52	\$0.00	\$0.00	(\$441.52)	\$0.00
Total Tax Charge					\$0.00
Grand Total Due as of 10/26/2023					\$0.00

Tax Billed at 2022 Rates for Tax Area 436 - 436

Authority	Mill Levy	Amount	Values	Actual	Assessed
RANGEVIEW LIBRARY DISTRICT	3.6150000*	\$22.77	AG DRY FARMING LAND	\$14,003	\$3,700
FIRE DISTRICT 9 - BYERS	9.7740000	\$61.57	AG DRY GRAZING LAND	\$9,832	\$2,600
ADAMS COUNTY	26.9670000	\$169.90			
SD 32 GENERAL (Byers)	29.7280000*	\$187.28	Total	\$23,835	\$6,300
Taxes Billed 2022	70.0840000	\$441.52			

* Credit Levy

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SPECIAL TAXING DISTRICTS AND THE BOUNDARIES OF SUCH DISTRICTS MAY BE ON FILE WITH THE BOARD OF COUNTY COMMISSIONERS, THE COUNTY CLERK, OR, THE COUNTY ASSESSOR.

This certificate does not include land or improvements assessed under a separate account number, personal property taxes, transfer tax, or, miscellaneous tax collected on behalf of other entities, special or local improvement district assessments, or mobile homes, unless specifically mentioned.

I, the undersigned, do hereby certify that the entire amount of taxes due upon the above described parcels of real property and all outstanding lien sales for unpaid taxes as shown by the records in my office from which the same may still be redeemed with the amount required for redemption on this date are as noted herein. In witness whereof, I have hereunto set my hand and seal.



TREASURER & PUBLIC TRUSTEE
ADAMS COUNTY, COLORADO
Certificate Of Taxes Due

TREASURER & PUBLIC TRUSTEE, ADAMS COUNTY,
Alexander L Villagran

4430 S. Adams County Parkway
Brighton, CO 80601

A handwritten signature in cursive script, appearing to read "Alexander L. Villagran".





TREASURER & PUBLIC TRUSTEE

ADAMS COUNTY, COLORADO

Certificate Of Taxes Due

Account Number R0080979
 Parcel 0173700000042
 Assessed To
 MORRIS RAYMOND J AND
 C/O: MORRIS DONNA R JONES
 3305 BEHRENS RD
 BYERS, CO 80103

Certificate Number 2023-237299
 Order Number
 Vendor ID
 PAUL E GASCOIGNE
 2237 E CAMINO WAY SALT LAKE CITY, UT 84121

Legal Description	Situs Address
SECT,TWN,RNG:29-2-59 DESC: ALL EXC CO RD 659/80A	0

Year	Tax	Interest	Fees	Payments	Balance
Tax Charge					
2022	\$555.76	\$0.00	\$0.00	(\$555.76)	\$0.00
Total Tax Charge					\$0.00
Grand Total Due as of 10/26/2023					\$0.00

Tax Billed at 2022 Rates for Tax Area 436 - 436

Authority	Mill Levy	Amount	Values	Actual	Assessed
RANGEVIEW LIBRARY DISTRICT	3.6150000*	\$28.67	AG DRY GRAZING LAND	\$30,020	\$7,930
FIRE DISTRICT 9 - BYERS	9.7740000	\$77.51	Total	\$30,020	\$7,930
ADAMS COUNTY	26.9670000	\$213.84			
SD 32 GENERAL (Byers)	29.7280000*	\$235.74			
Taxes Billed 2022	70.0840000	\$555.76			

* Credit Levy

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ADAMS COUNTY, COLORADO
Certificate Of Taxes Due

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Alexander L Villagran

4430 S. Adams County Parkway
Brighton, CO 80601

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TREASURER & PUBLIC TRUSTEE
ADAMS COUNTY, COLORADO
Certificate Of Taxes Due

Account Number R0080980

Certificate Number 2023-237303

Parcel 0173700000043

Order Number

Assessed To

Vendor ID

BEAUPREZ LISA AND BEAUPREZ MARK UND 80% INT
 11780 MIMOSA RD
 BYERS, CO 80103-8613

PAUL E GASCOIGNE
 2237 E CAMINO WAY SALT LAKE CITY, UT 84121

Legal Description	Situs Address				
SECT,TWN,RNG:30-2-59 DESC: ALL 668/10A	0				
Year	Tax	Interest	Fees	Payments	Balance
Tax Charge					
2022	\$556.12	\$0.00	\$0.00	(\$556.12)	\$0.00
Total Tax Charge					\$0.00
Grand Total Due as of 10/26/2023					\$0.00

Tax Billed at 2022 Rates for Tax Area 439 - 439

Authority	Mill Levy	Amount	Values	Actual	Assessed
RANGEVIEW LIBRARY DISTRICT	3.6150000*	\$27.65	AG DRY GRAZING LAND	\$28,926	\$7,640
BYERS PARK & RECREATION DIS	2.5890000	\$19.81	AG OTHER LAND	\$17	\$10
FIRE DISTRICT 9 - BYERS	9.7740000	\$74.77	Total	\$28,943	\$7,650
ADAMS COUNTY	26.9670000	\$206.29			
NORTH KIOWA BIJOU GROUND WA	0.0230000	\$0.18			
SD 32 GENERAL (Byers)	<u>29.7280000*</u>	<u>\$227.42</u>			
Taxes Billed 2022	72.6960000	\$556.12			

* Credit Levy

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TREASURER & PUBLIC TRUSTEE
ADAMS COUNTY, COLORADO
Certificate Of Taxes Due

TREASURER & PUBLIC TRUSTEE, ADAMS COUNTY,
Alexander L Villagran

4430 S. Adams County Parkway
Brighton, CO 80601

A handwritten signature in cursive script, reading "Alexander L. Villagran".





TREASURER & PUBLIC TRUSTEE
ADAMS COUNTY, COLORADO
Certificate Of Taxes Due

Account Number R0080981
 Parcel 0173700000045
 Assessed To
 MORRIS RAYMOND J AND
 C/O: MORRIS DONNA R JONES
 3305 BEHRENS RD
 BYERS, CO 80103

Certificate Number 2023-237301
 Order Number
 Vendor ID
 PAUL E GASCOIGNE
 2237 E CAMINO WAY SALT LAKE CITY, UT 84121

Legal Description	Situs Address
SECT,TWN,RNG:32-2-59 DESC: W2 334/70A	0

Year	Tax	Interest	Fees	Payments	Balance
Tax Charge					
2022	\$593.62	\$0.00	\$0.00	(\$593.62)	\$0.00
Total Tax Charge					\$0.00
Grand Total Due as of 10/26/2023					\$0.00

Tax Billed at 2022 Rates for Tax Area 436 - 436

Authority	Mill Levy	Amount	Values	Actual	Assessed
RANGEVIEW LIBRARY DISTRICT	3.6150000*	\$30.62	AG DRY FARMING LAND	\$26,251	\$6,930
FIRE DISTRICT 9 - BYERS	9.7740000	\$82.79	AG DRY GRAZING LAND	\$5,841	\$1,540
ADAMS COUNTY	26.9670000	\$228.41			
SD 32 GENERAL (Byers)	29.7280000*	\$251.80	Total	\$32,092	\$8,470
Taxes Billed 2022	70.0840000	\$593.62			

* Credit Levy

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TREASURER & PUBLIC TRUSTEE
ADAMS COUNTY, COLORADO
Certificate Of Taxes Due

TREASURER & PUBLIC TRUSTEE, ADAMS COUNTY,
Alexander L Villagran

4430 S. Adams County Parkway
Brighton, CO 80601

A handwritten signature in cursive script, reading "Alexander L. Villagran".





TREASURER & PUBLIC TRUSTEE
ADAMS COUNTY, COLORADO
Certificate Of Taxes Due

Account Number R0080982
 Parcel 0173700000046
 Assessed To
 MORRIS RAYMOND J AND
 C/O: MORRIS DONNA R JONES
 3305 BEHRENS RD
 BYERS, CO 80103

Certificate Number 2023-237300
 Order Number
 Vendor ID
 PAUL E GASCOIGNE
 2237 E CAMINO WAY SALT LAKE CITY, UT 84121

Legal Description	Situs Address				
SECT,TWN,RNG:32-2-59 DESC: E2 EXC 1A FOR SCHOOL	332/20A	0			
Year	Tax	Interest	Fees	Payments	Balance
Tax Charge					
2022	\$536.14	\$0.00	\$0.00	(\$536.14)	\$0.00
Total Tax Charge					\$0.00
Grand Total Due as of 10/26/2023					\$0.00

Tax Billed at 2022 Rates for Tax Area 436 - 436

Authority	Mill Levy	Amount	Values	Actual	Assessed
RANGEVIEW LIBRARY DISTRICT	3.6150000*	\$27.65	AG DRY FARMING LAND	\$23,423	\$6,180
FIRE DISTRICT 9 - BYERS	9.7740000	\$74.77	AG DRY GRAZING LAND	\$5,552	\$1,470
ADAMS COUNTY	26.9670000	\$206.30			
SD 32 GENERAL (Byers)	29.7280000*	\$227.42	Total	\$28,975	\$7,650
Taxes Billed 2022	70.0840000	\$536.14			

* Credit Levy

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**TREASURER & PUBLIC TRUSTEE
ADAMS COUNTY, COLORADO
Certificate Of Taxes Due**

TREASURER & PUBLIC TRUSTEE, ADAMS COUNTY,
Alexander L Villagran

4430 S. Adams County Parkway
Brighton, CO 80601

A handwritten signature in cursive script, appearing to read "Alexander L. Villagran".





TREASURER & PUBLIC TRUSTEE

ADAMS COUNTY, COLORADO

Certificate Of Taxes Due

Account Number R0081263
 Parcel 0180700000007
 Assessed To
 MORRIS RAYMOND J AND
 C/O: MORRIS DONNA R JONES
 3305 BEHRENS RD
 BYERS, CO 80103

Certificate Number 2023-237302
 Order Number
 Vendor ID
 PAUL E GASCOIGNE
 2237 E CAMINO WAY SALT LAKE CITY, UT 84121

Legal Description	Situs Address
SECT,TWN,RNG:5-3-59 DESC: ALL EXC CO RD 632/80A	0

Year	Tax	Interest	Fees	Payments	Balance
Tax Charge					
2022	\$1,444.40	\$0.00	\$0.00	(\$1,444.40)	\$0.00
Total Tax Charge					\$0.00
Grand Total Due as of 10/26/2023					\$0.00

Tax Billed at 2022 Rates for Tax Area 263 - 263

Authority	Mill Levy	Amount	Values	Actual	Assessed
ARAPAHOE LIBRARY	5.7530000	\$104.82	AG DRY	\$65,255	\$17,230
FIRE DISTRICT 9 - BYERS	9.7740000	\$178.08	FARMING LAND		
ADAMS COUNTY	26.9670000	\$491.33	AG DRY	\$3,754	\$990
NORTH KIOWA BIJOU GROUND WA	0.0230000	\$0.42	GRAZING LAND		
SD 26	36.7590000	\$669.75	Total	\$69,009	\$18,220
Taxes Billed 2022	79.2760000	\$1,444.40			

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TREASURER & PUBLIC TRUSTEE
ADAMS COUNTY, COLORADO
Certificate Of Taxes Due

TREASURER & PUBLIC TRUSTEE, ADAMS COUNTY,
Alexander L Villagran

4430 S. Adams County Parkway
Brighton, CO 80601

A handwritten signature in cursive script, reading "Alexander L. Villagran".





TREASURER & PUBLIC TRUSTEE ADAMS COUNTY, COLORADO

Certificate Of Taxes Due

Account Number R0081261
Parcel 0180700000005
Assessed To
HOLDEN JAMES W
7110 HANKS CROSSING RD
BYERS, CO 80103-8405

Certificate Number 2024-239183
Order Number
Vendor ID
NOVIS RENEWABLE
1 BRIDGE ST STE 11, IRVINGTON NY 10533

Legal Description						Situs Address
SECT,TWN,RNG:4-3-59 DESC: N2 320A						7110 HANKS CROSSING
Year	Tax	Interest	Fees	Payments	Balance	
Tax Charge						
2023	\$2,772.34	\$0.00	\$0.00	\$0.00	\$2,772.34	
Total Tax Charge					\$2,772.34	
Grand Total Due as of 01/30/2024					\$2,772.34	

Tax Billed at 2023 Rates for Tax Area 261 - 261

Authority	Mill Levy	Amount	Values	Actual	Assessed
ARAPAHOE LIBRARY	5.4130000*	\$188.75	AG DRY FARMING	\$19,234	\$5,080
FIRE DISTRICT 9 - BYERS	9.7740000	\$340.82	LAND		
ADAMS COUNTY	26.8350000	\$935.74	AG DRY GRAZING	\$5,907	\$1,560
SD 26	37.4830000	<u>\$1,307.03</u>	LAND		
			FARM/RANCH RESID	\$243,489	\$12,630
Taxes Billed 2023	79.5050000	\$2,772.34	FARM/RANCH BLDG	<u>\$59,072</u>	<u>\$15,600</u>
* Credit Levy			Total	\$327,702	\$34,870

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TREASURER & PUBLIC TRUSTEE, ADAMS COUNTY, Alexander

L Villagran



4430 S. Adams County Parkway
Brighton, CO 80601

10.0 Trip Generation Analysis

The State of Colorado requires notification to mineral rights owners of applications for surface development (i.e. zoning, plats, etc.). Mineral or Surface right owners may be found in the title commitment for the subject property. You may also search the Office of the Clerk and Recorder for any recorded deeds, easements, or other documents.



March 15th, 2024

Adams County Community and Economic Development
4430 S. Adams County Parkway
Brighton, CO 80601

Re: **Trip Generation Analysis Letter**
Hanks Crossing Energy Project – Adams County, Colorado

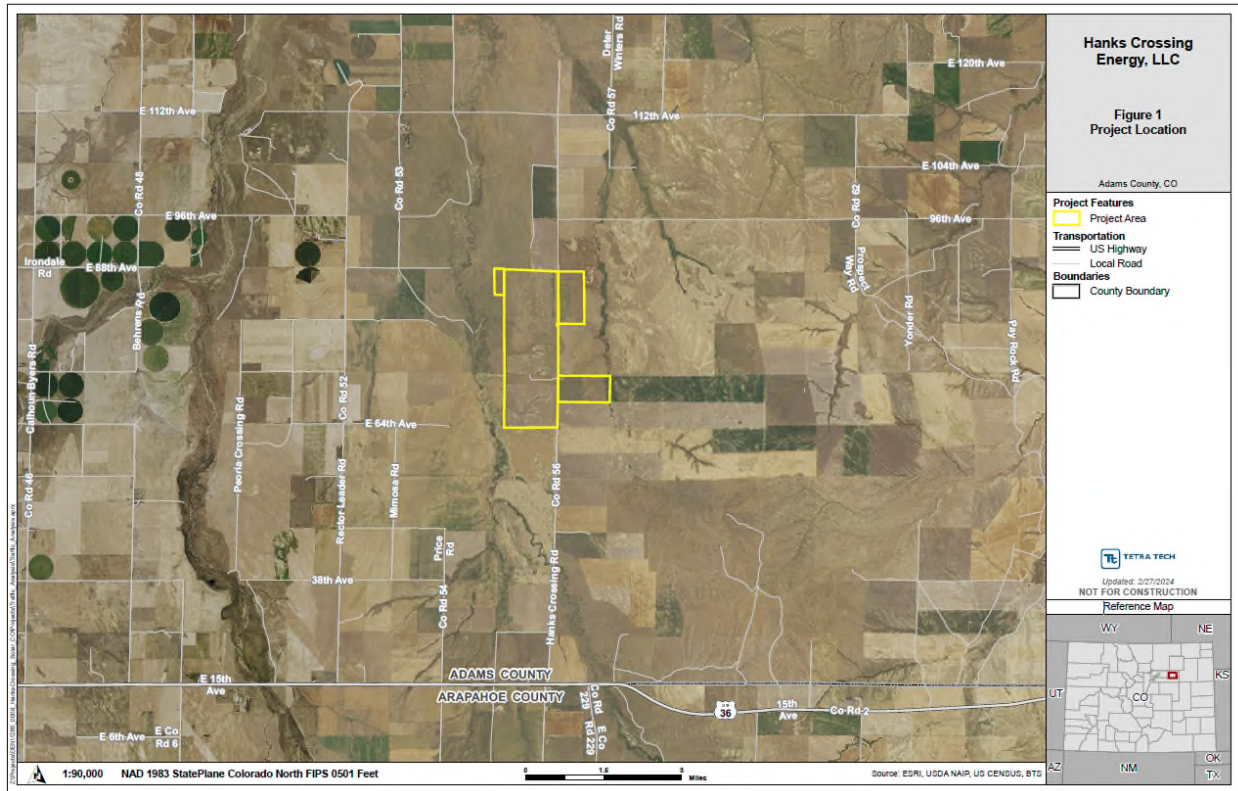
Dear Reviewer,

The purpose of this Trip Generation Analysis (TGA) is to analyze and document the traffic impacts of the proposed Hanks Crossing Energy Project (Project) in support of a Conditional Use Permit for the Project. Hanks Crossing Energy, LLC, a subsidiary of Novis Renewables, LLC (Novis) is proposing to construct, maintain, and operate a proposed 355-megawatt (MW) photovoltaic utility-scale solar power facility encompassing approximately 2,659 acres of private land (Project Area) in unincorporated Adams County, Colorado, approximately 13 miles northeast of the town of Byers. A TGA was requested by Adams County to determine the level of traffic generated by the operational phase of the Project. On behalf of Novis, Tetra Tech, Inc. (Tetra Tech) has prepared this TGA to provide Adams County the trip generation data needed to determine whether additional traffic analyses may be required for the Project.

This TGA has been prepared in accordance with Chapter 8 of the Adams County Development Standards and Regulations, as well as guidance provided to Tetra Tech via email and phone by Mr. Matt Emmens, Adams County Community and Economic Development Department Senior Engineer, on February 20th, 2024. Mr. Emmens outlined the expectations for development of a TGA, clarified that the analysis should focus on routine operational trip generation, and concurred that the Institute of Transportation Engineers' (ITE) Trip Generation Manual does not include codes specific to solar facilities. As an alternative to the ITE Trip Generation Manual, Mr. Emmens noted that Tetra Tech's proposed methodology of determining average operational traffic numbers by utilizing comparable solar facility traffic data to scale trip generation would be an acceptable method. A brief description of construction trip generation has been included in this letter for informational purposes only. Any roadway impacts from construction will be repaired in accordance with applicable conditions of the Conditional Use Permit granted by the County.

A vicinity map of the Project Area and associated transportation network is provided in Figure 1. The southern boundary of the Project is located approximately 5 miles north of U.S. Highway 36 (US-36), in the eastern portion of Adams County. The majority of workers are anticipated to access the Project Area via US-36 and then north up Hanks Crossing Road, which bisects the

Project Area. Land use within the Project vicinity is agricultural, consisting of rangeland, cultivated cropland with associated agricultural structures, and scattered rural residences.



Trip Generation Analysis

Trip estimates for both construction and operations are provided below. Where appropriate, trips have been divided into Peak AM and PM Hour estimates. Construction and operational trip estimates were based on both routine and peak construction and operational workforce and delivery estimates provided by Novis.

Construction

During construction, the Project is expected to have a peak workforce of up to 500 workers. The Project is estimated to have a construction duration of 18 to 24 months, with anticipated completion in early to mid-2027. Workers are anticipated to originate mainly from the Denver Metro Area west of the Project and travel to the Project via US-36. The workforce is likely to arrive between 6AM and 7AM (Peak AM Hour) and leave between 4PM and 5PM (Peak PM Hour). A small percentage may come from lower-population towns such as Fort Morgan, CO. Due to the rural nature of the Project location, it is likely that some workers may carpool. However, to account for the most conservative construction trip estimates, no carpooling was assumed. At the peak of construction, workers would generate 500 trips in the AM Peak Hour and 500 trips in the PM Peak Hour. In addition, the Project is expected to have 20 to 30 truck deliveries per day at the peak of construction, generating up to 60 additional one-way delivery vehicle trips per day.

Operations

Once the construction phase is complete, the Project will transition into the operational phase, which will last 40 years. At this point, only monitoring and maintenance personnel will routinely access the Project Area. Novis anticipates a peak of up to 15 operational employees on site at one time, however most routine day-to-day operations will likely require only 2-3 employees. To conservatively create an average operational trip generation estimate, it was assumed that 8 trips would be generated in the AM Peak Hour and 8 trips in the PM Peak Hour. It was also conservatively assumed that these trips would occur both during the work week and on weekends. This would result in an average of 16 total operational employee trips per day, and an average of 5,844 one-way employee trips per year.

In addition to routine personnel commuting trips during operation, nonroutine trips will include panel washing approximately twice per year. This typically involves hauling water via truck to the Project Area to use for washing. For a 355-MW site with up to 2,200 acres of panels, it is conservatively assumed that up to 1,100 water truck round trips would be necessary for each washing event (assuming all water would be sourced offsite). It is anticipated that these trips would be spread out over several weeks and would be unlikely to occur during peak hour times. Per year, this would result in an additional 4,400 one-way operational non-routine trips.

Combining the average employee trips and estimated panel washing truck trips, this results in a total of 10,244 one-way operational trips per year. Over the 40-year Project life, the Project would conservatively generate approximately 409,760 operational one-way trips, with the actual number of operational trips anticipated to be lower.

Conclusion

The total routine operational vehicle trips per day for the Project is estimated at an average of 16, with 8 trips generated in the AM Peak Hour and 8 trips in the PM Peak Hour. Given the low number of routine operational trips being generated, Tetra Tech anticipates any impact to the local traffic network will be negligible. Based on guidance provided by Mr. Emmens, Tetra Tech understands that these values do not meet the threshold for operational vehicle trips per day that would warrant additional analysis as part of a Traffic Impact Study.

If you have any questions or require any additional information, please do not hesitate to contact us at (303) 980-3549.

Sincerely,
TETRA TECH, INC.



Perry Patton, P.E.
Project Civil Engineer



Em Johnson E.I.T.
Senior Associate Civil Engineer



11.0 Supplemental Information

11.1 Neighborhood Meeting/Outreach Summary

Neighborhood Meeting/Outreach Summary

Per the requirements under Adams County Regulations 2-02-09-05, all Applicants for a conditional use permit may be required to hold a neighborhood meeting, if determined necessary by the Director of Community and Economic Development. The Applicant received confirmation from the Director of Community and Economic Development via email on December 21, 2023, that a neighborhood meeting was not required for the Project (email included below). The determination was based on the remoteness of the Project area and the lack of residents in the area. In lieu of holding a neighborhood meeting, the Applicant mailed Project outreach letters to all landowners within 1-mile of the Project boundary. The list of landowners within 1-mile of the Project area was obtained from the County Clerk's Office and is included under this submittal item and summarized in Table 11-1. Example notification letters and supporting materials regarding the Project have also been included. No notifications were returned undeliverable. To date, the Applicant has not received any feedback from landowners expressing concerns regarding the construction or operation of the Project. One landowner did respond and confirmed receipt of the letter.

Table 11-1 Summary of Neighbor Mailing List

Owner	Address
Lisa and Mark Beauprez	11780 Mimosa Rd Byers, CO 80103
L and S Capital LTD	800 US Highway 36 Byers, CO 80103
Raymond and Donna Morris	3305 Behrens Rd Byers, CO 80103
Linnebur Grain and Buffalo LLLP	PO Box 298 Byers, CO 80103
Silicon Ranch Corporation	222 2nd Ave S. STE 1900 Nashville, TN 37201
Adams County School District No. 32	444 E Front St Byers, CO 80103
Henry Jaco Land LLC	48921 E 128th AVE Unit A Bennett, CO 80102
The Hinerman Trust	24224 SE 129th Ave Kent, WA 98030
James W. Holden	7110 Hanks Crossing Rd Byers, CO 80103
Kalco Land LLC	48921 E 128th AVE Unit A Bennett, CO 80102

From: [Paul Gascoigne](#)
To: [Sara Stribley](#)
Cc: [David Powell](#); [Kiersten Stanley](#)
Subject: FW: PRE2023-00069 Hanks Crossing Energy Concept - Neighborhood Meeting Determination
Date: Thursday, December 21, 2023 2:05:01 PM

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Here is our answer from the County.

Paul Gascoigne
Sr. Mgr., Site Acquisition & Strategy
Novis Renewables
508.505.0890
paul.gascoigne@novisrenew.com

From: Paul Gascoigne
Sent: Thursday, December 21, 2023 2:03 PM
To: Cody Spaid <CSpaid@adcogov.org>
Subject: RE: PRE2023-00069 Hanks Crossing Energy Concept - Neighborhood Meeting Determination

Thanks Cody. We will make sure to provide landowner notice as instructed.

Paul

Paul Gascoigne
Sr. Mgr., Site Acquisition & Strategy
Novis Renewables
508.505.0890
paul.gascoigne@novisrenew.com

From: Cody Spaid <CSpaid@adcogov.org>
Sent: Thursday, December 21, 2023 2:01 PM
To: Paul Gascoigne <paul.gascoigne@novisrenew.com>
Subject: FW: PRE2023-00069 Hanks Crossing Energy Concept - Neighborhood Meeting Determination

You don't often get email from cspaid@adcogov.org. [Learn why this is important](#)

Paul,

Please see below, Thanks.



<!--[if !vml]--><!--[endif]--> **Cody Spaid, AICP**
Planner II, *Community and Economic Development Dept.*
ADAMS COUNTY, COLORADO
4430 S. Adams County Parkway, 1st Floor, Suite W2000A
Brighton, CO 80601-8216
720.523.6855 | cspaid@adcogov.org

From: Jen Rutter <JRutter@adcogov.org>
Sent: Thursday, December 21, 2023 1:48 PM
To: Cody Spaid <CSpaid@adcogov.org>
Subject: RE: PRE2023-00069 Hanks Crossing Energy Concept - Neighborhood Meeting Determination

Hi Cody,

Due to the remoteness of the proposed location and lack of residents in the area, I don't think a neighborhood meeting is necessary. However, I recommend that they send out a mailing to the property owners and residents within a mile of their proposed solar development and invite comments, questions, and concerns before they apply so that they can open up dialogue with their neighboring property owners and address issues in advance.

Thanks,
Jen



<!--[if !vml]--><!--[endif]--> **Jen Rutter, AICP**
Planning & Development Manager, *Community & Economic Development*
ADAMS COUNTY, COLORADO
4430 South Adams County Parkway, 1st Floor, Suite W2000A
Brighton, CO 80601
o: 720.523.6841 | jrutter@adcogov.org
www.adcogov.org

From: Cody Spaid <CSpaid@adcogov.org>
Sent: Thursday, December 21, 2023 1:42 PM
To: Jen Rutter <JRutter@adcogov.org>
Subject: PRE2023-00069 Hanks Crossing Energy Concept - Neighborhood Meeting Determination

Hi Jen,

I was hoping to get a determination on whether a neighborhood meeting will be required for this large scale solar development. Attached is their pre-app. Let me know if you need any other information,

Thanks,



Cody Spaid, AICP
Planner II, *Community and Economic Development Dept.*
ADAMS COUNTY, COLORADO
4430 S. Adams County Parkway, 1st Floor, Suite W2000A
Brighton, CO 80601-8216
720.523.6855 | cspaid@adcogov.org

Adams County Clerk's Office - Landowner List within 1-mile of Hanks Crossing Energy Project Boundary

PARCELNB	ACCOUNTNO *	ACCTTYPE	SITE_ADDRESS	LOCCITY	OWNER	ADDRESS	CITY	STATE	ZIPCODE
0173500000040	R0080912	Agricultural	0		BEAUPREZ LISA AND BEAUPREZ MARK UND 80% INT	11780 MIMOSA RD	BYERS	CO	801038613
0173500000060	R0080922	Agricultural	0		SILICON RANCH CORPORATION	222 2ND AVE S STE 1900	NASHVILLE	TN	372012383
0173500000061	R0080923	Agricultural	0		BEAUPREZ LISA AND BEAUPREZ MARK UND 80% INT	11780 MIMOSA RD	BYERS	CO	801038613
0173500000092	R0108391	Agricultural	0		BEAUPREZ LISA AND BEAUPREZ MARK UND 80% INT	11780 MIMOSA RD	BYERS	CO	801038613
0173700000025	R0080966	Agricultural	0		HINERMAN TRUST THE	24224 129TH AVE SE	KENT	WA	980305087
0173700000027	R0080968	Agricultural	0		BEAUPREZ LISA AND BEAUPREZ MARK UND 80% INT	11780 MIMOSA RD	BYERS	CO	801038613
0173700000028	R0080969	Agricultural	0		BEAUPREZ LISA AND BEAUPREZ MARK UND 80% INT	11780 MIMOSA RD	BYERS	CO	801038613
0173700000030	R0080971	Agricultural	0		LINNEBUR GRAIN AND BUFFALO LLLP	PO BOX 298	BYERS	CO	801030298
0173700000039	R0080976	Agricultural	0		LINNEBUR GRAIN AND BUFFALO LLLP	PO BOX 298	BYERS	CO	801030298
0173700000040	R0080977	Agricultural	0		LINNEBUR GRAIN AND BUFFALO LLLP	PO BOX 298	BYERS	CO	801030298
0173700000041	R0080978	Agricultural	0		MORRIS RAYMOND J AND MORRIS DONNA R JONES	3305 BEHRENS RD	BYERS	CO	80103
0173700000042	R0080979	Agricultural	0		MORRIS RAYMOND J AND MORRIS DONNA R JONES	3305 BEHRENS RD	BYERS	CO	80103
0173700000043	R0080980	Agricultural	0		BEAUPREZ LISA AND BEAUPREZ MARK UND 80% INT	11780 MIMOSA RD	BYERS	CO	801038613
0173700000045	R0080981	Agricultural	0		MORRIS RAYMOND J AND MORRIS DONNA R JONES	3305 BEHRENS RD	BYERS	CO	80103
0173700000046	R0080982	Agricultural	0		MORRIS RAYMOND J AND MORRIS DONNA R JONES	3305 BEHRENS RD	BYERS	CO	80103
0173700000047	R0080983	Agricultural	0		LINNEBUR GRAIN AND BUFFALO LLLP	PO BOX 298	BYERS	CO	801030298
0173700000048	R0080984	Agricultural	0		LINNEBUR GRAIN AND BUFFALO LLLP	PO BOX 298	BYERS	CO	801030298
0173700000049	R0080985	Agricultural	0		LINNEBUR GRAIN AND BUFFALO LLLP	PO BOX 298	BYERS	CO	801030298
0173700000051	R0080987	Exempt	0		SCHOOL DISTRICT NO.32	444 E FRONT ST	BYERS	CO	80103
0173700000054	R0080988	Agricultural	0		BEAUPREZ LISA AND BEAUPREZ MARK UND 80% INT	11780 MIMOSA RD	BYERS	CO	801038613
0173700000055	R0080989	Agricultural	0		LINNEBUR GRAIN AND BUFFALO LLLP	PO BOX 298	BYERS	CO	801030298
0173700000062	R0108395	Agricultural	0		L AND S CAPITAL LTD	800 US HIGHWAY 36	BYERS	CO	801039700
0173700000063	R0108397	Agricultural	0		BEAUPREZ LISA AND BEAUPREZ MARK UND 80% INT	11780 MIMOSA RD	BYERS	CO	801038613
0173700000064	R0108398	Agricultural	0		L AND S CAPITAL LTD	800 US HIGHWAY 36	BYERS	CO	801039700
0173700000065	R0108400	Agricultural	0		BEAUPREZ LISA AND BEAUPREZ MARK UND 80% INT	11780 MIMOSA RD	BYERS	CO	801038613
0180700000002	R0081258	Agricultural	0		HENRY JACO LAND LLC	48921 E 128TH AVE UNIT A	BENNETT	CO	801029418
0180700000003	R0081259	Agricultural	0		HENRY JACO LAND LLC	48921 E 128TH AVE UNIT A	BENNETT	CO	801029418
0180700000004	R0081260	Agricultural	0		KALCO LAND LLC	48921 E 128TH AVE UNIT A	BENNETT	CO	801029418
0180700000005	R0081261	Agricultural	7110 HANKS CROSSING		HOLDEN JAMES W	7110 HANKS CROSSING RD	BYERS	CO	801038405
0180700000006	R0081262	Agricultural	0		KALCO LAND LLC	48921 E 128TH AVE UNIT A	BENNETT	CO	801029418
0180700000007	R0081263	Agricultural	0		MORRIS RAYMOND J AND MORRIS DONNA R JONES	3305 BEHRENS RD	BYERS	CO	80103
0180700000008	R0081264	Agricultural	0		LINNEBUR GRAIN AND BUFFALO LLLP	PO BOX 298	BYERS	CO	801030298
0180700000009	R0081265	Agricultural	0		LINNEBUR GRAIN AND BUFFALO LLLP	PO BOX 298	BYERS	CO	801030298
0180700000010	R0081266	Agricultural	0		LINNEBUR GRAIN AND BUFFALO LLLP	PO BOX 298	BYERS	CO	801030298
0180700000012	R0081268	Agricultural	0		KALCO LAND LLC	48921 E 128TH AVE UNIT A	BENNETT	CO	801029418
0180700000020	R0081276	Agricultural	0		LINNEBUR GRAIN AND BUFFALO LLLP	PO BOX 298	BYERS	CO	801030298
0180700000021	R0081277	Agricultural	0		LINNEBUR GRAIN AND BUFFALO LLLP	PO BOX 298	BYERS	CO	801030298
0180709100001	R0178898	Agricultural	0		KALCO LAND LLC	48921 E 128TH AVE UNIT A	BENNETT	CO	801029418
0180709300001	R0178897	Agricultural	0		KALCO LAND LLC	48921 E 128TH AVE UNIT A	BENNETT	CO	801029418

From: [Kristine Jensen](#)
To: [Sara Stribley](#)
Cc: [Renee Bridges](#); [Sarah Smith](#); [Paul Gascoigne](#)
Subject: RE: Mailing List Confirmation - CUP Application
Date: Thursday, January 25, 2024 8:19:12 AM
Attachments: [image006.png](#)
[ParcelOwnerSelection1Mi_updated_012524.pdf](#)
[ParcelOwners_Within1MiRad_updated_012524.xlsx](#)

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Good morning Sara,
Please see the updated ownership list and map. Looks like 4 additional parcels were added to the 1 mile radius list.

Cheers,

Kristi Jensen | GIS Tax District Specialist, *Assessor's Office*

ADAMS COUNTY, COLORADO | o: 720-523-6733

 Please consider the environment before printing this email

From: Sara Stribley <sstribley@logansimpson.com>
Sent: Wednesday, January 24, 2024 5:21 PM
To: Kristine Jensen <KMJensen@adcogov.org>
Cc: Renee Bridges <RBridges@adcogov.org>; Sarah Smith <ssmith@logansimpson.com>; Paul Gascoigne <paul.gascoigne@novisrenew.com>
Subject: RE: Mailing List Confirmation - CUP Application

You don't often get email from sstribley@logansimpson.com. [Learn why this is important](#)

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Hi Kristine –

Apologies, but could you also provide a list of any additional landowners within 1-mile of the following: NENE and SENE of S30 T02S R59W.

Thank you again for your assistance!

Sara Stribley

Logan Simpson

C 970.231.9026

From: Sara Stribley
Sent: Wednesday, January 24, 2024 2:12 PM
To: Kristine Jensen <KMJensen@adcogov.org>

Cc: Renee Bridges <RBridges@adcogov.org>; Sarah Smith <ssmith@logansimpson.com>; Paul Gascoigne <paul.gascoigne@novisrenew.com>

Subject: RE: Mailing List Confirmation - CUP Application

Thanks Kristine!

We have one additional parcel that we are confirming the legal description for and will send that over shortly!

Sara Stribley

Logan Simpson

C 970.231.9026

From: Kristine Jensen <KMJensen@adcogov.org>

Sent: Wednesday, January 24, 2024 2:10 PM

To: Sara Stribley <sstribley@logansimpson.com>

Cc: Renee Bridges <RBridges@adcogov.org>; Sarah Smith <ssmith@logansimpson.com>; Paul Gascoigne <paul.gascoigne@novisrenew.com>

Subject: RE: Mailing List Confirmation - CUP Application

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Good afternoon,

I am attaching a list of the property owners within 1 mile radius of the parcels given below.

Kristi Jensen | GIS Tax District Specialist, *Assessor's Office*

ADAMS COUNTY, COLORADO | o: 720-523-6733



Please consider the environment before printing this email

From: Renee Bridges <RBridges@adcogov.org>

Sent: Wednesday, January 24, 2024 12:43 PM

To: Kristine Jensen <KMJensen@adcogov.org>

Subject: FW: Mailing List Confirmation - CUP Application

Here's the legal for the 1 mile radius...see below



<!--[if !vml]--><!--[endif]--> **Renee Bridges**

Analyst, *Assessor's Office*

ADAMS COUNTY, COLORADO

4430 S. Adams County Parkway, Suite C2100

Brighton, CO 80601

Office: 720-523-6747

rbridges@adcogov.org | www.adcogov.org

From: Sara Stribley <sstribley@logansimpson.com>
Sent: Wednesday, January 24, 2024 12:28 PM
To: Renee Bridges <RBridges@adcogov.org>
Cc: Sarah Smith <ssmith@logansimpson.com>; Paul Gascoigne <paul.gascoigne@novisrenew.com>
Subject: RE: Mailing List Confirmation - CUP Application

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Good Morning Renee –

Could you please provide us with the list of landowners within 1-mile of the following Project area so we can confirm with the contact list we've generated.

Parcel Number	Legal Description
0173700000046	EAST 1/2 LESS AND EXCEPT ONE (1) ACRE PARCEL IN THE NORTHEAST CORNER FOR SCHOOL, SECTION 32, TOWNSHIP 2 SOUTH, RANGE 59 WEST, 6TH PM, ADAMS COUNTY, CO
0173700000045	PARCEL2: WEST 1/2, SECTION 32, TOWNSHIP 2 SOUTH, RANGE 59 WEST, ADAMS COUNTY, CO
0173700000042	ALL, EXCEPT FOR COUNTY ROADS, OF SECTION 29, TOWNSHIP 2 SOUTH, RANGE 59 WEST, 6TH PM, ADAMS COUNTY, CO
0180700000007	ALL, EXCEPT FOR COUNTY ROADS, OF SECTION 5, TOWNSHIP 3 SOUTH, RANGE 59 WEST, 6TH PM. ADAMS COUNTY, CO
0173700000041	SECT,TWN,RNG:28-2-59 DESC: W2 319/30A
0180700000005	SECT,TWN,RNG:4-3-59 DESC: N2 320A

Thank you,

Sara Stribley

Logan Simpson
C 970.231.9026

From: Renee Bridges <RBridges@adcogov.org>
Sent: Tuesday, January 23, 2024 9:01 AM
To: Sarah Smith <ssmith@logansimpson.com>
Cc: Sara Stribley <sstribley@logansimpson.com>
Subject: FW: Mailing List Confirmation - CUP Application

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Hello,

I've checked with our GIS, but they need a legal description of the property you would like to receive the 1-mile radius.

If you can respond with that information, we should be able to provide you with a list of owners.

Thanks,

Renee



<!--[if !vml]--><!--[endif]--> **Renee Bridges**

Analyst, Assessor's Office

ADAMS COUNTY, COLORADO

4430 S. Adams County Parkway, Suite C2100

Brighton, CO 80601

Office: 720-523-6747

rbridges@adcogov.org | www.adcogov.org

From: Sarah Smith <ssmith@logansimpson.com>

Sent: Friday, January 19, 2024 2:34 PM

To: Assessor <Assessor@adcogov.org>

Cc: Sara Stribley <sstribley@logansimpson.com>

Subject: Mailing List Confirmation - CUP Application

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Hi Ken,

Logan Simpson is working on the proposed Hanks Crossing Solar project in Adams County. The Cody Spaid, the Planner handling our CUP permit application, has requested that we send out letters to residents within one mile of the project boundary. Should we send the list of identified residents to directly to Cody for confirmation, or to you?

Thank you for your assistance!

Sarah J. Smith

Associate Ecologist, CERP

Logan Simpson

213 Linden St., Ste. 300

Fort Collins, CO 80524

C 904-629-2774

ssmith@logansimpson.com

www.logansimpson.com



L O G A N S I M P S O N



February 2, 2024

Lisa and Mark Beauprez

11780 Mimosa Rd
Byers, CO 80103

NOTIFICATION OF PROPOSED HANKS CROSSING ENERGY PROJECT

Dear Lisa and Mark Beauprez,

As you may know, Hanks Crossing Energy, LLC, a subsidiary of Novis Renewables, LLC (“Novis”), is proposing to develop, own and operate a utility-scale solar energy and battery storage facility, known as the Hanks Crossing Energy Project (“Project”). The Project was recently selected by Public Service Company of Colorado (PSCo) as part of its Preferred Plan. The Project is located within unincorporated Adams County, Colorado, approximately 13 miles northeast of Byers, Colorado (see enclosed Figure 1). Primary access to the Project site is from Hanks Crossing Road, approximately 5 miles north of SH 36. The Project sits entirely on privately-owned land consisting of approximately 1,959 acres, with the option to incorporate up to an additional 679 acres into the Project (see enclosed Figure 2). The Project is adjacent to an existing high-voltage transmission corridor owned by PSCo, facilitating easy connection to the electrical grid. The Project consists of a 355-megawatt (MW) photovoltaic (PV) system and 178 MW battery energy storage system (BESS), along with internal access roads, inverters and transformer equipment, an electrical collection system, a substation, an operations and maintenance building, and other associated facilities.

The Project will provide electricity to local Colorado communities, help meet growing energy demand with a clean, renewable resource and will provide local jobs and economic benefits to Adams County. Novis has considered the environment and sensitive resources during siting and planning this Project and is working closely with regulatory agencies and other stakeholders to ensure the Project is developed in a way that minimizes impacts to environmental and local resources.

Key Project Information

- **Approximately 1,959 (up to 2,638) acres consisting of solar panels and a battery energy storage system**
- **Producing approximately 355 MW of PV generation capacity**
- **Strengthening the grid with 178 MW of energy storage capacity**
- **Siting of Project to minimize impacts to sensitive resources and viewsheds**

A Conditional Use Permit (CUP) from Adams County will be required prior to construction of the Project. Novis anticipates submitting a CUP to the County for Project approval in the second quarter of 2024. Novis will also secure all other required local, state, and federal permits prior to the start of construction. The Project will be fully decommissioned at the end of its operational life, which is estimated to be between 40 and 80 years. Enclosed with this notification letter are maps of the Project area.



February 2, 2024

Novis cares about the concerns you may have related to the construction and operation of this Project and is requesting your written feedback as a landowner located within one mile of the Project area. If you would also like to discuss the Project with us, we would be pleased to schedule a time to speak with you directly. We can be reached at paul.gascoigne@novisrenew.com or by phone at 508.505.0890.

Sincerely,

Paul Gascoigne

Senior Manager | Novis Renewables

Enclosed:

Figure 1. Project Location Map

Figure 2. Preliminary Project Layout

Figure 1. Project Location Map

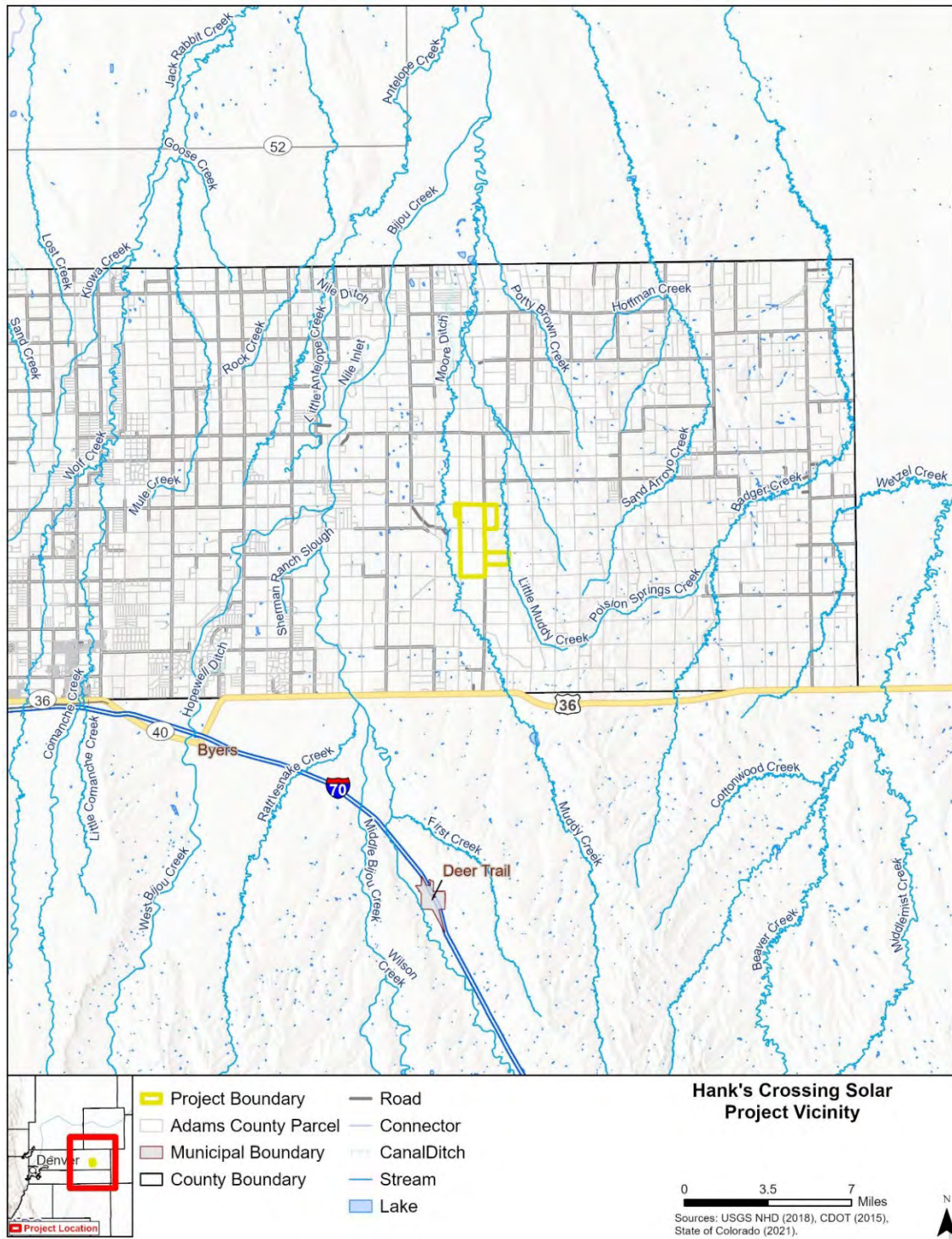
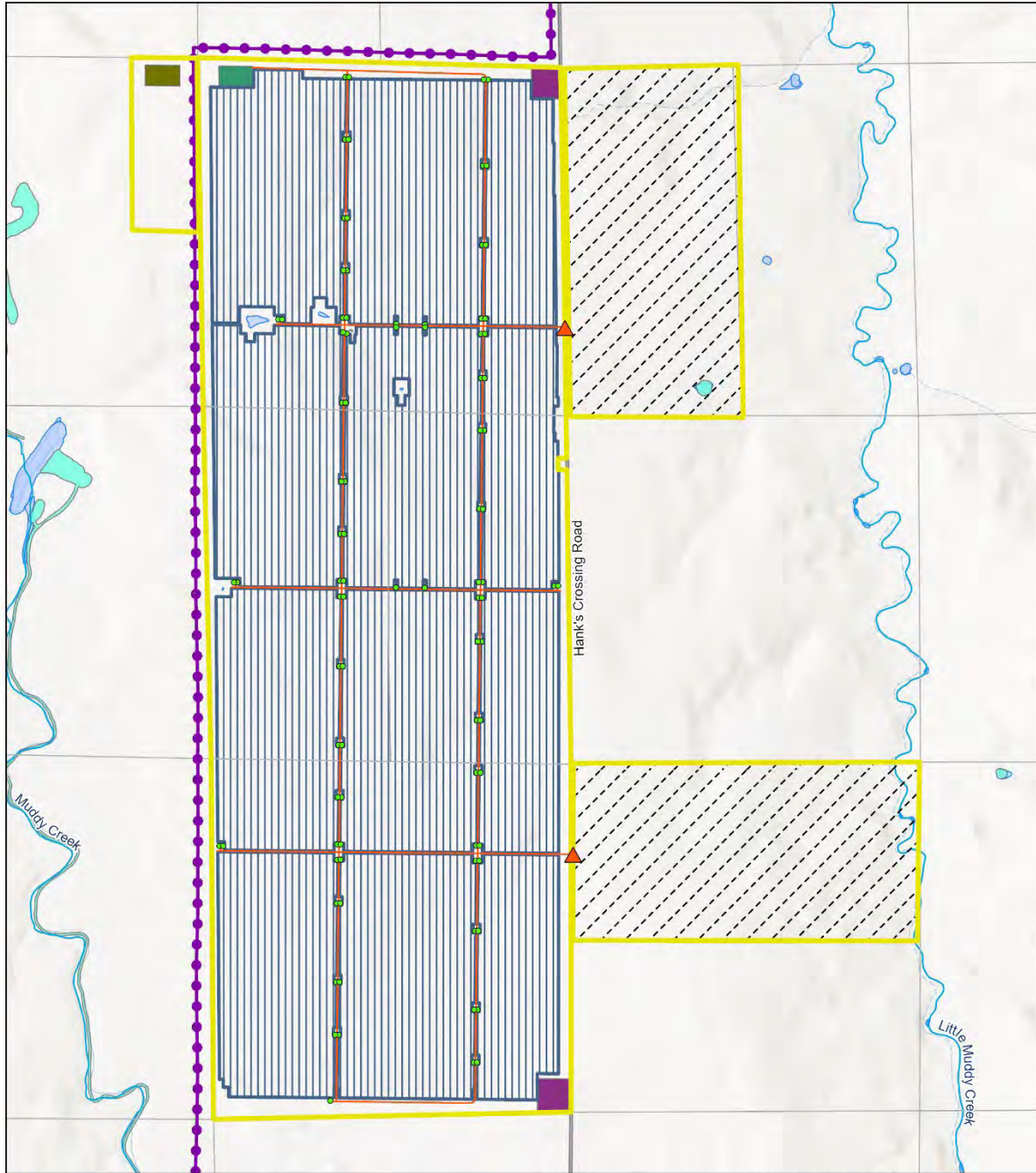


Figure 2. Preliminary Site Layout



- | | | | |
|-------------------------|---------------------------------|--------------------------------|---------|
| Project Area | Proposed Inverter | Proposed Construction Entrance | Stream |
| Optional Expansion Area | Proposed Substation | Proposed Road | Lake |
| Proposed Solar Array | Alternative Substation Location | Existing Road | Wetland |
| | Mineral Rights Area | Existing Transmission Line | Parcel |

Hank's Crossing Solar Project Boundary

0 0.25 0.5 Miles





February 2, 2024

L and S Capital LTD
800 US Highway 36
Byers, CO 80103

NOTIFICATION OF PROPOSED HANKS CROSSING ENERGY PROJECT

Dear Neighbor,

As you may know, Hanks Crossing Energy, LLC, a subsidiary of Novis Renewables, LLC (“Novis”), is proposing to develop, own and operate a utility-scale solar energy and battery storage facility, known as the Hanks Crossing Energy Project (“Project”). The Project was recently selected by Public Service Company of Colorado (PSCo) as part of its Preferred Plan. The Project is located within unincorporated Adams County, Colorado, approximately 13 miles northeast of Byers, Colorado (see enclosed Figure 1). Primary access to the Project site is from Hanks Crossing Road, approximately 5 miles north of SH 36. The Project sits entirely on privately-owned land consisting of approximately 1,959 acres, with the option to incorporate up to an additional 679 acres into the Project (see enclosed Figure 2). The Project is adjacent to an existing high-voltage transmission corridor owned by PSCo, facilitating easy connection to the electrical grid. The Project consists of a 355-megawatt (MW) photovoltaic (PV) system and 178 MW battery energy storage system (BESS), along with internal access roads, inverters and transformer equipment, an electrical collection system, a substation, an operations and maintenance building, and other associated facilities.

The Project will provide electricity to local Colorado communities, help meet growing energy demand with a clean, renewable resource and will provide local jobs and economic benefits to Adams County. Novis has considered the environment and sensitive resources during siting and planning this Project and is working closely with regulatory agencies and other stakeholders to ensure the Project is developed in a way that minimizes impacts to environmental and local resources.

Key Project Information

- **Approximately 1,959 (up to 2,638) acres consisting of solar panels and a battery energy storage system**
- **Producing approximately 355 MW of PV generation capacity**
- **Strengthening the grid with 178 MW of energy storage capacity**
- **Siting of Project to minimize impacts to sensitive resources and viewsheds**

A Conditional Use Permit (CUP) from Adams County will be required prior to construction of the Project. Novis anticipates submitting a CUP to the County for Project approval in the second quarter of 2024. Novis will also secure all other required local, state, and federal permits prior to the start of construction. The Project will be fully decommissioned at the end of its operational life, which is estimated to be between 40 and 80 years. Enclosed with this notification letter are maps of the Project area.



February 2, 2024

Novis cares about the concerns you may have related to the construction and operation of this Project and is requesting your written feedback as a landowner located within one mile of the Project area. If you would also like to discuss the Project with us, we would be pleased to schedule a time to speak with you directly. We can be reached at paul.gascoigne@novisrenew.com or by phone at 508.505.0890.

Sincerely,

Paul Gascoigne

Senior Manager | Novis Renewables

Enclosed:

Figure 1. Project Location Map

Figure 2. Preliminary Project Layout

Figure 1. Project Location Map

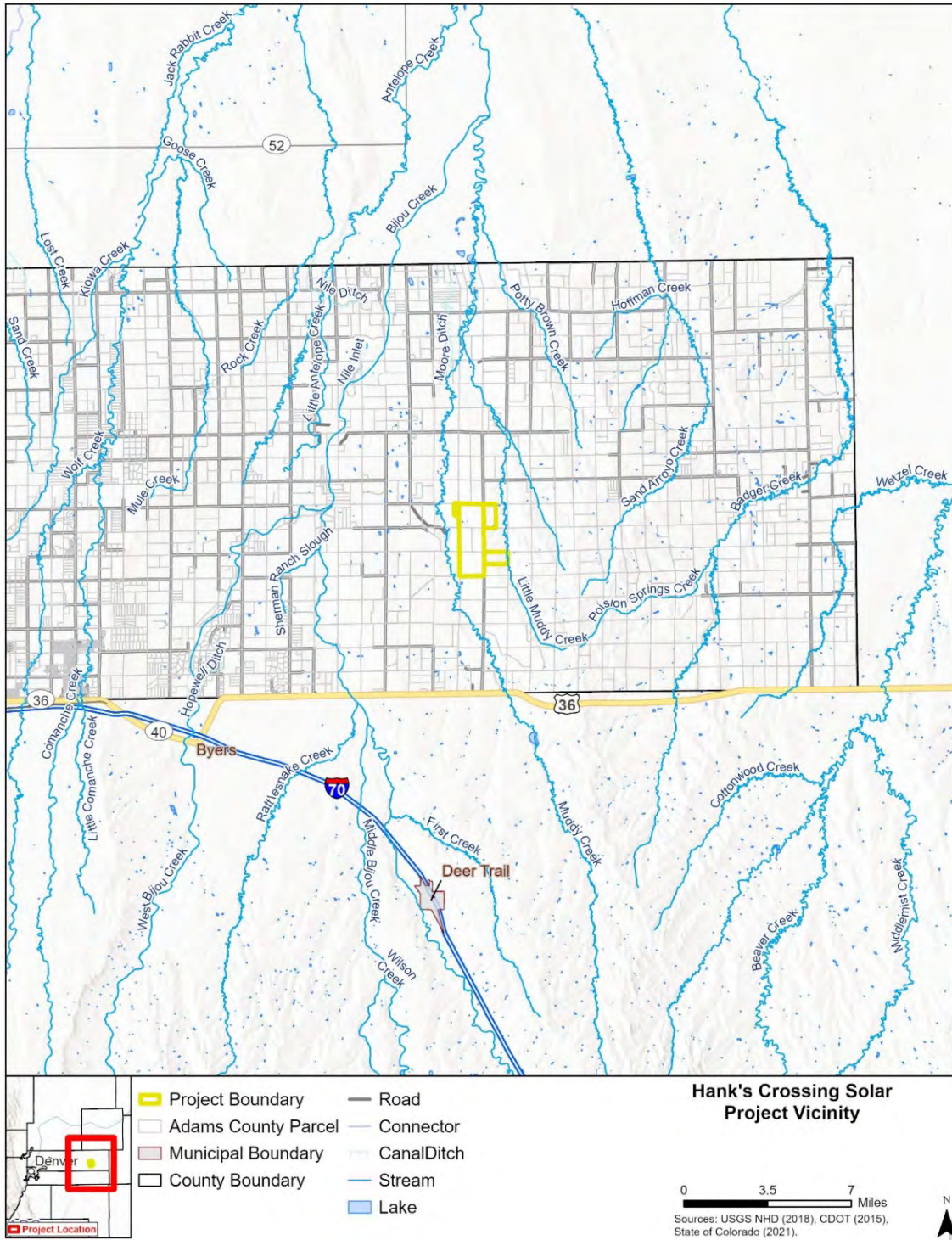
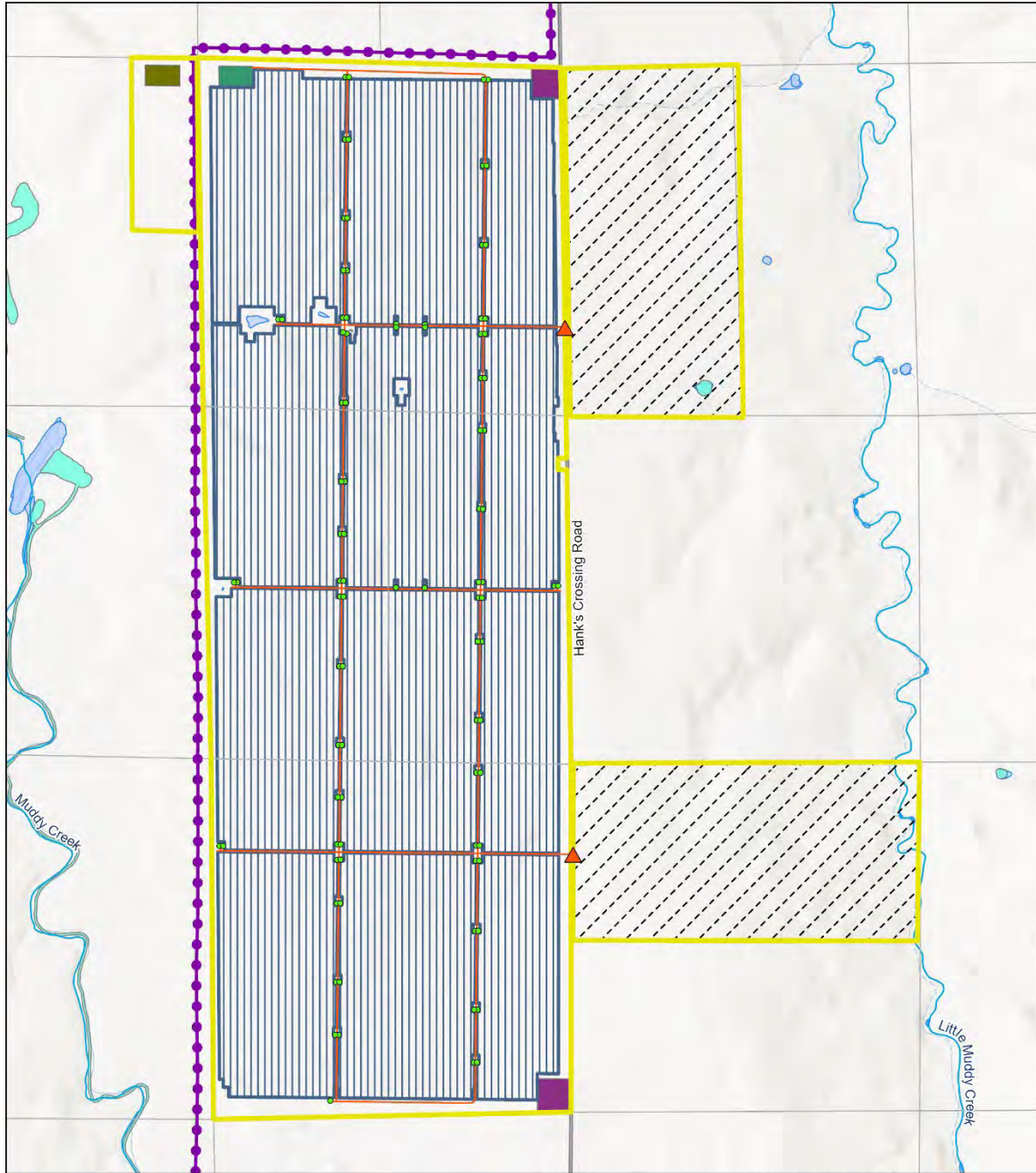


Figure 2. Preliminary Site Layout



- | | | | |
|-------------------------|---------------------------------|--------------------------------|---------|
| Project Area | Proposed Inverter | Proposed Construction Entrance | Stream |
| Optional Expansion Area | Proposed Substation | Proposed Road | Lake |
| Proposed Solar Array | Alternative Substation Location | Existing Road | Wetland |
| | Mineral Rights Area | Existing Transmission Line | Parcel |

Hank's Crossing Solar Project Boundary

0 0.25 0.5 Miles





February 2, 2024

Raymond and Donna Morris

3305 Behrens Rd
Byers, CO 80103

NOTIFICATION OF PROPOSED HANKS CROSSING ENERGY PROJECT

Dear Raymond and Donna,

As you may know, Hanks Crossing Energy, LLC, a subsidiary of Novis Renewables, LLC (“Novis”), is proposing to develop, own and operate a utility-scale solar energy and battery storage facility, known as the Hanks Crossing Energy Project (“Project”). The Project was recently selected by Public Service Company of Colorado (PSCo) as part of its Preferred Plan. The Project is located within unincorporated Adams County, Colorado, approximately 13 miles northeast of Byers, Colorado (see enclosed Figure 1). Primary access to the Project site is from Hanks Crossing Road, approximately 5 miles north of SH 36. The Project sits entirely on privately-owned land consisting of approximately 1,959 acres, with the option to incorporate up to an additional 679 acres into the Project (see enclosed Figure 2). The Project is adjacent to an existing high-voltage transmission corridor owned by PSCo, facilitating easy connection to the electrical grid. The Project consists of a 355-megawatt (MW) photovoltaic (PV) system and 178 MW battery energy storage system (BESS), along with internal access roads, inverters and transformer equipment, an electrical collection system, a substation, an operations and maintenance building, and other associated facilities.

The Project will provide electricity to local Colorado communities, help meet growing energy demand with a clean, renewable resource and will provide local jobs and economic benefits to Adams County. Novis has considered the environment and sensitive resources during siting and planning this Project and is working closely with regulatory agencies and other stakeholders to ensure the Project is developed in a way that minimizes impacts to environmental and local resources.

Key Project Information

- **Approximately 1,959 (up to 2,638) acres consisting of solar panels and a battery energy storage system**
- **Producing approximately 355 MW of PV generation capacity**
- **Strengthening the grid with 178 MW of energy storage capacity**
- **Siting of Project to minimize impacts to sensitive resources and viewsheds**

A Conditional Use Permit (CUP) from Adams County will be required prior to construction of the Project. Novis anticipates submitting a CUP to the County for Project approval in the second quarter of 2024. Novis will also secure all other required local, state, and federal permits prior to the start of construction. The Project will be fully decommissioned at the end of its operational life, which is estimated to be between 40 and 80 years. Enclosed with this notification letter are maps of the Project area.



February 2, 2024

Novis cares about the concerns you may have related to the construction and operation of this Project and is requesting your written feedback as a landowner located within one mile of the Project area. If you would also like to discuss the Project with us, we would be pleased to schedule a time to speak with you directly. We can be reached at paul.gascoigne@novisrenew.com or by phone at 508.505.0890.

Sincerely,

Paul Gascoigne

Senior Manager | Novis Renewables

Enclosed:

Figure 1. Project Location Map

Figure 2. Preliminary Project Layout

Figure 1. Project Location Map

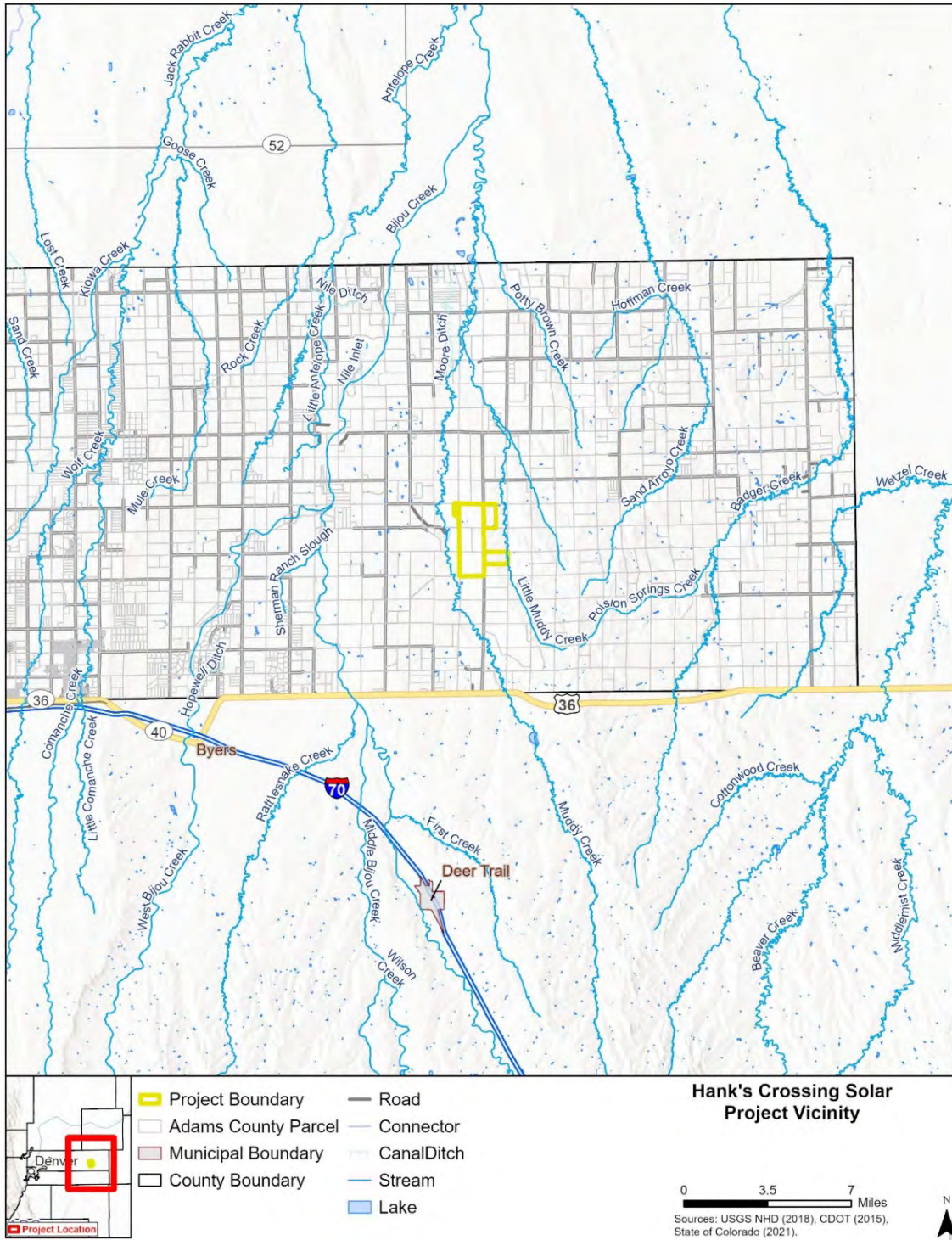
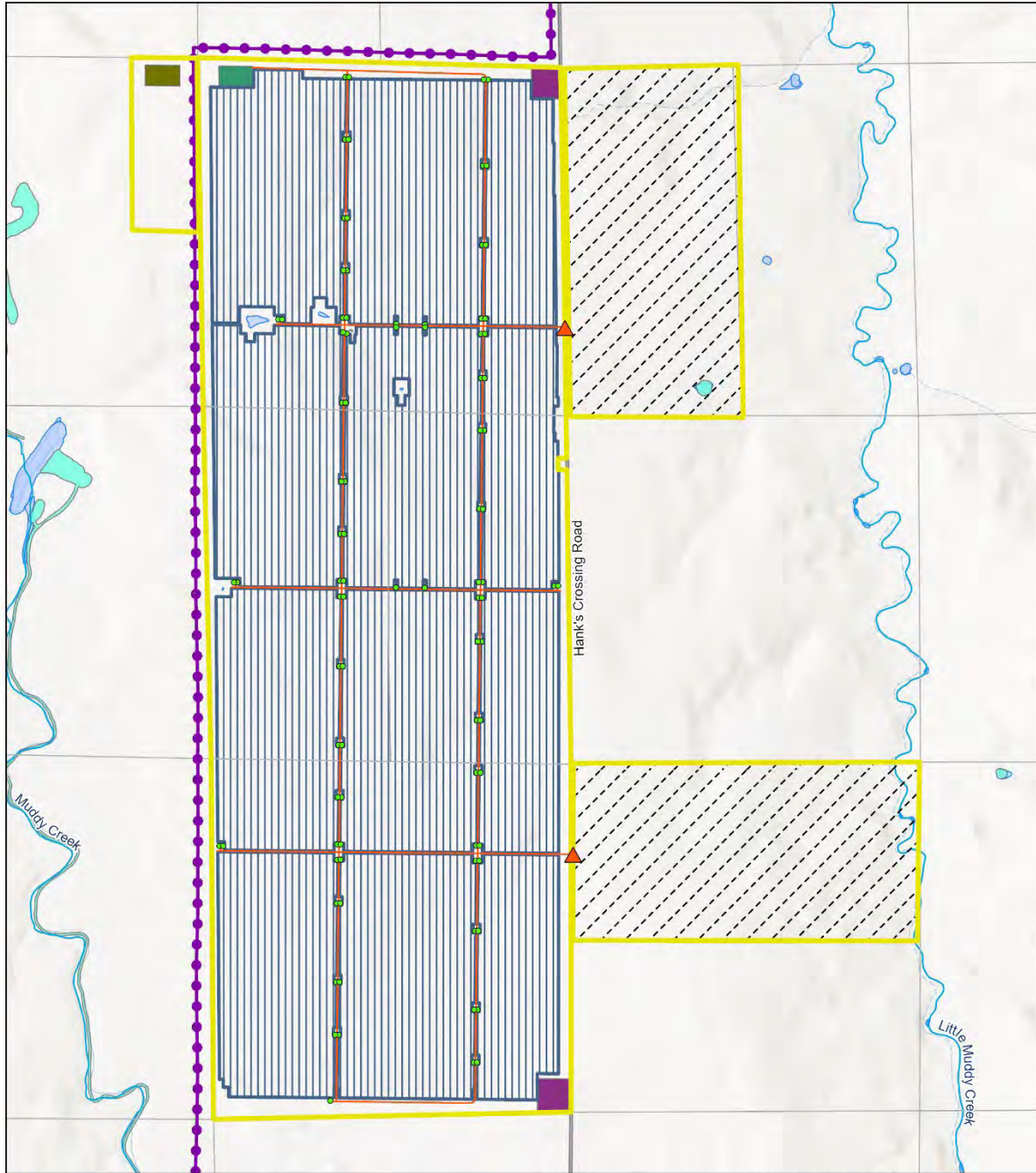


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| | Mineral Rights Area | Existing Transmission Line | Parcel |

Hank's Crossing Solar Project Boundary

0 0.25 0.5 Miles





February 2, 2024

Linnebur Grain and Buffalo LLLP

PO Box 298
Byers, CO 80103

NOTIFICATION OF PROPOSED HANKS CROSSING ENERGY PROJECT

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Key Project Information

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February 2, 2024

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Senior Manager | Novis Renewables

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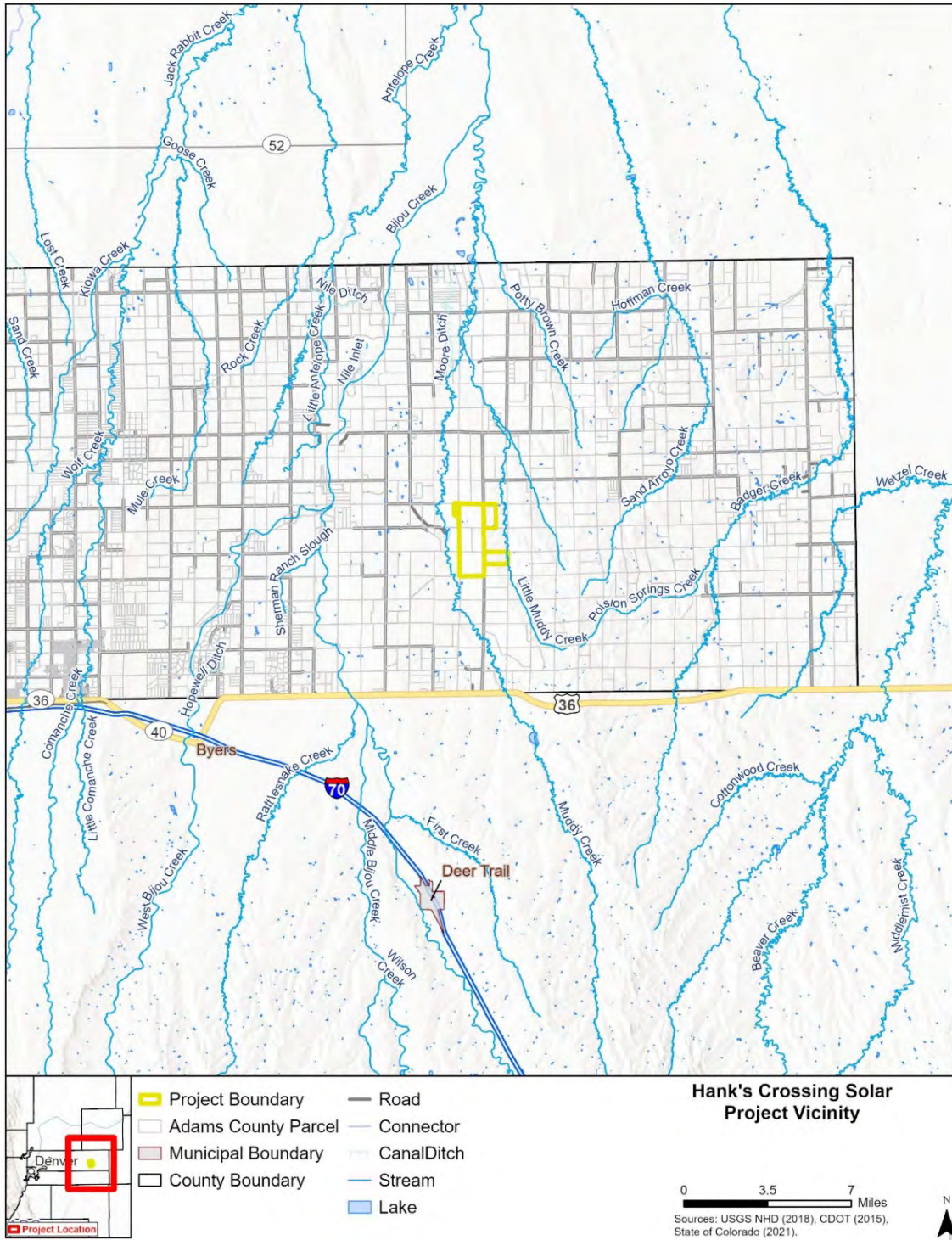
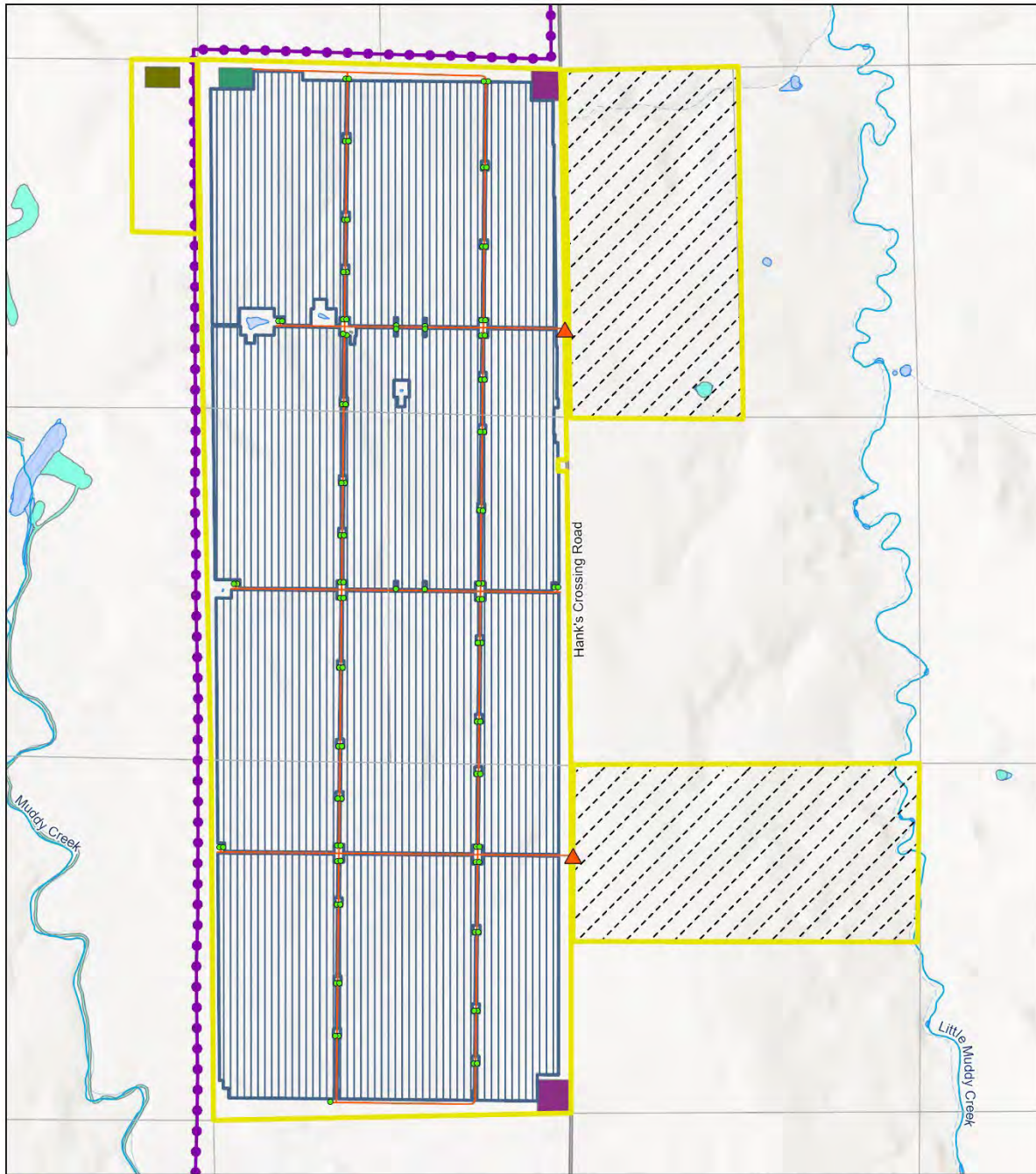


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Hank's Crossing Solar Project Boundary

0 0.25 0.5 Miles





February 2, 2024

Silicon Ranch Corporation

222 2nd Ave S.
STE 1900
Nashville, TN 37201

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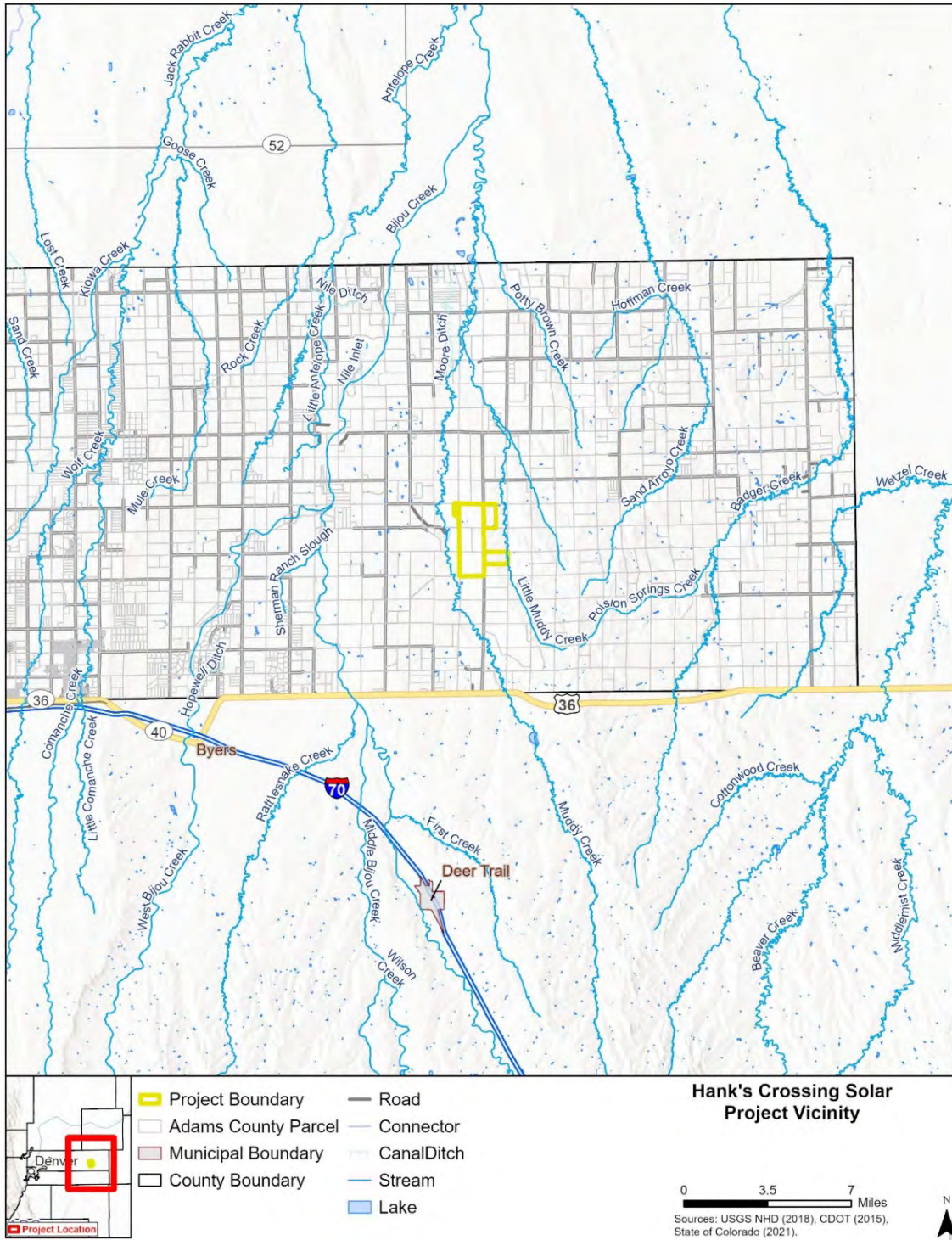
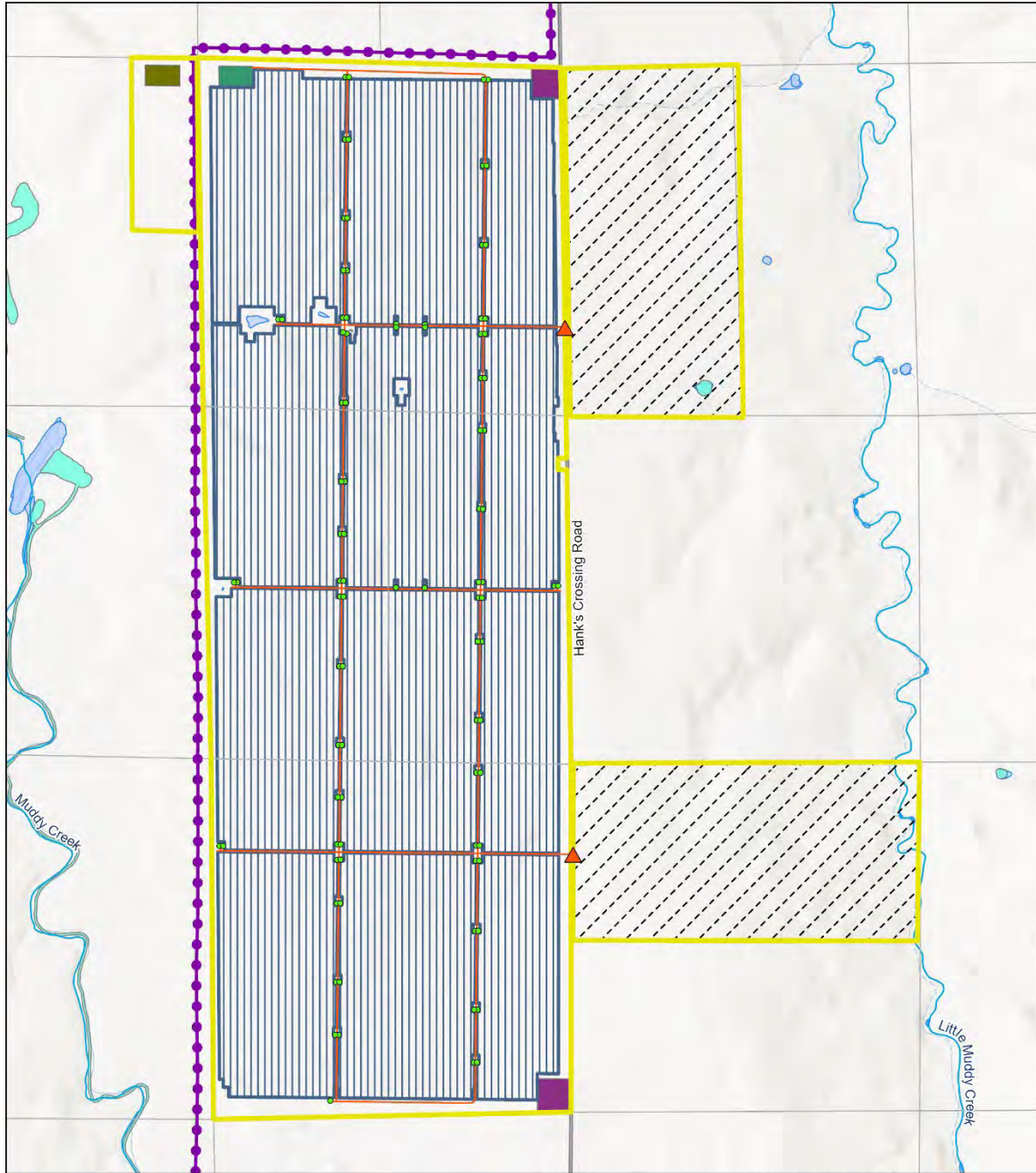


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Hank's Crossing Solar Project Boundary

0 0.25 0.5 Miles





February 2, 2024

Adams County School District No. 32

444 E Front St
Byers, CO 80103

NOTIFICATION OF PROPOSED HANKS CROSSING ENERGY PROJECT

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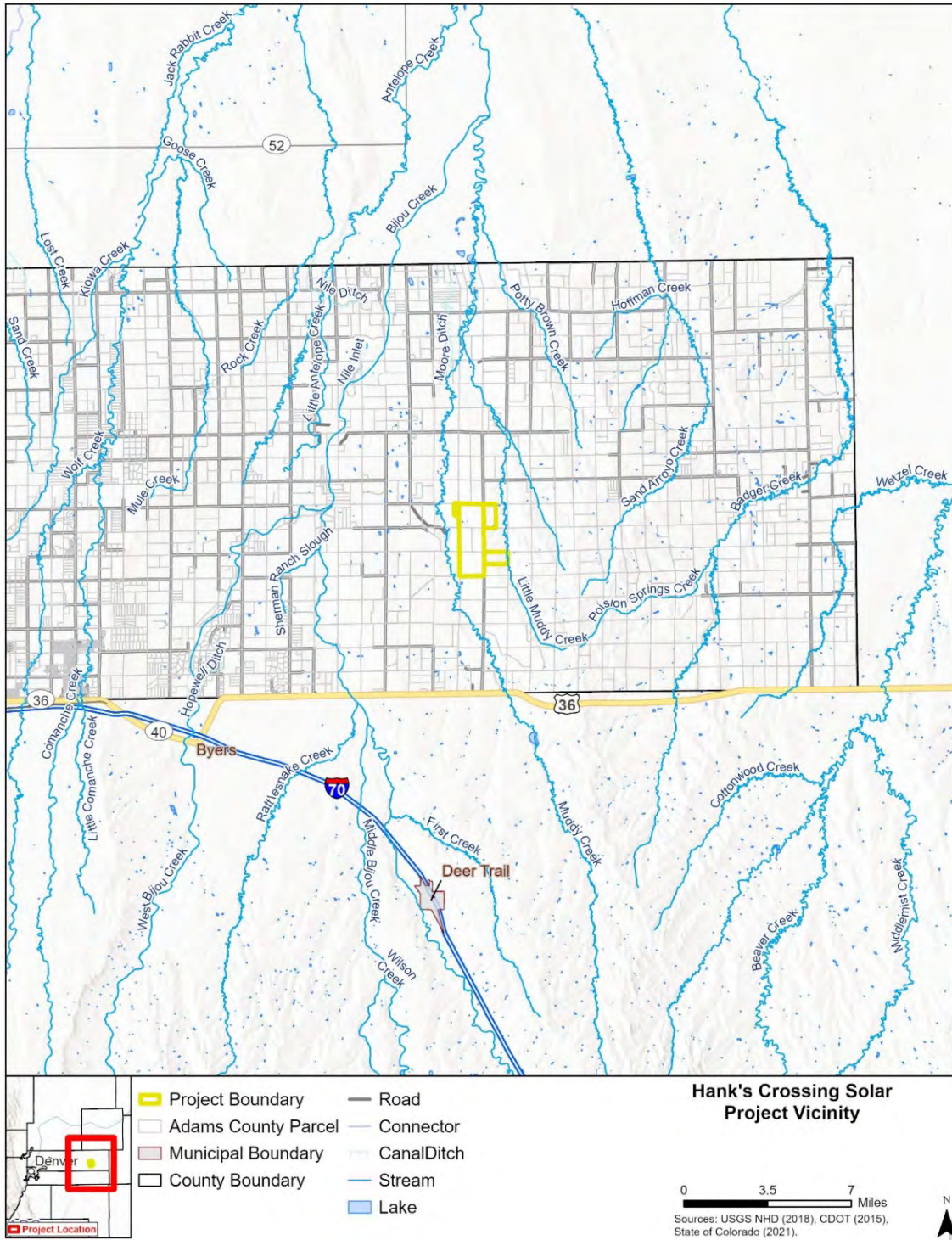
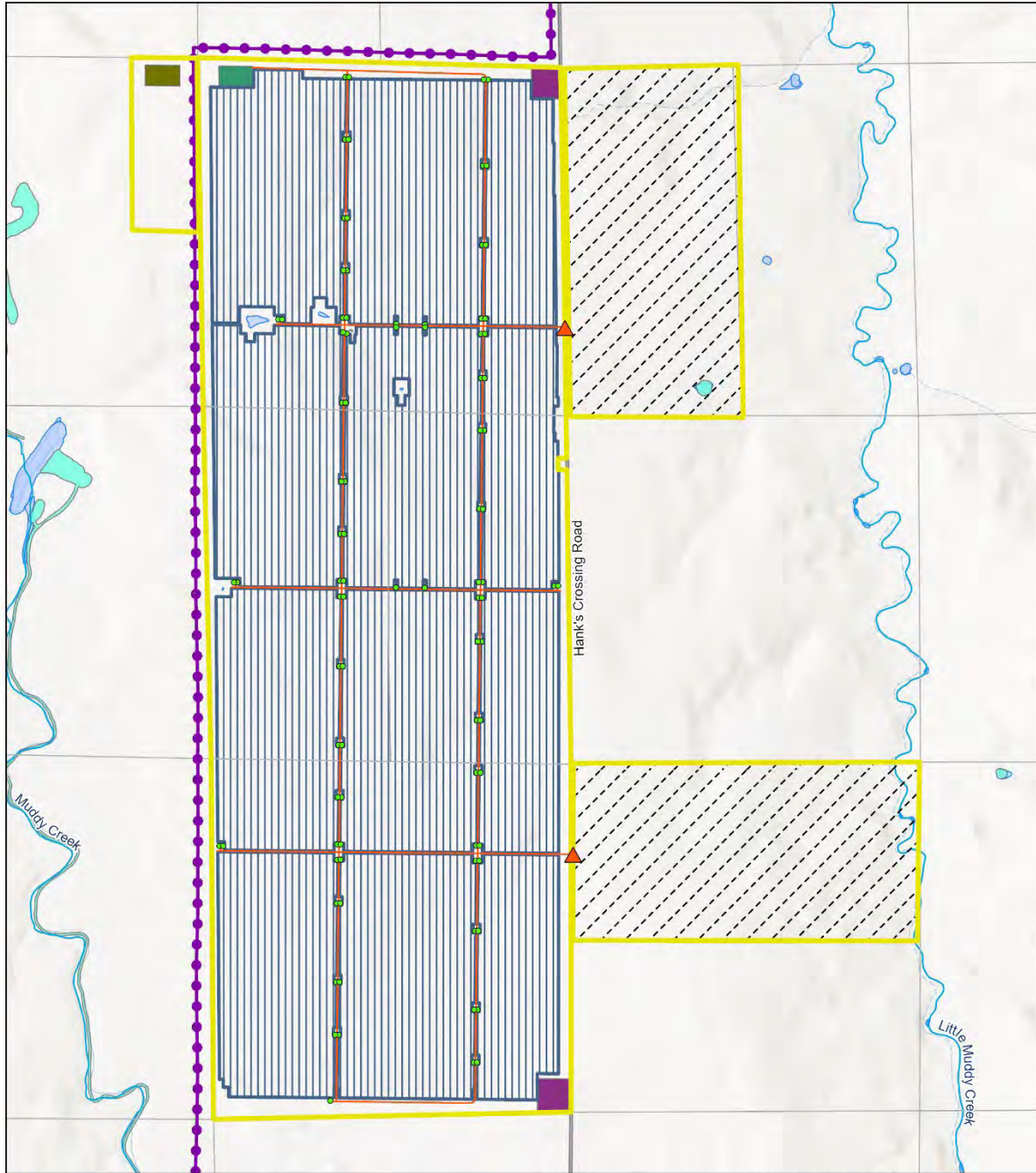


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Hank's Crossing Solar Project Boundary

0 0.25 0.5 Miles





February 2, 2024

Henry Jaco Land LLC

48921 E 128th AVE
Unit A
Bennett, CO 80102

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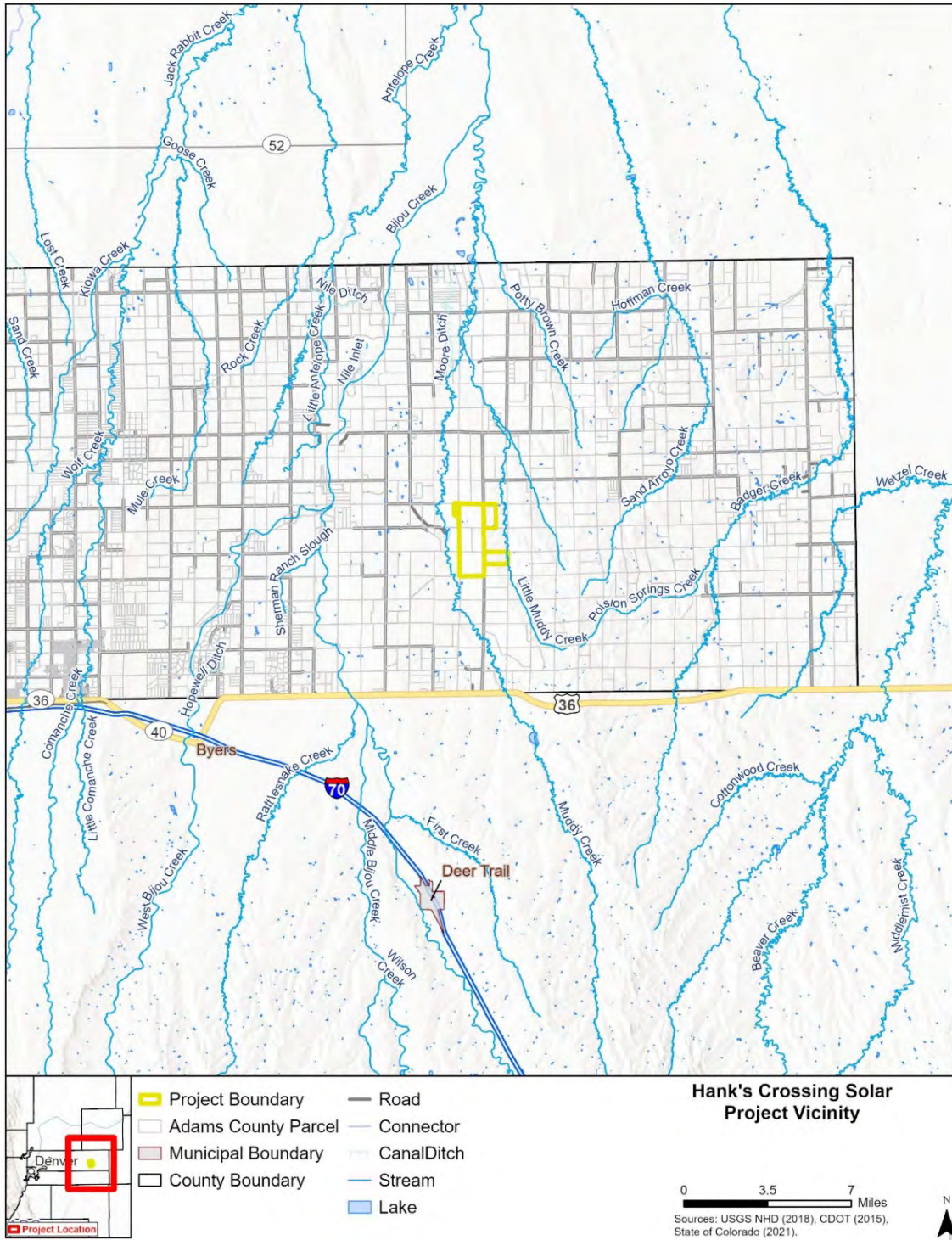
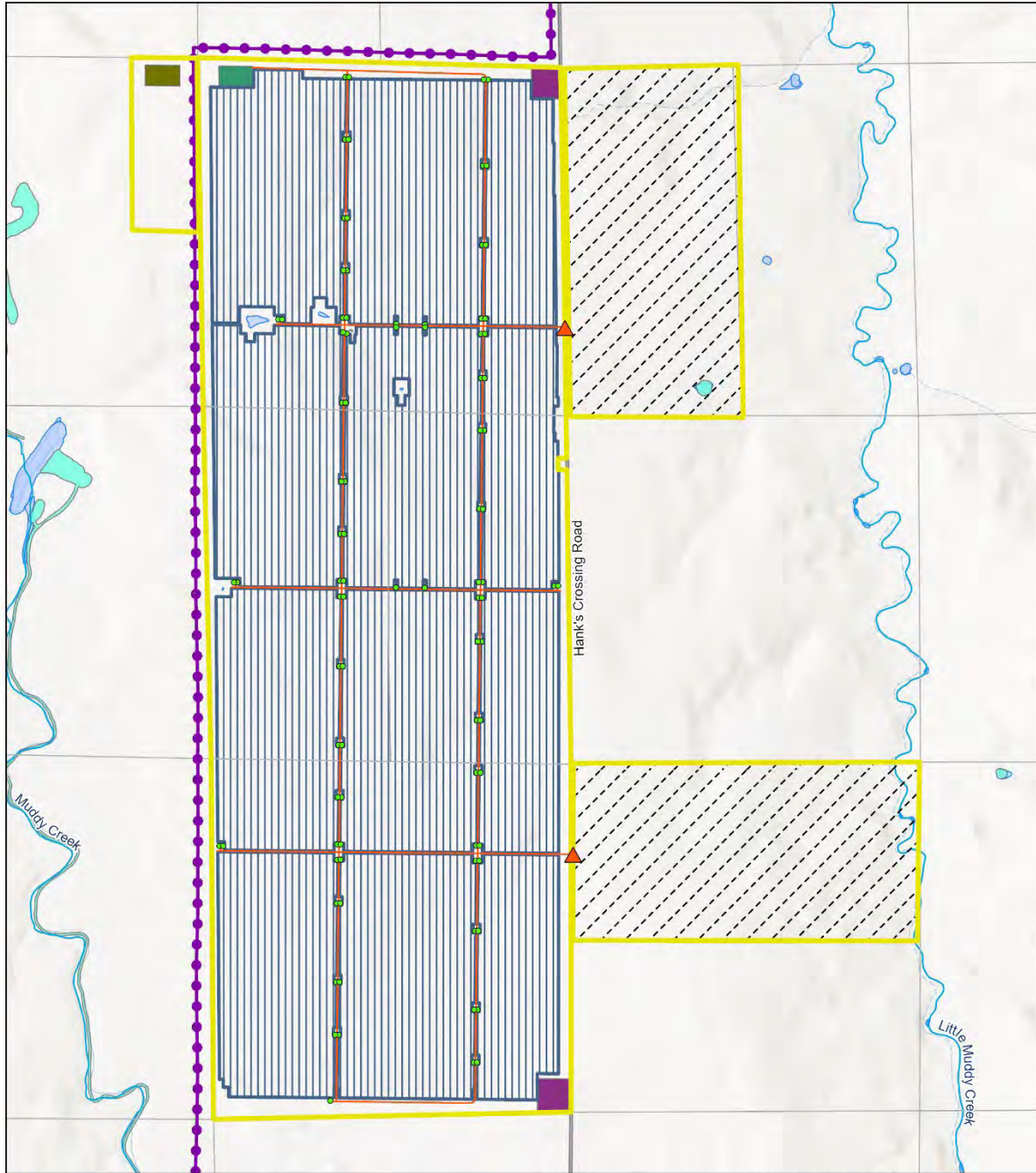


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Hank's Crossing Solar Project Boundary

0 0.25 0.5 Miles





February 2, 2024

The Hinerman Trust

24224 SE 129th Ave
Kent, WA 98030

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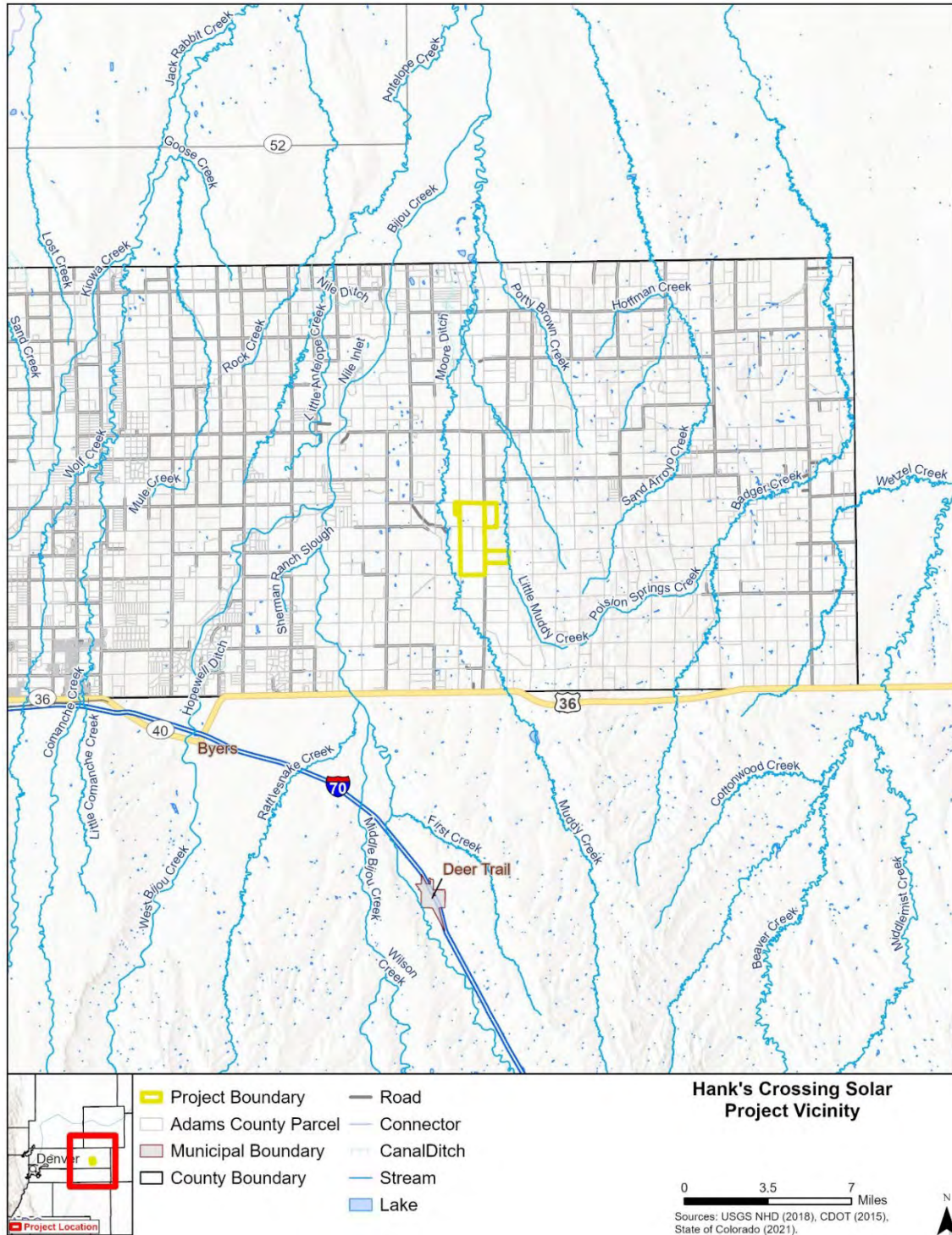
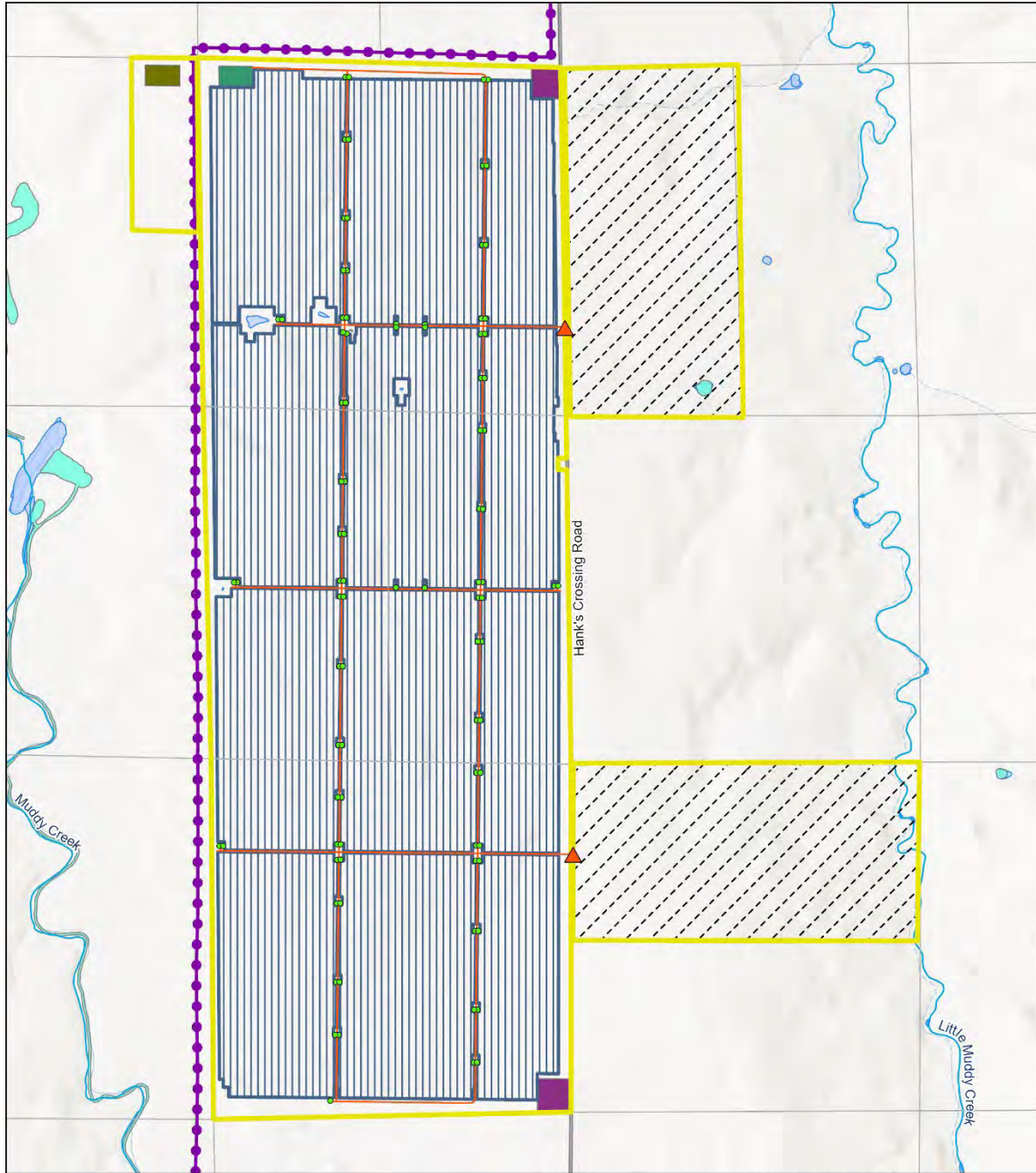


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Hank's Crossing Solar Project Boundary

0 0.25 0.5 Miles





February 2, 2024

James W. Holden
7110 Hanks Crossing Rd
Byers, CO 80103

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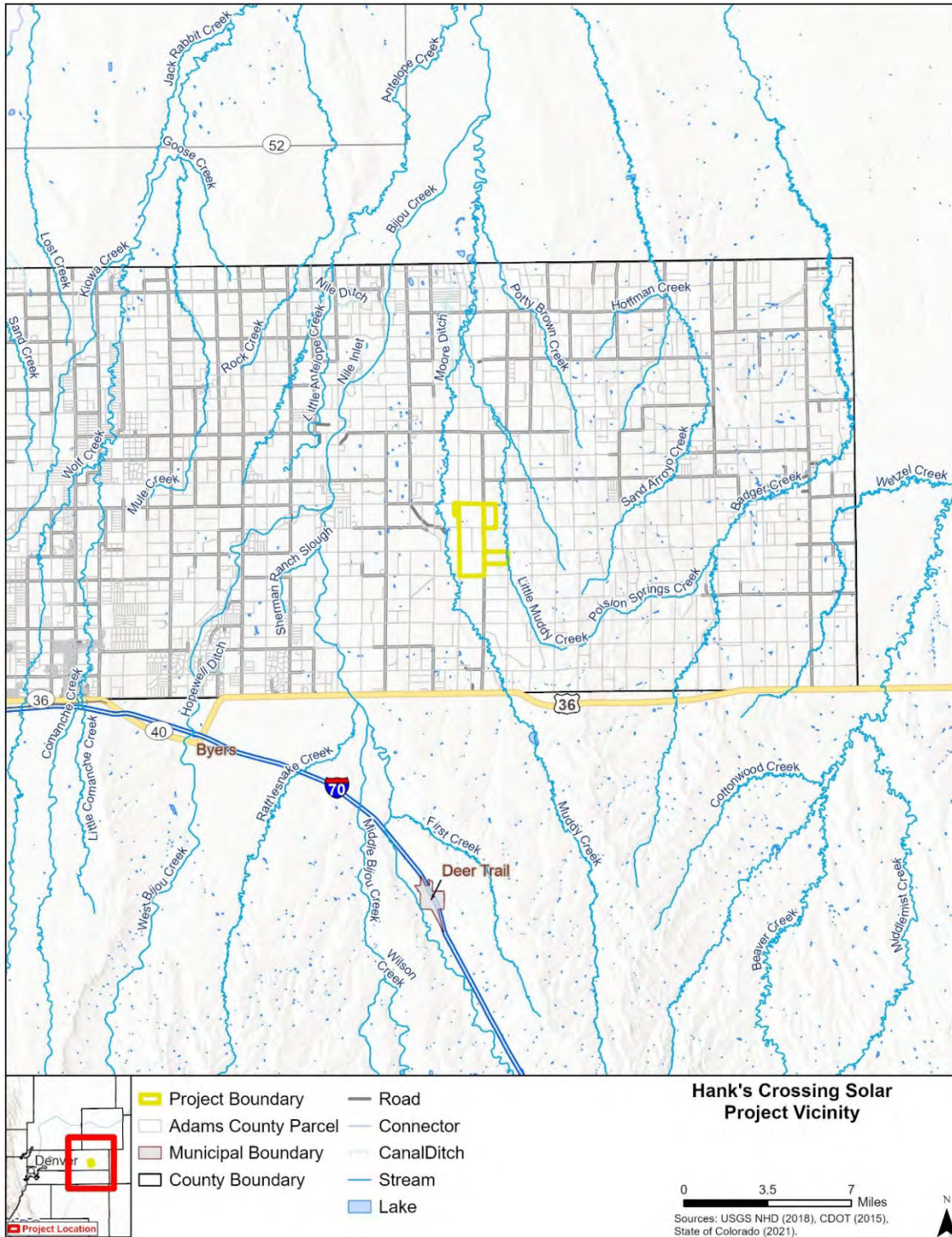
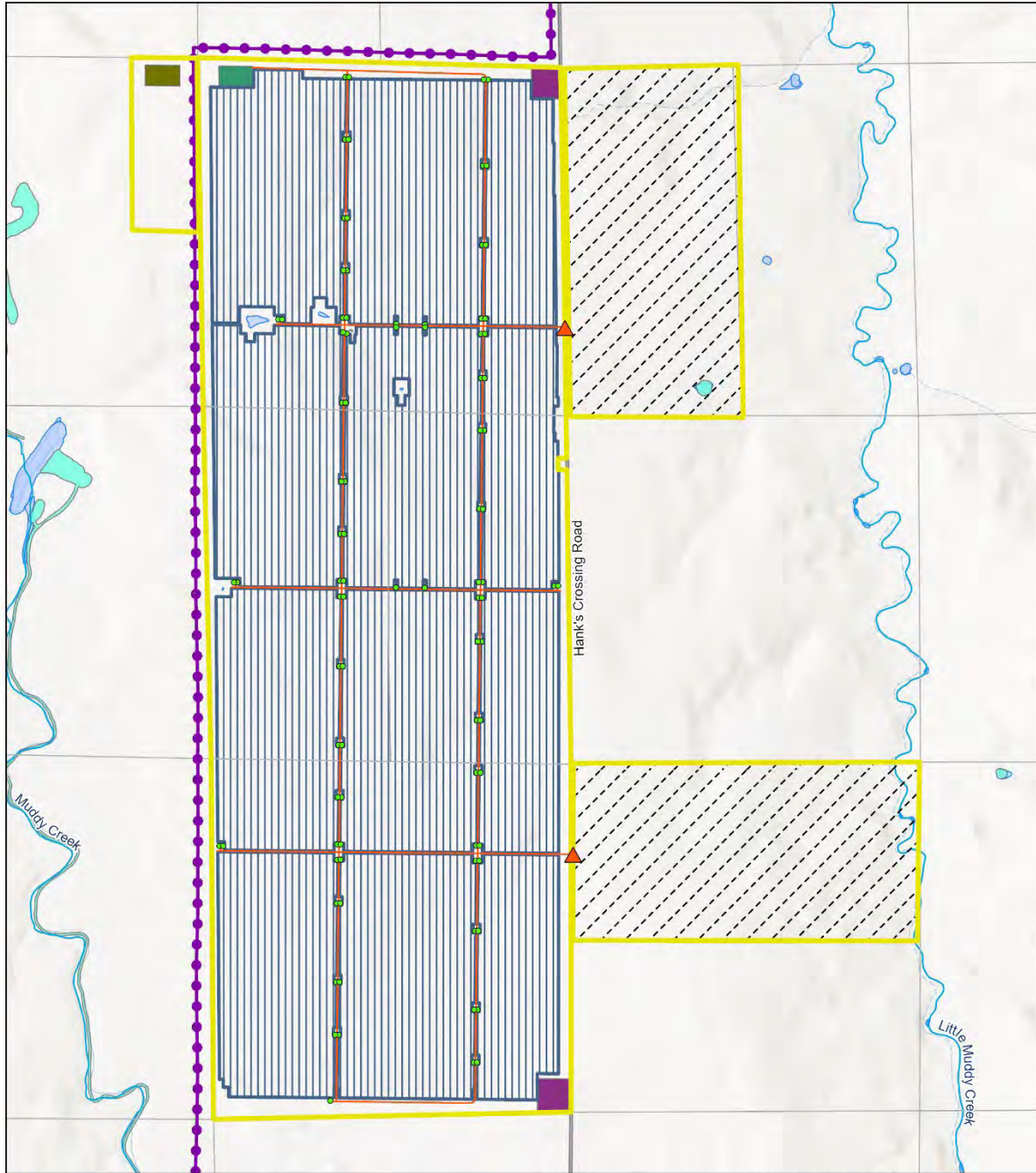


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Hank's Crossing Solar Project Boundary

0 0.25 0.5 Miles





February 2, 2024

Kalco Land LLC
48921 E 128th AVE
Unit A
Bennett, CO 80102

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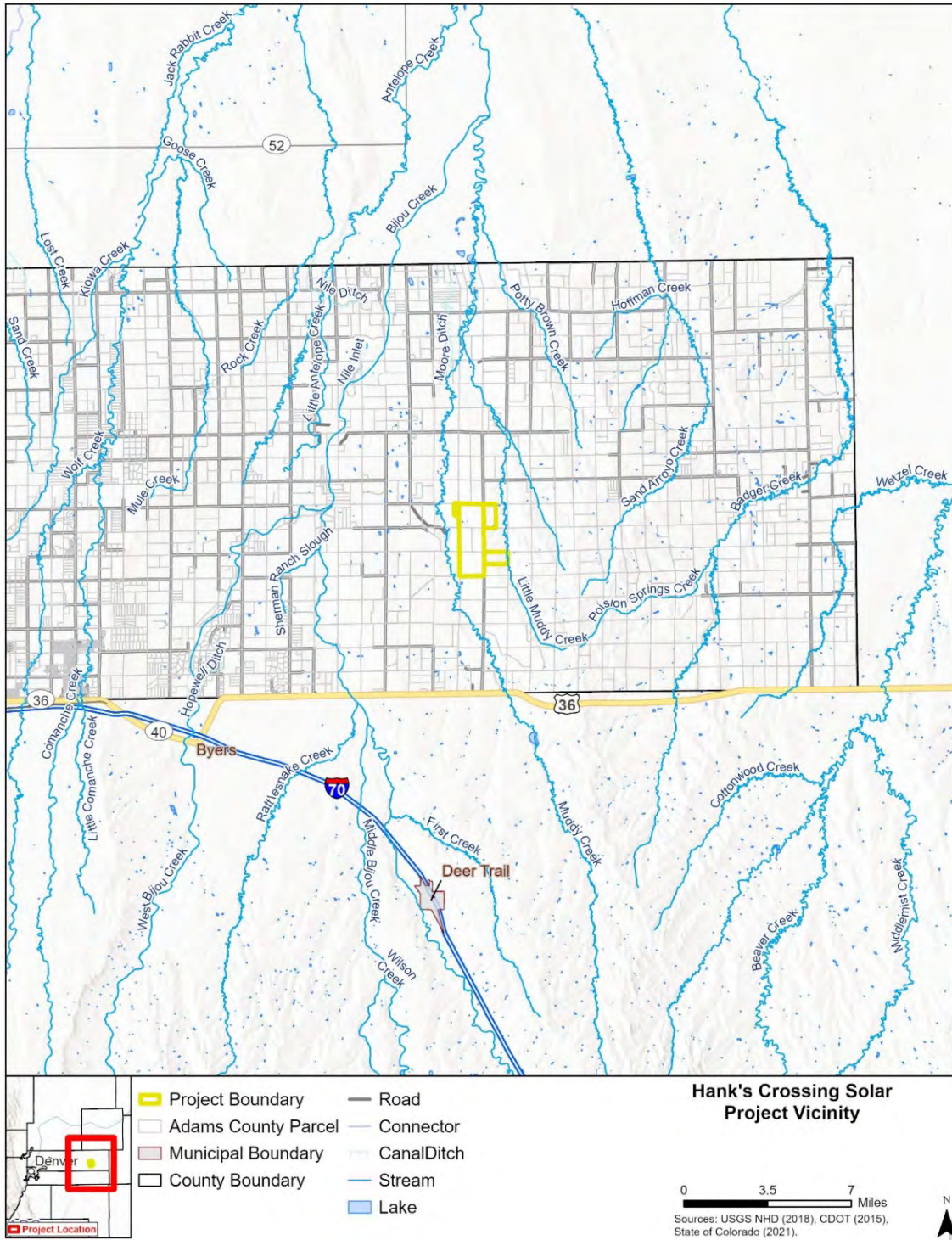
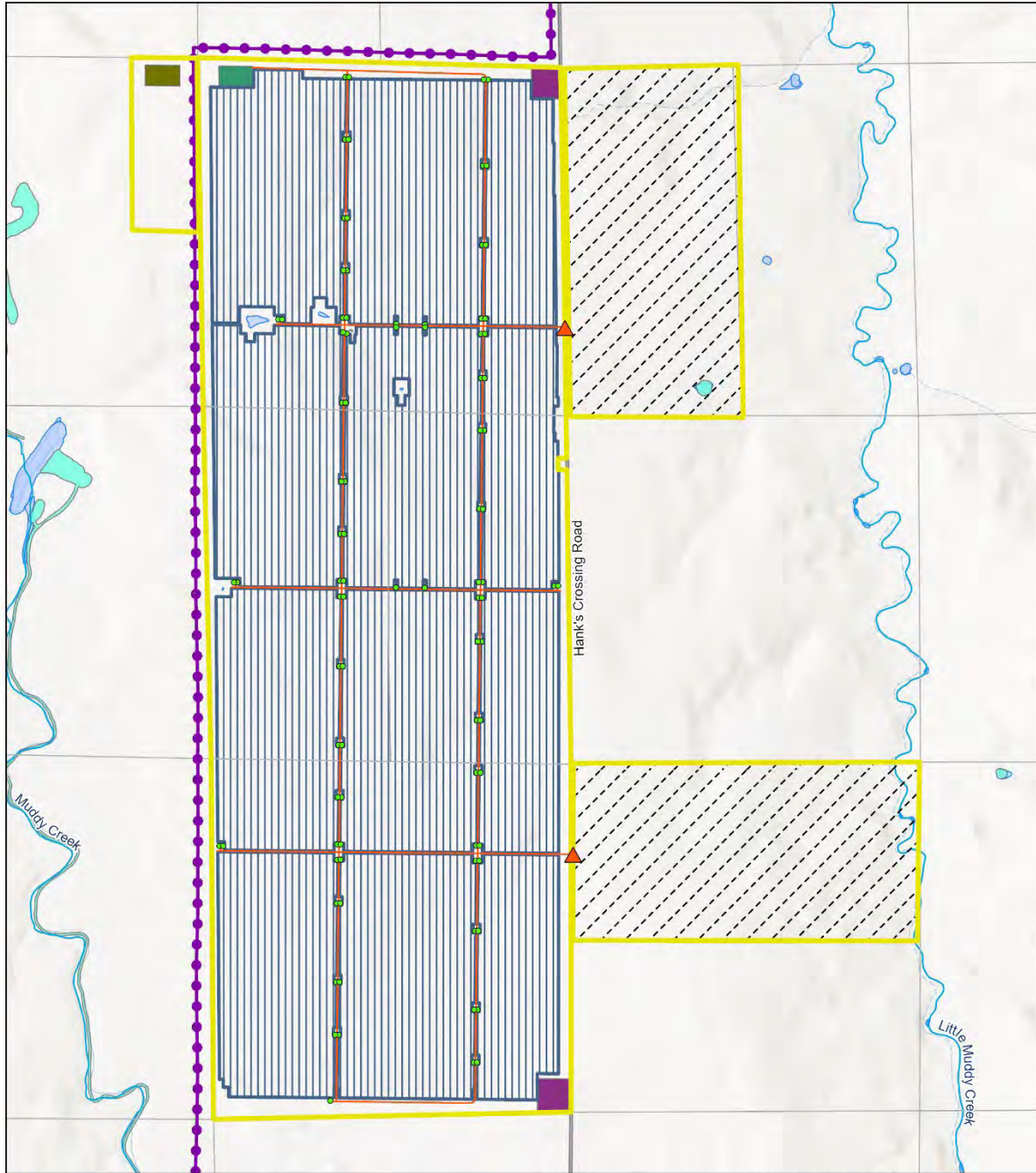
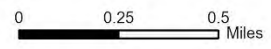


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Hank's Crossing Solar Project Boundary



11.2 Level 1 Storm Drainage Study

Level 1 Storm Drainage Study (SDS) submittal items have been incorporated into the Project Site Plan (see Submittal Item 4.0). The SDS checklist has been included under Submittal Item 11.2 for reference.

Level 1 – Storm Drainage Plan				
Item No.	Submitted ¹	County Use Only		
		Rejected	N/A	
1.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sheet Size –24" x 36" or 11" x 17" or 8½" x 11"
2.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Project Title Sheet
3.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Project Site Plan
4.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Title Block – include name and address of proposed project/development.
5.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	• Drawing Information
				<ul style="list-style-type: none"> • North arrow indicator • Section-Township-Range • Drawing Scale • Symbol Legend
6.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Name, address and telephone of the applicant, agent, or owner.
7.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Name, address and telephone of the person preparing the plan.
8.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Site Layout – including property boundaries, dimensions, area (in square feet or acres), adjoining street names and right-of-way widths.
9.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Contour Lines - from the best available source, spot elevations, or indications of direction and steepness of slopes, with the source clearly identified
10.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Drainage Structures - including existing and proposed structures (pipes, catch basins , channels, ponds, irrigation ditches, etc.) and impervious surfaces (parking lots, driveways, patios, buildings, etc.)
11.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Utilities – existing and/or proposed with easements identified.
12.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Natural Features – including drainage channels, wetlands, water bodies, areas of natural vegetation, and flood plains.
13.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Area of Disturbance – including proposed clearing limits, areas to be graded, filled, excavated, or otherwise disturbed. The location of graded slopes shall be indicated, together with the proposed steepness and height. The location of stockpiles, haul roads and disposal sites shall also be indicated
14.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Erosion and Sedimentation Control – including location and type of erosion and sedimentation control measures proposed.
15.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	General Construction Notes – include notes for clarification (see Appendix for County Examples.)
<p>Developer’s Comments (please reference the item number for each comment)</p> <p>All submittal items have been incorporated into the Site Plan for the Hanks Crossing Energy Project.</p>				
<p>County’s Comments</p>				

¹ To be checked by the Developer. If a “submitted” box is not checked, the Applicant must explain (in comment box above) or the application may be rejected for insufficient information.

12.0 References, Acronyms, and Abbreviations

12.1 Acronyms and Abbreviations

Acronym/Abbreviation	Definition
A-3 Zoning District	Agricultural-3 Zoning District
AC	Alternating Current
Applicant	Hanks Crossing Energy, LLC
BESS	Battery Energy Storage System
BGEPA	Bald and Golden Eagle Protection Act
BMP	Best Management Practice
Board	Board of County Commissioners
CO	Colorado
COMPASS	Colorado Cultural Resource Online Database
CPW	Colorado Parks and Wildlife
CUP	Conditional Use Permit
DC	Direct Current
ERP	Emergency Response Plan
ESA	Environmental Site Assessment
FAA	Federal Aviation Administration
FEMA	Federal Emergency Management Agency
HPH	High Priority Habitat
Inc.	Incorporated
kV	Kilovolt
LLC	Limited Liability Company
MW	Megawatt
MWh	Megawatt Hours
Novis	Novis Renewables, LLC
NRCO	Natural Resources Conservation Overlay District
NRHP	National Register of Historic Places
O&M	Operations and Maintenance

Acronym/Abbreviation	Definition
OAHP	Office of Archaeology and Historical Preservation
Peak AM Hour	6:00AM – 7:00AM
Peak PM Hour	4:00PM – 5:00PM
PM	Prime Meridian
Project	Hanks Crossing Energy Project
PSCo	Public Service Company of Colorado
PV	Photovoltaic
REC	Recognized Environmental Condition
Regulations	Adams County Development Standards and Regulations
RNG	Range
ROW	Right-of-way
SAM	Species Activity Mapping
SECT	Section
SH	State Highway
Site Plan	Preliminary Site Plan for the Project
S.p.A.	Sale and Purchase Agreement
TGA	Trip Generation Analysis
TWN	Township
U.S.	United States
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
WOTUS	Waters of the U.S.

12.2 References

Adams County. 2020. Adams County Development Standards and Regulations. Available online at <https://adcogov.org/development-standards-regulations>.

Adams County. 2023. Agricultural Property Profile for Participating Landowners.

Adams County. 2024. Parcel data for Participating Landowners.

Adams County Assessor. 2024. Adams County GIS Parcel Data. Available online at: <https://data-adcogov.opendata.arcgis.com/#data>.

Adams County GIS. 2023. Adams County GIS Zoning Data. Available online at: <https://data-adcogov.opendata.arcgis.com/#data>.

Adams County Health Department. 2023. Will Serve Letter for Water and Sewer.

Adams County Treasurer and Public Trustee. 2023 Certificate of Taxes Due for Morris Property.

Adams County Treasurer and Public Trustee. 2024. Certificate of Taxes Due for Holden Property.

Colorado Cultural Resource Online Database (COMPASS). 2023. File Search of database. Conducted December 14, 2023.

Colorado Division of Local Affairs. 2024. Special Districts GIS data. Available online at: https://gis.dola.colorado.gov/CO_SpecialDistrict/.

Colorado Division of Water Resources. 2023. Status of Well Permits in the Project area.

Colorado Energy & Carbon Management Commission (CECMC). July 11, 2024. Oil and gas locations GIS data. Available online at: <https://ecmc.state.co.us/data2.html#/downloads>.

Colorado Natural Heritage Program. 2023. Colorado Ownership, Management and Protection database. Available online at: <https://cnhp.colostate.edu/projects/comap/>.

Colorado Parks and Wildlife (CPW). 2009. Fencing with Wildlife in Mind. Available online at: <https://cpw.state.co.us/Documents/LandWater/PrivateLandPrograms/FencingWithWildlifeInMind.pdf>.

Colorado Parks and Wildlife (CPW). 2020. Recommended Buffer Zones and Seasonal Restrictions for Colorado Raptors. Available online at: <https://cpw.state.co.us/Documents/WildlifeSpecies/LivingWithWildlife/Raptor-Buffer-Guidelines.pdf>.

Colorado Parks and Wildlife (CPW). 2021. Best Management Practices for Solar Development. Available online at: <https://cpw.state.co.us/Documents/Conservation-Resources/Energy-Mining/Solar-Energy-BMPs.pdf>.

Colorado Parks and Wildlife (CPW). 2023. Species Activity Mapping (SAM) GIS data for Species Occurrence. As submitted in Appendix G: Wildlife Habitat Characterization and Site Reconnaissance.

Federal Aviation Administration (FAA). 2024. Project Submission Documentation and Status Reports and Communications.

Federal Emergency Management Agency. 2020. The National Flood Hazard Layer. GIS data available online at: <https://www.fema.gov/flood-maps/national-flood-hazard-layer>.

Hanks Crossing. 2024. Estimated Tax Payments to Adams County from the Project.

Logan Simpson. 2024a. Vegetation Management Plan for Hanks Crossing Energy Project. 24pp.

Logan Simpson. 2024b. Decommissioning Plan for Hanks Crossing Energy Project. 7pp.

Morgan County Rural Electric Association. 2024. Certification of Electric Power for Proof of Utilities.

Natural Resources Conservation Service (NRCS). 2023. Soil Survey Geographic Database. Available online at: <https://www.nrcs.usda.gov/resources/data-and-reports/soil-survey-geographic-database-ssurgo>.

Strasburg Fire Protection District. 2024. Commercial Project Fire Code Plan Review Comments. 2pp.

Tetra Tech. 2024a. Trip Generation Analysis. 3pp.

Tetra Tech. 2024b. Soils and Geology Assessment. Hanks Crossing Energy. 13pp.

Tetra Tech. 2024c. Wetlands and Other Waters of the U.S. Delineation Report. Hanks Crossing Energy, Adams County Colorado. 46pp.

Tetra Tech. 2024d. Wildlife Habitat Assessment. 46pp.

Tetra Tech. 2024e. Colorado Parks and Wildlife (CPW) Call Notes. February 5, 2024. 4pp.

Tetra Tech. 2024f. Final Environmental Site Assessment (ESA). Hanks Crossing Energy, Adams County, Colorado. 192pp.

Tetra Tech. 2024g. Cultural Resources Desktop Assessment. Hanks Crossing Energy, Adams County, Colorado. 8pp.

U.S. Fish and Wildlife Service (USFWS). 2019. National Wetlands Inventory. Available online at: <https://www.fws.gov/program/national-wetlands-inventory/download-state-wetlands-data>.

U.S. Fish and Wildlife Service (USFWS). 2024a. Information for Planning and Consultation Report. Submitted as Appendix A of the Wildlife Habitat Assessment (Tetra Tech 2024d).

U.S. Fish and Wildlife Service (USFWS). 2024b. Re: [External] USFWS Request for Project Review and Comment - Hanks Crossing Energy Project, Adams County, CO. email response from USFWS January 30, 2024.

U.S. Geological Survey. 2018. National Hydrography Dataset. Available online at:
<https://www.usgs.gov/national-hydrography/national-hydrography-dataset>.

13.0 List of Appendices

Appendix A: Project Maps

Appendix B: Preliminary Vegetation Management Plan

Appendix C: Preliminary Decommissioning Plan

Appendix D: Federal Aviation Administration Coordination

Appendix E: Referral Agency Outreach

Appendix F: Wetland Delineation Plan

Appendix G: Wildlife Habitat Characterization and Site Reconnaissance

Appendix H: Cultural Resources Summary Report

Appendix I: Phase I Environmental Site Assessment (Full Report)

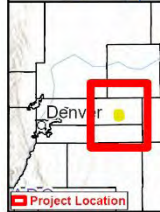
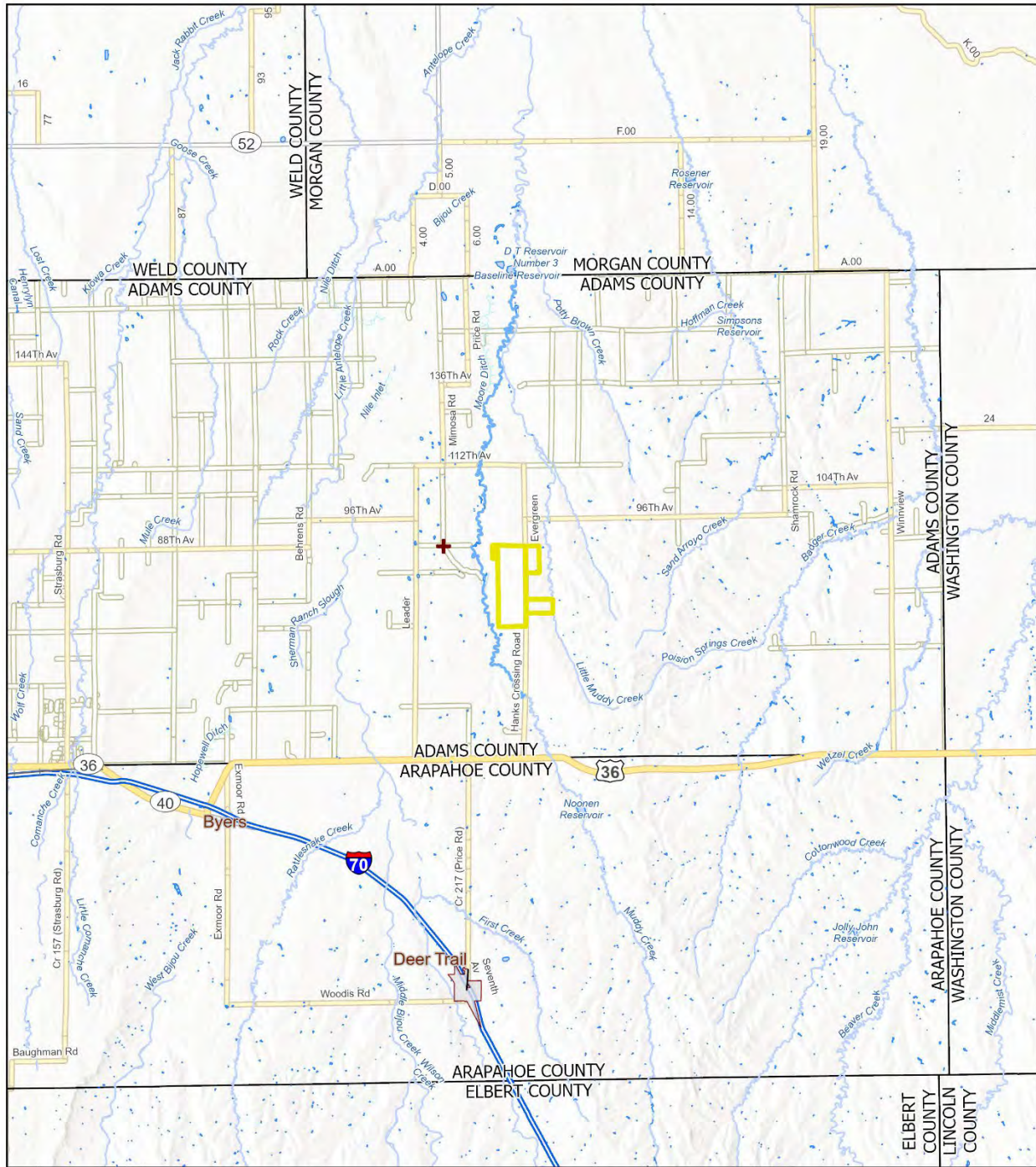
Appendix J: Letter of Support from PSCo and Landowners

Appendix K: Soils and Geology Report

Appendix L: Greater Prairie Chicken Survey Report

APPENDIX A PROJECT MAPS

Figure 1. Overview for the Project



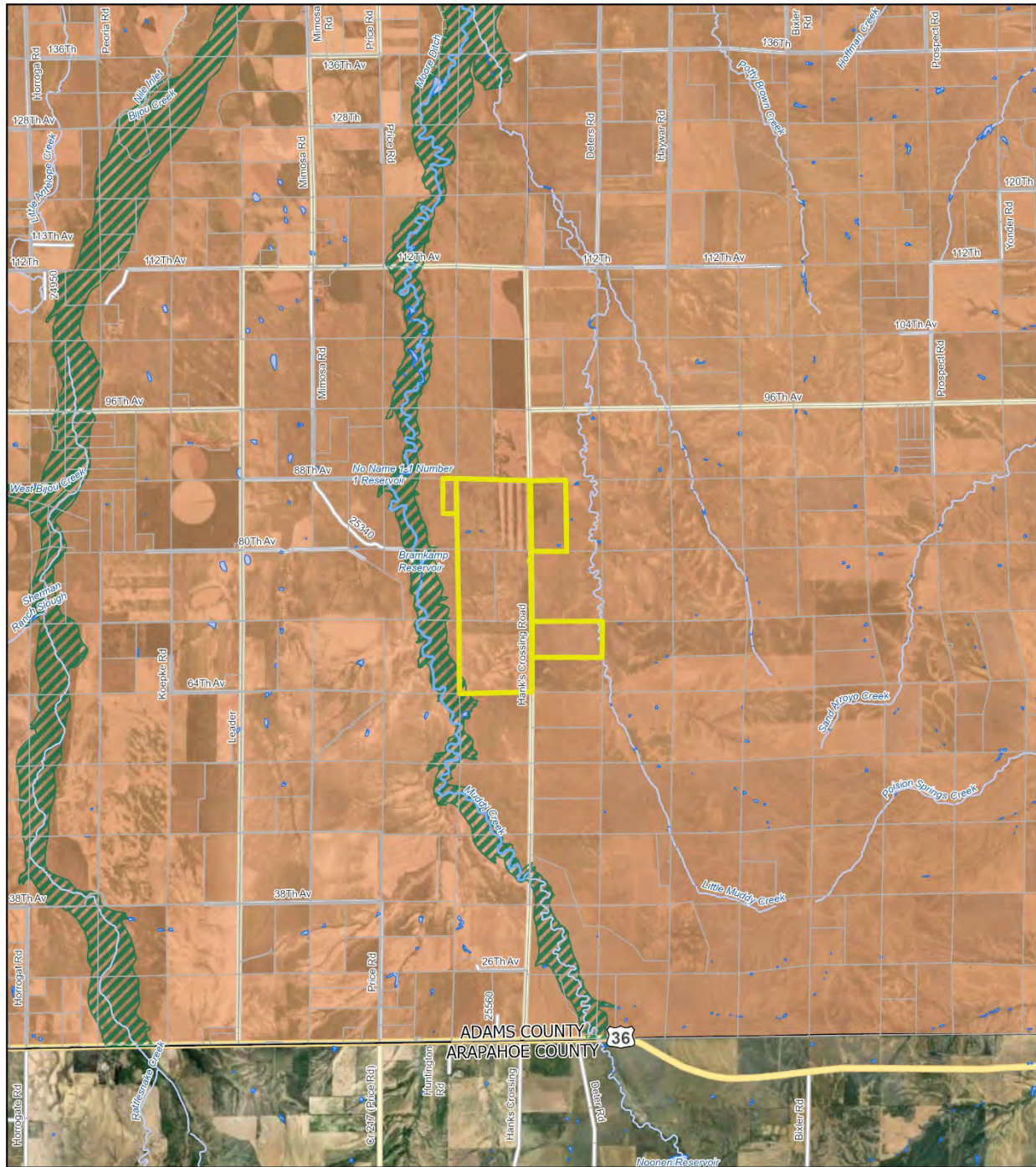
- █ Project Boundary
- + Woolsey Cemetery
- Municipal Boundary
- County Boundary
- Perennial Stream
- Intermittent Stream
- Ditch
- █ Lake

**Hanks Crossing Energy Project,
Adams County, Colorado
Project Location**

LOGAN SIMPSON
0 2.5 5 Miles

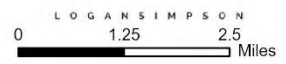
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Sources: USGS NHD (2018), DOE (2024), State of Colorado (2021), Adams County (2024).

Figure 2. Zoning for the Project



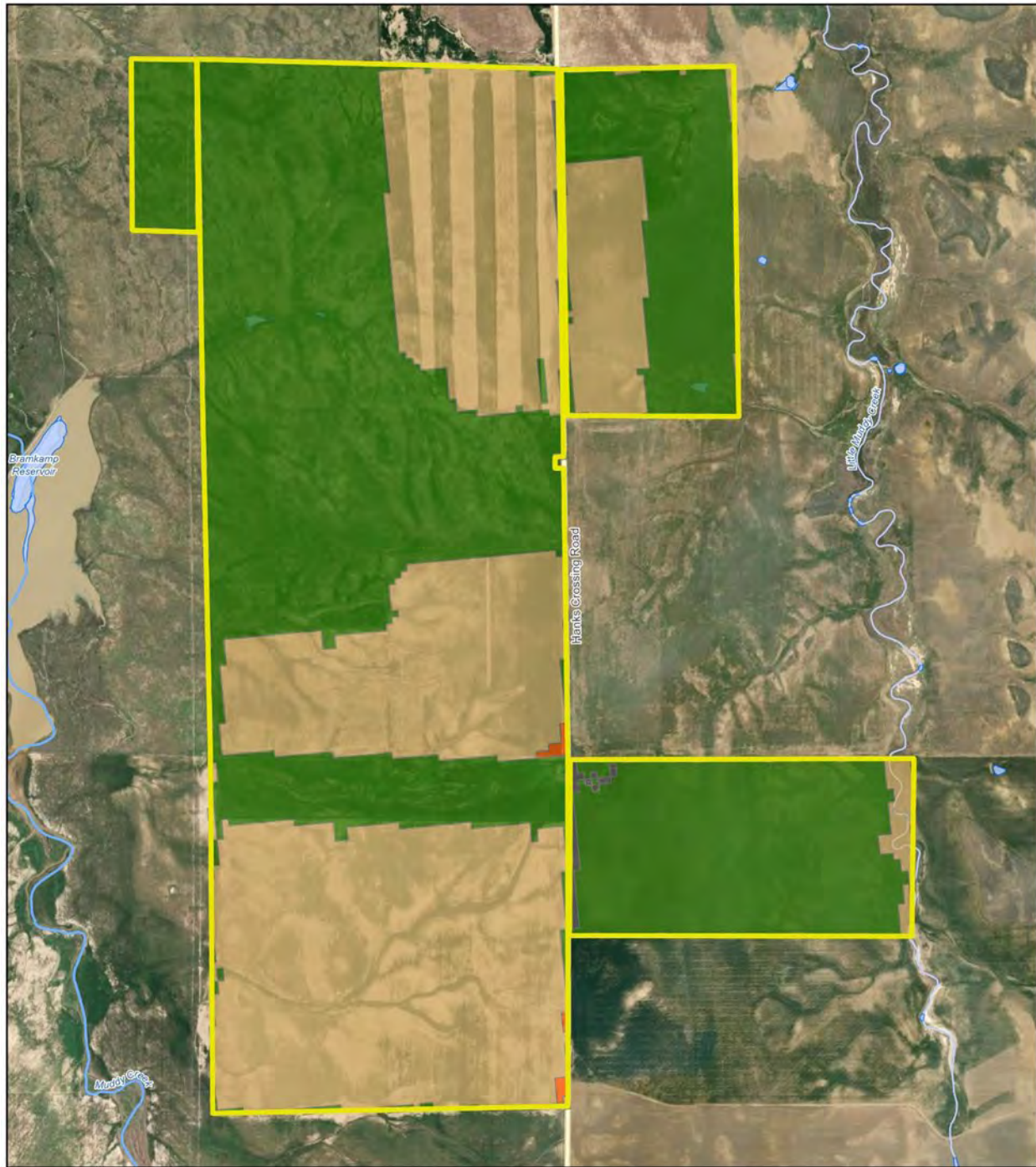
- | | | |
|--|---------------------|-----------------|
| Project Boundary | Perennial Stream | Parcel |
| Zoning | Intermittent Stream | County Boundary |
| Agriculture-3 | Ditch | |
| Natural Resources Conservation Overlay | Lake | |

**Hanks Crossing Energy Project,
Adams County, Colorado
Zoning**



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Sources: USGS NHD (2018), Adams County (2023).

Figure 3. Landcover at the Project Area



Project Boundary

Landcover

- Cultivated Crops
- Hay/Pasture
- Herbaceous
- Developed, Open Space

**Hanks Crossing Energy Project,
Adams County, Colorado
Landcover**

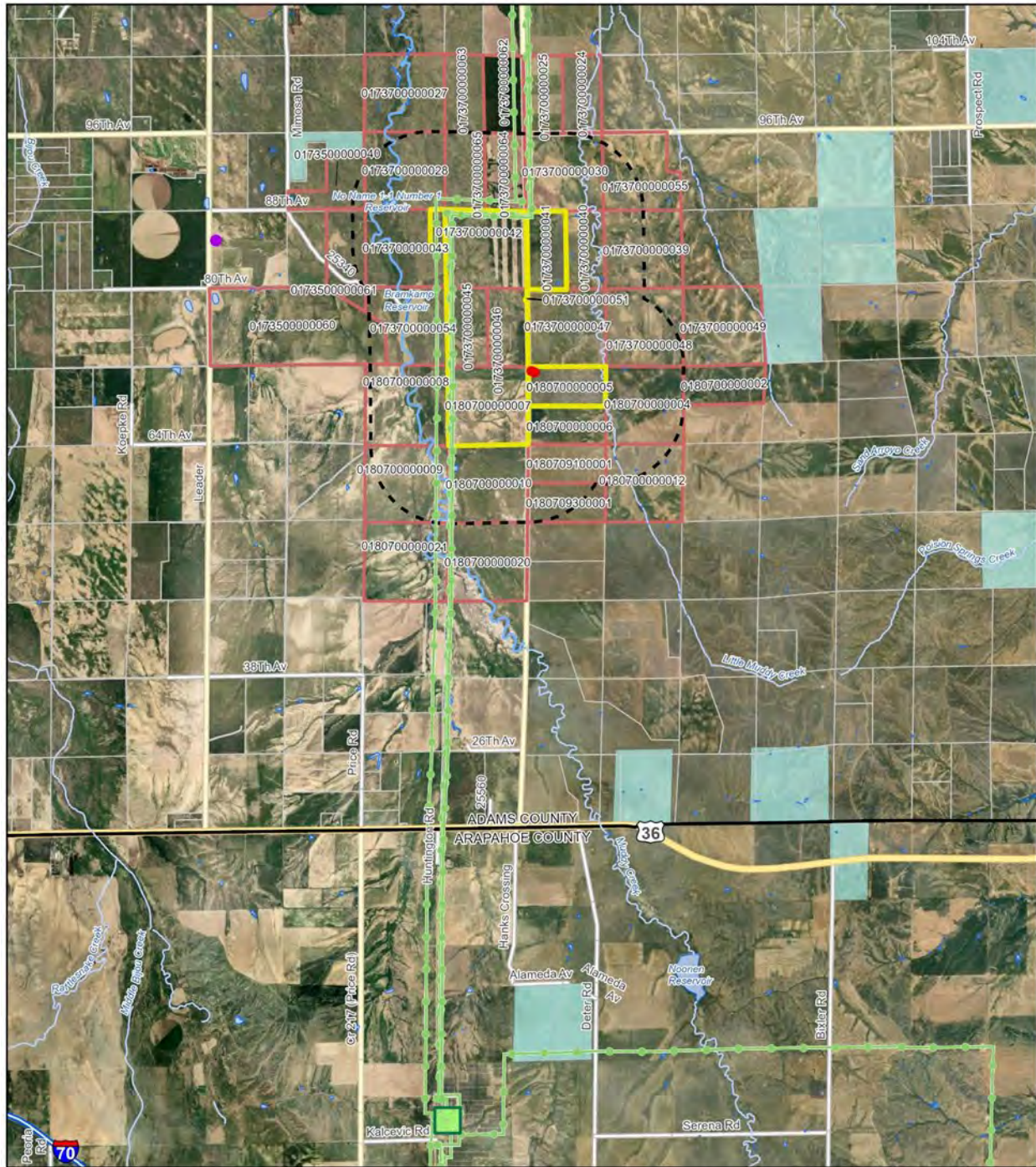


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Sources: USGS NHD (2018), NLCD (2021).

Figure 4. Context Map for the Project



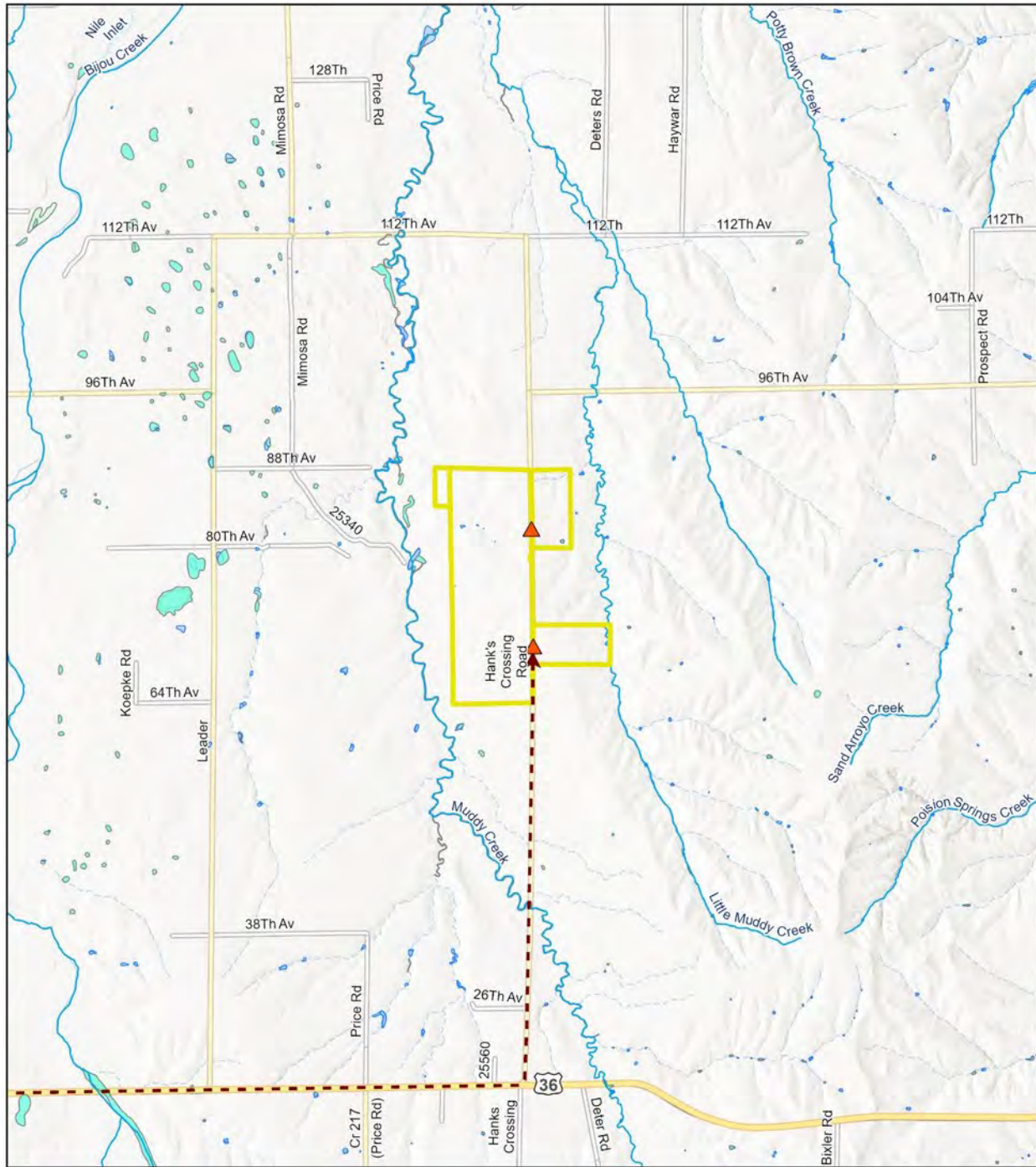
- Participating Residence
- Closest Non-Participating Residence
- Project Boundary
- 1 Mile Buffer
- Substation
- Transmission Line
- Land Management**
- Private (Hollow)
- SLB
- Perennial Stream
- Intermittent Stream
- Lake
- Parcel within 1 Mile
- Adams County Parcel
- County Boundary

**Hanks Crossing Energy Project,
Adams County, Colorado
Context Map**



Date Exported: 4/4/2024 3:39 PM
Sources: USGS NHD (2018), COMaP (2023), Adams County (2023).

Figure 5. Haul Routes to the Project



- ▭ Project Boundary
- ▲ Proposed Construction Entrance
- ▶ Primary Haul Route
- Existing Road
- Stream
- Canal/Ditch
- Lake
- Wetland

**Hanks Crossing Energy Project
Proposed Haul Routes
and Access Points**

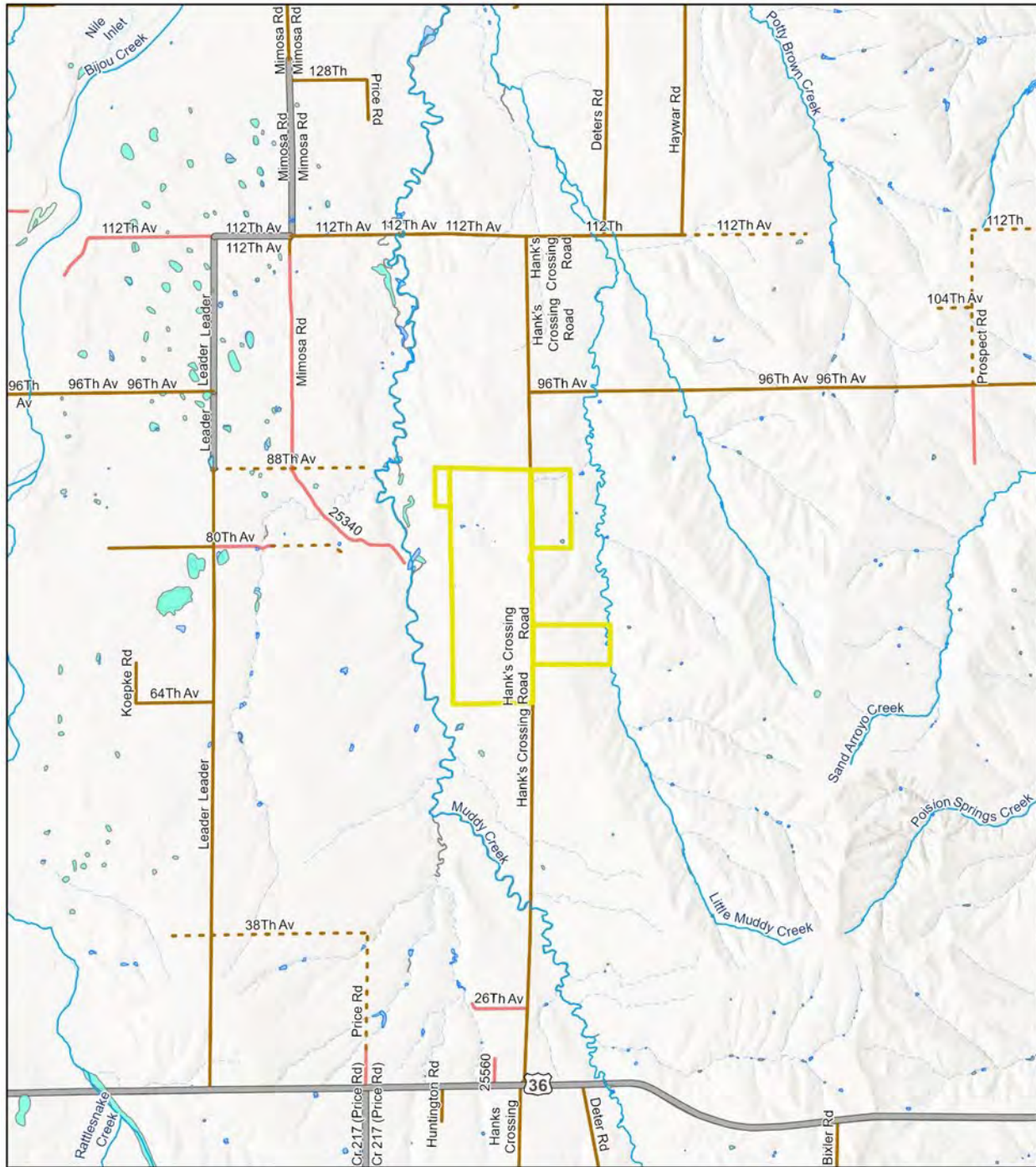
LOGAN SIMPSON

0 1 2 Miles

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Sources: USGS NHD (2018), NWI (2019).

Figure 6. Road Surface at the Project



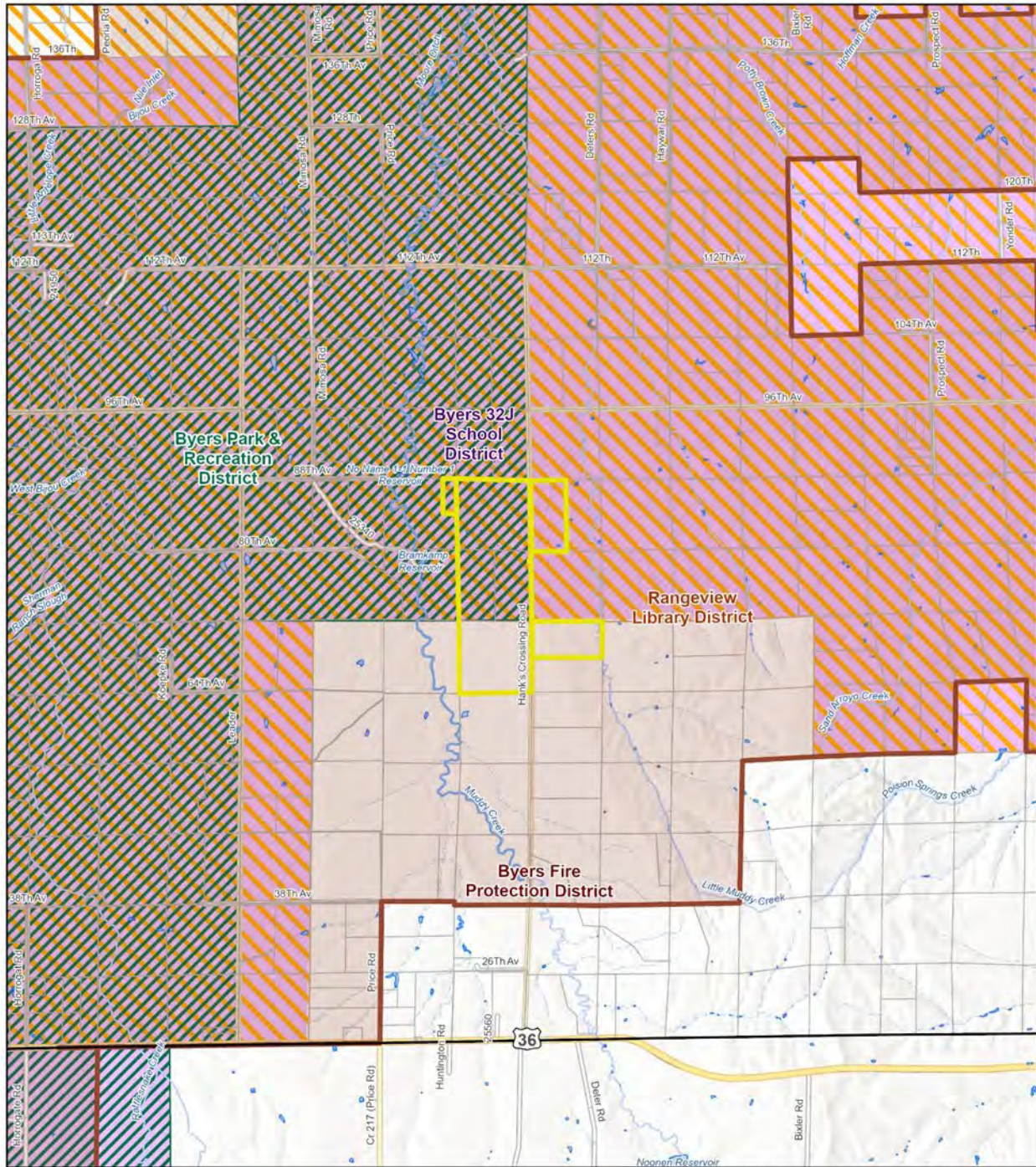
- | | | |
|-----------------------|---------------------|--------|
| Project Boundary | Road Surface | Stream |
| Asphalt | Canal/Ditch | Lake |
| Soil, Gravel or Stone | Wetland | |
| Graded & Drained | | |
| Unimproved | | |

**Hanks Crossing Energy Project,
Adams County, Colorado
Road Surface Types**



Date Exported: 4/4/2024 3:52 PM
Sources: USGS NHD (2018), NWI (2019).

Figure 7. Special Districts at the Project



- Project Boundary
- Parcel
- County Boundary
- ▨ Park District
- ▨ Library District
- ▨ Fire District Boundary
- ▨ School District
- Perennial Stream
- Intermittent Stream
- Ditch
- Lake

**Hanks Crossing Energy Project,
Adams County, Colorado
Special Districts**



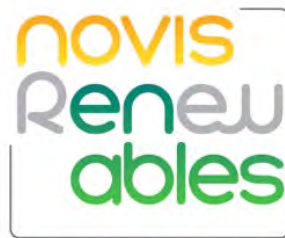
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Sources: USGS NHD (2018), DOLA (2024), Adams County (2023).

APPENDIX B PRELIMINARY VEGETATION MANAGEMENT PLAN

Vegetation Management Plan for Hanks Crossing Energy Project

Adams County, Colorado

Prepared for:



Prepared By:



May 2024

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Introduction

Hanks Crossing Energy, LLC (“Hanks Crossing”), a subsidiary of Novis Renewables, LLC (“Novis”) (collectively the “Applicant” is proposing to develop, own, and operate the Hanks Crossing Energy Project (the “Project”), a large-scale solar energy facility (including battery storage facility) and collector substation in unincorporated Adams County, Colorado. The Project is located entirely on privately-owned land consisting of approximately 2,659 acres (**Figure 1**). Primary access to the Project site is from Hanks Crossing Road, approximately five miles north of State Highway 36.

The Project consists of a 355-megawatt (“MW”) photovoltaic (“PV”) system and 178 MW battery energy storage system, along with internal access roads, inverters and transformer equipment, an electrical collection system, a collection substation, an operations and maintenance building, and other associated facilities. The Project is located adjacent to an existing high voltage transmission corridor owned by Public Service Company of Colorado, facilitating convenient connection to the electrical grid. A preliminary layout has been developed for the Project (**Figure 2**).

The Project is located within the A-3 Agricultural Zoning District. Much of the land within the Project site has previously been graded and tilled for dry crop cultivation. The Project site also consists of uncultivated areas comprised of grassland/pastureland cover. Final plans for grading and vegetation removal will be determined following additional engineering and field studies, but surface disturbance could occur across the Project site as shown in **Figure 3**.

Plan Purpose

The purpose of the Revegetation Plan (“Plan”) for the Project is to outline Best Management Practices (“BMPs”) and specifications as they relate to surface-disturbing activities during the pre-construction, construction, and post-construction phases of the Project. This Plan also outlines how the Project will maintain vegetation at the site and comply with the adopted Adams County Fire Code Ordinance. The following sections detail existing site conditions and revegetation specifications and BMPs for topsoil salvage and storage, erosion control, seedbed preparation, seeding, fire and fuels reduction and mitigation, maintenance and monitoring, and weed management.

Hanks Crossing is also considering environmental enhancement of the Project site through integration of pollinator habitat into the Project footprint. Such integration will impact the Revegetation Plan per guidance from Project partners. This draft Plan will be finalized following completion of the final Site Plan (**Submittal Item 4.0**) and decisions to pursue participation in agrivoltaics programs, and an updated plan will be provided to the County prior to construction.

Site Description

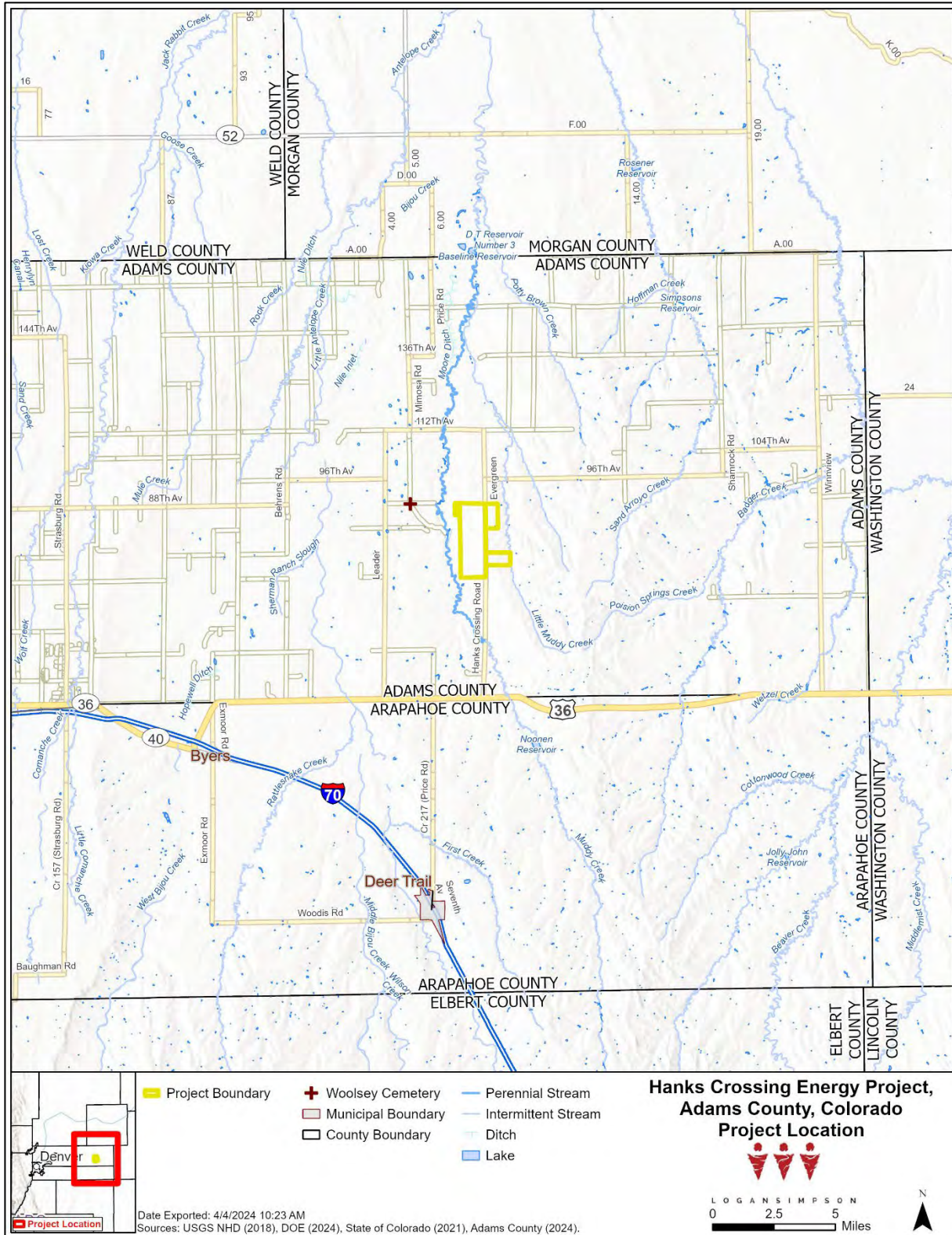
The Project is located in eastern Adams County, Colorado, near the town of Byers on approximately 2,659 acres of private land (**Figure 1**). The Project site is currently zoned for agriculture. The eastern portion of Adams County is within the eastern plains’ region of Colorado, which is historically dominated by shortgrass prairie species. Local weather is detailed below in **Table 1**.

Table 1. Annual weather for Byers, Colorado.

Weather Parameter	Min	Mean	Max
Temperature (°F)	-17.0	49.8	105
Precipitation (inches)	7.7	16.6	24.6
Snowfall (inches)	24	41.3	59

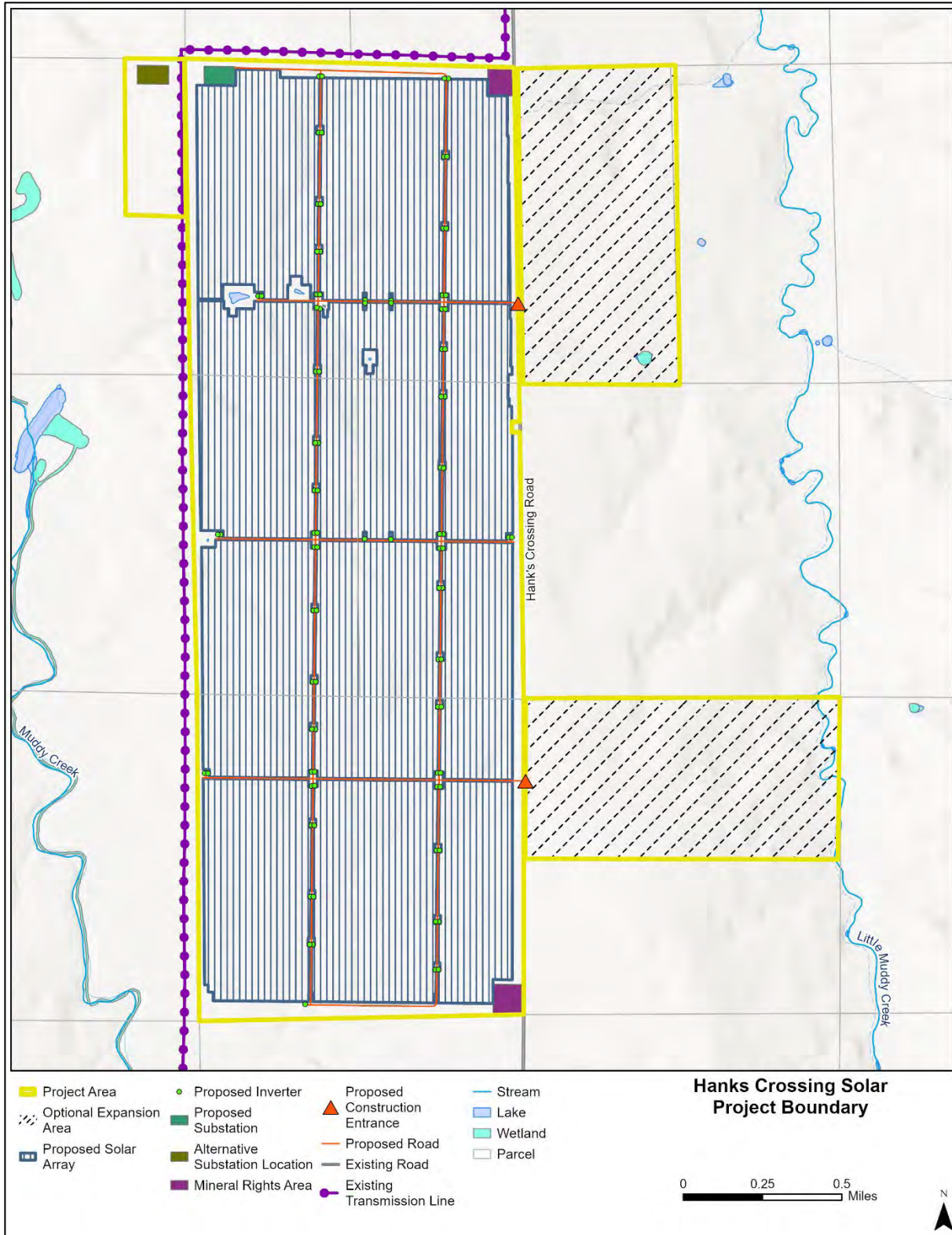
Source: NOAA Byers 5 ENE Weather Station, 2000-2024.

Figure 1. Project location in Adams County, Colorado.



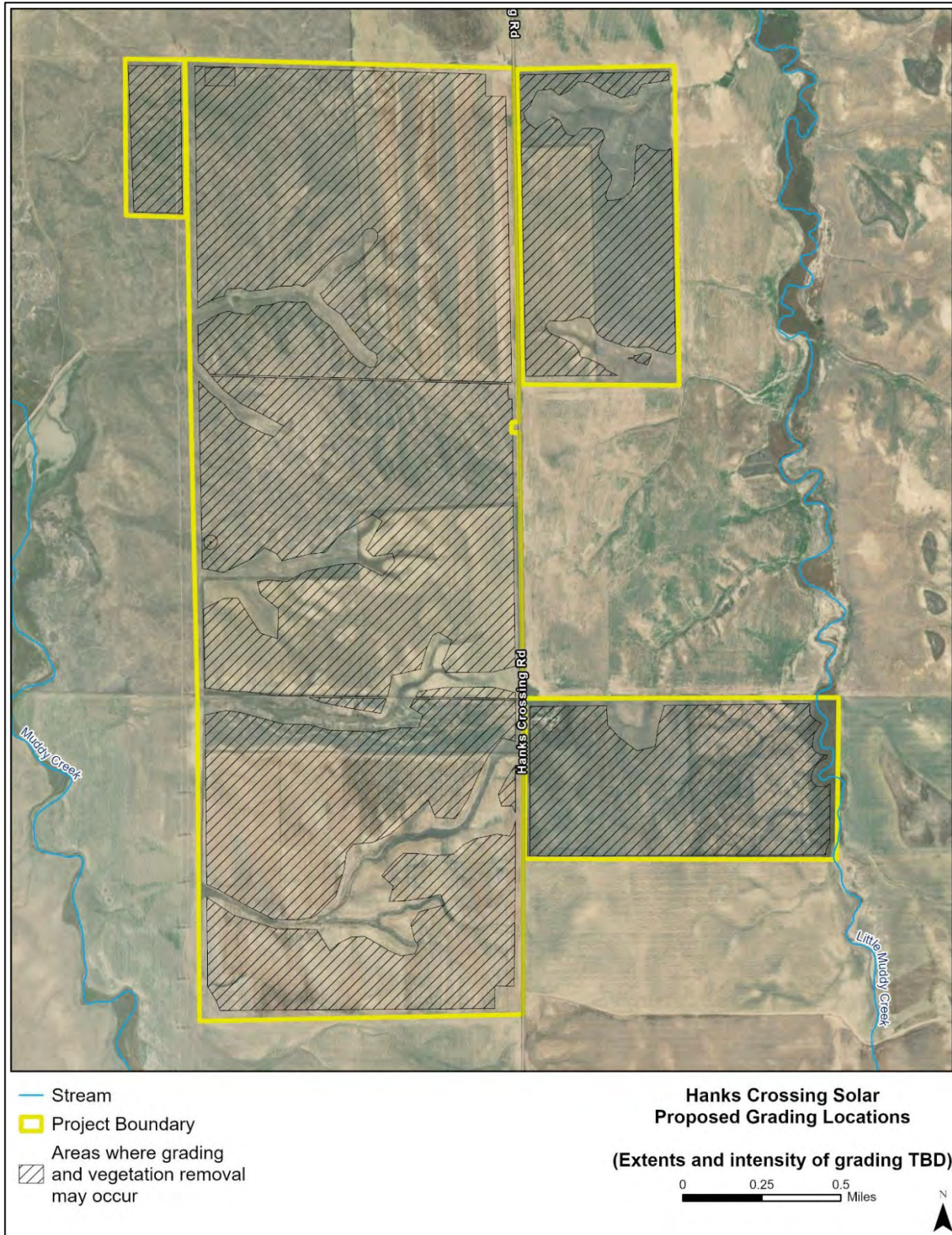
Source: Adams County GIS Dept. (2024), USGS NHD 2018, Novis Renewables

Figure 2. Preliminary Site Plan.



Source: Novis Renewables 2024

Figure 3. Likely locations of potential grading. Extent and degree of grading/vegetation removal to be determined.



Source: Novis Renewables 2024

Soils

The dominant soil units are Ascalon-Vona sandy loams (slopes 1-5%) and Terry fine sandy loam (slopes 3-9%), making up approximately 50% of soils within the Project site (Table 2, Figure 4) (NRCS 2022). These soils are predominately found on interdunes (area between dunes), interfluves (area between two watercourses), and terrace landforms (Table 3) (NRCS 2022). To help inform appropriate plant species for temporary and permanent seed mixes, wind erodibility groups (“WEG”) and K Factor were analyzed. WEGs consist of soils that have similar properties influencing their susceptibility to erosion by wind in cultivated areas, while K Factor indicates susceptibility of soils to erosion by water (NRCS 2022). Approximately 73% of the Project site is highly susceptible to wind erosion, falling within WEGs 1-3; however, only 3% of soils are susceptible to erosion from water, falling within K Factor ranges between 0.40-0.69 (Table 2).

Table 2. Characteristics of soil units within the Project boundary.

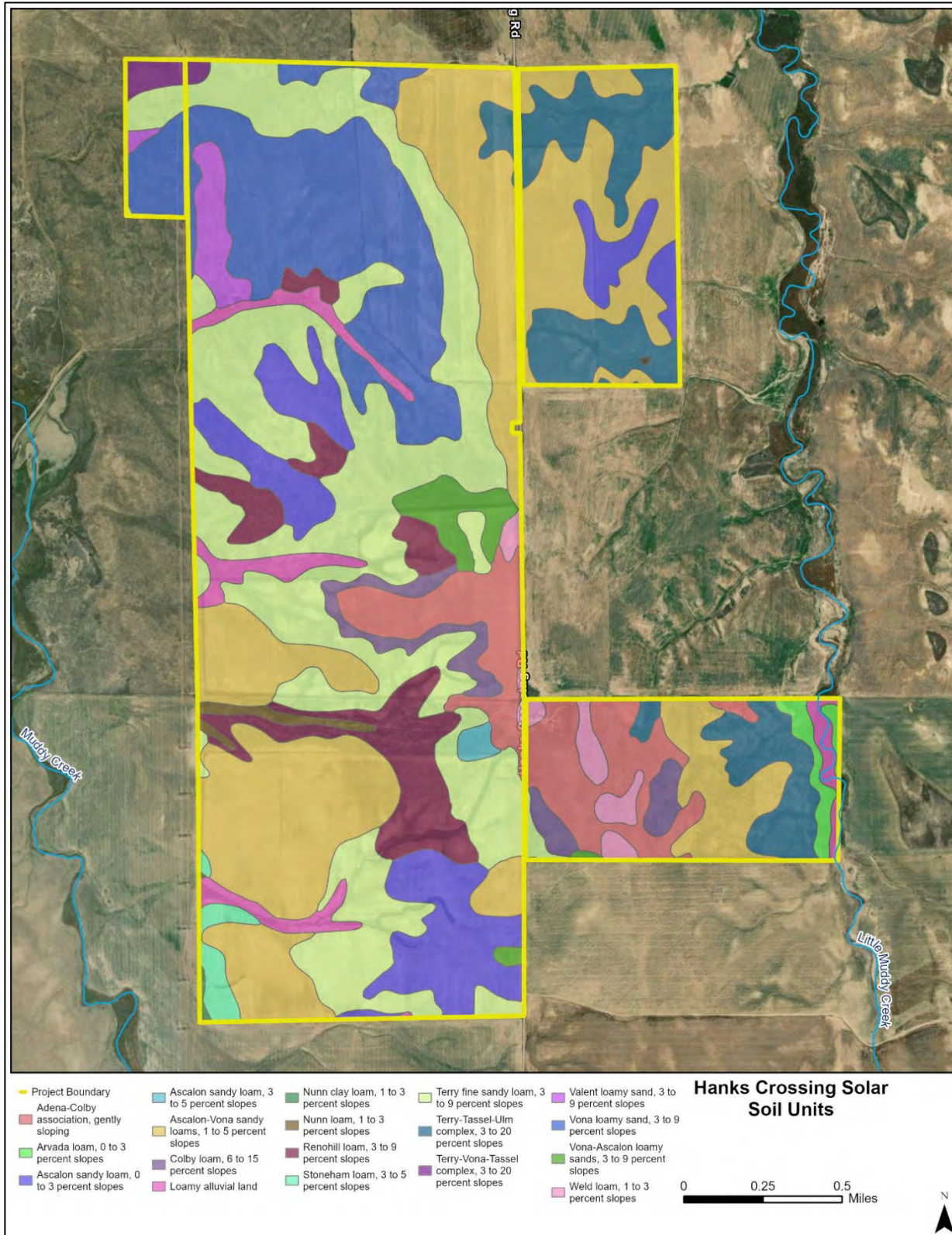
Soil Unit	Area (acres)	% of Project Area	WEG ⁺	KFactor [*]
Ascalon-Vona sandy loams, 1 to 5 percent slopes	701.6	26	3	.17
Terry fine sandy loam, 3 to 9 percent slopes	626.0	24	3	.15
Vona loamy sand, 3 to 9 percent slopes	293.4	11	2	.20
Ascalon sandy loam, 0 to 3 percent slopes	207.8	8	4L	.17
Terry-Tassel-Ulm complex, 3 to 20 percent slopes	205.9	8	3	.15
Adena-Colby association, gently sloping	185.9	7	6	.28
Renohill loam, 3 to 9 percent slopes	145.2	6	6	.37
Loamy alluvial land	72.6	3	5	.37
Colby loam, 6 to 15 percent slopes	54.9	2	4L	.49
Arvada loam, 0 to 3 percent slopes	39.8	2	6	.32
Stoneham loam, 3 to 5 percent slopes	34.4	1	6	.37
Terry-Vona-Tassel complex, 3 to 20 percent slopes	32.9	1	3	.15
Valent loamy sand, 3 to 9 percent slopes	21.2	1	2	.17
Vona-Ascalon loamy sands, 3 to 9 percent slopes	20.0	1	2	.15
Weld loam, 1 to 3 percent slopes	12.8	0	6	.43
Ascalon sandy loam, 3 to 5 percent slopes	7.3	0	3	.17
Nunn clay loam, 1 to 3 percent slopes	3.5	0	6	.28
Nunn loam, 1 to 3 percent slopes	2.0	0	5	.43
Water	0.4	0	NA	NA
Totals	2,659	100%	--	--

Source: NRCS 2022

*Wind Erodibility Groups: Soils in group 1 are most susceptible to wind erosion and those in group 8 are least susceptible.

*KFactor: Ranges from 0.02 to 0.69, with the higher the value, the more susceptible to erosion by water. Values over 0.4 are generally considered highly erodible by water.

Figure 4. Soil units within the Project Site.



Source: NRCS 2022.

Revegetation Specifications and Best Management Practices

The goal of revegetation is to maintain a desired vegetation community that maximizes ecosystem services while minimizing erosion and the risk of wildland fire. A desired seed mix will be agreed upon by Novis and the County to revegetate areas disturbed by construction. This plan establishes a vegetation management approach while maintaining buffers around access points and electrical equipment that will remain void of vegetation (i.e., defensible spaces).

For locations that may be repeatedly disturbed during the construction phase (including soil stockpiles), temporary seeding, erosion control, and weed monitoring should occur until more permanent revegetation efforts can be applied.

Revegetation efforts should be implemented three days after surface disturbance activities have concluded, and prior to the typical spring rainy season (March through May). If surface disturbance activities occur in a phased approach, so should revegetation. This will minimize the potential for soil loss and establishment of noxious weeds, as well as maximize revegetation efforts. If satisfactory revegetation is challenging, Novis will coordinate with a qualified plant ecologist and/or botanist and Adams County to improve success.

Pollinator Habitat Consideration

In addition to maintaining vegetation appropriate for the site, Novis is currently exploring the option to integrate pollinator habitat into the Project footprint. Such integration will impact the revegetation strategies, per guidance from Project partners.

Reference Communities

Defining a reference community that represents pre-disturbance conditions for the Project area informs revegetation strategies. Reference communities appropriate for the Project area were determined by ecological sites identified by the Ecosystem Dynamics Interpretive Tool, which details past, present, and future ecological states based on land use, soils, and climate (NRCS, JER, and NMSU 2021).

The Project site falls within Major Land Resource Area (“MLRA”) 067B – Central High Plains, Southern Part. MLRA 067B is characterized by shallow to deep, loamy, or clayey soils with a mesic soil temperature regime and arid soil moisture regime (NRCS, JER, and NMSU 2021). Much of this area supports species characteristic of shortgrass prairies. Most of the land within this MLRA is in agricultural use (NRCS 2006).

As a result of the proposed solar arrays, in combination with revegetation strategies, soil health should be improved over the lifetime of the Project, as the lack of continued disturbance will increase soil carbon, water retention and infiltration, and reduce surface run-off (Nordberg et al. 2021). Within the Project site, seven ecological sites occur: sandy plains, loamy plains, deep sand, overflow, loamy slopes, salt flat, and clayey plains (**Table 3, Figure 5**).

Table 3 describes the characteristics of the ecological sites within the Project site used to inform seed mixes. Sandy Plains is the dominant ecological site, covering 67% of the Project site (**Table 3**).

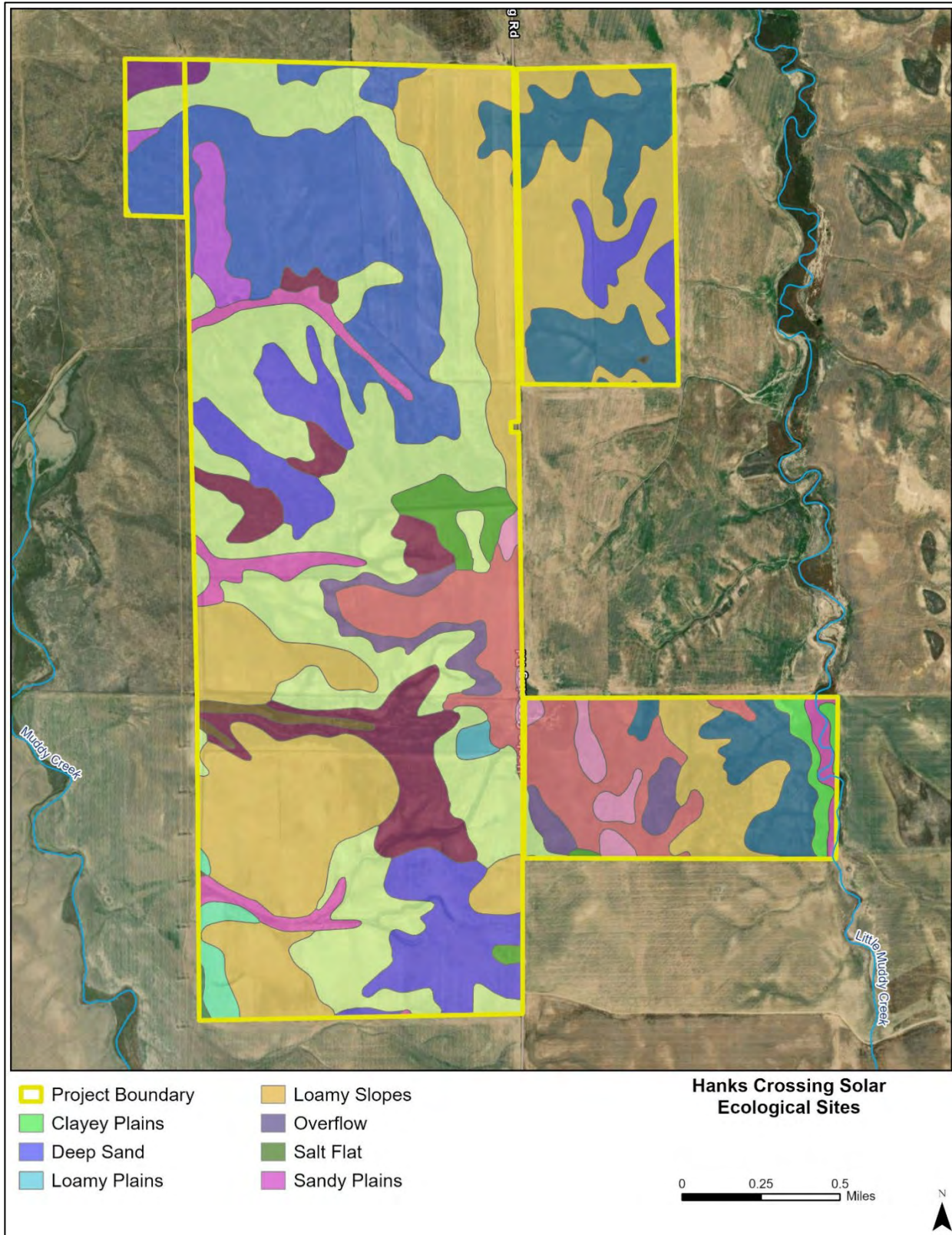
Table 3. Ecological Sites within the Project boundary used to inform seed mixes and revegetation strategies.

Ecological Site Name	Soil Units	Area (acres)	% of Project		Dominant Plant Species
			Area	Landforms	
Sandy Plains	Ascalon sandy loam, Ascalon-Vona sandy loams, Terry fine sandy loam, Terry-Tassel-Ulm complex, Terry-Vona-Tassel complex	1,783	67%	Interdune, Interfluve, Terrace	spreading buckwheat (<i>Eriogonum effusum</i>), blue grama (<i>Bouteloua gracilis</i>), prairie sandreed (<i>Calamovilfa longifolia</i>)
Loamy Plains	Adena-Colby, Nunn loam, Renohill loam, Stoneham loam	399	15%	Interfluve, Terrace	fourwing saltbush (<i>Atriplex canescens</i>), winterfat (<i>Krascheninnikovia lanata</i>), western wheatgrass (<i>Pascopyrum smithii</i>), blue grama (<i>Bouteloua gracilis</i>)
Deep Sand	Valent loamy sand, Vona loamy sand	326	12%	Dune, Hill	leadplant (<i>Amorpha canescens</i>), western sandcherry (<i>Prunus pumila var. besseyi</i>), sand bluestem (<i>Andropogon hallii</i>), prairie sandreed (<i>Calamovilfa longifolia</i>)
Overflow	Loamy alluvial land	73	3%	Floodplain, Drainageway, Draw	fourwing saltbush (<i>Atriplex canescens</i>), winterfat (<i>Krascheninnikovia lanata</i>), western wheatgrass (<i>Pascopyrum smithii</i>), green needlegrass (<i>Nassella viridula</i>),
Loamy Slopes	Colby loam	55	2%	Hill, Ridge	fourwing saltbush (<i>Atriplex canescens</i>), winterfat (<i>Krascheninnikovia lanata</i>), western wheatgrass (<i>Pascopyrum smithii</i>), blue grama (<i>Bouteloua gracilis</i>)
Salt Flat	Arvada loam	20	1%	Fan, Terrace, Drainageway	fourwing saltbush (<i>Atriplex canescens</i>), winterfat (<i>Krascheninnikovia lanata</i>), alkali sacaton (<i>Sporobolus airoides</i>), western wheatgrass (<i>Pascopyrum smithii</i>)
Clayey Plains	Nunn clay loam	2	0%	Terraces, Interfluve, Swale	fourwing saltbush (<i>Atriplex canescens</i>), winterfat (<i>Krascheninnikovia lanata</i>), western wheatgrass (<i>Pascopyrum smithii</i>), blue grama (<i>Bouteloua gracilis</i>)
Totals¹		2,659	100%		

Source: NRCS, JER, and NMSU (2021)

¹ Total acreage includes all land within the proposed Project boundary and does not include exclusion areas from preliminary site plan.

Figure 5. Ecological sites with the Project boundary.



Source: NRCS, JER, and NMSU (2021)

Topsoil Salvage and Storage

Where feasible, stockpiled or salvaged topsoil should be used to restore pre-disturbance contours to the site, with salvaged topsoil restored to the site following construction. In instances when salvaged topsoil and its associated seed bank are not in sufficient supply, the approved seed mix shall be used. To determine if associated seed banks are in sufficient supply, a survey of existing plant density and land use history should be conducted prior to topsoil removal. If topsoil in general is not sufficiently available, it may be purchased from a nearby vendor to support revegetation. The seed mix shall be certified weed-free of noxious and undesirable species, obtained from local vendors, and comprised of native cultivars that originate from within 500 feet elevation of the Project site (locally adapted).

BMP's and specifications for topsoil removal and storage are as follows:

- Stockpile locations shall be at least 25 feet from waterways, wetlands, or drainage/sewer systems.
- Sediment control shall be placed around stockpiles (e.g., silt fencing, sediment control logs, straw bales, or sandbags).
- Depending on soil type, topsoil shall be excavated to at least 8 inches.
- Stockpiled soil shall not exceed 10 feet in height.
- Soils intended to be stockpiled for 30-60 days shall be stabilized with surface roughening, erosion control blankets or mulch, or soil binders immediately after forming stockpile.
- Soils intended to be stockpiled for more than 60 days shall be seeded with the temporary seed mix and stabilized with erosion control blankets or mulch immediately after forming stockpile.

If topsoil is unsalvageable or unavailable for some areas of the site, (i.e., where dunes currently exist), topsoil can be obtained from local suppliers. Topsoil should be sourced from areas with similar vegetation composition and climate, typically from areas with similar or associated ecological sites, and from areas within Colorado. Purchase of commercial topsoil is not recommended. Additional topsoil can be stored at the site in a similar manner as described above to prevent loss from erosion or contamination from weeds and other undesirable vegetation.

Seedbed Preparation

For all disturbed areas that will undergo temporary and/or permanent seeding, to increase the likelihood of successful seed establishment, the following appropriate soil/seedbed preparation specifications and BMPs shall be used.

Decompaction

- All ripping and tilling shall be done in a direction which follows the natural contour of the land.
- Prior to spreading salvaged topsoil and/or seeding, thoroughly till or rip to a depth of 12 inches all areas compacted by access, staging, or construction traffic. Other, non-compacted areas shall be tilled to a depth of 6 inches. Soil shall be worked until no clods greater than 2 inches in diameter remain. Rocks and other objects 3 inches and greater in any dimension shall be removed.
- Areas receiving salvaged topsoil shall be spread to depths required to meet grades and elevations as shown in the 100% construction drawings.
- Prior to seeding, areas to be seeded shall be graded to a smooth, even surface, with loose, uniformly fine texture. Rolling and raking shall be applied to remove ridges, and fill depressions to meet finished grades as depicted in the 100% construction drawings.

Soil Amendments

- A representative soil test shall be sent to a laboratory to determine pH, organic matter content, electrical conductivity, and concentrations of carbon, phosphorus, and nitrogen to determine appropriate soil amendment product(s) for application.
- Soil amendments shall be applied on the surface of the spread topsoil and/or decompacted soils and tilled thoroughly to a depth of 4 inches, prior to seeding.
- Soil amendments, such as Richlawn or Biosol, shall be applied at a rate of 500 pounds per acre.
- If organic compost or humic acid is deemed necessary, the material shall be applied at a rate of 15 cubic yards per acre.
 - Recommended Vendor: A1 Organics, Eaton, Colorado

Seeding

Temporary and permanent seed mixes were developed to be specific to the Project site’s elevation, hydrology, adapted to sandy/coarse textured soils, occurrence in Adams County, and known vendor availability. Species included in seed mixes are low maintenance (i.e., do not require mechanical treatments) and low water use.

Temporary Seed Mix

The recommended temporary seed mix (**Table 4**) includes species that are native and/or sterile, establish quickly, and have root structures suitable for erosion control. The temporary seed mix shall be used on soil stockpiles and any area that will not be disturbed for 30 days or more. Contractors shall follow pure live seed (“PLS”) application rates outlined by the seed vendor.

Table 4. Temporary seed mix species.

Scientific Name	Common Name	Cultivar	Season	Growth Habit	% Mix
	*Regreen <i>OR</i> Quickguard		NA	Bunchgrass	20
<i>Buchloe dactyloides</i>	Buffalograss	Cody	Warm	Rhizomatous	20
<i>Bouteloua gracilis</i>	Blue grama	Lovington or Hachita	Warm	Bunchgrass	15
<i>Distichlis spicata</i>	Saltgrass	Colorado Ecotype	Warm	Rhizomatous	15
<i>Elymus trachycaulus</i>	Slender wheatgrass	Pryor or San Luis	Cool	Rhizomatous	15
<i>Pleuraphis jamesii</i>	James’ galleta	Viva	Warm	Rhizomatous	15
Total:					100%

Permanent Seed Mix

The recommended permanent seed mix (**Table 5**) includes species with multiple life history traits (i.e., perennial vs annual, grass vs forb) to increase biodiversity in the area. The mature plant height was also considered and limited to 2 feet to minimize interference with solar array infrastructure; however, some taller species were included (primarily forbs) as they have the ability to resprout and continue reproducing after cutting (i.e., mowing), especially those adapted to prairie ecosystems. Contractors shall follow PLS application rates and germination recommendations outlined by the seed vendor.

Table 5. Permanent seed mix species.

Scientific Name	Common Name	Cultivar	Life History	% Mix
	*Regreen OR Quickguard		Sterile cover crop	10
<i>Bouteloua curtipendula</i>	Sideoats grama	Niner	Native perennial grass	10
<i>Bouteloua gracilis</i>	Blue grama	Lovington or Hachita	Native perennial grass	10
<i>Buchloe dactyloides</i>	Buffalograss	Cody	Native perennial grass	10
<i>Distichlis spicata</i>	Clover saltgrass	Colorado Ecotype	Native perennial grass	10
<i>Elymus elymoides</i>	Squirreltail	Pueblo or Wapiti	Native perennial grass	10
<i>Pleuraphis jamesii</i>	James’ galleta	Viva	Native perennial grass	10
<i>Achnatherum hymenoides</i>	Indian ricegrass	Paloma, Rimrock, or White River	Native perennial grass	10
<i>Hordeum pusillum</i>	Little barley	Colorado Ecotype	Native annual grass	10
<i>Artemisia frigida</i>	Prairie sagewort	Colorado Ecotype	Native perennial forb	4
<i>Vicia americana</i>	American vetch	Colorado Ecotype	Native perennial forb	2
<i>Adenolinum lewisii</i>	Lewis flax	Maple Grove	Native perennial forb	1
<i>Erigeron eatonii</i>	Eaton’s fleabane	Colorado Ecotype	Native perennial forb	1
<i>Rudbeckia hirta</i>	Black-eyed susan	Colorado Ecotype	Native biannual forb	1
<i>Sphaeralcea coccinea</i>	Scarlett globemallow	Colorado Ecotype	Native perennial forb	1
Total:				100%

Seeding Options

Seeding should follow the PLS guidelines provided by the seed vendor. Drill seeding is recommended where feasible to reduce potential losses from wind erosion or herbivory while plants establish. However, drill seeding is more expensive to implement and may not be feasible in areas with steep slopes or rockier soils. The ideal times to seed are in the fall before the first major freeze of the season or in the spring, between March and June.

Drill Seeding

- All seed is to be drilled ¼ inch to ½ inch into the soil at the specified PLS per acre rate with a mechanical drill with depth bands and an agitator in the seed box.
- Rows shall be spaced not more than 7 inches apart.

Broadcast Seeding

- If areas of the Project are inaccessible to drill seeding, broadcast seeding shall be utilized.
- Seed shall be uniformly broadcast at twice the specified PLS per acre and covered with soil to a depth of ¼ inch to ½ inch by hand raking or harrowing by some other means acceptable.
- Broadcast seeding shall be accomplished using hand-operated “cyclone type” seeders or rotary broadcast equipment attached to construction or revegetation machinery. All machinery shall be equipped with metering devices.
- Broadcasting by hand shall be acceptable on small, isolated sites. Prior to hand broadcast seeding, the seed shall be divided into two halves, with the first half of the seed being applied, followed by the second half of the seed to ensure complete coverage.
- When using hopper type equipment, seed shall be frequently mixed within the hopper to discourage seed settling and uneven planting distribution of species.
- Broadcast seeding shall take place immediately following the completion of final seedbed preparation techniques.
- Broadcast seeding shall not be conducted when wind velocities will prohibit seed to soil contact and/or even seed distribution (wind speeds higher than 8 miles per hour).

Seed Vendor Requirements

To reduce the likelihood of additional non-native and/or noxious species being introduced to the Project site, seed shall be purchased with the following specifications and BMPs:

- Seed shall be purchased from a local vendor (see recommendations below) and all seed shall be reported in PLS per pound.
- Vendor shall provide weed content by species for each seed lot. If any noxious species occur within an individual lot, the species shall be removed from use and percent mix shall be adjusted to accommodate the loss.
- Vendor shall provide dormancy and germination information for each lot.
- Vendor shall disclose if any stratification or other seed preparation is required prior to applying seed on site.
- **Recommended Vendor:** Western Native Seed, Coaldale, Colorado. Stevenson Intermountain Seed, Inc. Ephraim, Utah. Granite Seed or Arkansas Valley in Denver, Colorado can be used for Regreen or Quickguard.

Post Seeding Soil Surface Protection and Erosion Control

To reduce the potential for fugitive dust, erosion, and/or loss of applied seed, soil surface protection/erosion control techniques and BMPs shall be implemented after seeding is completed. Three soil surface protection/erosion control methods are recommended: certified weed-free straw, erosion control blanket (“ECB”), or wood straw.

Certified Weed-Free Straw

- Straw shall be certified weed-free by the vendor to ensure non-native and/or noxious weed species are not introduced to the Project site.
- Straw shall be applied immediately after seeding has been completed with a mechanical spreader at a rate not less than 1.5 tons per acre and not more than 2 tons per acre.
- Straw mulch shall be anchored to the soil with a standard commercial crimper, which shall crimp straw 4 inches or more into the soil.
- Straw shall only be utilized on flat areas or slopes less than 3:1.
- **Recommended Vendor:** HayCo, LLC, Monument, Colorado

Erosion Control Blanket (“ECB”)

- ECB shall be manufactured with fully biodegradable materials, such as jute, hemp, or coconut fibers. Photodegradable ECB shall not be utilized, such as the photonetting traps wildlife.
- Slopes of 3:1 or steeper, concave areas, drainage swales, or areas along the edges of hard surfaces (e.g., trails, roads), and any other areas with the potential to rill, shall have ECB installed.
- All clods and rock shall be removed from area, and grade shall be smoothed prior to installation of ECB so that blanket to soil contact is maximized and potential for holes/pockets is minimized.
- The edges of the fabric shall be secured by 2-foot wooden stakes, installed 2 feet on center along all edges and seams.
- Seams shall overlap 1 foot and the body of the fabric shall be further secured to the soil surface with 12-inch eco-stakes in a diamond pattern 3 feet on center.
- The top of ECB shall be trenched with 2-foot wedge stakes 2 feet on center.
- **Recommended Vendors:** Grainger Industrial Supply, Fort Collins, Colorado, Ferguson Waterworks, Aurora, Colorado, American Excelsior, Arlington, Texas

Wood Straw

- Wood straw shall be applied at a rate of 276 bales per acre and shall be spread to achieve 70% ground cover.
- No crimping or tackifier is required for wood straw application (unless using aspen straw).
- Wood straw shall only be utilized on flat areas or slopes less than 3:1.
- **Recommended Vendor:** Mountain Pine Manufacturing, Craig, Colorado

Grassland Fuels Mitigation, Wildfire Prevention, and Fire Management

Vegetation management within the Project site will prioritize fuel breaks, fuel reduction, the establishment of native species, and the control of non-native and invasive species. These will reduce the wildfire risk associated with the Project.

The Project has initiated coordination with the Byers Fire District and will continue to coordinate regarding fire and fuel prevention and will incorporate the appropriate Fire Codes into the Project design and site maintenance activities.

To reduce the potential for buildup of fuels and mitigate risk of wildfire, vegetation within the recommended seed mixes will be limited to 2 to 3 feet in height at maturity to limit possible interference of vegetation with infrastructure associated with the PV arrays. Additionally, vegetation within the Project area will be routinely managed by mowing. A maintenance schedule will be developed once site design is finalized.

Monitoring and Maintenance

Areas that have received temporary and permanent seeding shall be monitored for adequate cover. Adequate cover within the Project site is quantified by bare ground cover of 3% or less, with bare patches ranging from 3 to 5 inches in diameter (NRCS, JER, and NMSU 2021). If seeded areas do not meet these criteria, a qualified plant ecologist should conduct a site visit to determine if additional topsoil, soil amendments, seed, or combination are needed.

To enhance revegetation efforts, site maintenance in the form of mowing may need to be restricted to ensure seeded species are able to adequately grow to maturity and can reproduce.

Weed Monitoring and Management

Monitoring Methods

Colorado listed noxious weed species with the potential to occur in the Project site are listed in **Table 6. Appendix A** includes identification and treatment information regarding each species listed below. Any additional information can be found on the Colorado Department of Agriculture Noxious Weed Species ID website (<https://ag.colorado.gov/conservation/noxious-weeds/species-id>).

The Adams County point of contact for the County Weed Program is the Forestry and Weeds Superintendent, Greg McKenzie (720-217-7104, gmckenzie@adcogov.org). Adams County established a Noxious Weed Management Plan and Noxious Weed Enforcement Policy in 1997, which mandates that all landowners in unincorporated Adams County control the designated noxious weeds on their property. Priority noxious species are highlighted by **bold** text in **Table 7**.

To determine all noxious and undesirable weed species present, and the extent of these occurrences in the Project site, a survey will be conducted prior to surface disturbing activities by qualified botanists/plant ecologists, including all construction areas and areas adjacent to the Project. This survey will focus on identifying and mapping populations of noxious and undesirable weed species, as listed by the Colorado Department of Agriculture based on the Colorado Noxious Weed Act (Title 35, Article 5.5 §§101-119). For non-native species that are not listed by the State of Colorado, the [California Invasive Plant Council](#) provides additional materials and management recommendations. Weed populations will be mapped with a hand-held global positioning system unit. All identified weed occurrences will be treated using the methods provided in fact sheets provided in **Appendix A** prior to ground-disturbing activities to reduce the likelihood of spreading to other areas or remaining viable in the soil (if within the growing season).

Table 6. List B and C noxious weed species with potential to occur in and surrounding the Project site¹.

Scientific Name	Common Name	List Status
<i>Acroptilon repens</i>	Russian knapweed	B
<i>Aegilops cylindrica</i>	Jointed goatgrass	B
<i>Anthemis cotula</i>	Mayweed chamomile	B
<i>Artemisia wormwood</i>	Absinth wormwood	B
<i>Carduus acanthoides</i>	Plumeless thistle	B
<i>Carduus nutans</i>	Musk thistle	B
<i>Carum carvi</i>	Wild caraway	B
<i>Centaurea diffusa</i>	Diffuse knapweed	B
<i>Centaurea maculosa</i>	Spotted knapweed	B
<i>Cirsium arvense</i>	Canada thistle	B
<i>Cirsium vulgare</i>	Bull thistle	B
<i>Clematis orientalis</i>	Chinese clematis	B
<i>Cynoglossum officinale</i>	Houndstongue	B
<i>Cyperus esculentus</i>	Yellow nutsedge	B
<i>Dipsacus fullonum</i> and <i>D. laciniatus</i>	Common & Cutleaf teasel	B
<i>Eleagnus angustifolia</i>	Russian olive	B
<i>Euphorbia esula</i>	Leafy spurge	B
<i>Hesperis matronalis</i>	Dames rocket	B
<i>Hyoscyamus niger</i>	Black henbane	B

Scientific Name	Common Name	List Status
<i>Lepidium draba</i>	Hoary cress	B
<i>Lepidium latifolium</i>	Perennial pepperweed	B
<i>Leucanthemum vulgare</i>	Oxeye daisy	B
<i>Linaria dalmatica and L. genistifolia</i>	Dalmatian toadflax	B
<i>Linaria vulgaris</i>	Yellow toadflax	B
<i>Lythrum salicaria</i>	Purple loosestrife	B
<i>Onopordum acanthium</i>	Scotch thistle	B
<i>Potentilla recta</i>	Sulfur cinquefoil	B
<i>Saponaria officinalis</i>	Bouncingbet	B
<i>Tamarix chinensis</i>	Salt cedar	B
<i>Tanacetum vulgare</i>	Common tansy	B
<i>Tripleurospermum inodorum</i>	Scentless chamomile	B
<i>Verbascum blattaria</i>	Moth mullein	B
<i>Abutilon theophrasti</i>	Velvetleaf	C
<i>Ailanthus altissima</i>	Tree of heaven	C
<i>Arctium minus</i>	Common burdock	C
<i>Bromus tectorum</i>	Cheatgrass	C
<i>Cichorium intybus</i>	Chicory	C
<i>Convolvulus arvensis</i>	Field bindweed	C
<i>Elymus repens</i>	Quackgrass	C
<i>Erodium cicutarium</i>	Redstem filaree	C
<i>Panicum miliaceum</i>	Wild-proso millet	C
<i>Sonchus arvensis</i>	Perennial sowthistle	C
<i>Sorghum halepense</i>	Johnsongrass	C
<i>Tribulus terrestris</i>	Puncturevine	C
<i>Ulmus pumila</i>	Siberian elm	C
<i>Verbascum thapsus</i>	Common mullein	C

¹ If additional noxious weeds not presented in this table are identified within the Project site, they will be treated using appropriate methods, as identified in this plan.

Integrated Weed Management

Integrated Weed Management involves a combination of methods to prevent, and control weed populations on a site (Knezevic et al. 2017). Primary methods include mechanical (e.g., mowing, hand pulling) and chemical (i.e., use of species-specific herbicides). Combining treatment methods increases the effectiveness of controlling weed populations throughout the site. The Project should generally adhere to the BMPs provided by the Colorado Department of Agriculture (“CDA”) (2016).

Additional non-native weed species identified in the Project site that are not on the noxious weed list may also be evaluated for treatment using field observations and professional judgment. All vegetation in the Project site will periodically be cut throughout the growing season to maintain a height of less than or equal to 2 feet to mitigate fuels and reduce fire hazard. Some noxious weed species, including those not required for treatment under the Colorado Noxious Weed Act may need additional treatment to reduce their cover and prevent resprouting following vegetation treatments.

The selection and use of various weed control methods is based on a variety of factors, including the biology of the target species, the application method, and consideration for surrounding resource concerns. Prior to treatment of specific non-native weed species, a detailed treatment plan should be prepared to outline which methods will be used, where they will be used, and when they will be used. Detailed treatment records should be maintained to determine the effectiveness of treatments and may be required by Adams County and the CDA.

Preventative Methods

Preventing weed establishment is the most effective weed management practice. Preventing or reducing the potential for weed establishment reduces additional effort, costs, and time invested in subsequent weed control or eradication measures. Several measures, such as washing construction equipment undercarriages prior to entering the Project site, using certified weed-free materials for site stabilization and revegetation, cleaning boots of workers and equipment, and restricting vehicle travel to established routes have proven to be effective toward preventing the spread and establishment of weeds and will be implemented during surface disturbing activities. Additionally, maintaining native plant cover is a preventative method for controlling weeds.

Mechanical Methods

Mechanical treatments use physical means to remove plants, reproductive parts, or propagules. Mechanical treatments include manual methods (e.g., pulling weed plants from the soil), use of hand tools and hand-held power tools, mowing, and other methods involve removing above and below ground plant structures. The designation of the appropriate mechanical treatment depends on variables, including season, weed species, their biology, and the size of each population. Mechanical methods will be used in conjunction with chemical applications to eradicate noxious weeds on the site. Mowing will be used for all vegetation to maintain a maximum height of 2 feet on the site.

Chemical Methods

Chemical treatments involve the use and application of herbicides. The use of herbicides is highly regulated and involves a variety of specific protocols, safety measures, and precautions for eliminating, reducing, and mitigating uncontrolled releases. Chemical herbicides shall only be applied by individuals who hold a State of Colorado Applicator License or are working under a Qualified Supervisor (Colorado Dept. of Agriculture 2023). Applicators shall adhere to all directions and safety protocols outlined on herbicide labels, as required by law. Selection of the appropriate herbicide for noxious weed control depends on the weed's biology and the herbicide's mechanism of action on the target species. Care should be taken to avoid and reduce potential applications to native plants remaining on the site. This can include using inert dyes to indicate where herbicide is applied, using backpack sprayers to improve application accuracy, and mechanically removing weeds near or next to native plants. Depending on the size of the weed population, application methods can range from backpack application to broadcast application from all-terrain vehicles/trucks.

Post Construction

Noxious weed monitoring should begin during the growing season immediately following surface disturbance at all disturbed sites, and then once a year for three consecutive years after the Project's completion. Identified noxious weed occurrences should be noted and recorded in the same manner as described above for preconstruction inventories.

Ongoing Monitoring

Noxious weed monitoring will occur on an ongoing basis during operation of the Project. Qualified and appropriately trained personnel will use the results of the initial noxious weed inventory to monitor known populations while also monitoring for new ones. During construction, managing weed populations will be the

responsibility of the Engineering, Procurement, and Construction (“EPC”). Once construction is complete and the EPC has demobilized, the owner of the property may oversee maintenance of the developer's seed mix and weed mitigation.

The state has zero tolerance for List A species: they must be eradicated from the Project. Efforts towards eradication for List B species is required by the state, with the goal of all List B species being eradicated by 2030 or earlier (see https://docs.google.com/spreadsheets/d/1fHXmYI_VYOMGNqe0ZZzJ8NwXON-Lr3Rs8i_KvBY0Vug/edit#gid=1161904098 for additional information on eradication). For all other weed species, total percent surface cover shall not exceed 10%.

References

Colorado Department of Agriculture (CDA). 2016.

E.J. Nordberg, M.J. Caley, L. Schwarzkopf, Designing solar farms for synergistic commercial and conservation outcomes, *Solar Energy*, Volume 228, 2021, Pages 586-593, ISSN 0038-092X, <https://doi.org/10.1016/j.solener.2021.09.090>.

Natural Resources Conservation Service (NRCS). 2022. Web Soil Survey Available online at: <https://websoilsurvey.nrcs.usda.gov/>.

Northern Water Data Viewer: Station NW106. [Northern Water Data Viewer](#)

S.Z. Knezevic, A. Jhala, A. Datta, Integrated Weed Management, *Encyclopedia of Applied Plant Sciences* (Second Edition), Academic Press, 2017, Pages 459-462, ISBN 9780123948083, <https://doi.org/10.1016/B978-0-12-394807-6.00231-8>.

United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS), Jornada Experimental Range (JER), and New Mexico State University (NMSU) (NRCS, JER, and NMSU). 2021. Ecosystem Dynamics Interpretive Tool. Various Ecological Site Descriptions. Available online at: <https://edit.jornada.nmsu.edu/>

United States Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS). 2006. Land Resource Regions and Major Land Resource Areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296.

Appendix A – Noxious Weeds Fact Sheets

Absinth wormwood

Colorado Department of
Agriculture

305 Interlocken Pkwy
Broomfield, CO 80021

(303) 869-9030
weeds@state.co.us



Key ID Points

1. Absinth is well branched and gets 3 feet tall and 2 feet across.
2. Silver-grey leaves and small yellow flowers.

Absinth wormwood Identification and Management



Identification and Impacts

Absinth wormwood (*Artemisia absinthium*) is native to Eurasia, the Middle East and North Africa. It was introduced to North America in the early 19th century to be cultivated for medicinal use. It was first reported outside cultivated gardens in 1841, along roadsides and waste grounds.

Absinth wormwood is a long-lived perennial that possesses a strong sage odor and bitter taste. Plants grow 2 to 4 feet in height and are prolific seed producers. It has a taproot that can reach 2 inches in diameter and shallow lateral fibrous root branches that can extend up to 6 feet long in all given directions. Plants are woody at the base and regrow from the soil level each spring. The stems are numerous and are covered with fine, gray hairs while the leaves are blue-olive green, alternate and highly divided. Flowers are small, yellowish and arranged in large, spike-like panicles. The seed viability is estimated to be 3 to 4 years and are easily scattered by wind, water, animals, and in hay. The seeds are less than 1/6 inch long, smooth, flattened and light gray.

Habitats for Absinth wormwood include disturbed sites, moist soils, and is also shade tolerant. It can occur in 5,000 to 7,000 feet elevation and is considered a weed in pastureland, cropland, and rangeland. Absinth wormwood is listed as poor palatability in horses, but good for sheep.

The key to effective control of Absinth wormwood is a combination of control methods. Compared to most perennials, it is fairly easy to control with chemicals in combination with mechanical control. Details on the back of this sheet can help to create a management plan compatible with your site ecology.

Absinth wormwood is designated as a "List B" species in the Colorado Noxious Weed Act. It is required to be either eradicated, contained, or suppressed depending on the local infestations. For more information visit www.colorado.gov/ag/csd and click on the Noxious Weed Management Program. Or call the State Weed Coordinator at the Colorado Department of Agriculture, Conservation Services Division, 303-239-4100.



Photos © Kelly Uhing, Colorado Department of Agriculture; and map above by Crystal Andrews, Colorado Department of Agriculture.

Artemisia absinthium L.

**CULTURAL**

Cultural controls are possible in theory, but are very time consuming and expensive. Complete removal of any seedlings or newly established plants by continual hand pulling is also possible.

**BIOLOGICAL**

There is no biological control available for Absinth wormwood. Since biological control agents take years to research, develop and release, no releases are expected in the foreseeable future. For more information, contact the Palisade Insectary of the Colorado Department of Agriculture at 970-464-7916.

**MECHANICAL**

Hand pull or dig when soil is moist. Make certain to pull all the roots, including short horizontal roots. Bag specimens carefully so as to not scatter seeds if removed during or after flowering. Multiple mowings prior to seed generation can cause stress and may provide a control option.

Integrated Weed Management:

Absinth Wormwood is easily controlled using a combination of methods such as chemical and mechanical.

Compared to most perennials, it is fairly easy to control.

HERBICIDES

NOTE: The following are recommendations for herbicides that can be applied to range and pasturelands. Rates are approximate and based on equipment with an output of 30 gal/acre. Please read label for exact rates. **Always read, understand, and follow the label directions. The herbicide label is the LAW!**

Herbicide	Rate	Application Timing
Aminopyralid* (Milestone)	7 oz. product/acre + 0.25% v/v non-ionic surfactant	Apply late spring into summer though the flowering growth stage.
Aminopyralid* + Metsulfuron (Opensight)	3.3 oz. product/acre	Apply late spring into summer though the flowering growth stage.
Aminopyralid* + 2,4-D (Forefront HL)	2 pints product/acre	Apply late spring into summer though the flowering growth stage.
Clopyralid (Transline)	0.66 pint/acre	Apply late spring into summer though the flowering growth stage. Provides greater selectivity when applying near trees and shrubs.
Picloram* + 2,4-D (Tordon/Picloram 22K - Restricted use pesticide)	1 pint product/acre + 1 qt./acre 2,4-D	Apply late spring into summer though the flowering growth stage. DO NOT use near trees, desirable shrubs, water, or high water table.
*Product not permitted for use in the San Luis Valley.		
Additional herbicide recommendations for other species can be found at: www.colorado.gov/agconservation/CSUHerbicideRecommendations.pdf		

Top to bottom photos, © Chris Evans, River to River CWMA, Bugwood.org; Mary Ellen (Mel) Harte, Bugwood.org; and Richard Old, XID Services, Inc., Bugwood.org.

Absinth wormwood



Black henbane

Colorado Department of
Agriculture

305 Interlocken Pkwy
Broomfield, CO 80021

(303) 869-9030
weeds@state.co.us



Key ID Points

1. Shallow lobed leaves that have sticky hairs.
2. Flowers have purple centers and veins.

Black henbane Identification and Management



Identification and Impacts

Black henbane (*Hyoscyamus niger*) was introduced from Europe as an ornamental and medicinal herb. In Colorado it is mostly found on the western slope. The plant blooms June through September and may be an annual or biennial. A mature plant reaches 1 to 3 feet in height with foliage that has a fowl odor. Leaves are shallowly lobed to coarsely toothed with sticky hairs. The outer part of the flower is brownish yellow in color with a purple center and veins. Fruits are approximately 1 inch long with 5 lobes.

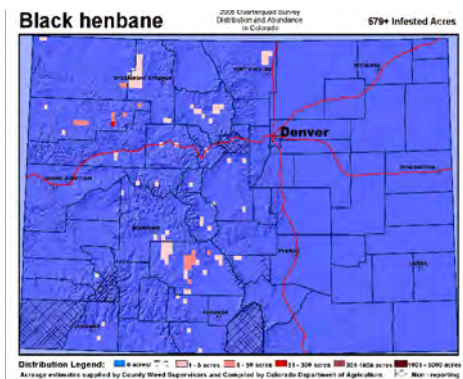
All parts of Black henbane are poisonous to both livestock and humans when ingested. However; the plant is usually avoided by livestock due to the foul odor. The plant is a strong competitor for moisture and nutrients and produces a persistent litter effecting germination and growth of native plants. Black henbane invades disturbed and overgrazed sites. A good preventable measure is to guard against overuse.

Habitats for Black henbane included disturbed open spaces, roadsides, fields, waste places and abandoned gardens. It grows in most soil types but likes sandy or well

drained loam soils. The seed viability or longevity is considered to be 1 to 5 years.

The key to effective control of Black henbane is guarding against disturbance and overuse, this can prove to be a good preventative measure against black henbane. Mechanical control and chemicals are the most commonly recommended method. Controlling plants in the spring or early summer prior to seed production is most effective, follow-up treatments are recommended to pick up missed or late bolting plants. Details on the back of this sheet can help to create a management plan compatible with your site ecology.

Black henbane is designated as a "List B" species in the Colorado Noxious Weed Act. It is required to be either eradicated, contained, or suppressed depending on the local infestations. For more information visit www.colorado.gov/ag/csd and click on the Noxious Weed Management Program. Or call the State Weed Coordinator at the Colorado Department of Agriculture, Conservation Services Division, 303-239-4100.



Photos © (2 on bottom, left): Steve Dewey, Utah State University; (Top left and top center): Mary Ellen Harte, forestryimages.com and Map above by Crystal Andrews, Colorado Department of Agriculture.

Hyoscyamus niger

**CULTURAL**

Cultural controls are possible in theory, but are very time consuming and expensive. Complete removal of any seedlings or newly established plants by continual hand pulling is also possible.

**BIOLOGICAL**

There is no biological control available for Black henbane. Since biological control agents take years to research, develop and release, no releases are expected in the foreseeable future. For more information, contact the Palisade Insectary of the Colorado Department of Agriculture at 970-464-7916.

**MECHANICAL**

Hand pull or dig from moist soil, so the entire tap root system can be removed. Tillage will control henbane, but is usually not recommended due to the land it occupies: rangeland, roadsides and pastures. Be sure to bag specimens carefully if removed during or after flowering.

Integrated Weed Management:

Controlling plants in the spring or early summer prior to seed production is most effective, follow-up treatments are recommended to pick up missed or late bolting plants.

Constant monitoring of site after last adult flowering plant is removed is suggested since seed viability can be up to 5 years.

Black henbane

HERBICIDES

NOTE: The following are recommendations for herbicides that can be applied to range and pasturelands. Rates are approximate and based on equipment with an output of 30 gal/acre. Please read label for exact rates. **Always read, understand, and follow the label directions. The herbicide label is the LAW!**

Herbicide	Rate	Application Timing
Metsulfuron (Escort XP)	1 oz. product/acre + 0.25% v/v non-ionic surfactant	Surfactant absolutely necessary. Apply late bolt to early flower. (Summer to Early Fall)
Chlorsulfuron* (Telar)	1 oz. product/acre + 0.25% v/v non-ionic surfactant	Apply late bolt to early flower. (Summer to Early Fall)
Chlorsulfuron + Metsulfuron (Cimarron Plus)	0.625-1.25 oz./acre + 0.25% v/v non-ionic surfactant	Apply late bolt to early flower. (Summer to Early Fall)
Note: *This herbicide has residual soil activity that will affect all broadleaf seedlings germinating after application has occurred.		
Additional herbicide recommendations for other species can be found at: www.colorado.gov/agconservation/CSUHerbicideRecommendations.pdf		

Top to bottom photos, © (Top 2 photos) Stevens County (Washington State) Noxious Weed Control Board; and bottom photo David Hallinan, Bannock County Weed Superintendent, Idaho Weed Awareness Campaign.



© Mike LeValley

Petals are usually pink to white and are recurved to reflexed, which makes the stamens exposed and the two styles centrally protruding. Within one season, flowers transition from a smaller paler staminate-phase to a larger pinker pistillate-phase, likely to avoid self-pollination (Davis et al. 2014). The five sepals are fused at the base to form a tube-like calyx. In Colorado, bouncingbet greens up in April, flowers emerge starting in June, and sets seed through October. Bees and wasps pollinate bouncingbet flowers (Davis et al. 2014). The fruits are capsules with dull black roundish to kidney-shaped seeds. Seed longevity is unknown. Bouncingbet forms densely thick taproot and rhizomes. With its robust root structure, bouncingbet can form dense colonies. It spreads by root and seed.

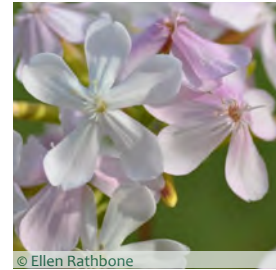
Bouncingbet (*Saponaria officinalis* L.) is a perennial forb in the Caryophyllaceae family, also known as soapwort or sweet William.

Mature plants grow up to three feet tall. Like other plants in the Carnation family, the leaves are opposite and smooth, about 2 to 4 inches long, and have an ovate to elliptic shape. Leaves have three very distinct deeply cleft parallel veins, with smaller lateral faint veins. They are fused at the base around the stem, which forms swollen nodes, similar to carnations. Like the leaves, the stems are smooth and erect. They are sparingly branched.

Showy bouncingbet flowers form at the end of an upright stem to form a cyme. Flowers are usually in pairs. Each flower has five petals per corolla; cultivare petals vary. The petals have a distinct notch on the petal margin, making it bi-lobed.

Originally, bouncingbet was introduced from Europe as a garden ornamental. In Colorado, bouncingbet occurs mainly municipal areas as a cultivated ornamental and escapee, such as in residential gardens, abandoned lots, exurban areas, and other sites that offer moist, well-drained soil, full to partial sun, such as roadsides and wetlands (EDDMapS 2018).

Bouncingbet contains saponin, which when wet produces lather, and thus was cultivated for this purpose (Challinor and De Voss 2012). Other chemical compounds in bouncingbet are investigated for "cytotoxic activity against human cancer cell lines" and other pharmacological or homeopathic uses (Challinor and De Voss 2012). While generally unpalatable to livestock, in large doses bouncingbet can be poisonous to livestock. The sapogenic glycosides can cause gastrointestinal irritation and destroy red blood cells when absorbed in the blood streams of grazing animals. In humans, it can be toxic when overdosed, however may be a culinary additive in some cultures (Wikipedia 2018).



© Ellen Rathbone



© Davis et al. 2014



Bouncingbet

Saponaria officinalis L.

bouncingbet
Saponaria officinalis
2016 Statewide Distribution in Colorado
Based on 2016 Quarterquad and EDDMapS Field Survey Data
Approximately 1,170 Infested Acres



Acres estimated by County Weed Supervisors and Other Data Sources. Compiled by Colorado Department of Agriculture
Department of Agriculture
0 acres 1-10 acres 11-50 acres
Scale: 0 20 40 Miles

Key ID Points

1. Five petals with notched margins
2. Pale staminate flowers and pinker pistillate flowers
3. Three parallel veins in leaves
4. Opposite leaves fused at the base with swollen nodes

Integrated Weed Management Recommendations

Effective integrated management means using a variety of eradication methods in the same site along with restoration, prevention of seed production and dispersal, and monitoring. Maintain robust healthy native landscapes. Restore degraded sites. Avoid soil disturbance. Prevent seed production and seed dispersal, e.g. on contaminated equipment. Rest sites until restored. Modify land use practices. Use methods appropriate for the site, including land use practices.



CULTURAL

Most bouncingbet seeds remain close to parent plants; spread is mainly by root or ornamental introductions. Cultural methods should follow other methods. Maintain or restore a competitive assemblage of shrubs, forbs, cool and warm season grasses that form large root biomass to crowd out bouncingbet roots. Implement whole site restoration of soils, plants and water regimes where dense colonies exist. Use locally adapted species that are ecologically appropriate for the site to improve competitiveness, including annual and perennial species. Incorporate soil amendments, soil microbes and mycorrhizal fungi in restoration efforts for natives. Minimize soil compaction and disturbance, especially in wetlands and moist soil.



BIOLOGICAL

Bouncingbet is not palatable to sheep, cattle or horses because of its saponin chemical content. If grazed, bouncingbet may resprout. Properly managed grazing can improve vigor of desired species and indirectly prevent bouncingbet. There are no biological control agents for bouncingbet authorized in Colorado that would effectively control it. For more information about biological control agents, visit the CDA Palisade Insectary website at: www.colorado.gov/ag/biocontrol



MECHANICAL

Mechanical methods are best for residential areas or small infestations, and best applied in early season or newly established plants. Completely remove all roots and root fragments in addition to above ground biomass. Repeat through the season. Mowing, chopping and deadheading leaves roots behind, stimulates more flower production; these methods require consecutive years of season-long treatments and only control but not eradicate it. Mowing when plants are flowering or producing seed disperses flowers and seeds, which expands the size of the infested area. Collect, bag, and dispose of or destroy flowers; seeds could mature and germinate if left on the ground. Low severity prescribed fires may damage above ground vegetation, leaving roots and seeds unaffected. High severity prescribed fire may not damage native plant roots; pile slash on bouncingbet to increase fire temps.



CHEMICAL

NOTE: Herbicide recommendations to control bouncingbet in pastures and rangeland are found at: <https://goo.gl/TvWnv9> Rates are approximate and based on equipment with an output of 30 gal/acre. Follow the label for exact rates. Consult local turf and ornamental experts for herbicides appropriate for residential settings. Always read, understand, and follow the label directions. The herbicide label is the LAW!

Bouncingbet

Saponaria officinalis L.



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www.colorado.gov/ag/weeds

Colorado
State
University



© Iowa Plants

like white hairs. Seeds remain viable for approximately three years. Mature plants can produce up to 4,000 seeds per plant. Bull thistle generally needs soil temperature between 50° and 80°F, moisture and canopy gaps to germinate seeds.

Bull thistle invades dry to moist environments. It prefers nitrogen-rich soils, and it grows on gravelly to clay-textured soils. It thrives in areas such as pastures, overgrazed rangeland, roadsides, and logged areas. Bull thistle infestations are heaviest in the northwestern portion of Colorado. It is widespread throughout the United States and parts of Canada.

Hheavy infestations reduce livestock forage. The presence of bull thistle in hay decreases the forage value and lowers the market price. It is an aggressive weed, but it will not withstand cultivation. Bull thistle is often a transient species, appearing in recently disturbed areas and becoming a dominant species for several years if left untreated. It can cause hay fever in some individuals.

Maintaining healthy pastures and rangeland, guarding against disturbance or overuse is the best prevention measure against bull thistle. As with most biennials, limiting seed production is critical to effective control. Chemical control is the most effective and efficient method of eradication if applied during the rosette stage, spring or early fall. To reduce seed production, plants with buds or flowers should be collected and

Bull thistle, *Cirsium vulgare* (Savi) Ten., is a biennial forb that was introduced to North America as a seed contaminant. Flowers are in a raceme arrangement. The gumdrop-shaped disk flowers are pinkish to dark purple in color and 1 ½ to 2 inches in diameter. The pappus has feather-like bristles; the receptacle is densely bristly. The flower bracts are somewhat tapered and covered with spines 2-5 mm long. Leaves are alternate with deeply lobed margins that are spiny. In mature plants the base of the leaves clasp the stem and extend down the stem to the lower node. The plant has one short, fleshy taproot with several lateral roots. There is debate about the effectiveness of self-pollination in bull thistle; outcrossing though pollination produces an abundance of viable seed. Flower buds and heads that are removed from the stalk can still mature and become viable. Seeds are capped with a circle of plume-



© Bruce Ackley, OH State University

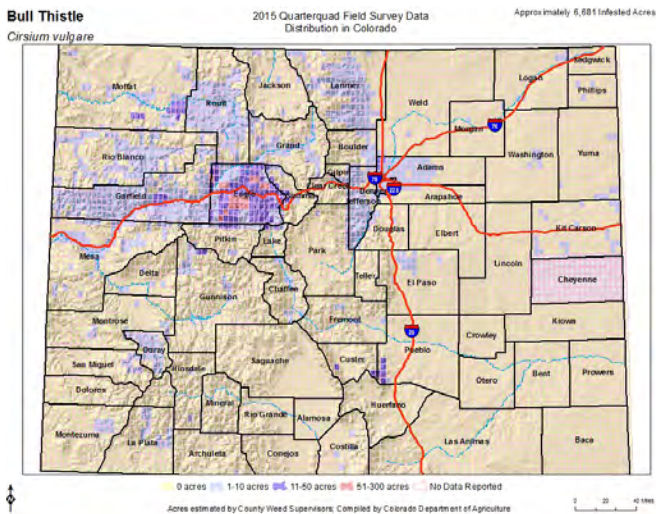


© Steve Dewey, UT State University



Bull thistle
Cirsium vulgare (Savi) Ten.

2015 Quarter Quad Survey



bagged, disposed of or destroyed. Mechanical control, such as pulling, has limited effectiveness.

Bull thistle is designated as a “List B” species in the Colorado Noxious Weed Act. It is required to be eradicated; some populations may be contained or suppressed depending on state regulations. For state regulations described for each county, refer to the most recent Rule, or visit www.colorado.gov/ag/weedcontacts for details.

Key ID Points

1. Flowers arranged in a raceme; flower is gum-drop shaped.
2. Base of leaves clasp the stem & extend down the stem to node below
3. Top surface of leaves have stiff, rough hairs

Integrated Weed Management Recommendations

Bull thistle *Cirsium vulgare* (Savi) Ten.

Effective integrated management means using a variety of eradication methods that also includes restoration, prevention of seed production and dispersal, and monitoring. Maintain robust healthy native landscapes and restore degraded sites. Avoid soil disturbance. As with most biennials, prevent seed production in the first and second year of bull thistle growth. Prevent seed from dispersing, such as on contaminated equipment. Rest sites until they are effectively restored.



© Bonnie Million, NPS

CULTURAL CONTROL METHODS

Since bull thistle germinates in canopy gaps, maintain or restore a competitive forb and cool and warm season grass assemblage to reduce spacing between plants. Use locally adapted and ecologically appropriate seeds whenever possible to improve competitiveness. Ensure annual species are included in the native seed mix as well as perennial. Incorporate soil amendments, soil microbes and mycorrhizal fungi in restoration efforts. Manage land uses so they do not cause soil disturbance or create bare mineral soil.



© Eric Coombs, OR Dept of Agriculture

BIOLOGICAL CONTROL METHODS

Horses, goats and sheep may eat flower heads on a few young individual plants, but seeds likely pass through their digestive tracks unaltered; cattle avoid bull thistle. Dense stands and large plants are usually avoided. Thus, bull thistle can become an “increaser” in over-grazed systems. Properly managed grazing can improve vigor of desired plants and indirectly reduce bull thistle. There is a biological control agent for this species, the bull thistle gall fly, *Urophora stylata*, but it was found to be ineffective in Colorado. Since it is not ethical to promote ineffective non-native insects in the state, this fly is not available in Colorado. For more information, visit the Colorado Department of Agriculture’s Palisade Insectary website at www.colorado.gov/ag/biocontrol.



© UAF Cooperative Extension

MECHANICAL CONTROL METHODS

Methods, such as hoeing, tilling and digging, are best for infestations smaller than 0.5 acres. Sever roots below the soil surface during the first year before the plant stores energy, and in the second year before seed production. Mowing, chopping and deadheading stimulates more flower production; these methods require consecutive years of season-long treatments. Flower heads and buds must be collected, bagged, and disposed of or destroyed; seeds will mature and germinate if left on the ground. Prescribed fire that leads to high soil burn severity can damage roots and above ground biomass of bull thistle but also damages desired plants. Fire favors bull thistle and is not recommended.

CHEMICAL CONTROL METHODS

NOTE: The following are recommendations for herbicides that can be applied to pastures and rangeland. Rates are approximate and based on equipment with an output of 30 gal/acre. Follow the label for exact rates. Always read, understand, and follow the label directions. The herbicide label is the LAW!

HERBICIDE	RATE	APPLICATION TIMING
Aminopyralid* (Milestone)	6 oz. product/acre + 0.25% v/v non-ionic surfactant	Apply to rosettes through bolting stage in spring, or to fall rosettes. *Product not permitted for use in the San Luis Valley.
Chlorsulfuron** (Telar)	1 oz. product/acre (0.75 oz. active ingredient/acre)+ 0.25% v/v non-ionic surfactant	Spring from bolting to bud stages. **This herbicide has residual soil activity that will affect all broadleaf seedlings germinating after application has occurred.
Clopyralid (Transline)	0.67-1.33 pints product/acre + 0.25% v/v non-ionic surfactant	Apply to rosettes through flower bud stage in spring, or to fall rosettes.
Aminocyclopyrachlor + chlorsulfuron (Perspective)*	4.75-8 oz. product/acre + 0.25% v/v non-ionic surfactant	Apply from the seedling to the bolting stage. IMPORTANT: Applications greater than 5.5 oz. product/acre exceeds the threshold for selectivity. DO NOT treat in the root zone of desirable trees and shrubs. Not for use on grazed or feed forage. *Product not permitted for use in the San Luis Valley.



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www.colorado.gov/ag/weeds





its root system, and quickly form dense stands. Each fragmented piece of root, 0.25 inch or larger, is capable of forming new plants. The key to controlling Canada thistle is to eliminate seed production and to reduce the plant's nutrient reserves in its root system through persistent, long-term management.

Canada thistle is one of the most troublesome noxious weeds in the U.S. It can infest diverse land types, ranging from roadsides, ditch banks, riparian zones, meadows, pastures, irrigated cropland, to the most productive dryland cropland. Large infestations significantly reduce crop and cattle forage production and native plant species. It is a host plant to several agricultural pests and diseases. Canada thistle prefers moist soils, but it can be found in a variety of soil types. It has been found at elevations up to 12,000 feet.

Effective Canada thistle control requires a combination of methods. Prevention is the most important strategy. Maintain healthy pastures and rangelands, and continually monitor your property for new infestations. Established plants need to be continually stressed. Management options become limited once plants begin to produce seeds. Details on the back of this sheet can help to create a management plan compatible with your site ecology.

Canada thistle (*Cirsium arvense*) is a non-native, deep-rooted perennial that spreads by seeds and aggressive creeping, horizontal roots called rhizomes. Canada thistle can grow 2 to 4 feet in height. The leaves are oblong, spiny, bright green, and slightly hairy on the undersurface. Unlike other noxious biennial thistles which have a solitary flower at the end of each stem, Canada thistle flowers occur in small clusters of 1 to 5 flowers. They are about 1 cm in diameter, tubular shaped, and vary from white to purple in color.

Canada thistle emerges from its root system from late April through May. It flowers in late spring and throughout the summer. It produces about 1,000 to 1,500 seeds per plant that can be wind dispersed. Seeds survive in the soil for up to 20 years. Additionally, Canada thistle reproduces vegetatively through



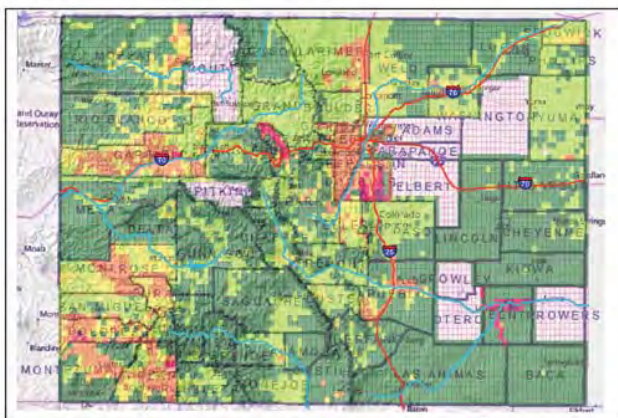
Canada thistle
Cirsium arvense

2013 Quarter Quad Survey

Canada Thistle
Cirsium arvense

2013 Quarterquad Survey
Distribution and Abundance
in Colorado

129,572+ Infested Acres



Distribution Legend: 0 acres 1-10 acres 11-50 acres 51-300 acres 301-999 acres >1000 acres Not Reported
Acreage estimates supplied by County Weed Coordinators and compiled by the Colorado Department of Agriculture.

Canada thistle is designated as a “List B” species as described in the Colorado Noxious Weed Act. It is required to be either eliminated, contained, or suppressed depending on the local infestations. For more information visit www.colorado.gov/ag/weeds and click on the Noxious Weed Program link or call the State Weed Coordinator at the Colorado Department of Agriculture, Conservation Services Division, (303) 869-9030.

Key ID Points

1. Cluster of 1-5 white to purple flowers on a stem.
2. Floral bracts are spineless.
3. Small flowers that are 1 cm in diameter.
4. Perennial, rhizomatous plant with spiny, oblong, green leaves.

Integrated Weed Management Recommendations

Integrated weed management is imperative for effective Canada thistle control. This weed needs to be continually stressed, forcing it to exhaust root nutrient stores, and eventually die. Mowing or grazing can be followed up with herbicide application. Avoid hand-pulling and tilling which can stimulate the growth of new plants.



CULTURAL

Prevention is the best control strategy. Maintain healthy pastures, riparian areas, and rangelands. Prevent bare ground caused by overgrazing, and continually monitor your property for new infestations. Establishment of select grasses can be an effective control.

BIOLOGICAL

Cattle, goats, and sheep will graze on Canada thistle when plants are young and succulent in the spring. Follow up grazing with a fall herbicide application. Insects are available, and provide limited control. Currently, collection and distribution methods for Canada thistle rust (*Puccinia punctiformis*) are being refined. For more information on Canada thistle biocontrol, contact the Colorado Department of Agriculture - Palisade Insectary at (970) 464-7916.

MECHANICAL

Due to Canada thistle's extensive root system, hand-pulling and tilling create root fragments and stimulate the growth of new plants. Mowing can be effective if done every 10 to 21 days throughout the growing season. Combining mowing with herbicides will further enhance Canada thistle control.

CHEMICAL

The table below includes recommendations for herbicides that can be applied to rangeland and some pastures. Treatments may be necessary for an additional 1 to 3 years because of root nutrient stores. Always read, understand, and follow the label directions.

Herbicide	Rate	Application Timing
Aminopyralid* (Milestone)	5-7 oz. product/acre + 0.25% v/v non-ionic surfactant OR 1 teaspoon product/gal water + 0.32 oz./gal water	Apply in spring at the pre-bud growth stage until flowering and/or to fall regrowth. Can also add chlorsulfuron (Telar) at 1 oz./acre to the mix.
Clopyralid + Triclopyr (Prescott; Redeem; others)	3 pints product/acre + 0.25% v/v non-ionic surfactant OR 1.25 oz. product/gal water + 0.32 oz./gal water	Apply until flowering and/or fall regrowth.
Aminocyclopyrachlor + chlorsulfuron (Perspective)*	5.5 oz. product/acre + 0.25% v/v non-ionic surfactant	Apply to spring rosette to flower bud growth stage; or fall. IMPORTANT: Applications greater than 5.5 oz. product/acre exceeds the threshold for selectivity. DO NOT treat in the root zone of desirable trees and shrubs. Not for use on grazed or feed forage.

Note: *Product not permitted for use in the San Luis Valley.

Additional herbicide recommendations for this and other species can be found at:
www.colorado.gov/agconservation/CSUHerbicideRecommendations.pdf

Canada thistle

Cirsium arvense



has a very robust, long taproot and rootlets.

The peduncles leading to the flowers are very short, less than 2 mm. The inflorescence is an open panicle. The green stiff phyllaries are in two rows, each series has between five and six sepals; the outer row is reduced in size. The phyllaries are lanceolate and have glandular tipped hairs visible with a hand lens. The inflorescence has only ray flowers which are ligulate with five teeth on the edge (Jepson eFlora 2019). Flower color ranges from cornflower blue to off white. The stamens, style and bilobed stigma are usually blue. The pappus on the achene is nearly absent, consisting of minute toothed scales (Leach 1921). The achene has five ribs and since it lacks a feathery pappus architecture like many other Asteraceae plants, the seeds fall near the parent plants (Leach 1921). Chicory reproduces by seed and its longevity is at least 10 years (Priestley et al. 1985).

Chicory (*Cichorium intybus* L.) is a perennial forb in the Asteraceae family, also known as coffeeweed, French endive, and succory, not to be confused with curly endive (*Cichorium endivia* L.) (iNaturalist 2019).

Mature plants can be four feet tall. Oblanceolate basal leaves range in size from 5 to 35 cm long and are persistent (SEINet 2019). Their margins are highly variable, sometimes dentate or denticulate like dandelion leaves, sometimes pinnatifid (Plants of the World Online 2019). The rigid ascending stems have stiff short hairs. Branches are widely apart. Stems are hollow, have milky sap and linear ribs (University of Wisconsin-Madison 2019). Its stem leaves are sessile, rigid, oblong to lanceolate, usually with smooth margins, and are narrower than the basal leaves; short stiff hairs are on both surfaces and leaf margins. The base of leaves clasp the stem. Chicory

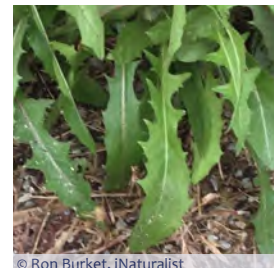
Chicory is often confused with blue flax (*Linum lewisii* Pursh) mainly due to their blue flower color and overlapping distributions. Being in a different plant family, upon closer inspection it becomes apparent that it lacks basal leaves, stem leaves are slender, the five petals are bi-lobed.

Chicory is native to Mediterranean areas in Europe, Africa, and Middle East. It has a long cultivation history for pharmacology dating back to ancient Egypt, Greek and Roman eras, 2000 BC. (Bahmani et al.

2015). Modern cultivation is for coffee substitution (roots) and salad (leaves). It has worldwide distribution. It has been in Colorado since at least 1872 when Townshend Stith Brandegee collected a specimen in Fremont County (SEINet 2019). In Colorado its either under-reported or rare. It is ruderal, inhabiting roadsides and disturbed areas at elevations below 8,000 feet.



© Andreas Stiller, iNaturalist



© Ron Burket, iNaturalist

Chicory

Cichorium intybus L.

Key ID Points

1. Ligulate flowers with 5 teeth at ends
2. Blue stamens, style and bilobed stigma
3. Stiff short hairs on stems, leaves and achene
4. Persistent basal leaves resembling dandelion leaves



Integrated Weed Management Recommendations

Effective integrated management means using a variety of eradication methods in the same site along with restoration, prevention of seed production and dispersal, and monitoring. Maintain robust healthy native landscapes. Restore degraded sites. Avoid soil disturbance. Prevent seed production and seed dispersal, e.g. on contaminated equipment. Rest sites until restored. Modify land use practices. Use methods appropriate for the site, including land use practices.



© Weedsak, Alaska Bureau of Land Management



© California Department of Transportation

CULTURAL

Since chicory is sensitive to competition from grasses, maintain or drill seed bluebunch wheatgrass (*Pseudoroegneria spicata*) and Sandberg bluegrass (*Poa secunda*) with vesicular-arbuscular mycorrhizae; these are drought tolerant natives that are highly competitive against chicory but require mycorrhizae. Native shrubs with competitive robust root biomass is another option. It is ruderal so minimize soil disturbance, especially near infestations. For cultivated sites, select native plants with blue flowers instead of chicory: *Scutellaria brittonii*, *Gentiana parryi*, *Mertensia lanceolata*, *Penstemon glaber*, *Eritrichium aretoides*, or *Aconitum columbianum*. Be cautious when purchasing seed as chicory may be in mixes. Use seed pillows to disperse seeds.

MECHANICAL

Mechanical methods are best for residential areas, small infestations or soils where the entire taproot can be removed. Mowing is not recommended; it leaves roots behind, stimulates flower production, disperses seeds, and expands the size of the infested area. Chopping the inflorescence just below the root crown and bagging the biomass may reduce vigor with consecutively treatment; effectiveness is dependent on cultivare type. Collect, bag, and dispose of or destroy flowers; seeds can mature and germinate if left. Subsoiling must be deeper than 10 inches; use a subsoiler. Fall prescribed fire may kill seeds if hot enough; chicory sets seed through the growing season so timing is important. Fire is unlikely to affect its deep taproot. The effects to chicory from prescribed fire is not tested.

Chicory

Cichorium intybus L.



© EverGraze



© Aspen Public Radio

BIOLOGICAL

Chicory provides high quality forage for goats, sheep and cattle. It is sensitive to grazing; fall is best for control (Alemseged et al. 2003, Barry 1998, Li and Kemp 2005, Li et al. 2003). Properly managed grazing can improve vigor of desired species and indirectly reduce chicory. Currently there are no biological control agents for chicory authorized in Colorado. For biocontrol information, visit the Colorado Department of Agriculture's Palisade Insectary website at: www.colorado.gov/ag/biocontrol

CHEMICAL

NOTE: Herbicide recommendations to control chicory in pastures and rangeland are found at: <https://goo.gl/TvWnv9>. Rates are approximate and based on equipment with an output of 30 gal/acre. Follow the label for exact rates. Consult local turf and ornamental experts for residential settings. Always read, understand, and follow the label directions. The herbicide label is the LAW!



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Chinese clematis

Colorado Department of
Agriculture

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weeds@state.co.us



Key ID Points

1. Solitary flowers with four yellow sepals.
2. A herbaceous to woody vine climbing perennial.

Updated on:
07/2015

Chinese clematis Identification and Management



Identification and Impacts

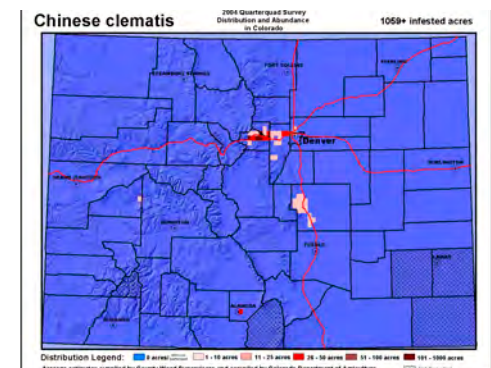
Chinese clematis (*Clematis orientalis*) is a herbaceous to woody vined perennial that is native to Eurasia. It is an escaped ornamental species that is a deciduous climber growing up to 12 feet. Solitary flowers have four yellow sepals (petal-like structures) that are often nodding. Each flower produces numerous feathery, long-tailed fruits which are conspicuous all winter. The plant flowers from August to September.

Habitats for Chinese clematis include roadsides, riparian corridors and rocky slopes. It is sometimes found in open woods. Plants prefer sunny areas but have shown to be somewhat shade tolerant. Chinese clematis prefers well-drained soils.

Chinese clematis can cause death to young trees and brush. It outcompetes native shrubs and herbaceous species. Plants will completely cover; rock walls, trees, bushes and fences. The juice of freshly crushed leaves and stems have blister causing agents.

The key to effective control of Chinese clematis is preventing the plants from going to seed. Pulling the woody stem prior to flowering can be an effective control. Chemical treatments are also effective when dealing with Chinese clematis. Details on the back of this sheet can help to create a management plan compatible with your site ecology.

Chinese clematis is designated as a "List B" species in the Colorado Noxious Weed Act. It is required to be either eradicated, contained, or suppressed depending on the local infestations. For more information visit www.colorado.gov/ag/weeds and click on the Noxious Weed Management Program. Or call the State Weed Coordinator at the Colorado Department of Agriculture, Conservation Services Division, 303-239-4100.



Photos and Map © Colorado Department of
Agriculture.

Clematis orientalis

**CULTURAL**

Cultural controls are possible in theory, but are very time consuming and expensive. Complete removal of any seedlings or newly established plants by continual hand pulling is also possible.

**BIOLOGICAL**

There is no biological control available for Chinese clematis. Since biological control agents take years to research, develop and release, no releases are expected in the foreseeable future. For more information, contact the Palisade Insectary of the Colorado Department of Agriculture at 970-464-7916.

**MECHANICAL**

Hand pull or dig when soil is moist. Make certain to pull all the roots and bag specimens carefully so as to not scatter seeds if flowering.

Integrated Weed Management:

The most effective control method for dealing with Chinese clematis is preventing the plant from going to seed. Pulling the plant from the ground, by the woody stem, prior to the plant flowering is the most effective control. Chinese clematis also responds well to chemical treatments.

HERBICIDES

NOTE: The following are recommendations for herbicides that can be applied to range and pasturelands. Rates are approximate and based on equipment with an output of 30 gal/acre. Please read label for exact rates. Always read, understand, and follow the label directions. The herbicide label is the LAW!

Herbicide	Rate	Application Timing
2,4-D amine	2 qts. product/acre at 4.0 lb active ingredient/gallon of product + 0.25% v/v non-ionic surfactant	Apply anytime when the plant is actively growing. Will damage neighboring brush species, if present.
Imazapic (Plateau, Panoramic)	12 oz. product/acre + 1 qt./acre methylated seed oil	Apply in the fall at flowering growth stage.
Aminopyralid (Milestone)	4 oz. product/acre + 0.25% v/v non-ionic surfactant	Apply at flowering growth stage in the fall.
Additional herbicide recommendations for other species can be found at: www.colorado.gov/agconservation/CSUHerbicideRecommendations.pdf		

Top to bottom photos, © (Top 2 photos) Stevens County (Washington State) Noxious Weed Control Board; and bottom photo David Hallinan, Bannock County Weed Superintendent, Idaho Weed Awareness Campaign.

Chinese clematis



Common burdock

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Identification and Management



year due to the spines and burs. The burs can easily get entangled into livestock fur, make distribution easy over large areas.

The key to effective control of minimizing soil disturbance and preventing the establishment of plants. Using an integrated weed management approach combining chemical, cultural, and mechanical methods to control these plants is effective. Details on the back of this sheet can help to create a management plan compatible with your site ecology.

Identification and Impacts

Common burdock (*Arctium minus*) is a biennial forb that is native to Europe. The first year of growth is a basal rosette, producing large cordate, thickly hairy leaves. The second year of growth, is a coarse, multi-branched, erect stem that will grow to heights of 3 to 10 feet tall. The large, dark green leaves are alternate and appear to have toothed or wavy margins. They are broadest and the base of the leaf and diminish as they approach the tip of the leaf, and have a hairy underside. The flowers appear at the end of the branches, numerous, clustered and are pink to purple in color. At the base of the flower there are many spines that often have a hook on the end. The flower and the spines dry and become an easily dispersible bur. Flowering and seed production occur from July to October. The plant grows from a sturdy taproot that is brown and fleshy in color.

Common burdock is designated as a "List C" species on the Colorado Noxious Weed Act. It is required to be either eradicated, contained, or suppressed depending on the local jurisdictions managing this species. For more information, visit www.colorado.gov/ag/weeds or call the State Weed Coordinator at the Colorado Department of Agriculture, Conservation Services Division, 303-239-4100.



Key ID Points

Habitats for Common burdock include roadsides, ditch banks, waste places, pastures, and fencerows. Animals will avoid eating the plant in both years of growth, the first year due to the hairy leaves and the second



Photos © All Photos from Kelly Uhing, Department of Agriculture

Arctium minus

**CULTURAL**

Minimizing soil disturbance and encouraging the establishment of desirable grasses and forbs, can assist in controlling Common burdock. For specific seed recommendations contact your local Natural Resources Conservation Services for seed mixes.

**BIOLOGICAL**

Currently there is not any biocontrol available for Common burdock. Biocontrol takes many years of research and development. For more information, contact the Palisade Insectary of the Colorado Department of Agriculture at 970-464-7916 for more information.

**MECHANICAL**

Hand pull or dig when soil is moist, but make sure to wear gloves. Bag specimens carefully so as not to scatter seeds. Mowing is also effective, cutting the top growth of the plant. The key to effective control is to prevent seed production and/or spread.

Integrated Weed Management:

Preventing the establishment and minimizing soil disturbance is an effective way to control Common burdock. Combining treatment methods of cultural, mechanical and chemical assist with controlling these plants.

Common burdock

HERBICIDES

NOTE: The following are recommendations for herbicides that can be applied to range and pasturelands. Rates are approximate and based on equipment with an output of 30 gal/acre. Please read label for exact rates. Always read, understand, and follow the label directions. The herbicide label is the LAW!

HERBICIDE	RATE	APPLICATION TIMING
Aminopyralid (Milestone)	4-7 oz/acre or 1 teaspoon/gal water	Apply in rosette stage in spring or fall. Add non-ionic surfactant @ 0.32 oz/gal water or 1 qt/100 gal water.
Clopyralid (Stinger)	1/2-1 1/3 pts/acre	Apply to young to actively growing plants in the spring. Add non-ionic surfactant @ 0.32 oz/gal water or 1 pt/100 gal water.
2,4-D Amine	2 pts/acre	Apply to young to actively growing plants in the spring. Add non-ionic surfactant @ 0.32 oz/gal water or 1 pt/100 gal water.
2,4-D Dicamba	1 pt/acre	Apply to young to actively growing plants pre-flower stages in spring. Add non-ionic surfactant @ 0.32 oz/gal water or 1 pt/100 gal water.

Photos © Top to Bottom; Kelly Uhing, Colorado Department of Agriculture; Whitney Cranshaw, Colorado State University, Bugwood.org; Kelly Uhing, Colorado Department of Agriculture

Common mullein

Colorado Department of
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Key ID Points

Identification and Management



Identification and Impacts

Common mullein (*Verbascum thapsus*) is a biennial forb native to Europe and Asia. The first year of the plant it produces a basal rosette. Basal rosettes can grow to 30 inches in diameter. The leaves are light-green in color and are covered in fine soft hairs. The woolly leaves are alternate and overlapping each other and can grow over a foot long. In spring of the second year the plant bolts an erect stem, that grows 2 to 6 feet tall. The flowers of the plant are borne in terminal spikes. These terminal spikes may reach up to 20 inches in length. The flowers are sulfur-yellow in color and have five petals. The flowers range from 3/4 of an inch to 1 1/2 inches in diameter. Numerous two chambered fruits produce 100,000 to 250,000 seeds per plant. Flowering and seed production typical occur from June to August. The plant has a deep taproot along with a fibrous root system.

Habitats for Common mullein are roadsides, waste places, right-of-ways, pastures, hay fields, and abandoned lands. It prefers gravelly soil types, but can grow in other soil types. Livestock will avoid eating

Common mullein, due to the hairy leaves of the plants. The plants were originally introduced as a medicinal plant. The Europeans used the flowers for tea, and the leaves for many remedies like burns and rashes. Both the Europeans and the Indians smoked the dried leaves to treat bronchitis.

The key to effective control of Common mullein is preventing the production of seeds. This plant is difficult to control due to the large amount of seed produced and seed bank left in the soil. Mechanical, cultural, biological and chemical treatments can be successful if utilized together in an integrated weed management plan. Details on the back of this sheet can help to create a management plan compatible with your site ecology.

Common mullein is designated as a "List C" species on the Colorado Noxious Weed Act. It is required to be either eradicated, contained, or suppressed depending on the local jurisdictions managing this species. For more information, visit www.colorado.gov/ag/weeds or call the State Weed Coordinator at the Colorado Department of Agriculture, Conservation Services Division, 303-239-4100.



Photos © All Photos from Kelly Uhing, Department of Agriculture; Except Bottom left Mary Ellen (Mel) Harte, United States

Verbascum thapsus

**CULTURAL**

Cultural control can be effective in assistance with other treatment options. Once the parent plants have been removed, cultivating the area with desirable grasses and forbs may outcompete Common mullein seedlings. For specific seed recommendations contact your local Natural Resources Conservation Services for seed mixes.

**BIOLOGICAL**

Gymnetron tetrum, a seed eating weevil, biological control has been found in eastern Washington State and is currently working on populations there. The weevil has not yet been approved for use in Colorado. Contact the Palisade Insectary of the Colorado Department of Agriculture at 970-464-7916 for more information.

**MECHANICAL**

Hand pull or dig when soil is moist, prior to flowering and seed production can be effective. If flowers are present, bag specimens carefully so as not to scatter any potential seeds. The key to effective control is to prevent seed production and/or spread.

Integrated Weed Management:

Preventing the establishment and the seed production of Common mullein is key to controlling populations. If the population is established, using a combination of cultural, chemical, biological and mechanical treatments can aid in suppressing population size. Since plants produce thousands of seed treatments need to occur over an extended period of time.

Common mullein

HERBICIDES

NOTE: The following are recommendations for herbicides that can be applied to range and pasturelands. Rates are approximate and based on equipment with an output of 30 gal/acre. Please read label for exact rates. Always read, understand, and follow the label directions. The herbicide label is the LAW!

HERBICIDE	RATE	APPLICATION TIMING
Chlorsulfuron (Telar XP)	1-3 oz/acre	Apply to rosette stages in spring or fall prior to bolting. Add non-ionic surfactant @ 0.32 oz/gal water or 1 pt/100 gal water.
2,4-D Picloram (Grazon P+D *this is a Restricted Use Pesticide*)	4 pts/acre	Apply to rosette stages in spring or fall prior to bolting. Add non-ionic surfactant @ 0.32 oz/gal water or 1 pt/100 gal water. DO NOT apply near trees/shrubs/high water table.
Picloram (Tordon 22K *this is a Restricted Use Pesticide*)	1-2 qts/acre	Apply to rosette stages to early growth stages in spring or fall. Add non-ionic surfactant @ 0.32 oz/gal water or 1 pt/100 gal water. DO NOT Apply near trees/shrubs/high water table.
Metsulfuron (Cimmaron)	1.0 oz/acre	Apply to rosette stages in spring or fall. Add non-ionic surfactant @ 0.32 oz/gal water or 1 pt/100 gal water.

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In Colorado, flowering typically starts in June lasting to September. Seeds are yellowish brown achenes with short, five-toothed crowns. One plant can produce up to about 50,000 seeds. Seeds is well adapted to cold environments with germination rates as high as 70% (Gucker 2009). Seed longevity is at least two years, and most seeds remain near the parent plant since they lack wind-dispersed structures (Gucker 2009). Roots are robust, often with rhizomes that can be woody, coiled and at least 51 inches below the soil surface (Gucker 2009). Rhizomatous spread occurs, but reproduction is primarily by seed (Gucker 2009).

Common tansy (*Tanacetum vulgare* L.) is a perennial plant in the Asteraceae family, also known as golden buttons and garden tansy.

Mature plants range from 1.5 to seven feet tall. The stem leaves are alternate and oblong. Leaves are deeply divided with four to ten pairs of leaflets. Glands appear on the leaf surface. The leaf margins are dentate. From afar, leaves have a fern-like appearance and have a strong odor when crushed. Stems are stiff, upright, ribbed often purplish-red to green in color, and hairless. Common tansy has only button-like perfect disc flowers; it lacks ray flowers. Yellow disc flowers are numerous and arranged as a flattened dense cluster at the terminal end of the stems. The outer ring of disc flowers are pistillate. Ovate shaped phyllaries that surround the head are arranged in series. Phyllary margins are lighter in color than the center.

Common tansy is often confused with *Achillea millefolium* ('Moonshine' yarrow), which is a similar height, leaf structure, and has yellow terminal flowers. When common tansy is not in flower, it can also be confused with *Conium maculatum* (poison hemlock) because of its leaf structure, the stiff ribbed stems and corymbiform flower head.

In Colorado, common tansy is mostly found along the banks of irrigation ditches, streams, seeps and roads (EDD-MapS 2018). It is also found in residential areas as an ornamental, and occasionally on semi-arid rangelands and pastures (EDDMapS 2018). It survives cold, prefers wet environments and full sun but can tolerate partial shade (Gucker 2009). Common tansy is reported predominantly in the northern portion of the United States (EDDMapS 2018).



© SEINet Herbarium of Hollis Koster

Common Tansy

Tanacetum vulgare L.

Key ID Points

1. Yellow button-like composite flower heads that lack ray flowers
2. Fern-like pinnately divided alternate leaves, foul smell
3. Ribbed stiff tall stems
4. Dense woody-like root mass

common tansy
Tanacetum vulgare
2016 Statewide Distribution in Colorado
Based on 2016 Quarterquad and EDDMapS Field Survey Data
Up to Approximately 313 Infested Acres



Acres estimated to nearest whole acre by county weed supervisors and other data sources, compiled by Colorado Department of Agriculture
COLORADO Department of Agriculture
0 1-10 acres 11-50 acres
0 30 60 Miles

With adequate moisture common tansy can outcompete and displace native and desirable species; allelopathy may be a factor (Gucker 2009). When stands get robust, it can reduce irrigation water flow (Gucker 2009). Its seeds float, so water can be a vector and downstream riparian corridors and irrigation channels can become infested. It tends to be fairly aggressive and difficult to control.

Integrated Weed Management Recommendations

Effective integrated management means using a variety of eradication methods along with restoration, prevention of seed production and dispersal, and monitoring. Maintain robust healthy native landscapes. Restore degraded sites. Avoid soil disturbance. Prevent seed production and seeds from dispersing, e.g. on contaminated equipment. Rest sites until restored. Modify land use practices. Use methods appropriate for the site, other plants present and land uses.



© Kayla Malone

CULTURAL

Common tansy prefers bare mineral soil, high light and few competitors to germinate, so maintain deep mulch and litter cover and select shade producing species. Since common tansy forms robust rhizomatous roots, select plants that will have equally or more competitive below ground root structures that includes an assemblage of shrubs, forbs, cool and warm season grasses, annuals and perennials. Use locally adapted species that are ecologically appropriate for the site and ecoregion to improve competitiveness. Implement whole site restoration, where needed. Common tansy prefers frequent disturbance and flooding, so where possible, modify the hydrology and disturbance regimes until control is established, especially where dense colonies exist.



© University of Colorado Outdoor Services

BIOLOGICAL

Common tansy is toxic to cattle, not recommended for horses, however confined domestic sheep and goats eat it during early flower (Gucker 2009). Targeted grazing can be effective, but opens the canopy for new seeding or shoot growth; repeat integrated entries with chemical (Gucker 2009). Non-targeted grazing should be light, with less than 60% defoliation to maintain competitiveness against common tansy (Gucker 2009). There are no biological control agents authorized in Colorado that would effectively control this species.



© Practically Functional

MECHANICAL

Because of common tansy's robust roots and prolific seed production, mechanical methods are best for residential areas and small infestations. Remove all root biomass or sever roots below the soil surface early in the season to reduce energy storage and before seed production. Mowing, chopping, hand-pulling, and deadheading leaves roots behind and stimulates flower production, requiring consecutive years of season-long treatments. Mowing disperses seeds and expands the infested area. Collect, bag, and dispose of or destroy all flowers; seeds could mature and germinate if left on the ground. Its large size may increase fire hazard. High intensity prescribed fire may top kill plants but leave roots mildly affected (Gucker 2009). Combine prescribed fire with other methods to improve treatment efficacy (Gucker 2009).



© Dave and Karin Hanna, Techline News

CHEMICAL

NOTE: Herbicide recommendations to control common tansy in pastures and rangeland are found at: <https://goo.gl/TvWnv9>. Rates are approximate and based on equipment with an output of 30 gal/acre. Follow the label for exact rates. Consult local turf and ornamental experts for herbicides appropriate for residential settings. Always read, understand, and follow the label directions. The herbicide label is the LAW!

Common tansy

Tanacetum vulgare L.

Colorado Department of Agriculture - Conservation Services



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Colorado
State
University



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Common teasel, *Dipsacus fullonum* L., is a biennial or sometimes short-lived perennial forb. Mature plants can grow up to or over six feet tall and have a taproot. Common teasel has simple lanceolate to oblanceolate basal and stem leaves. Both leaves are conspicuously veined, wrinkled and have rough surface. Leaf margins are crenate. Stems leaves are lined with stiff prickles along the midrib. Stem leaves are opposite, net-veined, stalkless, and clasp the stem. The stem is rigid and also lined with several rows of downward turned prickles.

Flowers are range from white to violet. The flower head is generally egg-shaped, with a square base. The long thin stiff floral bracts at the base of the inflorescence are generally longer than the flower head; these also have prickles. It flowers from April to September. This species reproduces by seed. In a Canadi-

an study, common teasel resprouted 50% of the time after mechanically removing above ground vegetation. Common teasel can produce more than 2,000 seeds per plant. Plants die after production of seed has occurred. Seeds can stay viable for up to 14 years. Seeds germinate and establish readily, however, seeds don't generally disperse far from the parent plant. The fruits are a four-angled achene, each containing a single seed.

Common teasel is native to Europe where historically it had many uses. Common teasel is spreading rapidly in America. It is common along major travel corridors and previously disturbed areas. It is invasive in moist soils, such as wetlands, fens and riparian corridors. This includes roadsides, swales, irrigation ditches. Upland dry sites are also vulnerable. These include open, sunny habitats such as abandoned fields, pastures, meadows and woodlands.

Restoration of infested and degraded sites is one of the keys to eradicating common teasel. Wetlands are important but very sensitive environments. Methods and techniques used in infested wetlands should follow best management practices, such as those available at <https://www.colorado.gov/pacific/ag-conservation/noxious-weed-publications>. Preventing seed production is necessary to curtail the spread of this forb. Eradication efforts will need to continue for multiple consecutive seasons until the seed bank is depleted. Once eradication is complete, monitoring will be needed.

Common teasel is designated as a "List B" species in the Colorado Noxious Weed Act. It is required to be eradicated; some populations may be contained or suppressed depending on state regulations. For state regulations described for each county, refer to the most recent Rule, or visit www.colorado.gov/ag/co-weedcontacts for details.



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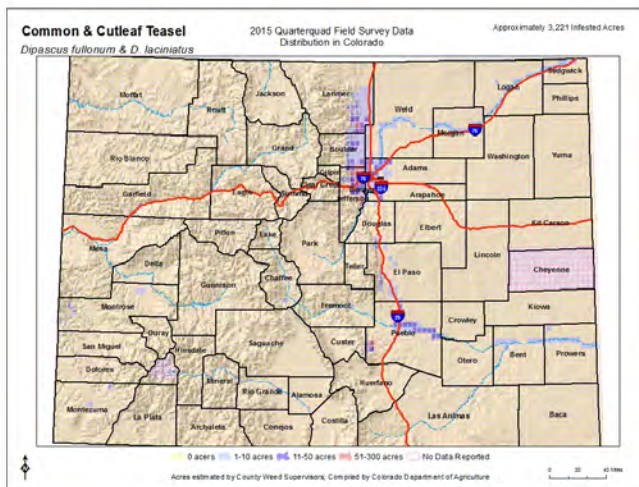


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2015 Quarter Quad Survey



Key ID Points

1. Long slender floral bracts extend beyond the top of the flower head.
2. Leaves are crinkled and have prickles.
3. Stems are stiff and have rows of prickles.

Integrated Weed Management Recommendations

Common teasel *Dipsacus fullonum* L.

Effective integrated management means using a variety of eradication methods along with restoration, prevention of seed production and dispersal, and monitoring. Maintain robust healthy native landscapes. Restore degraded sites. Avoid soil disturbance. Prevent seed production in the first and second year. Prevent seed from dispersing, e.g. contaminated equipment. Rest sites until restored. Change land use practices. Use methods appropriate for the site; disturbing wetlands, fens and riparian areas is generally not advised without proper training.



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CULTURAL CONTROL METHODS

Maintain or restore a competitive assemblage of forbs, cool and warm season grasses. Implement whole site restoration of soils, plants and water regimes where stands of common teasel exist. Use locally adapted species that are ecologically appropriate for the site to improve competitiveness (e.g. wetland plants or upland plants). Include annual as well as perennial species. Incorporate soil amendments, soil microbes and mycorrhizal fungi in restoration efforts. Minimize soil compaction and disturbance, especially in wetlands and moist soil. Acquire permits for wetland restoration, if required.



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BIOLOGICAL CONTROL METHODS

Common teasel is not palatable to domestic livestock in part because of the abundance of prickles. Properly managed grazing can improve vigor of desired species and indirectly reduce common teasel. There are no biological control agents for common teasel authorized in Colorado that would effectively control common teasel. For more information about biological control agents, visit the Colorado Department of Agriculture's Palisade Insectary website at <https://www.colorado.gov/pacific/agconservation/biocontrol>



© Lady Barbaras Garden, Pintrest

MECHANICAL CONTROL METHODS

Mechanical methods are best for infestations smaller than 0.5 acres; weigh this against other plants present, ecology and site condition. Sever roots below the soil surface during the first year before the plant stores energy, and in the second year before seed production. Mowing, chopping and deadheading stimulates more flower production; these methods require consecutive years of season-long treatments. Flower heads must be collected, bagged, and disposed of or destroyed; seeds will mature and germinate if left on the ground. Fire effects are unknown. Vegetation may not carry fire. Low severity prescribed fires may only kill the above ground vegetation, leaving roots and seeds unaffected. High severity prescribed fire may kill common teasel, but could damage native species and is not recommended.

CHEMICAL CONTROL METHODS

NOTE: The following are recommendations for herbicides that can be applied to pastures and rangeland. Rates are approximate and based on equipment with an output of 30 gal/acre. Follow the label for exact rates. Always read, understand, and follow the label directions. The herbicide label is the LAW!

HERBICIDE	RATE	APPLICATION TIMING
Metsulfuron (Escort XP)	1 oz. product/acre + 0.25% v/v non-ionic surfactant	Apply when in rosette or bolting growth stage. (Spring or fall rosettes, or early summer bolting)
Aminopyralid (Milestone)*	4-7 oz. product/acre (start with 7 oz.) + 0.25% v/v non-ionic surfactant	Apply when in rosette or bolting growth stage. Best choice of herbicide to use in riparian areas. (Spring or fall rosettes, or early summer bolting) *Not permitted for use in the San Luis Valley.
Imazapic (Plateau)	8-12 oz. product/acre + 2 pints/acre methylated seed oil	Apply when in rosette or bolting growth stage. Good choice of herbicide to use in riparian areas. (Spring or fall rosettes, or early summer bolting)
Aminocyclopyrachlor + chlorsulfuron (Perspective)*	4.75-8 oz. product/acre + 0.25% v/v non-ionic surfactant	Apply from the seedling to the bolting stage. IMPORTANT: Applications greater than 5.5 oz. product/acre exceeds the threshold for selectivity. DO NOT treat in the root zone of desirable trees and shrubs. Not for use on grazed or feed forage. *Product not permitted for use in the San Luis Valley.



Colorado Department of Agriculture - Conservation Services

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www.colorado.gov/ag/weeds



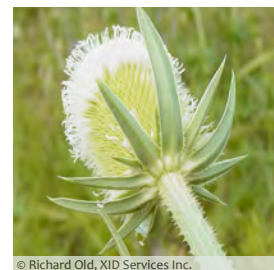


to common teasel, the bracts on cutleaf teasel are wider and generally shorter than the entire length of the flower head. Cutleaf teasel blooms from April through September and is cross-pollinated by hoverflies, bumblebees and about 40 other insects. Fruits are oblong, four-angled achenes. Each achene contains a single seed. A single teasel plant can produce over 2,000 seeds. Seeds remain viable for up to 14 years but generally are believed to germinate within a few seasons after seeds set. This species reproduces only by seed. Generally seeds remain close to the parent plant, however seeds have the ability to disperse in water, such as creeks, by animals such as birds or small mammals, or by humans. New plants tend to reoccupy the vacancy that parent plants left after dying.

Cutleaf teasel, *Dipsacus laciniatus* L., is a biennial forb, but under ideal growing conditions it may act as a short-lived perennial. Mature plants can grow over six feet tall. Cutleaf teasel has basal rosette leaves and stem leaves. First year basal leaves are conspicuously veined. Stem leaves are opposite but distinctly clasp the stem at the point of attachment to form a cup. Leaves have a lanceolate shape and a prominent white mid-rib that is lined with prickles. Leaf margins are deeply divided into narrow irregular segments. Stems are four-angled and have rows of prickles down the length of the stem. Flower heads are cream to white and bloom from the center of the head first. Individual flowers have a short four-lobed calyx and 4-lobed corolla. The green floral bracts are fused at the base, forming a cup. These bracts are linear to lanceolate shaped. They curve upward and are spine-tipped. In comparison

Cutleaf teasel is an aggressive exotic species that can out-compete native species. It can become a monoculture, and take over prairies and savannas once established. This species prefers moist soil conditions, such as fens, wetlands, riparian corridors, ditches, swales and roadsides that receive direct sun. It can also invade sunny dry upland sites, such as dryland pastures, abandoned fields, meadows and woodlands.

Restoration of infested and degraded sites and preventing seed production for consecutive multiple seasons are critical to eradicating cutleaf teasel. Monitoring sites post-treatment will be needed.



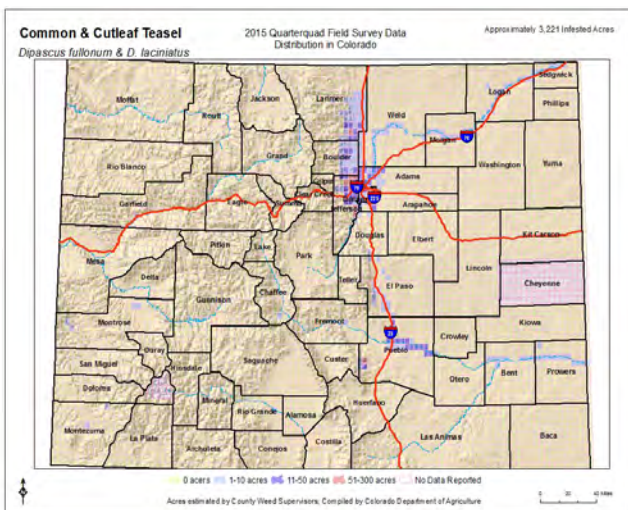
Cutleaf teasel

Dipsacus laciniatus L.

Key ID Points

1. Opposite stem leaves surround the stem and form a cup.
2. Leaves have a white mid-rib, are lined with prickles and deeply but irregularly lobed.
3. Floral bracts are wide, spine-tipped and shorter than the flower head.

2015 Quarter Quad Survey



Cutleaf teasel is designated as a “List B” species in the Colorado Noxious Weed Act. It is required to be eradicated; some populations may be contained or suppressed depending on state regulations. For management directions for each county, refer to the most recent Rule, or visit www.colorado.gov/ag/coweed-contacts for details.

Integrated Weed Management Recommendations

Cutleaf teasel *Dipsacus laciniatus* L.

Effective integrated management means using a variety of eradication methods along with restoration, prevention of seed production and dispersal, and monitoring. Maintain robust healthy pastures and native landscapes. Restore degraded sites. Avoid soil disturbance. As with most biennials, prevent seed production in the first and second year of growth. Prevent seed from dispersing, such as on contaminated equipment. Rest sites until they are effectively restored. Change land use practices. Use methods appropriate for the site.



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CULTURAL CONTROL METHODS

Maintain or restore a competitive assemblage of forbs, cool and warm season grasses. Implement whole site restoration of soils, plants and water regimes where stands of cutleaf teasel exist. Use locally adapted species that are ecologically appropriate for the site to improve competitiveness (e.g. wetland plants or upland plants). Include annual as well as perennial species. Incorporate soil amendments, soil microbes and mycorrhizal fungi in restoration efforts. Minimize soil compaction and disturbance, especially in wetlands and moist soil. Acquire permits for wetland restoration, if required.



© Sheep Sheephouse

BIOLOGICAL CONTROL METHODS

Cutleaf teasel is not palatable to domestic livestock in part because of the abundance of prickles. Properly managed grazing can increase vigor of desirable species and indirectly reduce cutleaf teasel. There are no biological control agents for cutleaf teasel authorized in Colorado that would effectively control cutleaf teasel. For more information about biological control agents, visit the Colorado Department of Agriculture's Palisade Insectary website at <https://www.colorado.gov/pacific/agconservation/biocontrol>



MECHANICAL CONTROL METHODS

Mechanical methods are best for infestations smaller than 0.5 acres; weigh this against other plants present, ecology and site condition. Sever roots below the soil surface during the first year before the plant stores energy and in the second year before seed production. Mowing, chopping and deadheading stimulates more flower production; these methods require consecutive years of season-long treatments. Flower heads must be collected, bagged, and disposed of or destroyed; seeds will mature and germinate if left on the ground. Fire effects are unknown. Vegetation may not carry fire. Low severity prescribed fires may only kill the above ground vegetation, leaving roots and seeds unaffected. High severity prescribed fire may kill cutleaf teasel, but could damage native species and is not recommended.

CHEMICAL

NOTE: The following are recommendations for herbicides that can be applied to pastures and rangeland. Rates are approximate and based on equipment with an output of 30 gal/acre. Follow the label for exact rates. Always read, understand, and follow the label directions. The herbicide label is the LAW!

HERBICIDE	RATE	APPLICATION TIMING
Metsulfuron (Escort XP)	1 oz. product/acre + 0.25% v/v non-ionic surfactant	Apply when in rosette or bolting growth stage. (Spring or fall rosettes, or early summer bolting)
Aminopyralid (Milestone)*	4-7 oz. product/acre (start with 7 oz.) + 0.25% v/v non-ionic surfactant	Apply when in rosette or bolting growth stage. Best choice of herbicide to use in riparian areas. (Spring or fall rosettes, or early summer bolting) *Not permitted for use in the San Luis Valley.
Imazapic (Plateau)	8-12 oz. product/acre + 2 pints/acre methylated seed oil	Apply when in rosette or bolting growth stage. Good choice of herbicide to use in riparian areas. (Spring or fall rosettes, or early summer bolting)
Aminocyclopyrachlor + chlorsulfuron (Perspective)*	4.75-8 oz. product/acre + 0.25% v/v non-ionic surfactant	Apply from the seedling to the bolting stage. IMPORTANT: Applications greater than 5.5 oz. product/acre exceeds the threshold for selectivity. DO NOT treat in the root zone of desirable trees and shrubs. Not for use on grazed or feed forage. *Product not permitted for use in the San Luis Valley.



Colorado Department of Agriculture - Conservation Services

305 Interlocken Parkway

Broomfield, CO 80021

(303) 869-9030

www.colorado.gov/ag/weeds

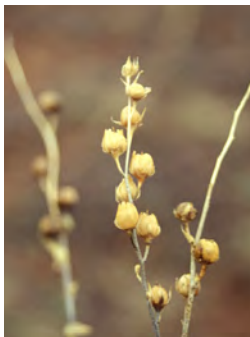


Dalmatian toadflax

Colorado Department of
Agriculture

305 Interlocken Pkwy
Broomfield, CO 80021

(303) 869-9030
weeds@state.co.us



Key ID Points

1. Showy yellow snapdragon-like flowers with an orange throat on elongated racemes.
2. Thick, waxy, bluish heart-shaped leaves that wrap the stem.

Dalmatian toadflax Identification and Management



Identification and Impacts

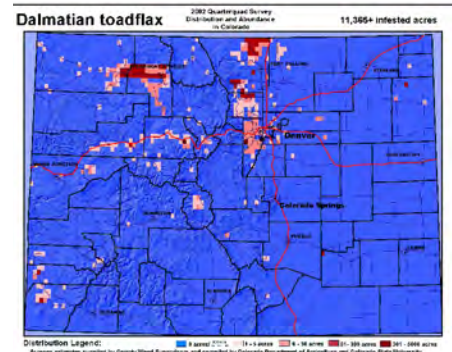
Dalmatian toadflax (*Linaria dalmatica*) is a non-native, perennial forb introduced from the Mediterranean region as a folk remedy, fabric dye and ornamental. It reproduces both by seed and by extensive, creeping rhizomes. A single plant produces 500,000 seeds, most of which fall within 18 inches of the parent plant. Seeds can remain viable for at least 10 years. Dalmatian toadflax grows to 3 feet, and has bright yellow snapdragon-like flowers with an orange throat on elongated racemes. The alternate leaves are broad, with a thick, waxy cuticle and a bluish cast. Each leaf is heart-shaped and wraps the stem.

Habitats for Dalmatian toadflax include disturbed open sites, fields, pastures, rangeland, roadsides, cropland and forest clearings. Infestations can begin in small disturbed sites, then spread even to rangeland and wildlife habitats in excellent condition. Dalmatian toadflax is a highly aggressive plant that can genetically adapt to varied environmental conditions and herbicide controls. Its extreme competitiveness is due to early spring regeneration from vegetative buds on roots that are not dependent on soil moisture or native plant competition. Once established, toadflax quickly overruns native plants and becomes

a monoculture that severely reduces forage, productivity, biodiversity and wildlife habitat.

The key to effective control of Dalmatian toadflax is prevention and integrating as many management strategies as possible. Prevention is always desirable when dealing with Dalmatian toadflax. Early detection and eradication can keep populations from exploding, making more management options available. With the plants varying genetically using many different approaches is important such as; chemical, mechanical, cultural and biological methods. Details on the back of this sheet can help to create a management plan compatible with your site ecology.

Dalmatian toadflax is designated as a "List B" species in the Colorado Noxious Weed Act. It is required to be either eradicated, contained, or suppressed depending on the local infestations. For more information visit www.colorado.gov/ag/csd and click on the Noxious Weed Management Program. Or call the State Weed Coordinator at the Colorado Department of Agriculture, Conservation Services Division, 303-239-4100.



Clockwise, from lower left, photos © John M. Randall of The Nature Conservancy; and Linda Wilson and Susan Turner of Invasive.org. Infestation map by Crystal Andrews, Colorado Department of Agriculture.

Linaria dalmatica

**CULTURAL**

It is imperative to seed managed areas with competitive grasses such as thickspike wheatgrass and streambank wheatgrass. The combination of herbicide spraying and seeding competitive grasses controls Dalmatian toadflax better than spraying alone. (K.G. Beck, CSU)

**BIOLOGICAL**

Calophasia lunula, a predatory noctuid moth, feeds on leaves and flowers of Dalmatian toadflax. *Eteobalea intermediella*, a root boring moth, and *Mecinus janthinus*, a stem boring weevil, are also available. For more information, contact the Palisade Insectary of the Colorado Department of Agriculture at 970-464-7916.

**MECHANICAL**

For small infestations, pulling toadflax by hand can be effective. Pull every year for 5 to 6 years to deplete the reserves of the root system. Monitor the site for 10 - 15 years to remove seedlings produced from dormant seeds.

Integrated Weed Management:

Because of the high genetic variability of the toadflax species, it is critical to integrate as many management strategies as possible into the control program. Two local populations may respond differently to the same herbicides.

Keys to management are to prevent seed formation and vegetative spread by roots.

Controlling toadflaxes is expensive and difficult, prevention is the best option.

HERBICIDES

NOTE: The following are recommendations for herbicides that can be applied to range and pasturelands. Rates are approximate and based on equipment with an output of 30 gal/acre. Please read label for exact rates. **Always read, understand, and follow the label directions. The herbicide label is the LAW!**

Herbicide	Rate	Application Timing
Aminocyclopyrachlor + chlorsulfuron (Perspective)*	4 oz. product/acre + 1% v/v methylated seed oil	Apply <u>when flowering</u> in spring and/or in the fall regrowth. IMPORTANT: Applications greater than 5.5 oz. product/acre exceeds the threshold for selectivity. DO NOT treat in the root zone of desirable trees and shrubs. Not for use on grazed or feed forage.
Picloram* (Tordon/Picloram 22K - Restricted use pesticide)	1-2 qts./acre + 1% v/v methylated seed oil	Apply <u>when flowering</u> in spring and/or in the fall regrowth. DO NOT use near trees, desirable shrubs, water, or high water table.
Chlorsulfuron** (Telar)	1.5-2 oz./acre + 1% v/v methylated seed oil	Apply <u>when flowering</u> in spring and/or in the fall regrowth.

Note: *Not permitted for use in the San Luis Valley. **This herbicide has residual soil activity that will affect all broadleaf seedlings germinating after application has occurred.

Additional herbicide recommendations for this and other species can be found at:
www.colorado.gov/agconservation/CSUHerbicideRecommendations.pdf

Dalmatian toadflax





© Melissa McCormick, City of Colorado Springs

Dame's rocket (*Hesperis matronalis* L.) is a perennial plant in the Brassicaceae family, also known as dame's violet, mother-of-the-evening.

Mature plants range from one to three feet tall. The erect stems are sparingly branched with simple or forked hairs, but sometimes glabrous (Francis et al. 2009). Basal rosette leaves range from entire to dentate. Alternate stem leaves range from lanceolate with a narrowly acute apex and acute base on the upper stem, to ovate-lanceolate with a broad apex and a long petiolate base on the lower stem. Stem leaves have toothed margins and the leaf surface is pubescent. Its fibrous lateral roots are usually shallow, especially in compacted soil, such as roadsides (Francis 2009).

Like all mustards, the bisexual flowers have four separate petals symmetrically arranged. Petals range in color

from white to fuchsia, and are lollipop in shape- oval on top with long linear tail that creates the appearance of a tubular type arrangement. Four tall stamens and two short stamens surround a superior ovary with two united carpels. Similar to the petals, there are four sepals and they look tubular, though they are separate. Sepals are pubescent with perpendicular hairs. The inflorescence is arranged in a loose to corymbiform raceme, that in total, can be up to 30 cm long and erect. In Colorado, flowers bloom from mid May to mid July. Like all plants in the Brassicaceae family, seeds are the key to confirm the species' identity. The silique seed pods are narrow and from 6 to 14 cm long with one row of 20 to 35 seeds in each silique (Francis et al. 2009). Wingless seeds range from 3 to 4 mm long to 1 to 1.5 mm wide. The seedbank likely does not persist, but there are no empirical studies about seed longevity (Francis 2009). Reproduction is only by seed (Francis et al. 2009).

Although the flower is pollinated by a variety of day and night pollinators, the strong dusk-time fragrance of flowers most successfully allures syrphid fly pollinators (Majetic et al. 2009). However it appears that daytime pollination doubles seed production compared to nighttime pollination (Francis et al. 2009).

From a distance, dame's rocket is often confused with garden phlox (*Phlox paniculata*) and fireweed (*Chamaenerion angustifolium*) due to flower color and similar gestalt. Common garden phlox

has five fused petals that form a tubular corolla, five sepals, five stamens, one pistil with a superior ovary and opposite narrowly elliptic leaves that are hairless. Fireweed's flower has four broad fuchsia petals and four linear sepals of a similar color and stamens with red anthers and white vein.

In Colorado, it is found mainly in urban and suburban, disturbed areas, wet and alkaline soils.



© Minnesota Wildflowers



© Minnesota Wildflowers



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Dame's Rocket

Hesperis matronalis L.

dame's rocket
Hesperis matronalis

2016 Statewide Distribution in Colorado
Based on 2016 Quarterquad and EDDMapS Field Survey Data
Approximately 583 Infested Acres



Acres estimated by County Weed Supervisors and Other Data Sources. Compiled by Colorado Department of Agriculture
Department of Agriculture
Colorado
0 acres 1-10 acres 11-50 acres
Scale: 0 20 40 Miles

Key ID Points

1. Four petals, four sepals, four tall and two stamens
2. Alternate lanceolate leaves, some petiolate, hairy stems & leaves
3. Silique with single row of seeds
4. Fibrous lateral roots

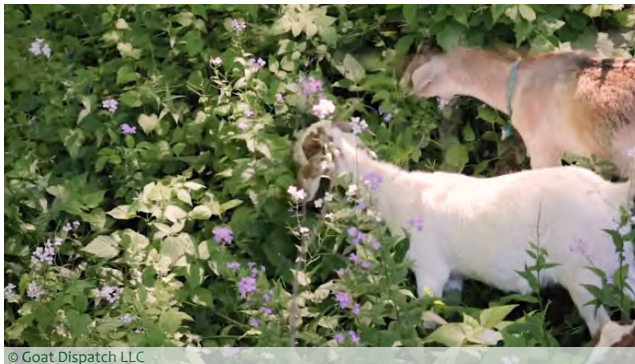
Integrated Weed Management Recommendations

Effective integrated management means using a variety of eradication methods in the same site along with restoration, prevention of seed production and dispersal, and monitoring. Maintain robust healthy native landscapes. Restore degraded sites. Avoid soil disturbance. Prevent seed production and seeds from dispersing, e.g. on contaminated equipment. Rest sites until restored. Modify land use practices. Use methods appropriate for the site and land uses.



CULTURAL

Dame's rocket has the uncanny ability to maximize use of nitrogen and especially high water availability to outcomplete and suppress native plants (Hwang and Laurenroth 2008). This remains even if one plant is present, if it is a seedling, or if natives are adults (Hwang and Laurenroth 2008). Thus, cultural methods should follow after integrating other methods. Implement whole site restoration of soils, plants and water regimes where dense colonies of dame's rocket exist. Use locally adapted species that are ecologically appropriate for the site, including annuals, perennials, shrubs, forbs, cool and warm season grasses. Do not add nitrogen or water. Give natives soil microbes and mycorrhizal fungi. Minimize disturbance. Choose garden phlox or the native fireweed for gardens and ornamental settings instead.



BIOLOGICAL

Dame's rocket is palatable to domestic goats. No information is available about targeted grazing using other livestock. Target grazing early in growing season and repeat entries through the season and years as control. There are no biological control agents for dame's rocket authorized in Colorado that would effectively control it. For more information about biological control agents, visit the Colorado Department of Agriculture's Palisade Insectary website at: www.colorado.gov/ag/biocontrol



MECHANICAL

When dame's rocket density is high, it will bolt and reproduce early (Rothfels et al. 2002). So timing mechanical methods should be based on density-dependent behaviors. Mechanical methods are best for residential areas, small infestations or seedlings. Remove as much of the lateral root mass as possible early in the season before the plant stores energy and produces seed. Mowing, chopping and deadheading leaves roots and chlorophyll structures behind, stimulates more flower production and allows energy storage; these methods require consecutive years of season-long treatments. Mowing disperses flowers and seeds, and expands the infested area. Collect and bag flowers; seeds germinate if left. Low severity prescribed fire may damage above ground vegetation, leaving roots and seeds unaffected. High severity prescribed fire may top kill plants and seeds.



CHEMICAL

NOTE: Herbicide recommendations to control dame's rocket in pastures and rangeland are found at: <https://goo.gl/TvWnv9> Rates are approximate and based on equipment with an output of 30 gal/acre. Follow the label for exact rates. Consult local turf and ornamental experts for herbicides appropriate for residential settings. Always read, understand, and follow the label directions. The herbicide label is the LAW!

Dame's rocket

Hesperis matronalis L.



Colorado Department of Agriculture - Conservation Services

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www.colorado.gov/ag/weeds

Colorado
State
University

Diffuse knapweed

Colorado Department of
Agriculture

305 Interlocken Pkwy
Broomfield, CO 80021

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weeds@state.co.us



Key ID Points

1. Floral bracts have yellow spines with teeth appearing as a comb and a distinct terminal spine.
2. Flowers are white or lavender.
3. Seedlings have finely divided leaves

Diffuse knapweed Identification and Management



Identification and Impacts

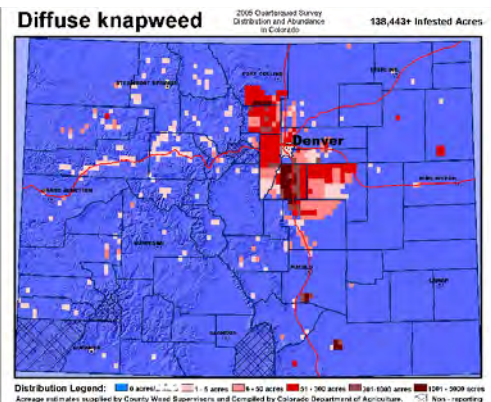
Diffuse knapweed (*Centaurea diffusa*) is a non-native biennial forb that reproduces solely by seed. A biennial is a plant that completes its lifecycle within two years. During the first year of growth, diffuse knapweed appears as a rosette in spring or fall. During the second year in mid to late spring – the stem bolts, flowers, sets seed, and the plant dies. Once the plant dries up, it breaks off at ground level and becomes a tumbleweed which disperses the still viable seeds over long distances. A prolific seed producer, diffuse knapweed can produce up to 18,000 seeds per plant. Therefore, the key to managing this plant is to prevent seed production. Diffuse knapweed can grow 1 to 3 feet tall, and is diffusely branched above ground. This gives the plant a ball-shaped appearance and tumble-weed mobility when broken off. Leaves are small, and are reduced in size near the flowering heads. Flowers are mostly white, sometimes purple, urn-shaped, and are located on each branch tip. Bracts that enclose the flowerheads are divided like the teeth of a comb, and are tipped with a distinct slender spine. Upon drying, the bracts become rough, rendering them injurious to the touch. Flowers bloom July through August. Seed set usually occurs by mid-August.

Diffuse knapweed tends to invade disturbed, overgrazed areas. Other habitats may also include rangeland, roadsides, riparian areas, and trails. It is a tough competitor

on dry sites and rapidly invades and dominates disturbed areas. Once established, diffuse knapweed outcompetes and reduces the quantity of desirable native species such as perennial grasses. As a result, biodiversity and land values are reduced, and soil erosion is increased.

The key to effective control of Diffuse knapweed is to prevent the plant from flowering and going to seed. An integrated weed management approach dealing with Diffuse knapweed is highly recommended. There are many options of mechanical, chemical, and biological controls, available. Details on the back of this sheet can help to create a management plan compatible with your site ecology.

Diffuse knapweed is designated as a "List B" species on the Colorado Noxious Weed Act. It is required to be either eradicated, contained, or suppressed depending on the local infestations. For more information, visit www.colorado.gov/ag/csd and click on the Noxious Weed Program link or call the State Weed Coordinator at the Colorado Department of Agriculture, Conservation Services Division at 303-239-4100.



Plant photo, top © Kelly Uhing. Infestation map above, Crystal Andrews. Flower photo © Cindy Roche. Rosette and leaf photos © Dale Swenarton.

Centaurea diffusa

**CULTURAL**

Establishment of selected grasses can be an effective cultural control of diffuse knapweed. Contact your local Natural Resources Conservation Service for seed mix recommendations. Maintain healthy pastures and prevent bare spots caused by overgrazing. Bareground is prime habitat for weed invasions.

**BIOLOGICAL**

The seedhead weevil (*Larinus minutus*) and the root weevil fly (*Cyphocleonus achates*) provide fair to good control when used in combination with each other. Expect to wait at least 3 to 5 years for the insects to establish and achieve optimum results. This is an option for large infestations. To obtain the insects, contact the Colorado Department of Agriculture, 970-464-7916.

**MECHANICAL**

Any mechanical or physical method that severs the root below the soil surface will kill diffuse knapweed. Mowing or chopping is most effective when diffuse knapweed plants are at full-bloom. Be sure to properly dispose of the flowering cut plants, since seeds can mature and become viable after the plant has been cut down.

Integrated Weed Management:

Diffuse knapweed is best controlled in the rosette stage. It is imperative to prevent seed production. Do not allow diffuse knapweed flowers to appear. Management must be persistent in order to deplete the seed bank in the soil.

HERBICIDES : The following are recommendations for herbicides that can be applied to range and pasturelands. Always read, understand, and follow the label directions. Rates are approximate and based on equipment with an output of 30 gal/acre. Please read label for exact rates. **The herbicide label is the LAW!**

Herbicide	Rate	Application Timing
Aminocyclopyrachlor + chlorsulfuron (Perspective)*	4.75-8 oz. product/acre + 0.25% non-ionic surfactant	Pre-emergence or from seedling to mid-rosette stage. IMPORTANT: Applications greater than 5.5 oz. product/acre exceeds the threshold for selectivity. DO NOT treat in the root zone of desirable trees and shrubs. Not for use on grazed or feed forage.
Aminopyralid* (Milestone)	5-7 oz./acre + 0.25% non-ionic surfactant	Spring at rosette to early bolt stage and/or in the fall to rosettes. Add 1 qt./acre 2,4-D or 3 oz. Perspective when treating in the bolting to flowering growth stages.
Clopyralid (Transline)	0.67-1.33 pints/acre + 0.25% non-ionic surfactant	Apply to spring/fall rosettes before flowering stalk lengthens. Add 1 qt./acre 2,4-D when treating in the bolting to flowering growth stages.

Note: *Not permitted for use in the San Luis Valley.

Additional herbicide recommendations for this and other species can be found at: www.colorado.gov/agconservation/CSUHerbicideRecommendations.pdf

Diffuse knapweed





©James Bailey, iNaturalist

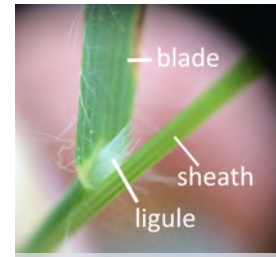
Cheatgrass (*Bromus tectorum* L.) is a winter annual grass in the Poaceae family, also known as downy brome.

Mature plants reach up to 24 inches tall. The stems are smooth but the leaf blades and sheath are hairy (downy). The ligules are fringed, short and membranous. The culms range from five to 90 cm long, can be prostrate or vertical, and have fine short hairs. Its fibrous roots can be up to 60 inches long, but the majority of root biomass is within first 12 inches of the soil surface. Roots are efficient at absorbing soil moisture, allowing cheatgrass to grow quickly early in season, while other plants are still dormant. Green up can occur twice per season. Cheatgrass has an unique spectral signature during seed set and senescence when it turns reddish purple. During these shoulder growing season events, it is easily detectable from other vegetation with satellite imagery.

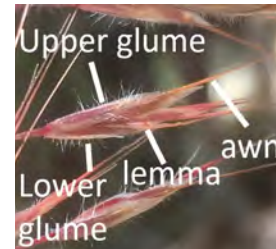
The flower is a simple one-sided panicle that characteristically flops over and hangs, branches and is open. Spikelets are usually terminal. Usually there are five to many florets; it has perfect flowers. The upper and lower glumes are usually unequal in length and shorter than florets; the lower glume ranges from 4 to 14 mm in length and is one veined. The upper glume is three-veined. The plant disarticulates above the glumes. The lemmas are usually downy, narrowly lanceolate with sharp tips and about 9 to 12 mm long. Usually there are five to many lemmas. Awns are usually present and range from 10 to 18 mm long. It is a prolific seed producer, capable of two seed crops per season. Seeds need to be buried in soil or litter and have fall moisture to germinate. The fall seed crop has greater reproductive success than spring. Seeds lack dispersal anatomy so fall close to parent plants but transport readily with animals, people and equipment. Seed longevity is about three years. Both inbreeding and cross breeding occur.

Cheatgrass is one of the most competitive non-natives in the Western US. It thrives in arid, semi arid, and cold environments. Colorado's high elevation range is not an issue for cheatgrass; plants were recently detected as high as 9,500 feet. It exhibits phenotypic plasticity and genetic diversity, making it highly adaptable to a variety of conditions, likely due to multiple introductions. Its presence has significant negative impacts throughout the West. Most notably, it alters fire regimes and thus engineers a positive fire feedback loop that favors its growth over other plants. This feedback loop is why cheatgrass forms monocultures throughout the West.

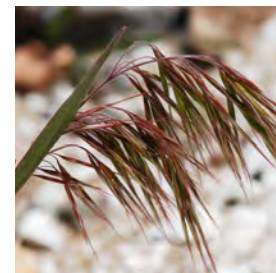
It is often confused with Japanese brome (*Bromus japonicus*), which has denser more compact spikelets, shorter awns, and changes from green to gold through the growing season.



© Priyantha Wijesinghe, iNaturalist



© Veronika Johansson, iNaturalist



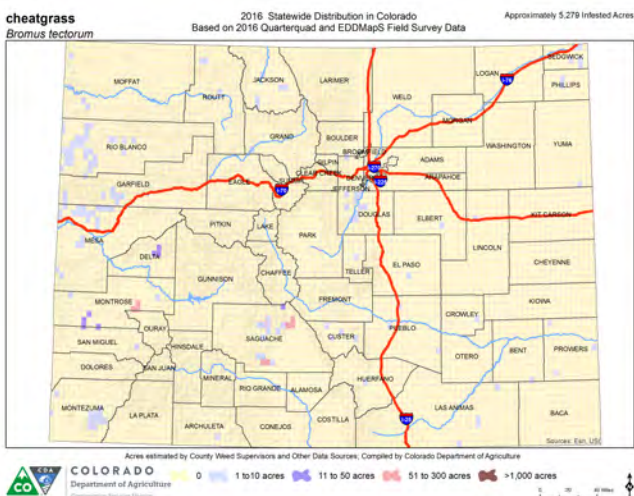
© Leslie J. Mehrhoff, University of CT

Cheatgrass

Bromus tectorum L.

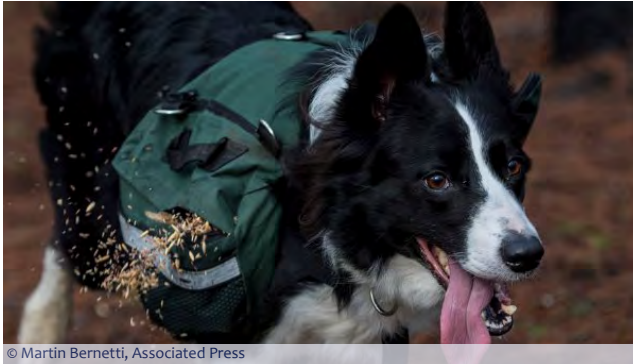
Key ID Points

1. Downy leaf blades, sheaths, ligules
2. Glumes are unequal size, lemmas are downy
3. One-sided panicle that droops, red-purple during seed set & senescence
4. Fibrous roots



Integrated Weed Management Recommendations

Effective integrated management means using a variety of eradication methods in the same site along with restoration, prevention of seed production and dispersal, and monitoring. Maintain robust healthy native landscapes. Restore degraded sites. Avoid soil disturbance. Prevent seed production and seed dispersal, e.g. on contaminated equipment. Rest sites until restored. Modify land use practices. Use methods appropriate for the site, including land use practices.



© Martin Bernetti, Associated Press



© Bureau of Land Management

CULTURAL

Biological soil crust is a soil health indicator of arid and semi arid sites; crusts inhibit cheatgrass seed germination. Aerial spread and cultivate soil crust where it is absent. Aerial and drill seeding bluebunch wheatgrass (*Pseudoroegneria spicata*) and Sandberg bluegrass (*Poa secunda*) with vesicular-arbuscular mycorrhizae; these are drought tolerant natives that are highly competitive against cheatgrass but require mycorrhizae. As these grasses establish and cheatgrass wanes slowly introduce additional species such as thickspike wheatgrass (*Elymus lanceolatus*), winterfat (*Krascheninnikovia lanata*), yarrow (*Achillea millefolium*) in the plant interspaces in subsequent years. Be cautious when purchasing seed as cheatgrass is often a contaminate, especially in mixes. Use seed pillows to disperse seeds.



© Stacy Litz, Associated Press

BIOLOGICAL

Sheep and cattle will select green cheatgrass which also affects desired cool-season grasses. Properly managed grazing can improve vigor of desired species and directly reduce cheatgrass. Post-fire grazing management varies depending on site potential and objectives. Currently there are no biological control agents for cheatgrass authorized in Colorado. For more biocontrol information, visit the Colorado Department of Agriculture's Palisade Insectary website at: www.colorado.gov/ag/biocontrol

MECHANICAL

Mechanical methods are best for residential areas and small infestations. Mowing and chopping are not recommended; they leave roots behind, stimulate flower production, disperse seeds, and expand the size of the infested area. Collect, bag, and dispose of or destroy flowers; seeds can mature and germinate if left. Tilling must be deeper than 6 inches to work. Prescribed fire applied before seed maturity, (late spring or early summer), may kill seeds; the trick is to get green cheatgrass and litter to carry fire and at a hot enough temperature to destroy seeds and seedlings. Always combine prescribed fire with cultural methods, timed appropriately, and base it on site conditions and other plants present. Monitoring and adaptive management are critical if prescribed fire is used as a tool for control.



© Helena Weed Control, Rocky Mountain Elk Foundation

CHEMICAL

Pseudomonas fluorescens D7 inhibits cheatgrass and is currently approved by EPA and Colorado. NOTE: Herbicide recommendations to control cheatgrass in pastures and rangeland are found at: <https://goo.gl/TvWnv9>. Rates are approximate and based on equipment with an output of 30 gal/acre. Follow the label for exact rates. Consult local turf and ornamental experts for residential settings. Always read, understand, and follow the label directions. The herbicide label is the LAW!

Cheatgrass

Bromus tectorum L.



Colorado Department of Agriculture - Conservation Services

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(303) 869-9030

www.colorado.gov/ag/weeds



Field bindweed

Colorado Department of
Agriculture

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Broomfield, CO 80021

(303) 869-9030
weeds@state.co.us



Key ID Points

1. Leaves are shaped like arrowheads.
2. Flowers are funnel-shaped, white to pink, and have two small bracts one inch below the flower base.

Field bindweed Identification and Management



Identification and Impacts

Field bindweed (*Convolvulus arvensis*) is a non-native deep-rooted perennial that reproduces from seed and creeping, horizontal roots (rhizomes). Field bindweed stems are prostrate (grows low to the ground) and twining, and grow up to 6 feet long. Leaves are distinguishable by their arrowhead shape. The flowers are bell or trumpet-shaped, white to pink in color, and are about 1 inch long. Field bindweed seeds can remain viable in the soil for up to 40 years.

Field bindweed emerges from its root system in the spring. Flowering occurs from June to September and until the first fall frost. The number of seeds produced per plant ranges from 25 to 300 and seed production is variable depending on environmental conditions. Field bindweed is an extremely difficult noxious weed to control because, in part, of its taproot that may go 20 feet deep into the soil, and which repeatedly gives rise to numerous long rhizomes.

Field bindweed is a problem throughout Colorado. It is one of the most competitive perennial weeds. It is widespread in cultivated areas, pastures, lawns, gardens, roadsides, and waste areas from 4,000 to 8,000

feet in elevation.

To successfully manage field bindweed, containment and persistence in controlling existing stands are necessary in order to exhaust the root system and deplete the soil seed bank. This weed needs to be continually stressed, forcing it to exhaust root nutrient stores and eventually die. Of all control methods, prevention is most important. Maintain healthy pastures and rangeland and continually monitor your property for new infestations. A healthy cover of desirable perennial plants will assist in discouraging field bindweed establishment.

Field bindweed is designated as a "List C" species on the Colorado Noxious Weed Act. It is required to be either eradicated, contained, or suppressed depending on the local jurisdictions managing this species.

On the back of this sheet are field bindweed management recommendations. For more information, visit www.ag.state.co.us/csd/csdhome.html. Or call the State Weed Coordinator at the Colorado Department of Agriculture, Conservation Services Division, 303-239-4100.



White flower © Mary Ellen Harte, Invasive.org.
All other photos © Kelly Uhing.

Convolvulus arvensis

**CULTURAL**

Establishment of selected grasses can be an effective cultural control of field bindweed. Contact your local Natural Resources Conservation Service for seed mix recommendations. Maintain healthy pastures and prevent bare spots caused by overgrazing. Bareground is prime habitat for **weed invasions**.



Bindweed mite damage

BIOLOGICAL

The bindweed gall mite, *Aceria mahlerbae*, has proven to be effective in reducing field bindweed infestations. This is an option for large infestations. To obtain a mite release, contact the Colorado Department of Agriculture, 970-464-7916.

**MECHANICAL**

Cutting, mowing, or pulling has a negligible effect unless the plants are cut below the surface in the early seedling stage. Well-established populations have a large seed bank in the soil that can remain viable for over 40 years.

Integrated Weed Management:

Field bindweed requires active management once it is established because of its potential to regenerate rapidly. Even small infestations should be viewed as a serious threat and managed aggressively.

Contain and persistently control infestations in order to exhaust the root system and deplete the soil seed bank.

Maintain a healthy cover of perennial plants to discourage field bindweed establishment.

HERBICIDES: The following are recommendations for herbicides that can be applied to range and pasturelands. *Rates are approximate and based on equipment with an output of 30 gallons per acre. Please read label for exact rates. Always read, understand, and follow the label directions. The herbicide label is the LAW!*

HERBICIDE	RATE	APPLICATION TIMING
Clarity + 2,4-D Amine	1 qt./acre or 1 oz/gal water	Just after full-bloom and/or fall. DO NOT apply near or under trees/shrubs or where soils have rapid permeability. DO NOT apply when outside temperatures will exceed 85 degrees. Add non-ionic surfactant @ 0.32oz/gal water or 1 qt/100 gal water.
Tordon 22K *this is a Restricted Use Pesticide*	1 qt./acre or 1 oz/gal water	Just after full-bloom and/or fall. DO NOT apply near or under trees/shrubs or where soils have rapid permeability. Add non-ionic surfactant @ 0.32oz/gal water or 1qt/100 gal water.
Roundup Ultra *non-selective herbicide, will kill all vegetation*	4 - 5 qts./acre or 4 - 5 oz/gal water	Apply at full-bloom and/or fall. Add non-ionic surfactant @ 0.32oz/gal water or 1qt/100 gal water. Use caution when applying near grasses or other desirable vegetation.

Field bindweed

Hoary cress

Colorado Department of
Agriculture

305 Interlocken Pkwy
Broomfield, CO 80021

(303) 869-9030
weeds@state.co.us



Key ID Points

1. White flowers.
2. Grows erect 10-24" in height.
3. Leaf is 3/4-4" long with blunt end and fine white hairs.

Hoary cress Identification and Management

well on alkaline soils.



Identification and Impacts

Hoary cress (*Lepidium draba*) commonly known as whitetop, is a creeping perennial that is a member of the mustard family and native to Europe. The stems, in the rosette stage, may grow up to 2 inches in height and produce grayish-green leaves that are lance shaped. The leaves are alternate and 3/4 to 4 inches long. The upper leaves have 2 lobes that clasp the stem. The plant has numerous small, white flowers with 4 petals on stalks radiating from a stem. Seed capsules are heart-shaped with two small, flat, reddish brown seeds. One plant can produce from 1,200 to 4,800 seeds. The plants emerge in early spring with stems emerging from the center of each rosette in late April. Hoary cress flowers from May to June and plants set seed by mid-summer.

Habitats for Hoary Cress include: fields, waste places, meadows, pastures, croplands and along roadsides. It is typically found on unshaded, generally open areas of disturbed ground. It generally does better with moderate amounts of precipitation and grows

The key to effective control of Hoary cress is prevention. Preventing the encroachment of these weeds is the most cost-effective management. Preventing invasions by limiting seed dispersal, monitoring and using weed free hay, and quarantine animals that may have grazed in infested areas. Beyond prevention, the key is early detection when infestations are small, and aggressive management. Integrated Weed Management is required for proper control. Details on the back of this sheet can help to create a management plan compatible with your site ecology.

Hoary cress is designated as a "List B" species in the Colorado Noxious Weed Act. It is required to be either eradicated, contained, or suppressed depending on the local infestations. For more information visit www.colorado.gov/ag/weeds and click on the Noxious Weed Management Program. Or call the State Weed Coordinator at the Colorado Department of Agriculture, Conservation Services Division.



Photos © Kelly Uhing, Colorado Department of Agriculture; Mark Schwarzlander, University of Idaho, Above map: Crystal Andrews, Colorado Department of Agriculture,

Lepidium draba

**CULTURAL**

Prevent the establishment of new infestations by minimizing disturbance and seed dispersal, eliminating seed production and maintaining healthy native communities. Contact your local Natural Resources Conservation Service for seed mix recommendations. Planting competitive legumes, such as alfalfa, can reduce Hoary cress in crop rotations.

**BIOLOGICAL**

There is no biological control available for Hoary cress. Since biological control agents take years to research, develop and release, no releases are expected in the foreseeable future. For more information, contact the Palisade Insectary of the Colorado Department of Agriculture at 970-464-7916.

**MECHANICAL**

Mowing several times before the plants bolt stresses Hoary cress and forces the plant to use nutrient reserves stored in the root system. Combining mowing with herbicides will further enhance control of this weed. Mow repeatedly during the summer, then apply a herbicide in the fall.

Integrated Weed Management:

No single treatment provides effective, long term control. The best and first defense is always prevention. Once established, integrate a variety of combinations of competitive planting, crop rotations, and herbicides. This can reduce Hoary cress to manageable levels.

HERBICIDES

NOTE: The following are recommendations for herbicides that can be applied to range and pasturelands. Rates are approximate and based on equipment with an output of 30 gal/acre. Please read label for exact rates. Always read, understand, and follow the label directions. The herbicide label is the LAW!

Herbicide	Rate	Application Timing
Chlorsulfuron* (Telar)	1 oz. product/acre + 0.25% v/v non-ionic surfactant	Apply at flowering. (Early spring to early summer)
Metsulfuron (Escort XP)	1 oz. product/acre + 0.25% v/v non-ionic surfactant	Apply at flowering. (Early spring to early summer)
Imazapic (Plateau, Panoramic)	12 oz./acre + 2 pints/acre methylated seed oil or crop oil concentrate	Apply at late flower to post-flower growth stage. (Late spring to mid-summer)

Note: *This herbicide has residual soil activity that will affect all broadleaf seedlings germinating after application has occurred.

Additional herbicide recommendations for other species can be found at:
www.colorado.gov/agconservation/CSUHerbicideRecommendations.pdf

Hoary cress

Hoary cress

Colorado Department of
Agriculture

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Photos © Kelly Uhing, Colorado Department of Agriculture; Mark Schwarzlander, University of Idaho, Above map: Crystal Andrews, Colorado Department of Agriculture,

Lepidium draba

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Note: *This herbicide has residual soil activity that will affect all broadleaf seedlings germinating after application has occurred.

Additional herbicide recommendations for other species can be found at:
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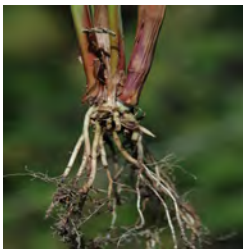
Hoary cress

Johnsongrass

Colorado Department of
Agriculture

305 Interlocken Pkwy
Broomfield, CO 80021

(303) 869-9030
weeds@state.co.us



Key ID Points

Identification and Management



Identification and Impacts

Johnsongrass (*Sorghum halpense*) is a perennial grass native to the Mediterranean region. The erect stems of this grass grows to be 2 to 8 feet tall and they are generally solid. At the base of the stalks they are reddish pink in color. Leaves of this grass range from 6 to 20 inches long and are 1/2 to 1 inch wide. The blades are flat with a very distinctive white midvein with maturity. The ligules of the plant are membranous and are surrounded with fine hairs. The inflorescence of Johnsongrass are a large open panicle, reddish to purple in color. The spikelets of the panicle are generally awn-tipped and shiny. Not all spikelets will contain awns, but the awns that are present can be bent and needle-like. Johnsongrass reproduces by seed and a thick fibrous rhizomes.

Habitats for Johnsongrass include; crop fields, hay fields, roadsides, fence rows, and waste areas. Originally introduced as a hay or forage crop, and thought to be a warm season grass, it has adapted in cooler climates. When found in areas that may frost or become moisture stressed, Johnsongrass becomes toxic

to livestock. It produces hydrocyanic acid, which can cause livestock's cells to lose the ability to utilize oxygen, similar to cyanide poisoning.

The key to effective control of Johnsongrass is the establishment and to minimize disturbance in areas susceptible to infestation. Using an integrated approach to control population of already established plant infestations can be an effective management tool. Depending on size of the infestation chemical, cultural and mechanical control options are useful. Details on the back of this sheet can help to create a management plan compatible with your site ecology.

Johnsongrass is designated as a "List C" species on the Colorado Noxious Weed Act. It is required to be either eradicated, contained, or suppressed depending on the local jurisdictions managing this species. For more information, visit www.colorado.gov/ag/weeds or call the State Weed Coordinator at the Colorado Department of Agriculture, Conservation Services Division, 303-239-4100.



Photos © (First 2) Chris Evans, River to River CWMA; Steve Dewey, Utah State University; Charles Bryson, USDA Agricultural Research Services; Bonnie Harper-Lore, Federal Highway Administrations; All Bugwood.org

Sorghum halpense

**CULTURAL**

Maintaining a healthy rangeland or pasture can help prevent the establishment of Johnsongrass. Planting native grasses and forbs to outcompete the grass can assist in control. For specific seed recommendations contact your local Natural Resources Conservation Services for seed mixes.

**BIOLOGICAL**

Currently there is not any biocontrol available for Johnsongrass. Biocontrol takes many years of research and development. For more information, please contact the Palisade Insectary of the Colorado Department of Agriculture at 970-464-7916 .

**MECHANICAL**

Hand pulling or hoeing when soil is moist, and infestations are small can be effective. When infestations are larger, mowing, tilling or plowing can assist with control when used in combination with herbicides. The key to effective control is to prevent seed production and/or spread through rhizomes.

Integrated Weed Management:

Preventing the establishment and maintaining healthy pastures by minimizing disturbance of the is most effective in controlling Johnsongrass. Using a combination of control methods can be effective if an infestation is already established. Cultural, chemical and mechanical treatments can be effective if used together.

HERBICIDES

NOTE: The following are recommendations for herbicides that can be applied to range and pasturelands. Rates are approximate and based on equipment with an output of 30 gal/acre. Please read label for exact rates. Always read, understand, and follow the label directions. The herbicide label is the LAW!

HERBICIDE	RATE	APPLICATION TIMING
Glyphosate + Isopropylamine (Glyphomax)	16 oz/acre	Apply in early growth stages before plant reaches 12 inches in height.
Glyphosate + Potassium	22 oz/acre	Apply in early growth stages before plant reaches 6 inches in height.
2,4-D + Glyphosate + Isopropylamine (Recoil)	1.25 -2.5 qts./acre	Apply in pre-seedhead stages of plant.

Johnsongrass





© WA State Noxious Weed Control Board

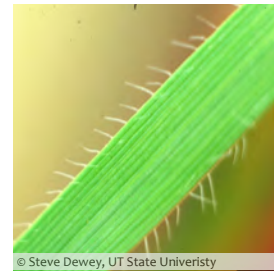
tains 1 to 3 viable seeds which develop quickly after pollination. Seeds germinate in fall and throughout cool months. Seeds remain viable for up to nine years. Often, spikelets will still be attached to the roots when plants are seedlings. In the seedling stage, Jointed goatgrass looks similar to winter wheat. The hairs on the jointed goatgrass will be the key diagnostic feature; winter wheat does not have these hairs.

Jointed goatgrass looks very similar to winter wheat in the younger stages of growth and hybridizes with winter wheat. The presence of the hairs on the leaf margin, sheath, ligules and auricles is key to identifying it apart from winter wheat. Mature hybrid spikelets closely resemble the zigzag structure of jointed goatgrass. A 2000 study found that hybrids do have a limited ability to produce viable seeds that can germinate and produce plants (Synder et al. 2006). The seeds of both species are also similar in terms of size and weight and so its assumed that hybrid seeds would be similar. It has a longer flowering season than winter wheat.

Jointed goatgrass is native to the temperate regions of central Asia, Russia and the Mediterranean. Long growing seasons, precipitation and cool weather favor jointed goatgrass. It invades a wide variety of sites, including grasslands, wheat fields, fence rows, waste places, roadsides, alfalfa fields, and pastures. Winter wheat fields infested with jointed goatgrass cause long-term economic loss

and wheat certification issues for the agricultural industry for years.

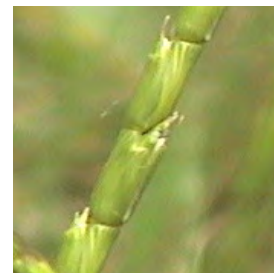
Jointed goatgrass is designated as a "List B" species on the Colorado Noxious Weed Act. It is required to be eradicated; some populations may be contained or suppressed depending on state regulations. For state regulations described for each county, refer to the most recent Rule, or visit www.colorado.gov/ag/weedcontacts for details.



© Steve Dewey, UT State University



© Steve Dewey, UT State University



© Alejandro Perez Jones et al. 2010, Weed Science
Jointed goatgrass (left), hybrid (middle), winter wheat (right)

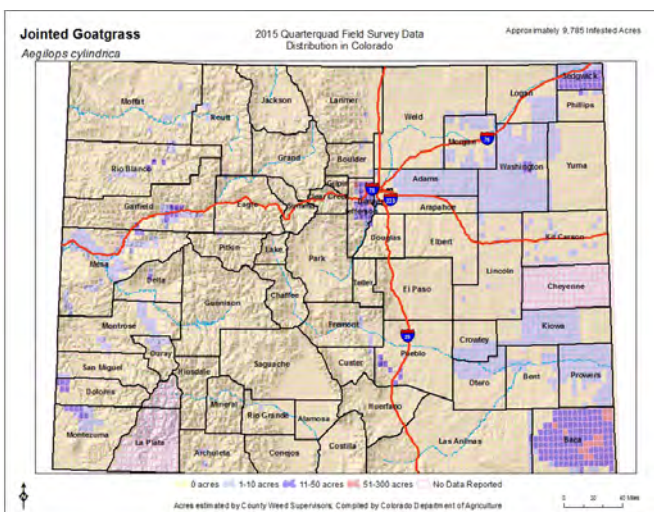
Jointed goatgrass

Aegilops cylindrica Host

Key ID Points

1. Stiff short hairs evenly spaced on the margins of leaf blades.
2. Evenly spaced hairs are on auricles, leaf sheath and ligules.
3. Spikelets fit in a zig-zag pattern in a cylindrical shape.

2015 Quarter Quad Survey



Integrated Weed Management Recommendations

Effective integrated management means using a variety of eradication methods that also includes restoration, prevention of seed production and dispersal, and monitoring. Maintain robust healthy native landscapes and restore degraded sites. Avoid soil disturbance. As with most annuals, prevent seed production. Prevent seed from dispersing, such as on contaminated equipment. Rest sites until they are effectively restored. Control jointed goatgrass before March for the most effective results. Implementation and choice of method must consider the plant's life cycle.



CULTURAL CONTROL METHODS

Rotate crops for three seasons or longer before winter wheat is recultivated. Alternate crop selection is important: winter wheat/sunflower/fallow and winter wheat/corn/fallow decrease jointed goatgrass seed density. Early spring crops may not be effective as rotation crops. Band nitrogen fertilizer with desired species' seeds and irrigate; avoid broad nitrogen fertilizer applications. Select cultivars that result in early fall or spring growth, taller plants, and high till capacity to outcompete jointed goatgrass. Increase seed rates and reduce row space of crops and seeded sites. Isolate and harvest jointed goatgrass patches separately from other crops.



© Steve Dewey, UT State University

BIOLOGICAL CONTROL METHODS

The long awns and hard seeds make jointed goatgrass unpalatable to domestic livestock and can cause injury and may even be fatal. Grazing before flower production is believed to stimulate growth and plant density; properly timed grazing may increase the vigor of desired plants. Avoid high intensity-short duration and heavy grazing. There are no known biological control agents effective against jointed goatgrass authorized in Colorado. For more information about biological control agents, visit the Colorado Department of Agriculture's Palisade Insectary website at www.colorado.gov/ag/biocontrol.



© Kirby Brumfield

MECHANICAL CONTROL METHODS

Mowing and weed whacking should be done before flower production; these methods can induce more tiller and flower production and disperse seeds. Ensure that all methods do not cause spikelets to shatter and disperse seeds. Tilling may bring buried seeds back to the soil surface and could increase germination. Till "in the fall when primary dormancy is lost, but before secondary dormancy is imposed" (Fandrich and Mallory-Smith 2006). Mechanical methods have limited success. Prescribed fire can kill seeds if there is enough vegetation (> 7,000 lbs/acre) on the soil surface to carry fire and increase heat generated. Consecutive fire applications will be needed.

CHEMICAL CONTROL METHODS

NOTE: The following are recommendations for herbicides that can be applied to pastures and rangeland. Rates are approximate and based on equipment with an output of 30 gal/acre. Follow the label for exact rates. Always read, understand, and follow the label directions. The herbicide label is the LAW!

HERBICIDE	RATE	APPLICATION TIMING
Glyphosate* (Roundup, and others)	16 oz./acre + 0.25% v/v non-ionic surfactant	Apply before first spikelets begin to emerge from the boot; usually weeds are < 6" in height. (Late winter to early spring). *These herbicide products are non-selective and will kill any vegetation contacted.
Imazapic + Glyphosate* (Journey)	6 oz./acre + 0.25% v/v non-ionic surfactant	Apply before first spikelets begin to emerge from the boot; usually weeds are < 6" in height. (Late winter to early spring). Note: *These herbicide products are non-selective and will kill any vegetation contacted.
Imazapic (Plateau, Panoramic)	6 oz./acre + 1% v/v methylated seed oil	Apply pre-emergence in late summer or fall, or early postemergence in late winter before tiller.
Aminocyclopyrachlor plus chlorsulfuron (Perspective)*	4.75-8 oz. product/acre + 0.25% v/v non-ionic surfactant	Apply from the seedling to the bolting stage. IMPORTANT: Applications greater than 5.5 oz. product/acre exceeds the threshold for selectivity. DO NOT treat in the root zone of desirable trees and shrubs. Not for use on grazed or feed forage. *Product not permitted for use in the San Luis Valley.

Colorado Department of Agriculture - Conservation Services

305 Interlocken Parkway

Broomfield, CO 80021

(303) 869-9030

www.colorado.gov/ag/weeds



Jointed goatgrass
Aegilops cylindrica Host

Leafy spurge

Colorado Department of
Agriculture

305 Interlocken Pkwy
Broomfield, CO 80021

(303) 869-9030
weeds@state.co.us



Key ID Points

1. Flowers are yellowish-green and have a pair of heart shaped yellow-green bracts below each inconspicuous flower.
2. The entire plant contains white, milky latex.

Leafy spurge Identification and Management



Identification and Impacts

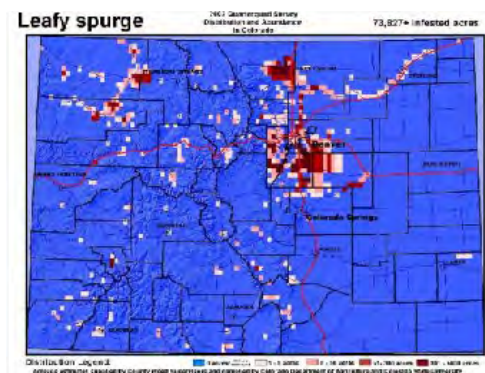
Leafy spurge (*Euphorbia esula*) is a non-native deep-rooted perennial that spreads by seed and extensive, creeping roots. The roots can extend as deep as 30 feet into the soil and are extremely wide-spreading. The roots are brown and contain numerous pink buds that generally produce new shoots or roots. Leafy spurge can grow from 1 to 3 feet in height. The stems are smooth, pale green, and thickly clustered. Leaves are alternate, narrow, linear, and 1 to 4 inches long. The flowers are very small and yellowish-green. They are enclosed by very visible yellowish-green, heart-shaped bracts. The entire plant contains white, milky sap that exudes readily upon stem or leaf breakage. This sap can damage eyes and sensitive skin. Leafy spurge is one of the earliest plants to emerge in the spring. Flower clusters develop 1 to 2 weeks after stem emergence which is from mid-April to late May. One large leafy spurge plant can produce up to 130,000 seeds. Three-sided seed capsules explode when ripe and project the seeds up to 15 feet away from the parent plant.

Leafy spurge has adapted to a wide variety of habitats in the state and is very competitive with other plant species. Where it becomes established in rangeland, pasture, and riparian sites, it crowds out practically all other vegetation. The competitive,

rapidly growing, and extensive root system makes leafy spurge very difficult to manage. Develop a management plan that uses several control methods that are compatible with your site.

The most effective method of control for Leafy spurge is to prevent its establishment through proper land management. Maintain healthy pastures and rangeland and continually monitor your property for new infestations. New infestations are much more easily controlled than established infestations. Details on the back of this sheet can help to create a management plan compatible with your site ecology.

Leafy spurge is designated as a "List B" species on the Colorado Noxious Weed Act. It is required to be either eradicated, contained, or suppressed depending on the local infestations. On the back of this sheet are leafy spurge management recommendations. For more information, please visit www.colorado.gov/ag/csd and click on the Noxious Weed Program link. Or contact the State Weed Coordinator at the Colorado Department of Agriculture, Conservation Services Division, 303-239-4100.



Flower photo, top, © Norman Rees, USDA, APHIS. Invasive.org. All other photos © Kelly Uhing.

Euphorbia esula

**CULTURAL**

Establishment of selected grasses can be an effective cultural control of leafy spurge. Contact your local Natural Resources Conservation Service for seed mix recommendations. Maintain healthy pastures and prevent bare spots caused by overgrazing. Bareground is prime habitat for weed invasions.

**BIOLOGICAL**

Both sheep and goats can be effective grazers of leafy spurge. The flea beetles *Aphthona nigricutis*, *A. lacertosa*, and *A. cyarissiae*, are effective especially when combined with grazing and/or herbicides. For more information, contact the Palisade Insectary of the Colorado Department of Agriculture, 970-464-7916.

Photo © USDA.

**MECHANICAL**

Due to the extensive root system, hand-pulling this plant is not a viable option. Mowing will reduce seed production if repeated every 2 to 4 weeks during the growing season, but will provide little long-term control.

Integrated Weed Management:

Persistent monitoring of areas with known or potential infestations is crucial to managing leafy spurge. A combination of management methods in a long-term management plan is imperative. The management objective is to exhaust the root system and deplete the soil seed bank.

HERBICIDES

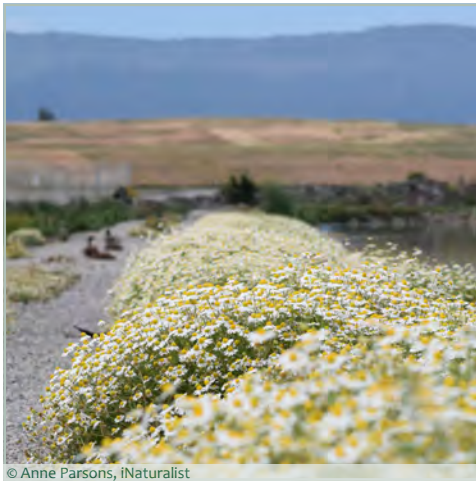
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Herbicide	Rate	Application Timing
Aminocyclopyrachlor + chlorsulfuron (Perspective)* + Diflufenzopyr + dicamba (Overdrive, Distinct)	3-4 oz. Perspective/acre + 4 oz. Overdrive/acre + 1% v/v methylated seed oil	At flowering in the spring and/or fall.
Quinclorac (Paramount, Facel-L, Quinstar) + Diflufenzopyr + dicamba (Overdrive, Distinct)	12-24 oz. Quinstar/acre + 4 oz. Overdrive/acre + 1% v/v methylated seed oil	At flowering in the spring and/or fall.
Aminocyclopyrachlor + chlorsulfuron (Perspective)*	4.75-8 oz. product/acre + 1% v/v methylated seed oil	Post-emergence in spring until flowering, or to fall rosettes.

Note: *IMPORTANT: Applications greater than 5.5 oz. product/acre exceeds the threshold for selectivity. DO NOT treat in the root zone of desirable trees and shrubs. Not permitted for use in the San Luis Valley. Perspective is not for use on grazed or feed forage.

Additional herbicide recommendations for this and other species can be found at: www.colorado.gov/agconservation/CSUHerbicideRecommendations.pdf

Leafy spurge



© Anne Parsons, iNaturalist

on the leaf upper surface. Stems have many branches, sometimes stems have red hue, hairs or glands. It has a fibrous taproot. White ray flowers have shallow three-lobed margin. It has ten to 15 ray flowers. Once the yellow disc flowers are developed, they form a cone shape that causes the white ray flowers to subtend. When vertically sliced, the receptacle is diagnostically narrowly cone-shaped, solid in the center, and has chaff- a few long shaggy soft hairs restricted to the center, and sometimes glands, all are observable with a hand lens. The imbricate phyllaries are oval, in a series of two or more and have soft hairs. The achenes are wrinkled with ten ridges and small glands that give it a bumpy surface. It spreads only by seed and like other Asteraceae plants, it is a prolific seed producer. Seeds lack anatomical dispersal structures so they remain close to parent plants.

Other Asteraceae species are easily confused with this species from a distance. These include two other List B species, scentless chamomile (*Tripleurospermum inodorum*) and oxeye daisy (*Leucanthemum vulgare*), as well as German chamomile (*Matricaria chamomilla*), sea mayweed (*Tripleurospermum maritimum*), chamomile (*Chamaemelum nobile*), pineapple weed (*Matricaria discoidea*), native annual fleabane (*Erigeron annuus*) and whiplash daisy (*Erigeron flagellaris*) (iNaturalist 2018).

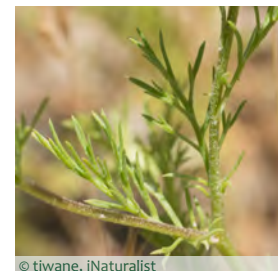
Mayweed chamomile is native to the arid Mediterranean and Middle Eastern areas and spread from there worldwide through trade and agriculture (Invasive Species Compendium 2019). Its status is unknown in Colorado; this species is likely both under-reported and incorrectly identified. Mayweed chamomile is ruderal, found mainly in Colorado's disturbed sites and the sides of impermeable surfaces, such as roads, sidewalks, trails, as well as gravelly or well-drained soils.



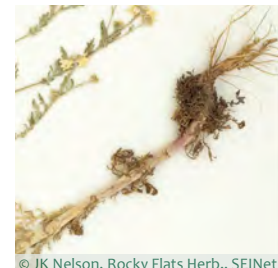
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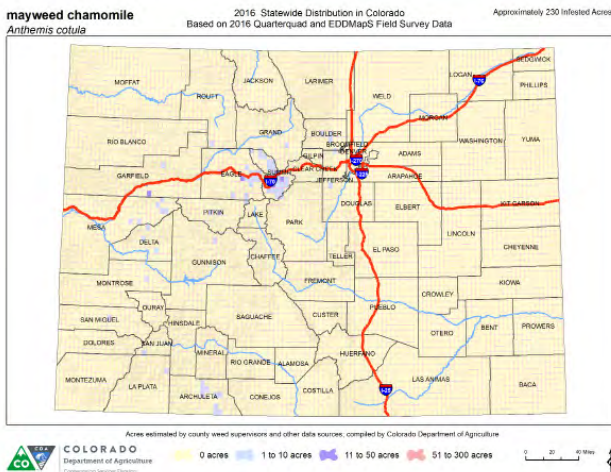
© JK Nelson, Rocky Flats Herb., SEINet

Mayweed chamomile (*Anthemis cotula* L.) is an annual forb in the Asteraceae family, also known as stinking chamomile, dog fennel, mayweed, and mayweed dogfennel. Distinguishing mayweed chamomile from similar looking species is difficult. Hybridization with scentless chamomile is reported (Kay 1971). It is believed to be phenotypically plastic, making visible traits inconsistent; traits overlap with other *Anthemis* species (Ali 2019, Kay 1971).

The most obvious diagnostic feature is its pungent odor. It may irritate skin of mammals upon contact (iNaturalist 2019). Mature plants range from 3 to 26 inches tall. Its leaves are alternate and deeply divided pinnately, each lobe is pinnately divided again two to three times (bi- to tripinnatifid), giving it a feather-like appearance. Each segment is short and narrow. Soft hairs are

mayweed chamomile

Anthemis cotula L.



Key ID Points

1. Three lobed ray flowers; pungent odor
2. Narrow cone-shaped receptacle with chaff- few long hairs; imbricate phyllaries with hairs
3. Alternate leaves are bi- to tripinnatifid
4. Fibrous taproot

Integrated Weed Management Recommendations

mayweed chamomile *Anthemis cotula* L.

Effective integrated management means using a variety of eradication methods along with restoration, prevention of seed production and dispersal, and monitoring. Maintain robust healthy native landscapes. Restore degraded sites. Avoid soil disturbance. Prevent seed production and seeds from dispersing, e.g. on contaminated equipment. Rest sites until restored. Modify land use practices. Use methods appropriate for the site, other plants present and land uses.



© Colorado State University

CULTURAL

Since mayweed chamomile is not a strong competitor and is ruderal, minimizing soil disturbance and maintaining high native canopy cover of drought tolerant plants is key. It prefers moist soil, so implement modify water regimes where dense colonies exist. Since mayweed chamomile can modify its life history to take advantage of conditions, tilling during shoulder seasons, hot temperatures or before bolting, exposes the shallow roots to drying (Allaie et al. 2005). Till frequently and seed cover plants. Maintain or restore a competitive assemblage of shrubs, forbs, cool and warm season grasses, annuals and perennials. In restoration efforts, select locally adapted species, soil amendments, soil microbes and mycorrhizal fungi that are ecologically appropriate for the site to improve competitiveness of other species.



© Getty Images

BIOLOGICAL

Mayweed chamomile is not palatable to domestic livestock and irritates the skin of mammals (Woo et al. 1999, Kay 1971). Properly managed grazing can improve vigor of desired species and indirectly reduce infestations. At present, there are no biological control agents authorized in Colorado that would effectively control it. For more information about biological control agents, visit the Colorado Department of Agriculture's Palisade Insectary website at: www.colorado.gov/ag/biocontrol.



MECHANICAL

Mayweed chamomile has shallow roots, so mechanical methods can be effective in residential areas and moderate sized infestations. In loose soil, dig to remove the fibrous taproot. In spring, sever roots below the soil surface before the plant stores energy. Mowing, chopping and deadheading leaves roots behind, stimulates more flower production and are not recommended. Mowing, especially when timed near flowering or seeding phases, often disperses flowers and seeds, which expands the size of the infested area. Collect, bag, and dispose of or destroy flowers; seeds could mature and germinate if left on the ground. Prescribed fire may be an effective tool to control mayweed chamomile but since it prefers roadsides and developed sites, it may not be possible to generate the heat needed to damage the root, greens and seeds. Little information exists on fire effects on this plant.



© Mountain Spraying Company

CHEMICAL

NOTE: Herbicide recommendations to control mayweed chamomile in pastures and rangeland are found at: <https://goo.gl/TvWnv9>. Rates are approximate and based on equipment with an output of 30 gal/acre. Follow the label for exact rates. Consult local turf and ornamental experts for herbicides appropriate for residential settings. Always read, understand, and follow the label directions. The herbicide label is the LAW!



Colorado Department of Agriculture - Conservation Services

305 Interlocken Parkway

Broomfield, CO 80021

(303) 869-9030

www.colorado.gov/ag/weeds

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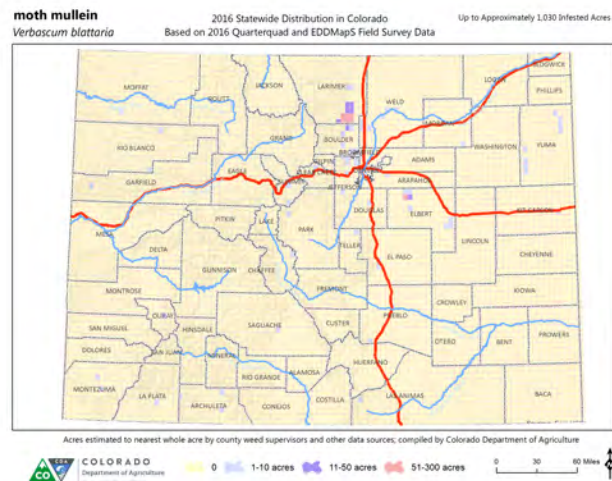
loosely arranged in a raceme. Sepals have glandular hairs. Lobed petals are 2 to 3 cm in diameter, ranging from off-white to yellow. Petals are slightly recurved, exposing faint guidelines towards the five stamens, which are densely lined with magenta knobby hairs, and single pistil that sits on a superior ovary with two chambers. Fruits are rounded bilobed capsules, about 8.5 mm in diameter and have conspicuous glandular hairs. Upon maturity, fruits split in two, revealing dark brown seeds whose surface has ridges and grooves. Seed is the primary reproductive method, but they lack dispersal anatomy so fall close to parent plants (Gros and Werner 1978). Viable seed longevity is at least 120 years (Telewski and Zeevaart 2002).

Moth mullein (*Verbascum blattaria* L.) is generally biennial, but in suitable sites it can be a short-lived perennial. Although recent genetic analyses split the family, this plant remains in the Scrophulariaceae family.

The stem is stiff, reaches up to 1.5 m tall and appears slender compared to common mullein. The upper stem, especially near the flowers, glistens in the sun from glandular-tipped hairs. Leaf shape varies. Initially they develop a basal rosette and are oval with slightly wavy margins. Leaves on mature plants alternate along the stem and are upright. Mature leaves are oblong in shape, have toothed margins but are not hairy, and are 8 to 45 cm long and 3 to 15 cm wide. The fibrous taproot is reportedly large (New Jersey Agricultural College Experimental Station 1892).

Solitary perfect flowers are five-parted,

Moth mullein is well adapted to upland semi arid or Mediterranean climates found in its Northern Africa and European origin (Bretzel et al. 2009, Plants of the World Online 2018). It is adapted to serpentine soils, including high levels of heavy metals such as lead, nickle, cobalt, chromium, and magnesium, but can also grow in fertile soils (Gross and Werner 1978, Shallari et al. 1998). As recently as 2009, moth mullein was recognized for its adaptations to infertile, nutrient poor and unproductive soils, attractiveness to pollinators, low maintenance, the quantity and duration of flowering, and promoted as an ornamental in its native Mediterranean range (Bretzel et al. 2009). It appears confined to elevations below 6500 feet in the USA and its native range (Ackerfield 2015, eFloras 2018).



Currently its distribution in Colorado is limited to the northern front range (EDD-MapS 2018). However, it is a prolific seeder and appears to be spreading south, so it is imperative to implement EDRR strategies before the infestation worsens. *V. blattaria* can hybridize with *V. thapus* (Flora of North America 2012, Gross and Werner 1978).



©Jesse Robinson iNaturalist



Key ID Points

1. Five-parted flowers (petal, sepal, stamen); magenta stamens densely lined with hairs
2. Oblong alternate leaves
3. Fibrous taproot
4. Conspicuous glandular hairs on stem and immature fruit

Moth mullein
Verbascum blattaria L.

Integrated Weed Management Recommendations

Effective integrated management means using a variety of eradication methods along with restoration, prevention of seed production and dispersal, and monitoring. Maintain robust healthy native landscapes. Restore degraded sites. Avoid soil disturbance. Prevent seed production and seeds from dispersing, e.g. on contaminated equipment. Rest sites until restored. Modify land use practices. Use methods appropriate for the site, other plants present and land uses.



© Colorado Natural Heritage Program



© The Nature Conservancy

CULTURAL

Very little information is available on cultural control methods effective against moth mullein; this remains a significant research gap. It does appear to prefer disturbed areas, so minimize soil disturbance especially near infested areas. In wildland settings, maintain or restore a competitive assemblage of shrubs, forbs, cool and warm season grasses, annuals and perennials. Use locally adapted species that are ecologically appropriate for the site to improve competitiveness. Incorporate soil amendments, soil microbes and mycorrhizal fungi to boost native species when appropriate. Aim to reduce above and below ground space and nutrients to make them unavailable to moth mullein.



© Cynthia Villa, NRCS

BIOLOGICAL

Moth mullein appears to be unpalatable to domestic livestock based on anecdotal reports. Properly managed grazing can improve vigor of desired species and indirectly reduce moth mullein. The biological control agent *Rhinusa tetra* attacks moth mullein, but its primary target is common mullein (Winston et al. 2014). Currently there are no biological control agents for moth mullein authorized in Colorado. For more biocontrol information, visit the Colorado Department of Agriculture's Palisade Insectary website at: www.colorado.gov/ag/biocontrol

MECHANICAL

Since moth mullein has a short life cycle, mechanical methods can be effective, especially in residential areas and small infestations. The key is to sever roots below the soil surface in the first year or early in the second season before the plant flowers. Mowing, chopping and deadheading is not effective; these methods leave roots behind, stimulate more flower production, disperse flowers and seeds, which expand the size of the infested area. Collect, bag, and dispose of all flowers and fruits; seeds will germinate if left on the ground. Since seed longevity is so long, consecutive years of treatment are necessary. Time prescribed fires before flowering to top kill above ground biomass. Low intensity prescribed fire would leave roots unaffected; spring burns increased cover by 0.2% so multiple entries are necessary (Denver Botanic Gardens 2002).



© Celestine Duncan, Techline Invasive Plant News

CHEMICAL

NOTE: Herbicide recommendations to control moth mullein in pastures and rangeland are found at: <https://goo.gl/TvWnv9>. Rates are approximate and based on equipment with an output of 30 gal/acre. Follow the label for exact rates. Consult local turf and ornamental experts for herbicides appropriate for residential settings. Always read, understand, and follow the label directions. The herbicide label is the LAW!

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Moth mullein
Verbascum blattaria L.



© Bruce Ackley, OH State University

plumose bristles that appear barbed under magnification. Musk thistle produces many flower heads. The tallest shoots flower first; lateral shoots develop in leaf axils. A robust plant may produce 100 or more flowering heads. Reproduction is usually via out-crossing through insect pollination, but self-pollination also occurs. Flowers emerge in May through September. Seeds develop shortly after flowers emerge. Flower buds can contain viable seeds from self-pollination. Seeds can mature on severed bud and flower-heads. Seeds remain viable in the soil for up to about 14 years. Seeds can germinate and emerge from spring through fall.

Musk thistle *Carduus nutans* L. is a non-native biennial forb that reproduces solely by seed. During the first year of growth, a rosette forms in spring or fall. During the second year in mid to late spring, the stem bolts, flowers, sets seed, and the plant dies.

Musk thistle can grow up to 6 feet tall. The leaves have spines, are waxy, and dark green in color with a prominent light green to white midrib that can be seen from a distance. Leaves are dentately lobed; leaf bases sometimes extend down below the point of attachment. The terminal flower heads are purple, large in size (1.5 to 3 inches in diameter) and bend over as if nodding. These flower heads are made up of only disk flowers. They are surrounded by numerous, wide and stout lance-shaped, spine-tipped bracts that resemble an open pineapple. The pappus has

Musk thistle habitat is found in a variety of environments extending from shortgrass prairie to alpine. It is strongly associated with heavily disturbed sites, where over-use occurs or where site conditions are poor due to land management practices. This includes over-grazed areas, large fires, trails, ditches and roadsides. Infested livestock pastures suffer from significantly decreased carrying capacity.

Because musk thistle reproduces solely from seed, the key for successful management is to prevent seed production. Once flowers emerge and start to produce seed, effective management options will become limited. Once sites are infested, musk thistle can form dense stands. Prevention, adjusting land management practices, a robust integrated treatment plan and restoration are critical to eliminating this species.



© Chris Evans, University of IL



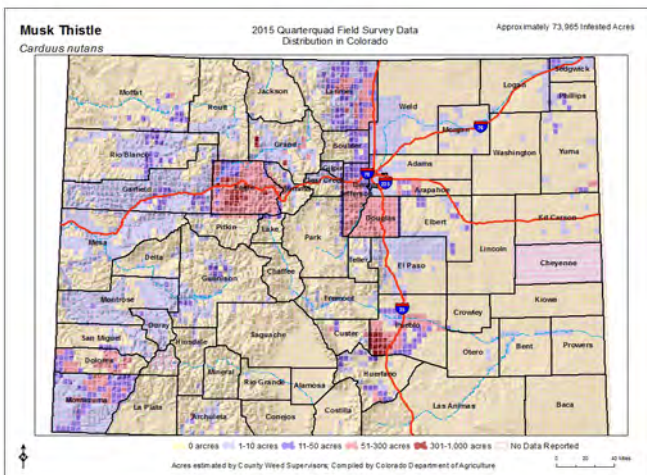
© Les Mehrhoff, DiscoverLife.org



Musk thistle

Carduus nutans L.

2015 Quarter Quad Survey



management practices, a robust integrated treatment plan and restoration are critical to eliminating this species.

Musk thistle is designated as a "List B" species in the Colorado Noxious Weed Act. It is required to be eradicated; some populations may be contained or suppressed depending on state regulations. For management directions for each county, refer to the most recent Rule, or visit www.colorado.gov/ag/weedcontacts for details.

Key ID Points

1. Leaf with white midrib and leaf margins with spines.
2. Pappus with plumose barbed bristles.
3. Wide, stout lance-shaped bracts with spiny tips.

Integrated Weed Management Recommendations

Effective integrated management means using a variety of eradication methods that also includes restoration, prevention of seed production and dispersal, and monitoring. Maintain robust healthy native landscapes and restore degraded sites. Avoid soil disturbance. As with most biennials, prevent seed production in the first and second year of musk thistle growth. Prevent seed from dispersing, such as on contaminated equipment. Rest sites until they are effectively restored. Change land use practices. Use methods appropriate for the site.



© Norman E. Rees, USDA Ag Research Service

CULTURAL CONTROL METHODS

Musk thistle is not tolerant of competition and needs light to germinate seeds. Cultural methods should aim to maintain or restore a competitive assemblage of forbs, cool and warm season grasses. Implement whole site restoration of soils, plants and water regimes where stands of musk thistle exist where needed. Use locally adapted species that are ecologically appropriate for the site to improve competitiveness. Include annual as well as perennial species. Incorporate soil amendments, soil microbes and mycorrhizal fungi in restoration and land management efforts. Minimize soil compaction and disturbance, especially in wetlands and moist soil. Irrigation can increase competitive species.



© Eric Coombs, OR Dept of Agriculture

BIOLOGICAL CONTROL METHODS

Although horses, cattle, goats and sheep may eat flower heads on a few plants, seeds pass through their digestive tracks unaltered and spread. The leaf and stalk spines can cause domestic livestock to avoid mature musk thistle. Thus, musk thistle can become an "increaser" in over-grazed systems. Properly managed grazing can improve vigor of desired species and indirectly reduce musk thistle. *Trichosirocalus horridus* is the only biological control agent available for musk thistle in Colorado. The other species, *Rhinocyllus conicus*, is not host specific and will damage native thistles, and therefore cannot be released as an agent in Colorado. For more information, visit the Colorado Department of Agriculture's Palisade Insectary website at www.colorado.gov/ag/biocontrol.



© Friends of NV Wilderness Stewardship Team

MECHANICAL CONTROL METHODS

Methods, such as tilling, hoeing and digging, are best for infestations smaller than 0.5 acres; weigh this against other plants present, ecology and site condition. Sever roots below the soil surface during the first year before the plant stores energy, and in the second year before flower production. Mowing, chopping and deadheading stimulates more flower production; these methods require consecutive years of season-long treatments. All flowerbuds and heads must be collected, bagged, and disposed of or destroyed; seeds will mature and germinate if left on the ground. Prescribed fire that results in high soil burn severity damage roots and above ground biomass, but is not recommended due to impacts on desired plants. Fire generally favors musk thistle germination.

CHEMICAL

NOTE: The following are recommendations for herbicides that can be applied to pastures and rangeland. Rates are approximate and based on equipment with an output of 30 gal/acre. Follow the label for exact rates. Always read, understand, and follow the label directions. The herbicide label is the LAW!

HERBICIDE	RATE	APPLICATION TIMING
Aminopyralid* (Milestone)	6 oz./acre + 0.25% v/v non-ionic surfactant	Apply in spring rosette to early bolting growth stages or in fall to rosettes. *Product not permitted for use in the San Luis Valley.
Chlorsulfuron** (Telar)	1-2.6 oz. product/acre + 0.25% v/v non-ionic surfactant	Apply in spring from rosette through very early flower growth stages. (Can prevent viable seed formation if applied no later than the first viable flowers begin to open.) **This herbicide has residual soil activity that will affect all broadleaf seedlings germinating after application has occurred.
Clopyralid (Transline)	0.67-1.33 pints product/acre + 0.25% v/v non-ionic surfactant	Apply to rosettes through flower bud stage in spring, or to fall rosettes.

Colorado Department of Agriculture - Conservation Services

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www.colorado.gov/ag/weeds



Musk thistle
Carduus nutans L.



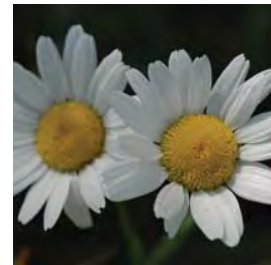
when necessary. Ornamental Shasta daisy (*Leucanthemum x superbum*) is not an aggressive invader and looks similar to oxeye daisy, but it is 6 to 12 inches taller and has larger flowers.

Oxeye daisy is a strong competitor. It forms dense stands that reduce native plant diversity. It degrades pastures and natural areas because cattle and wildlife avoid feeding on oxeye daisy. Heavy infestations may reduce nutrient cycling due to a shallow root system and create areas of bare soil, thus increasing soil erosion.

Habitats for oxeye daisy included mountain meadows, grasslands, pastures, streams, gardens, waste grounds, railway, and roadsides. Oxeye daisy typically grows in high elevations, up to 11,000 feet in Colorado.

The key to effective control of oxeye daisy is education and prevention. Oxeye daisy has been included in many different seed mixes, thus consumers should carefully read the label prior to planting so-called “native wildflower” mixes. Homeowners and land managers often overlook the impacts and the need to manage this weed because of the plant’s attractiveness. Details on the back of this sheet can help to create a management plan compatible with your site ecology.

Oxeye daisy (*Leucanthemum vulgare*) was introduced from Europe as a seed contaminant and as an ornamental. It is a rhizomatous, creeping, short-lived perennial that grows 10 inches to 2 feet tall. The basal and lower leaves are spoon-shaped, toothed, and with long petioles (leaf stem). The upper leaves are narrow, toothed, and clasp the stem. Flowers bloom between June and August. The flowers are 1 to 3 inches in diameter, with 15 to 30 white ray flowers, and mostly solitary. The phyllaries beneath the flower head are green with a dark brown margin. One flower head can produce up to 200 seeds. Oxeye daisy spread vegetatively from roots, root fragments, or by seed. Seeds may be viable up to 38 years or more. Infestation sites needs to be monitored for at least 10 years after the last flowering plant has been eliminated and treatments repeated



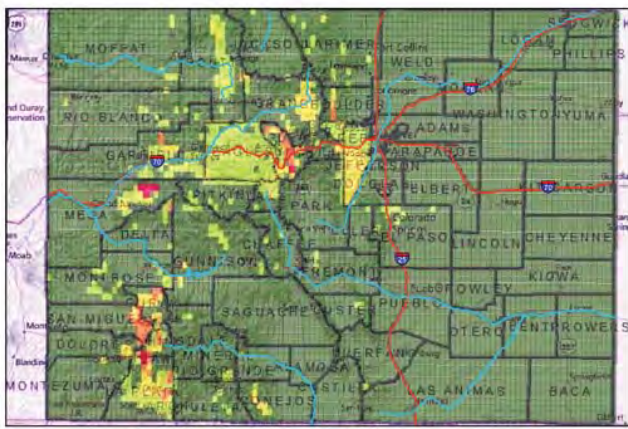
Oxeye daisy
Leucanthemum vulgare

2013 Quarter Quad Survey

Oxeye Daisy
Chrysanthemum leucanthemum

2013 Quarterquad Survey
Distribution and Abundance
in Colorado

16,506+ Infested Acres



Acres estimates supplied by County Weed Coordinators and compiled by the Colorado Department of Agriculture.

Oxeye daisy is designated as a “List B” species in the Colorado Noxious Weed Act. It is required to be either eliminated, contained, or suppressed depending on the local infestations. For more information visit www.colorado.gov/ag/weeds and click on the Noxious Weed Management Program. Or call the State Weed Coordinator at the Colorado Department of Agriculture, Conservation Services Division, (303) 869-9030.

Key ID Points

1. 15-30 white ray flowers on flowerheads that are 1-3 inches in diameter.
2. Rosette and lower leaves are spoon-shaped and toothed.
3. Upper leaves on the stem are narrow, toothed, and clasp the stem.

Integrated Weed Management Recommendations

Oxeye daisy has been included in many different seed mixes, thus consumers should carefully read the label prior to planting so-called “native wildflower” mixes. Repeated hand pulling can eliminate small infestations. Mowing or grazing by sheep or goats can be effective, in addition with a chemical approach.



CULTURAL

Generate awareness for this noxious weed. Carefully inspect “wildflower” seed mixes; do not plant mixes that include *Leucanthemum vulgare*. Avoid overgrazing, disturbance, and seed dispersal. Bare ground is prime habitat for weed invasions. Tall perennial grasses that shade oxeye daisy are good competitors.

BIOLOGICAL

Goats or sheep can be effective in the control of oxeye daisy. There are no insect biological controls available for oxeye daisy. For more information on biocontrols, contact the Colorado Department of Agriculture-Palisade Insectary at 970-464-7916.

MECHANICAL

Repeated hand pulling or digging when soil is moist and infestations are small. Oxeye daisy is fairly shallow rooted; pull up as much of the root as possible. If removed during or after flowering, bag specimens carefully so as to not scatter seeds. Mowing before flowering or when flower buds are present can limit dispersal; do not mow during or after flowering. Tilling at 6 inches or deeper, and repeated shallowly as necessary, can control patches.

CHEMICAL

The table below includes recommendations for herbicides that can be applied to rangeland and pastures. 0.25% v/v non-ionic surfactant is equivalent to 0.32 oz/gal of water or 1 pt/100 gal of water. Always read, understand, and follow the label directions. The herbicide label is the LAW!

Herbicide	Rate	Application Timing
Aminopyralid (Milestone)	4-6 oz./acre + 0.25% v/v non-ionic surfactant	Optimum control when applied <u>at the pre-flower bud growth stage</u> .
Metsulfuron (Escort XP)	1 oz. product/acre + 0.25% v/v non-ionic surfactant	Surfactant is absolutely necessary. Optimum control when applied <u>at flowering</u> growth stage. 1 oz. product is the minimum eradication rate based on best treatment observed in several CSU

Additional herbicide recommendations for this and other species can be found at:
www.colorado.gov/agconservation/CSUHerbicideRecommendations.pdf

Oxeye daisy
Leucanthemum vulgare

Perennial pepperweed

Colorado Department of
Agriculture

305 Interlocken Pkwy
Broomfield, CO 80021

(303) 869-9030
weeds@state.co.us



Key ID Points

1. White flowers in dense round clusters at branch tips.
2. Leaves are waxy with a white midrib.

Perennial pepperweed Identification and Management



and floodplains. If introduced, it can also invade roadsides, hay and alfalfa fields and rangeland. It readily invades disturbed and bareground areas. It can thrive in either low or high-saline soils. Large monocultures and dense litter layers prevent native plants from regenerating. Pepperweed displaces native plants and wildlife habitats, reduces food quality for wildlife and reduces agricultural and pasture production.

Identification and Impacts

Perennial pepperweed (*Lepidium latifolium*) is an extremely invasive perennial forb introduced from Europe and Asia in 1900 as a containment in sugar beet seed. Pepperweed reproduces both by seed and vegetatively by roots and shoots. Root fragments as small as 0.5 inch can grow into new plants. A serious threat, pepperweed alters ecosystems by acting as a "salt pump" absorbing salts from deep in the soil. The plant then excretes the salt through the leaves and deposits it on the surface soil. Since most desirable plants do not tolerate high saline concentrated soils, the entire plant composition and diversity of the area changes.

Growing 1 to 5 feet high, pepperweed has tiny white flowers. The flowers have four spoon-shaped petals in dense, rounded clusters on branch tips of erect stems. Stems emerge from deep, thick, woody root stocks that can penetrate 10 feet into the soil. Leaves of the mature plant are alternate, and lance or oblong in shape with serrated edges that are slightly wavy. They are glabrous (not hairy) and green to gray-green in color, with a distinctive white midrib. Upper leaves are smaller than basal leaves and have no stalks.

Perennial pepperweed invades a wide variety of habitats, from intermountain, mountainous areas and marshes. It is frequently found in riparian areas, wetlands, marshes, irrigation ditches, canals,

Perennial pepperweed rarely produces seedlings in the field, even with extensive seed crops. Research is underway, but the lack of seedlings may be due to seeds rapidly losing viability in the field (but not in the laboratory). Reproduction is primarily from deep, perennial roots and root pieces which break off and sprout new plants. However, preventing seed production is still recommended until further research is done.

The key to effective control of Perennial pepperweed is preventing establishment of large populations. Early detection and removal of plants if found, is the key to prevention. Planting desirable and competing grasses and forbs can aid in limiting the spread of Perennial pepperweed. Herbicide treatments are a good option if used during the bud to flowering stage of the plant. Once established, containment is key. Details on the back of this sheet can help to create a management plan compatible with your site ecology.

Perennial pepperweed is designated as a "List B" species in the Colorado Noxious Weed Act. It is required to be either eradicated, contained, or suppressed depending on the local infestations. For more information visit www.colorado.gov/ag/csd and click on the Noxious Weed Management Program. Or call the State Weed Coordinator at the Colorado Department of Agriculture, Conservation Services Division, 303-239-4100.

Photos courtesy of Kelly Uhing, Colorado Department of Agriculture.

Lepidium latifolium

**CULTURAL**

Prolonged spring flooding of new growth will kill pepperweed. Grazing is not recommended because the plant may be toxic. Reestablishing the native or desired plants can take years, so repeat plantings must be repeated, but it can aid in controlling populations. Contact your local Natural Resources Conservation Service for seed mix recommendations.

**BIOLOGICAL**

Biological control is not a viable option because 11 other species of native Lepidium are on the Endangered species list, and the risk to these species as well as agricultural species is too great. For more information, contact the Palisade Insectary of the Colorado Department of Agriculture at 970-464-7916.

**MECHANICAL**

Due to the deep, brittle root, most mechanical methods are not recommended, and can actually propagate, spread and increase the density of pepperweed. Hand pulling can also bring seeds to the soil surface, and spread pieces of root, which will sprout. However, spring mowing combined with chemical treatments can be effective.

Integrated Weed Management:

Because of the deep roots and persistence of pepperweed, it is critical to combine repeated herbicide application with monitoring and revegetation of the area. Control of Perennial pepperweed can be difficult, so prevention is the best option. Early detection, eradication and containment of small populations and their source are vital.

HERBICIDES

NOTE: The following are recommendations for herbicides that can be applied to specific areas. Rates are approximate and based on equipment with an output of 30 gal./acre. **Always read, understand, and follow the label directions. The herbicide label is the LAW!**

Herbicide	Rate	Application Timing
Chlorsulfuron* (Telar)	1 oz. product/acre + 0.25 v/v non-ionic surfactant	Apply when plant is in the early flower to flowering growth stages. (Early spring to early summer)
Metsulfuron (Escort XP)	1 oz. product/acre + 0.25 v/v non-ionic surfactant	Apply when plant is in the early flower to flowering growth stages. (Early spring to early summer)
Imazapic (Plateau, Panoramic)	12 oz./acre + 2 pints/acre methylated seed oil or crop oil concentrate	Apply when plant is in the early flower to flowering growth stages. (Early spring to early summer)
Note: *This herbicide has residual soil activity that will affect all broadleaf seedlings germinating after application has occurred.		
Additional herbicide recommendations for other species can be found at: www.colorado.gov/agconservation/CSUHerbicideRecommendations.pdf		

NOTE: Herbicides, when applied at the flower bud stage, are extremely effective to control pepperweed. Repeat applications for up to five years. However, the waxy leaf surface and the dense growth of this weed can make it difficult to obtain adequate coverage with the herbicide, so apply the chemical carefully and thoroughly for effective control.

Top photo, © Kelly Uhing, Colorado Department of Agriculture. *Calophasia lunula* larva photo © Bob Richard, USDA APHIS, Invasive.org. Root system, Nature Conservancy.

Perennial pepperweed

Perennial sowthistle

Colorado Department of Agriculture

305 Interlocken Pkwy
Broomfield, CO 80021

(303) 869-9030
weeds@state.co.us

Identification and Management



Perennial sowthistle produces by seeds and the rhizomatous root systems. Plants overwinter and begin to appear in early spring, seeds will germinate at this same time. Plants are palatable to grazing animals and can assist in control.

The key to effective control of Perennial sowthistle preventing the establishment of the plant populations. Reducing the production of seeds can assist in the control of Perennial sowthistle. Mechanical, chemical and grazing controls will also assist in control plant populations. Details on the back of this sheet can help to create a management plan compatible with your site ecology.

Identification and Impacts

Perennial sowthistle (*Sonchus arvensis*) is a perennial for native to Eurasia. The plants erect stems can grow 2 to 5 feet tall, they are hollow, and have a milky juice that appears when the plant is injured. The plant branches near the top of the stem and will exhibit a showy yellow disc flower about 1 1/2 inches in size, and resembles a dandelion. The flowers are borne out of bracts that are sticky and slightly hairy. Seeds are produced out of the flower bract and are red to brown in color, and have ribs that run lengthwise on the seed. The seeds are connected to a silky, parachute-like tuft of white hair and travel very easily in the wind. Leaves of the plant are alternate and clasping to the stem. The leaves vary in size generally getting smaller the higher up on the stem. Leaves are deeply lobed to whole and have prickly margins. Perennial sowthistle grows from a deep-taproot that exhibits horizontal rizome-like roots that will produce other stems.

Perennial sowthistle is designated as a "List C" species on the Colorado Noxious Weed Act. It is required to be either eradicated, contained, or suppressed depending on the local jurisdictions managing this species. For more information, visit www.colorado.gov/ag/weeds or call the State Weed Coordinator at the Colorado Department of Agriculture, Conservation Services Division, 303-239-4100.



Key ID Points

Habitats for Perennial sowthistle include roadsides, fertile waste areas, cultivated fields, gardens, woods, lawns, ditches, and rivers.



Photos © From Bottom left; Steve Dewey, Utah State University; (Next 2) Ohio Weed Lab State Archive, Ohio State University; John Cardina, Ohio State University; Michael Rasy, University of Alaska; (All Bugwood.org)

Sonchus arvensis

**CULTURAL**

Maintaining healthy plant populations and minimizing disturbance is a good way prevent weed populations. For specific seed recommendations contact your local Natural Resources Conservation Services for seed mixes.

**BIOLOGICAL**

Currently there is not any biocontrol available for Common burdock. Biocontrol takes many years of research and development. For more information, contact the Palisade Insectary of the Colorado Department of Agriculture at 970-464-7916.

**MECHANICAL**

Tilling plant populations where possible can assist with controlling Perennial sowthistle. Smaller root fragments have a harder time producing viable rosettes. The optimum time to treat mechanically is in the leaf rosette stage. Mowing can assist with control in depleting the root reserves for the plants.

Integrated Weed Management:

Combining mechanical and chemical control methods can assist with controlling Perennial sowthistle. Plant are palatable to grazing animals, this can also assist in controlling plant populations.

HERBICIDES

NOTE: The following are recommendations for herbicides that can be applied to range and pasturelands. Rates are approximate and based on equipment with an output of 30 gal/acre. Please read label for exact rates. Always read, understand, and follow the label directions. The herbicide label is the LAW!

HERBICIDE	RATE	APPLICATION TIMING
2 4-D + Dicamba (Rangestar)	1 to 2 pt/acre	Apply to rosettes or early bolting stage. Add non-ionic surfactant @ 0.32 oz/gal of water or 1 pt/100 gal of water.
Aminopyralid (Milestone)	3 to 5 oz/acre	Apply to rosettes or early growth under favorable growing conditions. Add non-ionic surfactant @ 0.32 oz/gal of water or 1 pt/100 gal of water.
Clopyralid (Stinger)	5 to 11 oz/acre	Apply to rosette to bud stages of plant growth. Add non-ionic surfactant @ 0.32 oz/gal of water or 1 pt/100 gal of water.
Picloram (Tordon 22K *this is a restricted use herbicide*)	4 pt/acre	Apply to rosette to early bolting stage. Add non-ionic surfactant @ 0.32 oz/gal of water or 1 pt/100 gal of water.

Photos © Top to Bottom; Theodore Webster, USDA Agricultural Research Service, Bugwood.org; Whitney Cranshaw, Colorado State University, Bugwood.org; Kelly Uhing, Colorado Department of Agriculture

Perennial sowthistle



Plumeless thistle

Colorado Department of
Agriculture

305 Interlocken Pkwy
Broomfield, CO 80021

(303) 869-9030
weeds@state.co.us



Key ID Points

1. Flower heads cluster 2-5 and are purple to dark red in color.
2. Leaves are alternate, stalk-less and hairy underneath.

Plumeless thistle Identification and Management



Identification and Impacts

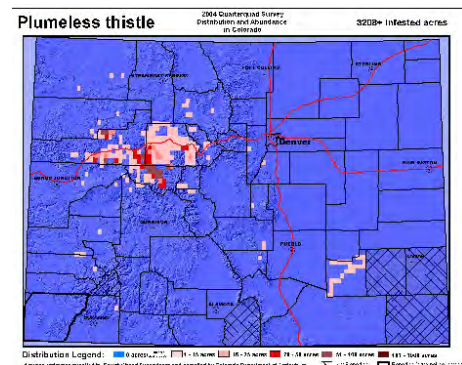
Plumeless thistle (*Carduus acanthoides*) is a winter annual or biennial that is native to Europe and Asia. Plumeless thistle rosettes have wavy leaves with yellow spines along the white-colored leaf margins. The stems are covered with leaf-like, winged spines that extend up to the flowering heads. The flower heads, in clusters of 2 to 5, are alone at the end of the branches. They are purple to dark red in color and are 1/2 to 1 inch in diameter. Leaves are alternate, stalk-less, hairy underneath and blend into the stem. Mature plants can grow taller than 5 feet and can produce upwards of 9,000 seeds.

Habitats for Plumeless thistle include pastures, fields, disturbed lands, logged-over areas, river valleys, along roadsides and in native grasslands. Plumeless thistle out competes native species and forage crops. It is one of the most aggressive thistles, due to its high seed production. Plumeless thistle is unpalatable to livestock and it may accumulate nitrates.

Plants over winter and grow from seeds and rosettes. The seed viability for Plumeless thistle is unknown. The site must be monitored for at least 10 years after the last flowering adult plants have been eliminated and treatments repeated when necessary.

The key to effective control of Plumeless thistle is very similar to Musk thistle. Preventing Plumeless thistle seed production and planting desirable grasses and forbs to out compete plumeless thistle is effective. An integrated weed management approach is an effective tool when dealing with plumeless thistle; using herbicide, biological and cultural control methods. Details on the back of this sheet can help to create a management plan compatible with your site ecology.

Plumeless thistle is designated as a "List B" species in the Colorado Noxious Weed Act. It is required to be either eradicated, contained, or suppressed depending on the local infestations. For more information visit www.colorado.gov/ag/csd and click on the Noxious Weed Management Program. Or call the State Weed Coordinator at the Colorado Department of Agriculture, Conservation Services Division, 303-239-4100.



Photos © Map above: Crystal Andrews, Colorado Department of Agriculture; All other photos: Kelly Uhing, Colorado Department of Agriculture.

Carduus acanthoides

**CULTURAL**

Establishment of selected grasses can be an effective cultural control of Musk thistle. Contact your local Natural Resources Conservation Service for seed mix recommendations. Maintain healthy pastures and prevent bare spots caused by overgrazing. Bareground is prime habitat for weed invasions.

**BIOLOGICAL**

Biological control insects, such as the seed head weevil and the crown weevil are effective on large infestations. When used together, these insects provide fair to good control. These insects have been known to threaten native thistle populations. Contact the Insectary of Colorado Department of Agriculture to get complete information at 970-464-7916. Or visit www.colorado.gov/ag/csd.

**MECHANICAL**

Any mechanical or physical method that severs the root below the soil surface will kill Plumeless thistle. Mowing or chopping is most effective when Plumeless thistle plants are at full bloom. Be sure to properly dispose of the flowering cut plants since seeds can mature and become viable after the plant has been cut down.

Integrated Weed Management:

The key to managing Plumeless thistle is to prevent seed production. Dense Plumeless thistle stands can be treated by spot use of herbicide programs. Due to the unknown seed viability of plumeless thistle, monitoring up to 10 years, and repeating control methods may need to occur for many years to completely eliminate an infestation.

Plumeless thistle

HERBICIDES

NOTE: The following are recommendations for herbicides that can be applied to range and pasturelands. Rates are approximate and based on equipment with an output of 30 gal/acre. Please read label for exact rates. **Always read, understand, and follow the label directions. The herbicide label is the LAW!**

Herbicide	Rate	Application Timing
Aminopyralid* (Milestone)	5 oz. product/acre + 0.25% v/v non-ionic surfactant	Apply in spring rosette to early bolting growth stages or in fall to rosettes.
Chlorsulfuron** (Telar)	1-2.6 oz. product/acre + 0.25% v/v non-ionic surfactant	Apply in spring from rosette through very early flower growth stages. (Can prevent viable seed formation if applied no later than the first viable flowers begin to
Clopyralid (Transline)	0.67-1.33 pints product/acre + 0.25% v/v non-ionic surfactant	Apply to rosettes through flower bud stage in spring, or to fall rosettes.

Note: *Product not permitted for use in the San Luis Valley. **This herbicide has residual soil activity that will affect all broadleaf seedlings germinating after application has occurred.

Additional herbicide recommendations for this and other species can be found at: www.colorado.gov/agconservation/CSUHerbicideRecommendations.pdf

Photos Top to bottom © Loke T. Kok, Virginia Polytechnic Institute and State University, Bugwood.org; Richard Old, XID Services, Inc., Bugwood.org; and Kelly Uhing, Colorado Department of Agriculture.

Puncturevine

Colorado Department of
Agriculture

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Broomfield, CO 80021

(303) 869-9030
weeds@state.co.us



Key ID Points

Identification and Management



Identification and Impacts

Puncturevine (*Tribulus terrestris*) is a summer annual forb, and is native to Europe. The plant is prostrate or ascending, spreading into mat forming cover. The stems are trailing and can grow to 1 1/2 to 5 feet long. Leaves are formed into leaflets, with each leaflet containing 5 to 8 oval leaves. The leaves are hairy and opposite. The flowers appear in July through October. They have five petals and are yellow in color. Each flower node will produce a fruit, at maturity the fruit will break into 5 seed capsules. Each seed capsule will produce 2-4 seeds. Each capsule is hard and contains many spines, almost tack like. The shape of the seed capsule has been referred to as a "goathead." The seeds will propagate after the first moisture of the spring and then any wet period following. Seeds can stay viable for 4 to 5 years.

Habitats for Puncturevine include, but are not limited to roadsides, pastures, waste areas, cultivated fields, yards, and disturbed sites. The seed capsules can cause injury to humans, animals, and tires. Seeds can be found in hay, which may cause injury to animals. The capsules

can also become entangled in wool, and decrease the quality. Due to the spiny nature of the plant, spreading seed over large areas is fairly easy.

The key to effective control of Puncturevine is preventing the plants to produce seed. Puncturevine can easily be dug up, making sure to get all the roots and to bag any flowering parts. Chemical and biological controls can also be effective as treatment options. Details on the back of this sheet can help to create a management plan compatible with your site ecology.

Puncturevine is designated as a "List C" species on the Colorado Noxious Weed Act. It is required to be either eradicated, contained, or suppressed depending on the local jurisdictions managing this species. For more information, visit www.colorado.gov/ag/weeds and click on the Noxious Weed Program link. Or call the State Weed Coordinator at the Colorado Department of Agriculture, Conservation Services Division, 303-239-4100.



Photos © From Bottom left; Steve Dewey, Utah State University, Bugwood.org; All other Kelly Uhing, Colorado Department of Agriculture

Tribulus terrestris

**CULTURAL**

Cultural control for Puncturevine is a difficult task, since seed reserves can stay viable for 4 to 5 years. Preventing the plants from establishing, by eliminating bareground can assist in the process. For specific seed recommendations contact your local Natural Resources Conservation Services for seed mixes.

**BIOLOGICAL**

There are two biological controls available for control of Puncturevine; *Microlarinus lareynii*, a seed feeding weevil, and *Microlarinus lypriformis*, a stem boring weevil. Contact the Palisade Insectary of the Colorado Department of Agriculture at 970-464-7916 for more information.

**MECHANICAL**

Hand pull or dig when soil is moist, but make sure to wear gloves. Bag specimens carefully so as not to scatter seeds. This is helpful unless infestations are too large. The key to effective control is to prevent seed production and/or spread.

Integrated Weed Management:

Using a combination of control options can be effective in the control of Puncturevine. The plants are hard to eradicate, due to the seed viability of 4 to 5 years in the soil. Constant monitoring and management can be helpful.

Puncturevine

HERBICIDES

NOTE: The following are recommendations for herbicides that can be applied to range and pasturelands. Rates are approximate and based on equipment with an output of 30 gal/acre. Please read label for exact rates. Always read, understand, and follow the label directions. The herbicide label is the LAW!

HERBICIDE	RATE	APPLICATION TIMING
Glyphosate (Roundup) *Non-selective herbicide*	1.6% solution or 2 oz./gal water	Apply in early plant growth stages, emergence and rosettes.
2,4 D and Dicamba (Outlaw)	1-2 pints/Acre or 0.5-1.0 oz/gal water	Spring at emergence of seedlings continue through growing season. Add non-ionic surfactant 0.32 oz./gal water or 1 qt./100 gal water.
Chlorusulfuron (Telar)	1-3 oz./Acre	Apply pre-emergence or early post-emergence.
Pendimethalin (Pendulum)	2.1-4.2 qts/Acre	A pre-emergence spray.

Photos © Top to Bottom; (middle) Neal Spencer, USDA Agricultural Research Service European Laboratory, Bugwood.org; (other 2) Kelly Uhing, Colorado Department of Agriculture

Colorado Department
of Agriculture
Conservation Services

305 Interlocken Pkwy
Broomfield, CO 80021
303-869-9030

Quackgrass



Key ID Points

1. The yellowish-white rhizomes (root systems).
2. The leaves ear-like appedages at the sheath node.

Quackgrass Identification and Management



Identification and Impacts

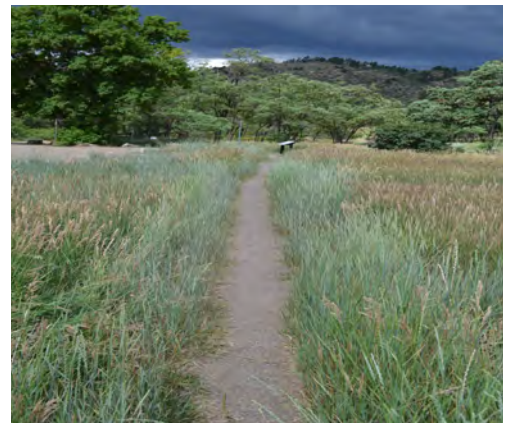
Quackgrass (*Elymus repens*) is a perennial grass that is native to Europe. It grows from underground rhizomes to an unmowed height of 1 to 4 feet with erect stems. The rhizomes are yellowish-white, sharp pointed and somewhat fleshy. Both the leaf sheath and blade are hairless or sparsely hairy. The seeds germinate in the fall and spring and plants can produce seeds more than 1 time per season. Spikelets are in 2 long rows and borne flatwise to the stem. The florets have short, straight awns or are awnless. The leaves of Quackgrass are constricted near the tips. Leave blades are 0.25 to 0.5 inches wide, flat, pointed, with small ear-like appendages at the junction of the blade and the sheath. Quackgrass's flowers appear from June through August and resemble wheat head in a slender spike. Each Quackgrass plant produces about 25 seeds. These seeds remain viable for 3 to 5 years in the soil.

The habitat of Quackgrass includes: crops, pasture, rangeland, roadsides, ditches, gardens, yards, and any disturbed moist area. It is a rapid invader that does stabilize eroding soils, but take over good areas for other plants. Since it adapts to moist soils the

optimal growth temperature is 68-77 degrees Fahrenheit. Quackgrass only moderately tolerates shade.

The key to effective control of Quackgrass is preventing the establishment of dense stands, once it becomes established it is hard to control. Using an integrated weed management approach proves to be the best control. Using a combination of cultural, mechanical and chemical controls can have an effect, with Quackgrass. Herbicide treatments are an option if used when plants are young, generally in the spring. Details on the back of this sheet can help to create a management plan compatible with your site ecology.

Quackgrass is designated as a "List C" species in the Colorado Noxious Weed Act. It is required to be either eradicated, contained, or suppressed depending on the local jurisdictions managing this species. For more information visit www.colorado.gov/ag/weeds or call the State Weed Coordinator at the Colorado Department of Agriculture, Conservation Services Division, 303-869-9030.



Photos © (Clockwise from lower left): Ohio State Weed Lab, Ohio State University; (Unknown) weeds.hotmeal.net; (Unknown) Shawnee County Kansas; (Next two) Steven Dewey,

Elymus repens

**CULTURAL**

Cultural methods for Quackgrass include outcompeting when in crop fields, but preventing the establishment of new infestations by minimizing disturbance, and maintaining healthy native communities proves to be successful. Contact your local Natural Resources Conservation Service for seed mix recommendations.

**BIOLOGICAL**

Currently, there are no biocontrol agents available for Quackgrass. Biocontrol takes many years of research and development. For more information, contact the Colorado Department of Agriculture's Insectary in Palisade, Colorado at 970-464-7916.

**MECHANICAL**

Mechanical treatments are tricky when dealing with Quackgrass. Tilling proves to be the best method, but it can also aid in the spread of the rhizomatous nature of the plant. If tilling is the only option till towards the center of the infestation, so spreading doesn't occur outward and till when the roots can be exposed to high or freezing temperatures. This will kill the roots and minimize regrowth.

Integrated Weed Management:

Using a combination of control methods proves to be the most effective method when dealing with Quackgrass. Using a mechanical and chemical approach seems to be most effective. Always revegetate with desirable grasses and forbs after treatments. Once infestations of Quackgrass become established control and containment become more difficult.

Quackgrass

HERBICIDES

NOTE: The following are recommendations for herbicides that can be applied to range and pasturelands. *Rates are approximate and based on equipment with an output of 30 gallons per acre. Always read, understand, and follow the label directions. The herbicide label is the LAW!*

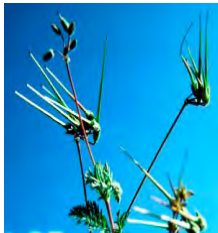
HERBICIDE	RATE	APPLICATION TIMING
Glyphosate (Roundup)	2 to 3 qt/acre or a 2% solution	Apply when grass is 8 or more inches tall.
Clethodim (Select 2EC)	8 to 16 fl. oz. of product /acre + 1% v/v crop oil concentrate	Apply when grass is 4 to 12 inches tall and repeat, if necessary, when 4 to 12 inches tall. *Select can be used in many crops, including alfalfa, and in non-crop areas.

Redstem filaree

Colorado Department of
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(303) 869-9030
weeds@state.co.us



Key ID Points

1. The hairy red colored stems.
2. The opposite leaf pattern in the rosette stage.
3. The long-beak like fruit and seed.

Updated on:
08/09

Redstem filaree Identification and Management



Identification and Impacts

Redstem filaree (*Erodium cicutarium*) is a winter annual or biennial forb that has a spreading or erect profile and is native to the Mediterranean or Asia. Part of the Geranium family, Redstem filaree grows generally from a rosette stage, and can grow from the 3 inches to 2 feet tall. The stems are hairy and red in color. The leaves are opposite and finely divided with toothed or lobed margins. They are pubescent, grow on short stems and have a reddish tint. The root system is a shallow taproot with fibrous secondary roots. The five petaled flowers are a purplish-pink in color and are in clusters of 2 or more. Each flower will produce five long lobed fruits. Each fruit will have an awn like tail which will dry and split with maturity. Redstem filaree primarily reproduces by seed and generally germinates in early spring.

Habitats for Redstem filaree include: dry pasturelands, landscapes, turfgrass and it prefers sandy soils. It can easily outcompete desirable vegetation once established. Redstem filaree is drought tolerant and can withstand a heavy stocking rate. The plant is

grazed by many different animals especially sheep.

The key to effective control of Redstem filaree is preventing establishment of the plant and seed production. There are many options for control of Redstem filaree depending on site ecology. Both chemical and mechanical control options are effective. Details on the back of this sheet can help to create a management plan compatible with your site ecology.

Redstem filaree is designated as a "List C" species in the Colorado Noxious Weed Act. It is required to be either eradicated, contained, or suppressed depending on the local infestations. For more information visit www.colorado.gov/ag/weeds or call the State Weed Coordinator at the Colorado Department of Agriculture, Conservation Services Division, 303-239-4100.



Photos © (Clockwise from lower left): Theodore Webster, USDA, Bugwood.org; (Unknown) Oregon State University; Howard F. Schwartz, Colorado State University, Bugwood.org; Richard Old, XID Services Inc., Bugwood.org; (Unknown) Oregon State University

Erodium cicutarium



CULTURAL
Prevent the establishment of Redstem filaree, in rangeland or pastureland by planting native grasses and forbs. Contact your local Natural Resources Conservation Service for seed mix recommendations that may help. Bareground is prime habitat for weed invasions.



BIOLOGICAL
Currently there is not any biocontrol available for Redstem filaree. Biocontrol takes many years of research and development. For more information, contact the Colorado Department of Agriculture's Insectary in Palisade, Colorado at 970-464-7916.



MECHANICAL
Hand pulling or digging when soil is moist, making sure to get the roots to prevent resprouting is effective. Removing flowers before the plant sets seed will also be effective. Be sure to bag specimens carefully so as not to spread seeds. Any kind of tillage to the area can also be effective.

Integrated Weed Management:

Locate and remove plants immediately before plants set seed to prevent the spread of Redstem filaree. Since the plant reproduces solely by seed, an integrated management effort must include the elimination of seed production and depletion of seed bank. Combing herbicide and mechanical can be effective.

Redstem filaree

HERBICIDES

NOTE: The following are recommendations for herbicides that can be applied to range and pasturelands. *Rates are approximate and based on equipment with an output of 30 gallons per acre. Always read, understand, and follow the label directions. The herbicide label is the LAW!*

HERBICIDE	RATE	APPLICATION TIMING
Metsulfuron (Escort XP)	.33 oz of product /acre +.025% v/v non-ionic surfactant	Apply rosette stage through early flower stage.
2,4-D + dicamba (Rangestar)	2 pt. + 1 pt. product / acre	Apply rosette stage of growth.



Above photos © (Top): Richard Old, XID Services Inc., Bugwood.org; (Middle) Whitney Cranshaw, Colorado State University, Bugwood.org; (Bottom) Kelly Uhing, Colorado Department of Agriculture



that can grow to become independent plants. Once rosettes emerge in the spring, remaining root buds slough-off until they develop again in late summer. Additionally, root fragments can develop into new plants.

Russian knapweed is allelopathic, which means it contains a toxic substance that inhibits the growth of competing plants. This weed may also be toxic to horses resulting in serious injury or possibly death of the animal. Russian knapweed displaces native vegetation and reduces forage values on range and pasturelands.

Habitat for Russian knapweed includes roadsides, ditch banks, riparian zones, pastures, rangeland, saline soils, clear cuts, and cropland. It typically invades degraded areas and sites with full sun.

The most effective method of control for Russian knapweed is to prevent its establishment through proper land management. Maintain healthy pastures and rangeland and continually monitor your property for new infestations. If Russian knapweed is already established, using an integrated weed management approach proves to be effective. Russian knapweed can be managed with herbicides or biocontrol insects, but long-term control must include planting competitive plant species to occupy bare ground once infested by the weed. Details on the back of this sheet can help to create a management plan compatible with your site ecology.



© Steve Dewey USU



Black, scaly root



Russian knapweed (*Acroptilon repens*) is a non-native, deep-rooted perennial that spreads by aggressive, creeping, horizontal roots (rhizomes) and seeds. The roots are brown to black with a scaly appearance. Russian knapweed can grow up to 3 feet in height. The stems and leaves are covered with short gray hairs. The flowers are urn-shaped, pink to purple in color, and are solitary at the tips of the upper branches. Russian knapweed can be distinguished from other knapweeds by the smooth, papery, rounded bracts that surround the flowers. Russian knapweed emerges in early spring after soil temperatures remain above freezing. It produces flowers from June to August and sets seed in late summer to early fall. The seeds are viable for two to three years. Russian knapweed reproduces primarily from its root system. Buds on the horizontal roots can form adventitious shoots, August through the winter,

Russian knapweed

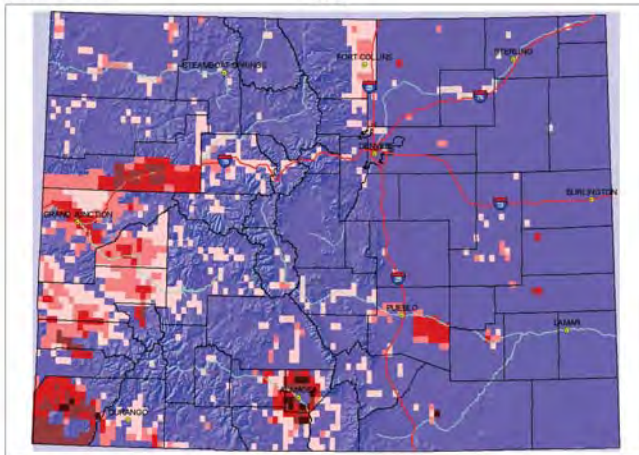
Acroptilon repens

2008 Quarter Quad Survey

Russian knapweed
Acroptilon repens

2008 Quarterquad Survey
Distribution and Abundance
in Colorado

132,466+ Infested Acres



Distribution Legend: 0 ACRES/0Q 1-5 6-50 51-300 301-1000 1001-5000
Acreage estimates supplied by county weed supervisors and compiled by the Colorado Department of Agriculture

Russian knapweed is redesignated as a “List B” species in the Colorado Noxious Weed Act. It is required to be either eliminated, contained, or suppressed depending on the local infestations. For more information, visit www.colorado.gov/ag/weeds and click on the Noxious Weed Program link or call the State Weed Coordinator at the Colorado Department of Agriculture, Conservation Services Division, 303-869-9030.

Key ID Points

1. Distinguished from other knapweeds by the flower’s smooth, papery bracts.
2. Roots are brown to black with scaly appearance.
3. Rosettes and lower leaves deeply lobed.
4. Upper leaves are smaller, smooth margined, and not lobed.

Integrated Weed Management Recommendations

Russian knapweed

Acrotilon repens

The most effective control for Russian knapweed is to prevent its establishment through proper land management. An integrated weed management approach can be effective when dealing with Russian knapweed. It can be managed with herbicides or insects, but long-term control must include planting competitive plant species to occupy bare ground once infested by the weed.



CULTURAL

Maintain healthy pastures and prevent bare spots caused by overgrazing. Bare ground is prime habitat for weed invasions. Establishing sod-forming grasses or vegetation with dense shade can be an effective cultural control of Russian knapweed. Contact your local Natural Resources Conservation Service for seed mix recommendations.

BIOLOGICAL

The gall midge, *Jaapiella ivannikovi*, is a fly that lays eggs in the shoot tips of Russian knapweed. It forms galls that reduce flowering, seed production, and stunts the plants' growth. This biocontrol will stress the stand of Russian knapweed but will not likely eliminate it. The Colorado Department of Agriculture - Palisade Insectary, 970-464-7916, is currently establishing this biocontrol. It is not yet available to the public.

MECHANICAL

Mowing several times before the plants bolt stresses Russian knapweed and forces it to use nutrient reserves stored in the root system. However, mowing alone will not eliminate the infestation and it can stimulate shoot sprouting the following year. Mowing combined with a fall herbicide application will enhance control. Tilling and disking can create root fragments that can sprout. However, repeated deep tillage (1 foot) over 3 years can kill much of the root system.

CHEMICAL

The following are recommendations for herbicides that can be applied to range and pasturelands. Always read, understand, and follow the label directions. Please read label for exact rates. The herbicide label is the LAW!

Herbicide	Rate	Application Timing
Aminopyralid* (Milestone)	7 oz. product/acre + 0.25% v/v non-ionic surfactant	Apply in the fall when above-ground stems die back and root buds are highly susceptible. Can also apply in the bud to senescence stages or in the spring during early bolt before flower buds form.
Aminocyclopyrachlor + Chlorsulfuron (Perspective)*	4-5 oz. product/acre + 1% v/v methylated seed oil	Apply in the fall when above-ground stems die back and root buds are highly susceptible. Can also apply in the bud to senescence stages or in the spring during early bolt before flower buds form. IMPORTANT: Applications greater than 5.5 oz. product/acre exceeds the threshold for selectivity. DO NOT treat in the root zone of desirable trees and shrubs. Not for use on grazed or feed forage. Not for use on grazed or feed forage.

Note: *Product not permitted for use in the San Luis Valley. **This herbicide has residual soil activity that will affect all broadleaf seedlings germinating after application has occurred.

Additional herbicide recommendations for this and other species can be found at:

www.colorado.gov/agconservation/CSUHerbicideRecommendations.pdf

Colorado Department of Agriculture - Conservation Services

305 Interlocken Parkway

Broomfield, CO 80021

(303) 869-9030

www.colorado.gov/ag/weeds

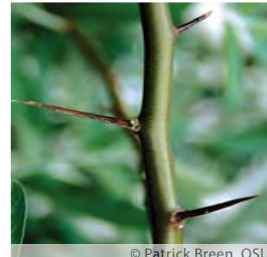




reddish, and have surfaces coated with gray and scaly pubescence, becoming smooth.

Once thought to be a beneficial windbreak tree, it since has been deemed detrimental to the environment. Russian olive can grow in a variety of soil and moisture conditions, but prefers open, moist, riparian zones. It is shade tolerant and can be found along streams, floodplains, fields and open areas up to approximately 8,000 feet in elevation. Russian-olive can outcompete native plants, interfere with natural plant succession and nutrient cycling, and tax water reserves. Because Russian olive is capable of fixing nitrogen in its roots, it can grow on bare, mineral substrates and dominate riparian vegetation. Although Russian olive provides a plentiful source of edible fruits for birds, ecologists have found that bird species richness is actually higher in riparian areas dominated by native vegetation.

The key to effective control of Russian olive is preventing establishment of the trees or shrubs. If plants are already present, control options include cut-stump treatments and mechanical mowing. These treatments depend on size and location of the plant. Details on the back of this sheet can help you create a management plan compatible with your site ecology.



Russian olive (*Elaeagnus angustifolia*) is a perennial tree or shrub that is native in Europe and Asia. The plant has olive-shaped fruits, silver color at first then becoming yellow-red when mature. Russian olive can reproduce by seed or root suckers. Seeds are readily spread by birds and can remain viable for up to 3 years. Spring moisture and slightly alkaline soil tend to favor seedling growth. The plant's extensive root system sprouts root suckers frequently. The tree can reach up to 30 feet in height with branches that have 1 to 2 inch thorns. Leaves are 2 to 3 inches long, alternate, narrow, and have simple blades with smooth edges. The leaf's lower surface is silvery white, while the upper surface is light green in color. Flowers are 4 small sepals in light yellow clusters, fragrant, and appear May through June. Fruits mature from September to November. Russian olive twigs are flexible,

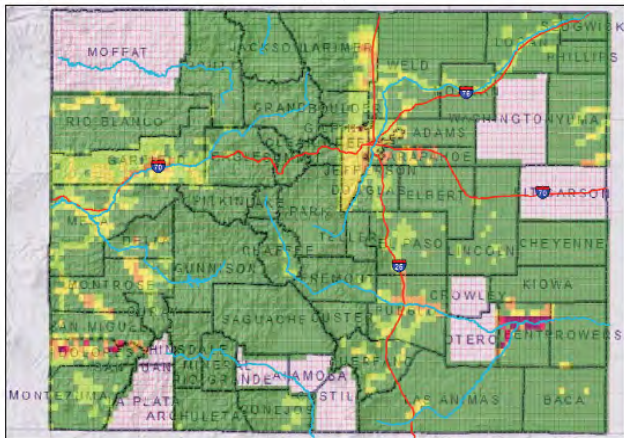
Russian Olive

Elaeagnus angustifolia

Russian Olive
Elaeagnus angustifolia

2013 Quarterquad Survey
Distribution and Abundance
In Colorado

64,150+ Infested Acres



Acresage estimates supplied by County Weed Coordinators and compiled by the Colorado Department of Agriculture.

Russian olive is redesignated as a “List B” species in the Colorado Noxious Weed Act. It is required to be either eradicated, contained, or suppressed depending on the local infestations. For more information visit www.colorado.gov/ag/weeds and click on the Noxious Weed Management Program. Or call the State Weed Coordinator at the Colorado Department of Agriculture, Conservation Services Division, 303-239-4100.

Key ID Points

1. Leaves are silvery white.
2. Branches have 1 to 2 inch thorns.
3. Yellow-red fruits on mature plants.
4. Mature trees have shedding, reddish-brown bark.

Integrated Weed Management Recommendations

Integrated weed management offers the most effective combination of control efforts through the “cut stump” treatment. Trees are cut down with a hatchet or chainsaw, then immediately treated with an approved herbicide on the surface of the cut stump. The most effective timing is late summer/early fall for herbicide transfer into the roots.



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© James Miller, USFS



© Chris Ness, Adams County



© Scott Peterson, USDA

Russian olive

Elaeagnus angustifolia

CULTURAL

Replace Russian olives with native trees. Prevent establishment of new trees by removing seedlings and saplings before they mature. Contact your local Natural Resources Conservation Service for recommendations of other possible trees or shrubs.

BIOLOGICAL

Tubercularia canker is an unapproved biocontrol. However, it overwinters on infected stems and spreads via rain-splash, animals, or pruning implements to open wounds in the bark. Infected tissue becomes discolored or sunken. Entire stems may be girdled and killed, and the disease can deform or kill stressed plants over time.

MECHANICAL

Saplings can be pulled with a weed-wrench or cut with brush-cutters. Trees can be girdled or cut with chainsaws. However, stump sprouting commonly occurs after cutting down the tree; and stump excavation without removing all parts of the roots can result in root sprouting. Treating cut-stumps with an herbicide can eliminate sprouting. Stump burning is practical when conditions support a long, hot fire and most effective in summer or early fall. Saplings are most sensitive to mechanical treatment.

CHEMICAL

The table below includes recommendations for herbicides that can be applied to range and pasturelands. Always read, understand, and follow the label directions. The herbicide label is the LAW!

Herbicide	Rate	Application Timing
Triclopyr (Garlon 4, Remedy)	20-30% solution in basal bark oil. The herbicide Pathfinder and does not require dilution.	Cut-Stump Treatment: Apply to the cambial layer of the tree immediately after the cut-stump treatment and to roots above soil surface. (Summer to fall; fall treatments showed fewer re-growth) Basal Bark Treatment: Spray till wet but not dripping; the roots above soil surface, root collar, and lower trunk to a height of 12-15 inches above ground (Late summer to fall)
Glyphosate* (Rodeo - approved aquatic label)	Undiluted (100% solution) or 50% solution in basal bark oil	Cut-Stump Treatment: Apply to the cambial layer of the tree immediately after the cut-stump treatment and to roots above soil surface. Diluted solutions requires regular agitation. Treat summer to fall; fall treatments showed fewer re-growth.

Note: *These products are non-selective and will kill any vegetation contacted.

Additional herbicide recommendations for this and other species can be found at:
www.colorado.gov/agconservation/CSUHerbicideRecommendations.pdf

Saltcedar

Colorado Department of
Agriculture

305 Interlocken Pkwy
Broomfield, CO 80021

(303) 869-9030
weeds@state.co.us



Key ID Points

1. Saltcedar is a tall shrub or small tree that has white to pink flowers in clusters called racemes.
2. Leaves are small and scaly.

Saltcedar Identification and Management



Identification and Impacts

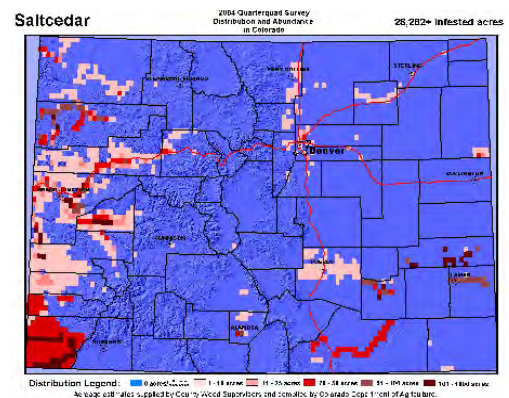
Saltcedar, or tamarisk (*Tamarix spp.*), is a non-native deciduous evergreen shrub or small tree that grows from 5 to 20 feet tall. The bark on saplings and stems is reddish-brown. The leaves are small, scale-like and bluish-green in color. Tiny pink to white flowers have five petals and grow on slender racemes. Saltcedar reproduces by seeds as well as vegetatively. A mature plant can produce up to 600,000 seeds per year. Seeds are viable for up to 45 days under ideal conditions. Saltcedar buds break dormancy in February or March. Flowering occurs anytime between April and August. Ideal conditions for saltcedar seedling survival are saturated soil during the first few weeks of life, a high water table, and open sunny ground with little competition from other plants.

Saltcedar was introduced from central Asia, northern Africa, and southern Europe for ornamental purposes and for stream bank stabilization. It is now widespread in the United States. Saltcedar crowds out native stands of riparian and wetland vegetation. Saltcedar increases salinity of surface soil, rendering the soil inhospitable to native plant species. Saltcedar can be

found along floodplains, riverbanks, streambanks, marshes, and irrigation ditches. Its heavy use of water has contributed to the intensity of the drought.

The most effective method of control for saltcedar is to prevent its establishment through proper land management. Monitor susceptible areas for new infestations. An integrated weed management approach has proven to be an effective control when dealing with saltcedar. Details on the back of this sheet can help to create a management plan compatible with your site ecology.

Saltcedar is designated as a "List B" species on the Colorado Noxious Weed Act. It is required to be either eradicated, contained, or suppressed depending on the local infestations. For more information, please visit www.colorado.gov/ag/csd and click on the Noxious Weed Program link. Or call the State Weed Coordinator of the Colorado Department of Agriculture, Conservation Services Division, 303-239-4100.



Plant and flower photos © Kelly Uhing. Leaf photo © USDA Aphis PPQ. Infestation photo above, © Steve Dewey, Invasive.org. Tamarisk branch © Stevens County, WA Noxious Weed Control Board

Tamarix spp.

**CULTURAL**

After a saltcedar infestation is managed, revegetation is necessary in order to protect the soil resource and reduce the threat of reinvasion. Seeded grasses, willow stakes, and cottonwood cuttings can reduce the chances of saltcedar reinvading managed sites.

**BIOLOGICAL**

The saltcedar leaf beetle (*Diorhabda elongata*) larvae and adults feed on foliage. This causes stem dieback and potential death of the plant if defoliation is consistent. The leaf beetle should be available for limited distribution. For more information, contact the Palisade Insectary of the Colorado Department of Agriculture, 970-464-7916.

**MECHANICAL**

A bulldozer or prescribed fire can be used to open up large stands of saltcedar. These methods must be followed up with a herbicide treatment of the resprouts when they are 1 to 2 meters tall. Chainsaws, or loppers for smaller plants, are effective for cut-stump treatments to smaller infestations or in environmentally-sensitive management areas.

Integrated Weed Management:

Select the appropriate control method based on the size of the area and other environmental or cultural considerations. Re-seed controlled areas with desirable species to protect the soil resource and to prevent or slow saltcedar reinvasion. Follow up control efforts the same growing season and for several years afterwards.

Saltcedar

HERBICIDES: The following are recommendations for herbicides that can be applied to range and pasturelands. Rates are approximate and based on hand-held equipment with an output of 30 gallons per acre. Always read, understand, and follow the label directions. **The herbicide label is the LAW!**

Herbicide	Rate	Application Timing
Triclopyr (Garlon 4, Remedy)	20-30% solution in basal bark oil. The herbicide Pathfinder comes pre-mixed in oil and does not require dilution.	Cut-Stump Treatment: Apply to the cambial layer of the tree immediately after the cut-stump treatment and to roots above soil surface. (Summer to fall) Basal Bark Treatment: Spray till wet but not dripping; the roots above soil surface, root collar, and lower trunk to a height of 12-15 inches above ground (Summer to fall)
Glyphosate* (Rodeo - approved aquatic label)	Undiluted (100% solution) or 50% solution in basal bark oil	Cut-Stump Treatment: Apply to the cambial layer of the tree immediately after the cut-stump treatment and to roots above soil surface. Diluted solutions requires regular agitation. (Summer to fall)
Triclopyr (Garlon 4, Remedy) + Aminopyralid (Milestone)	3 qts. Garlon 4/acre + 7 oz. Milestone/acre + 0.25% v/v non-ionic surfactant	Broadcast foliar treatment: Apply when plants are growing rapidly. (May to September)
Note: *These products are non-selective and will kill any vegetation contacted.		
Additional herbicide recommendations for other species can be found at: www.colorado.gov/agconservation/CSUHerbicideRecommendations.pdf		



to subtend. When vertically sliced, the receptacle is diagnostically cone-shaped, solid in the center, and lacks chaff. The phyllaries are oblong, in a series of two to five, are green in the middle, dried and thin on margins. The achenes diagnostically have three deep ribs that are well-separated, rounded oil-glands. It spreads only by seed; like other Asteraceae, it is a prolific seed producer. Seeds lack anatomical dispersal structures so remain close to parent plants.

Identification of this species is difficult and underwent numerous past taxonomic changes. There are several Asteraceae species that are easily confused with scentless chamomile from a distance. These include two other List B species, stinking chamomile (*Anthemis cotula*) and oxeye daisy (*Leucanthemum vulgare*), as well as German chamomile, sea mayweed (*Tripleurospermum maritimum*), chamomile (*Chamaemelum nobile*), pineapple weed (*Matricaria discoidea*), native annual fleabane (*Erigeron annuus*) and whiplash daisy (*Erigeron flagellaris*) (iNaturalist 2018).

It is native to mountains and river valleys in the Caucus region, Russia, Uzbekistan, Kazakstan, parts of China (eFloras 2019,). It was introduced into European prairies and spread through agriculture (Kay 1969, Woo et al. 1999). Diploid plants (two chromosome sets), which are more common, come from western Europe; tetraploid plants (four chromosome sets) come from marginal edges of its range in eastern and central Europe.

Scentless chamomile (*Tripleurospermum inodorum* L.) is an annual forb in the Asteraceae family, also known as scentless false mayweed, scentless mayweed, and false chamomile, not to be confused with the tea producing German chamomile (*Matricaria chamomilla*).

Distinguishing scentless chamomile from similar looking species is difficult. The lack of odor is one clue; lack of hairs is another. Mature plants are about 1 to 1.5 feet tall. Its alternate leaves are 2 to 8 cm long, divided pinnately, and each lobe is pinnately divided again (bipinnatifid), giving a fern-like appearance. It has more than two stem leaves. Its roots are shallow and fibrous. White ray flowers have shallow five-lobed margin, which sometimes are asymmetrical. It has ten to 24 ray flowers. Fully developed yellow disc flowers form a dome shape that causes the white ray flowers

scentless chamomile 2016 Statewide Distribution in Colorado
Tripleurospermum inodorum Based on 2016 Quarterquad and EDDMaps5 Field Survey Data. Up to Approximately 2,001 Infested Acres.



COLOREDADO Department of Agriculture

Tetraploidy may indicate sympatric speciation, hybridization, genetic modifications, climatic changes or different introduction pathways (Kay 1969).

Scentless chamomile is ruderal, found mainly in Colorado's disturbed sites in upper montane and subalpine, where soil water content is slightly higher. This is usually on the sides of impermeable surfaces, such as roads, sidewalks, trails, and gravelly areas.



Key ID Points

1. Receptacle is solid in the center, cone-shaped & naked
2. Phyllaries are oblong, green in center & dried on margins
3. Alternate leaves are bipinnatifid into filiform segments
4. Fibrous roots

Scentless chamomile
Tripleurospermum inodorum L.

Integrated Weed Management Recommendations

Effective integrated management means using a variety of eradication methods along with restoration, prevention of seed production and dispersal, and monitoring. Maintain robust healthy native landscapes. Restore degraded sites. Avoid soil disturbance. Prevent seed production and seeds from dispersing, e.g. on contaminated equipment. Rest sites until restored. Modify land use practices. Use methods appropriate for the site, other plants present and land uses.



© Glassdoor

CULTURAL

Since scentless chamomile is ruderal, and sensitive to drought, minimizing soil disturbance and maintaining high native canopy cover of drought tolerant plants is key. It prefers moist soil, so modify drainage where dense colonies of scentless chamomile exist. Tilling during shoulder seasons or hot temperatures, exposes the shallow roots to drying. Since seed viability is more than 6 years, till frequently and seed cover plants. Maintain or restore a competitive assemblage of shrubs, forbs, cool and warm season grasses, annuals and perennials. In restoration efforts, select locally adapted species, soil amendments, soil microbes and mycorrhizal fungi that are ecologically appropriate for the site to improve competitiveness of other species.



MECHANICAL

Since scentless chamomile has shallow roots, mechanical methods can be effective in residential areas and moderate sized infestations. In loose soil, dig to remove the fibrous roots, especially the caudex. Mowing, chopping and deadheading leaves roots behind, stimulates more flower production and are not recommended. Mowing, especially when timed near flowering or seeding phases, often disperses flowers and seeds, which expands the size of the infested area. Collect, bag, and dispose of or destroy flowers; seeds could mature and germinate if left on the ground. Prescribed fire may be an effective tool to control scentless chamomile, but since it prefers roadsides and developed sites it may not be possible to generate the heat needed to damage the caudex and seeds. Little information exists on fire effects to this plant.



© Getty Images

BIOLOGICAL

Scentless chamomile is not palatable to domestic livestock (Woo et al. 1999). Properly managed grazing can improve vigor of desired species and indirectly reduce infestations. In Canada, two biological control agents were released; only one established (Winston et al. 2014). At present, there are no biological control agents authorized in Colorado that would effectively control it. For more information about biological control agents, visit the Colorado Department of Agriculture's Palisade Insectary website at: www.colorado.gov/ag/biocontrol.



© Mountain Spraying Company

CHEMICAL

NOTE: Herbicide recommendations to control scentless chamomile in pastures and rangeland are found at: <https://goo.gl/TvWnv9>. Rates are approximate and based on equipment with an output of 30 gal/acre. Follow the label for exact rates. Consult local turf and ornamental experts for herbicides appropriate for residential settings. Always read, understand, and follow the label directions. The herbicide label is the LAW!

Colorado Department of Agriculture - Conservation Services

305 Interlocken Parkway

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www.colorado.gov/ag/weeds



Colorado
State
University



spine-tipped bracts curve away from the flowering head. The flower receptacle is fleshy and has pits to hold seeds. The plants flower from mid-June to September. Scotch thistle seeds have the ability to mature in flower buds and heads that have been removed from the stalk. Both species can produce up to 14,000 seeds per plant. Seeds remain viable for up to 30 years but germinate readily with moisture in spring and fall.

Scotch thistle includes two species, *Onopordum acanthium* L. and *O. tauricum* Willd. Both are non-native biennial forbs. During the first year of growth, both species appear as a rosette in spring or fall. During the second year in mid to late spring the stems bolt, the plants flower, set seed, and the plants die. Both Scotch thistle species can grow up to 12 feet tall and basal rosettes can be up to 2 feet in diameter. Stems are numerous and branched. Characteristically, the entire length of stems from both species have broad wings with spiny tips. *O. acanthium* leaves have an overall gray color from dense woolly hairs. *O. tauricum* leaves are glandular and not as hairy as *O. acanthium*. For both, leaves are spiny. Both species have a distinct mid-rib. Flower heads are terminal, violet to reddish in color, 1 to 3 inches in diameter, and arranged in a raceme. One plant can produce up to 100 flower heads. The

Scotch thistle invades rangeland, overgrazed pastures, roadsides, and irrigation ditches. Both species prefer moist soil, such as areas adjacent to creeks and rivers. Roadsides appear to be especially vulnerable to invasion likely due to the water runoff from the shoulders. Maintaining healthy pastures and native plants, minimizing soil disturbance, changing land use practices to prevent overuse, and using seed-free equipment are critical measures to preventing infestations. As with most biennials, once established, limiting seed production is critical to effective control. Due to the robust, spiny nature of Scotch thistle, this plant can act as a living barbed wire fence, making areas impassible for wildlife, livestock, and people and unpalatable to cattle.

To control seed production, plants with buds or flowers should be collected, bagged and immediately disposed of or destroyed. Chemical control is most effective when plants are in rosette stage, spring or early fall. Mechanical controls

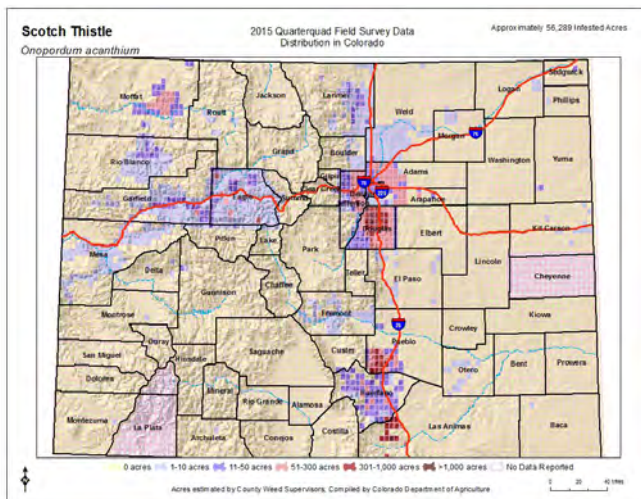
can be used to eliminate small patches or plants in a later growth stage.

Scotch thistle is designated as a "List B" species in the Colorado Noxious Weed Act. It is required to be eradicated; some populations may be contained or suppressed depending on state regulations. For state regulations described for each county, refer to the most recent Rule, or visit www.colorado.gov/ag/weedcontacts for details.



Scotch thistle
Onopordum acanthium L. and *O. tauricum* Willd.

2015 Quarter Quad Survey



Key ID Points

1. Pitted fleshy flower receptacle.
2. Prominent mid-rib.
3. Wide lobed leaves with distinct mid-rib.
4. Wide spiny wings extend the length of the stem.

Integrated Weed Management Recommendations

Effective integrated management means using a variety of eradication methods along with restoration, prevention of seed production and dispersal, and monitoring. Maintain robust healthy native landscapes. Restore degraded sites. Avoid soil disturbance. As with most biennials, prevent seed production in the first and second year of growth. Prevent seed from dispersing, such as on contaminated equipment. Rest sites until they are effectively restored. Change land use practices. Use methods appropriate for the site.



CULTURAL CONTROL METHODS

Effectiveness begins with maintaining or restoring a competitive native forb and forb assemblage. Continue restoration efforts until native plants are robust and abundant. Use locally adapted native seeds whenever possible to improve competitiveness. Include cool season and warm season, as well as perennial and annual grasses in revegetation efforts. Soil may need to be restored by adding soil amendments, soil microbes, mycorrhizal fungi and nitrogen fixing plants such as legumes. Manage land uses so they do not create bare mineral soil or compact soil. Annual crop cultivation appears to be an effective control measure.



© Jacqui Turner, The Timaru Herald

BIOLOGICAL CONTROL METHODS

Domestic livestock are likely to avoid this plant due the large number of spines all over the plant. Goats and sheep may eat flower heads if plants are small. Since most livestock and herbivores avoid the leaves and stems, Scotch thistle can become an “increaser” in over-grazed systems. Properly managed grazing systems can increase desirable plant vigor and indirectly reduce Scotch thistle. There are no known biological control agents effective against scotch thistle or authorized in Colorado. For more information about biological control agents, visit the Colorado Department of Agriculture’s Palisade Insectary website at www.colorado.gov/ag/biocontrol.



© Bugwood

MECHANICAL CONTROL METHODS

Methods, such as tilling, hoeing and digging, are best for infestations smaller than 0.5 acres; weigh this against other plants present, ecology and site condition. Sever roots below the soil surface during the first year before the plant stores energy and in the second year before seed production. Mowing, chopping and deadheading stimulates more flower production; these methods require consecutive years of season-long treatments. Flower heads must be collected, bagged, and disposed of or destroyed; seeds will mature and germinate if left on the ground. Fire gives Scotch thistle a competitive advantage. Large fleshy stems and leaves would not be consumed in a low severity fire and seeds would remain unaffected. High severity fires would likely damage native plants, which favors Scotch thistle if seeds are not killed and this is not recommended.

CHEMICAL

NOTE: The following are recommendations for herbicides that can be applied to pastures and rangeland. Rates are approximate and based on equipment with an output of 30 gal/acre. Follow the label for exact rates. Always read, understand, and follow the label directions. The herbicide label is the LAW!

HERBICIDE	RATE	APPLICATION TIMING
Aminopyralid* (Milestone)	7 oz. product/acre + 0.25-0.5% v/v non-ionic surfactant	Apply in spring rosette to early bolting growth stages or in fall to rosettes. *Product not permitted for use in the San Luis Valley.
Chlorsulfuron** (Telar)	1-2.6 oz. product/acre (0.75 oz. active ingredient/acre)+ 0.25% v/v non-ionic surfactant	Spring from bolting to flower bud stages. **This herbicide has residual soil activity that will affect all broadleaf seedlings germinating after application has occurred.
Metsulfuron + Chlorsulfuron (Cimarron X-tra)	2 oz. product/acre + 0.25-0.5% v/v non-ionic surfactant	Apply during rosette to flower bud stages.
Clopyralid (Transline)	0.67-1.33 pints product/acre + 0.25% v/v non-ionic surfactant	Apply to rosettes in spring or fall.
Aminocyclopyrachlor + chlorsulfuron (Perspective)*	4.75-8 oz. product/acre + 0.25% v/v non-ionic surfactant	Apply from the seedling to the bolting stage. IMPORTANT: Applications greater than 5.5 oz. product/acre exceeds the threshold for selectivity. DO NOT treat in the root zone of desirable trees and shrubs. Not for use on grazed or feed forage.

Colorado Department of Agriculture - Conservation Services

305 Interlocken Parkway

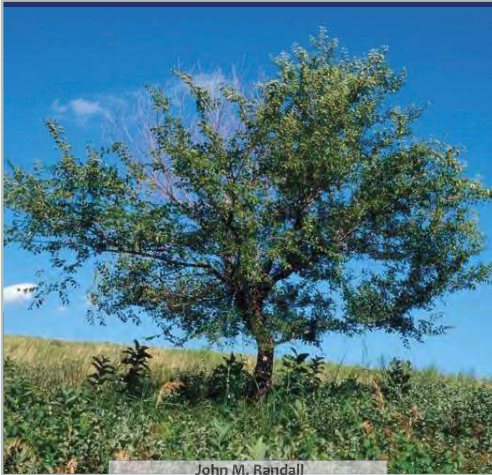
Broomfield, CO 80021

(303) 869-9030

www.colorado.gov/ag/weeds



Scotch thistle
Onopordum acanthium L. and O. tauricum Willd.



John M. Randall

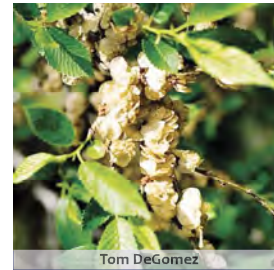
can also be self-fertilizing. Small clusters of 3-15 perfect flowers are produced at intervals along the preceding year's branches. Individual flowers are 1/8" across, consisting of a green calyx with 4-5 lobes, 4-8 exerted stamens, and a flattened pistil with a divided style. The blooming period occurs from early to mid-spring before the leaves develop, lasting about one week. Seeds develop in a light green, oval-shaped, and flattened wing-like fruit known as a samara. Under damp conditions, the seeds have the capacity to germinate within a week or two, and can persist in the seed bank for up to eight years.

Siberian elm is native to northern China, eastern Siberia, Manchuria, and Korea and was likely introduced in the late 1860s through the ornamental trade. It was used in the Midwest as a windbreak. It commonly grows on disturbed grounds, moist stream banks, in pastures and rangelands, and along road and railroad rights-of-way. Siberian elm does not tolerate flooding and seldom invades mature forest because of its high requirement for sunlight. Siberian elm can dominate new locations in just a few years due to its adaptability, high rate of germination, and rapid growth.

The key to effective control of Siberian elm is to prevent establishment through proper land management. Maintain healthy riparian corridors, wetlands and rights-of-way, and continually monitor your property for new infestations. Siberian elm is a designated "List C" species in the Colorado Noxious Weed Act. For List C species, the goal is to provide additional education, research, and biological control resources to jurisdictions that choose to require management of the List C species. The following page provides management recommendations. For more information please visit: www.colorado.gov/ag/weeds or call the CDA at 303-869-9000, and ask to speak with staff in the Noxious Weed Program.



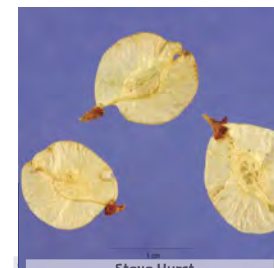
John M. Randall



Tom DeGomez



Robert Videki



Steve Hurst

Key Leaf ID Points:

1. Alternate, simple, 1"-2" long, dark green with conspicuous, grooved veins in a fishbone pattern,
2. Slightly hairy underneath when young; yellow in fall,
3. On short stalks, which are sometimes tinged dark red.

Siberian elm (*Ulmus pumila*) is a hardy fast growing, mid-sized, deciduous tree or shrub. It is also known by the names dwarf elm, and little leaf elm. Siberian elm can get up to 70 feet tall and has an open crown with upward-growing branches and many flexible, brittle branchlets that easily break off. There is usually a large accumulation of leaves and woody litter that builds up in the understory beneath Siberian elm. Leaves grow alternately on branches, are heart-shaped at the base and taper to a long point, with small teeth along the entire margin. Siberian elm is commonly confused with other elms in the *Ulmaceae* family.

Reproduction is by seed, primarily dispersed by wind, but also by water, animals, and in the undercarriages of equipment and vehicles. Flowers are cross-pollinated by the wind, and trees



Patrick Breen

Integrated Weed Management Recommendations

Effective integrated management means using a variety of eradication methods in the same site along with restoration, prevention of seed production and dispersal, and monitoring. Maintain robust healthy native landscapes. Restore degraded sites. Avoid soil disturbance. Prevent seed production and seed dispersal, e.g. on contaminated equipment. Rest sites until restored. Modify land use practices. Use methods appropriate for the site, including land use practices.



Whitney Cranshaw

CULTURAL

Maintain healthy plant communities to prevent or limit Siberian elm infestations, and limit disturbance. Promptly re-vegetate disturbed areas, and prevent establishment of new trees by removing seedlings and saplings before they mature. Replace existing Siberian elms with native trees. Contact your local Natural Resources Conservation Service for recommendations of alternative trees or shrubs.



BIOLOGICAL

There are currently no known biological control agents effective against Siberian elm or authorized in Colorado. For more information on the use of biocontrol agents to control weeds in Colorado, please contact the Palisade Insectary of the Colorado Department of Agriculture at 970-464-7916.



Northern Arizona Invasive Plants

MECHANICAL

Very young seedlings can be pulled fairly easily by hand or with a weed-wrench, especially in moist soil conditions. Cutting trees without chemical application often leads to significant basal and root sprouting. Mechanical methods alone are not recommended for older trees. Treating cut-stumps with herbicide is more effective than cutting alone and can eliminate sprouting.



Rutgers Plant and Pest Advisory/Cooperative

CHEMICAL

Methods include foliar application, basal bark spray, cut stump, and success is influenced by factors like time of year, the growth form (low growing, multi-stemmed shrub vs mid-sized, single stem tree), etc. The following are recommendations for herbicides that can treat Siberian elm; follow-up applications will be necessary. Please reference the label for exact rates. Always read, understand, and follow the label directions. The herbicide label is the LAW!

HERBICIDE	RATE	APPLICATION TIMING
Triclopyr (Garlon 3A, Garlon 4 Ultra, Pathfinder II)	Foliar treatment: 1-1.5% v/v solution plus 0.5% v/v non-ionic surfactant	Summer/early fall when actively growing and fully leafed but before fall color begins.
Glyphosate (Roundup, Accord XRT II, etc.)	Cut stump/girdling: 20-30% solution in oil or water carrier, depending on chemical	
Imazapyr (Arsenal, Habitat, Chopper, Stalker, etc.)	Foliar treatment: 1-5% v/v solution plus 0.5% v/v non-ionic surfactant	



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Broomfield, CO 80021
(303) 869-9030
www.colorado.gov/ag/weeds





Flowers bloom from June to October and seed-set usually occurs by mid-August. Spotted knapweed can also reproduce vegetatively from lateral roots.

Spotted knapweed tends to invade disturbed, overgrazed areas. It also occurs in grasslands, pastures, foothill clearings, logged areas, roadsides, sandy soils, and floodplains. Since it can tolerate both dry conditions and moist areas it is an especially versatile invader. Spotted knapweed and diffuse knapweed infestations often occur together in Colorado and plants can hybridize. Once established, spotted knapweed reduces livestock and wildlife forage by out-competing native and desirable species.

The most effective method of control for spotted knapweed is to prevent seed production and establishment through proper land management. Maintain healthy pastures, rangeland, and forests; and continually monitor for new infestations. If spotted knapweed is already established, applying an integrated weed management approach is effective. Details on the back of this sheet can help to create a management plan compatible with your site ecology.

Spotted knapweed is designated as a “List B” species as described in the Colorado Noxious Weed Act. It is required to either be eliminated, contained, or suppressed depending on the local infestations. For more information please visit www.colorado.gov/ag/weeds and click on the Noxious Weed Program link or call the State Weed Coordinator, Colorado Department of Agriculture at 303-869-9030.



© Rob Routledge, bugwood.org



Spotted Knapweed

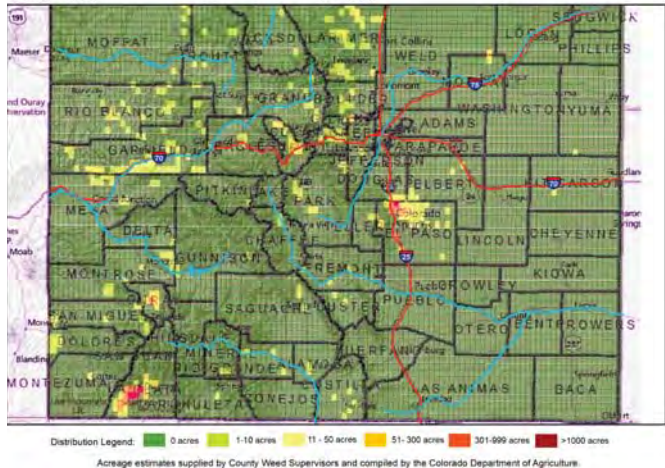
Centaurea stoebe

Key ID Points

1. Floral bracts have black tips, with comb-like spines of equal length.
2. Flowers are pink to purple, and rarely white.
3. Basal and stem leaves are deeply lobed, but become simple and oblong towards the tips of the stem.

2013 Quarter Quad Survey

Spotted Knapweed



Integrated Weed Management Recommendations

Spotted knapweed Centaurea stoebe

Spotted knapweed is best controlled at the rosette stage with mechanical or chemical techniques in the spring and fall. A key goal is to prevent seed production. Management must be intense and persistent in order to deplete the seed bank in the soil.



© Patrick J. Alexander



Hybrid spotted-diffuse knapweed flower



CULTURAL

Bareground is prime habitat for weed invasions. Maintaining healthy pastures and forests, while minimizing disturbance and overgrazing, is crucial. Contact your local Natural Resources Conservation Service for seed mix recommendations.

BIOLOGICAL

Root and seed head weevils (*Cyphocleonus achates* and *Larinus minutus*) attack the roots and reduce seed production in spotted and diffuse knapweeds. This is an option for large infestations, though optimum results take 3-5 years. To obtain the insects, contact the Colorado Department of Agriculture's Insectary in Palisade, Colorado at 970-464-7916.

MECHANICAL

Dig when the soil is moist; remove the root crown, 2-4 inches of taproot, and lateral roots. Digging alone requires several years of multiple treatments within a growing season. Mowing spotted knapweed when flower buds or early flowers are present will stress the plant, but not kill it. Do not mow after seed-set because it can disperse the seeds. Annual cultivation can eliminate spotted knapweed.

CHEMICAL

The table below includes recommendations for herbicides that can be applied to rangeland and some pastures. Always read, understand, and follow the label directions. The herbicide label is the LAW!

Herbicide	Rate	Application Timing
Aminocyclopyrachlor + chlorsulfuron (Perspective)*	4.75-8 oz. product/acre + 0.25% non-ionic surfactant	Pre-emergence or from seedling to mid-rosette stage. IMPORTANT: Applications greater than 5.5 oz. product/acre exceeds the threshold for selectivity. DO NOT treat in the root zone of desirable trees and shrubs. Not for use on grazed or feed forage.
Aminopyralid* (Milestone)	5-7 oz./acre + 0.25% non-ionic surfactant	Spring at rosette to early bolt stage and/or in the fall to rosettes. Add 1 qt./acre 2,4-D or 3 oz. Perspective when treating in the bolting to flowering growth stages.
Clopyralid (Transline)	0.67-1.33 pints/acre + 0.25% non-ionic surfactant	Apply to spring/fall rosettes before flowering stalk lengthens. Add 1 qt./acre 2,4-D when treating in the bolting to flowering growth stages.

Note: *Product not permitted for use in the San Luis Valley.

Additional herbicide recommendations for this and other species can be found at: www.colorado.gov/agconservation/CSUHerbicideRecommendations.pdf



loose cyme. Each flower has pale yellow petals and notched margins; flower color is not diagnostic. Like many *Potentilla* species, it has five bracts that subtend flowers, five petals, 25 or 30 stamens, numerous pistils, superior ovary and hypanthium. The style is not plumose or hooked at the top. The achene fruit is slightly winged with a heavily network-like veined surface, holding seeds. It is a prolific seeder (Zouhar 2003). Most seeds fall close to the parent plant. Seed longevity is at least four years (Zouhar 2003). It reproduces mainly vegetatively from the woody base where new shoots sprout as older portions die back, eventually forming new independent plants (Zouhar 2003). The woody taproot and lateral roots grow annual rings that can be used to age the plant up to 6 years (Dietz et al. 2002).

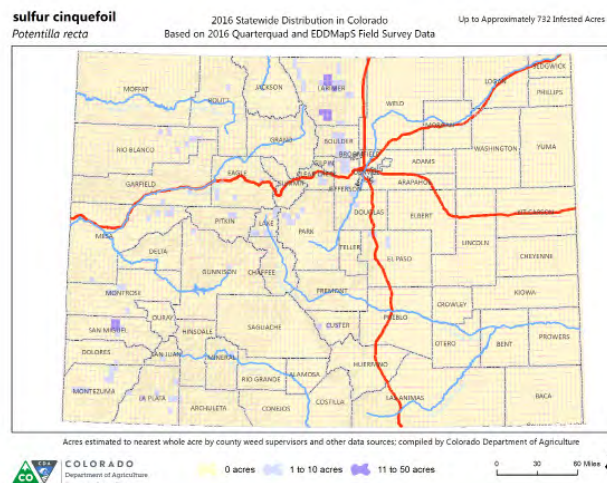
Sulfur cinquefoil (*Potentilla recta* L.) is a perennial forb in the Ranunculaceae family, also known as roughfruit or erect cinquefoil. There are 32 *Potentilla* species in Colorado, 32 have compound leaves, 26 of them are hairy, four are introduced, one is a rare endemic, and they hybridize within the Genus. Thus, correct identification is imperative.

The plant overall has a ring-like form, growing from the center outward and its stiff stems give it an upright growth form, up to three feet tall. The stem, petioles, calyx and underside of leaves are hirsute with long perpendicular hairs, sparse hairs on upper leaf surface. The palmate compound leaves with serrate margins and narrow oblanceolate and generally has five leaflets. The underside of its leaves are green. Leaves are basal, alternate on stem and stipulate.

The perfect flowers are arranged in a

The native slender cinquefoil (*Potentilla gracilis*) is often confused with sulfur cinquefoil. It has palmate compound leaves that are shallowly toothed, broad oblong-elliptical shape, has five leaflets, and the leaf underside is green. It can be sparsely to densely hairy, but the hairs on the stem are appressed; small hair tufts are on leaflet tips. Long yellow petals exceed the length of its sepals. It grows to three feet tall.

Beautiful potentilla (*Potentilla pulcherrima*) is another hirsute native that has many appressed stem hairs. However the underside of the leaves are gray and hairy. Its leaves are shallowly and obtusely serrate and each leaflet is rounded at the tip.



In Colorado, sulfur cinquefoil is robust in partial to full sun and moist soil found in wet meadows, swales, seeps, ditches, wetlands, riparian areas, and roadsides. However, it can also tolerate slopes and dry sites. Seedlings can be susceptible to drought when faced with interspecific competition (Zouhar 2003).



P. recta *P. pulcherrima*



P. recta *P. pulcherrima*



Key ID Points

1. Hirsute calyx with perpendicular hairs
2. Leaf underside is green
3. Hirsute stem, petioles & leaves with perpendicular hairs
4. Caudex & woody taproot with annual rings

Integrated Weed Management Recommendations

Effective integrated management means using a variety of eradication methods along with restoration, prevention of seed production and dispersal, and monitoring. Maintain robust healthy native landscapes. Restore degraded sites. Avoid soil disturbance. Prevent seed production and seeds from dispersing, e.g. on contaminated equipment. Rest sites until restored. Modify land use practices. Use methods appropriate for the site, other plants present and land uses.



© Douglas County



© Arizona Native Plant Society

CULTURAL

Since sulfur cinquefoil is shade-intolerant and seedlings are susceptible to drought, promote species that provide dense shade, high ground cover, or remain robust during drought, providing appropriate site conditions (Zouhar 2003). In cultivated sites, plowing, discing and reseeding to contiguous crop cover, such as grass may be effective as long as the entire root crown is killed (Zouhar 2003). In wildland settings, maintain or restore a competitive assemblage of shrubs, forbs, cool and warm season grasses, annuals and perennials. Use locally adapted species and mycorrhizal fungi that are ecologically appropriate for the site to improve competitiveness. Implement whole site restoration of soils, plants and water regimes where dense colonies of sulfur cinquefoil exist. Minimize soil compaction and disturbance, especially in moist soil.



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BIOLOGICAL

Sulfur cinquefoil is not palatable to cattle, sheep or horses likely due to tannins, but may be palatable to goats; when eaten, only buds and flowers are selected (Zouhar 2003). Properly managed grazing can improve vigor of desired species and indirectly reduce sulfur cinquefoil. There are no biological control agents for sulfur cinquefoil authorized in Colorado that would effectively control it. For more information about biological control agents, visit the Colorado Department of Agriculture's Palisade Insectary website at: www.colorado.gov/ag/biocontrol.

MECHANICAL

Since sulfur cinquefoil grows new shoots readily at the caudex, mechanical methods that fragment roots, such as tilling, hand-pulling and mowing are not recommended. Mowing, chopping and deadheading leaves roots behind, stimulates shoot and flower production and disperses flowers and seeds, which expands the infestation. Be sure to remove the entire upper root crown if digging in small infestations. Collect, bag, and dispose of or destroy flowers; seeds could mature and germinate if left. Low severity prescribed fires would leave root caudex unaffected and cause resprouting. Piling slash on infestations can increase temperature transferred to roots during prescribed fire, but resulting high severity effects can damage soils. Spring burns are more effective than fall burns for mature plants; fall burns are best for seedlings (Zouhar 2003).



© Techline Invasive Plant News

CHEMICAL

NOTE: Herbicide recommendations to control sulfur cinquefoil in pastures and rangeland are found at: <https://goo.gl/TvWnv9>. Rates are approximate and based on equipment with an output of 30 gal/acre. Follow the label for exact rates. Consult local turf and ornamental experts for herbicides appropriate for residential settings. Always read, understand, and follow the label directions. The herbicide label is the LAW!

Sulfur cinquefoil

Potentilla recta L.



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Colorado
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Richard Gardner

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like burnt peanuts. One female tree can produce 325,000 seeds or more annually, a large portion of which are viable, but not long lived, as seeds do not typically persist for more than two years. Leaves are pinnate-compound with dark green, broadly lanceolate leaflets, margins entirely with teeth or lobes at the base; light green veins and whitish green underneath with glandular red dots near their lobes. Bark is light brown to pale gray, rough with fissures on trunk, and fast-growing, as young sprouts grow as much as 10 to 15 feet in a year.

Tree of heaven (*Ailanthus altissima*), is a perennial, relatively short-lived deciduous tree, also known by the names stinking sumac, Chinese sumac, varnish tree, and stink tree. The tree grows up to 70' tall with up to 80' in crown width and 6' in trunk diameter. It is highly adaptable and can grow under limiting or harsh conditions, including soils that are saline, nutrient poor or highly compacted. It will also grow in areas affected by heat, drought, or pollution and has been troublesome in urban landscapes and woodlands. Tree of heaven is in the *Simaroubaceae* family.

Reproduction is mostly sexual by seed, but new plants are also produced asexually from root sprouts. The species is dioecious with female trees producing clusters of persistent, one-seeded, winged fruit and male trees producing groups of flowers that smell



Annemarie Smith

Tree of heaven is native to China, and was likely introduced in the late 1700s through the ornamental trade. The plant grows along roadsides, railways, fence rows, woodland edges, forest openings, or in riparian zones. It is most often found in waste areas or disturbed sites such as old fields and abandoned areas but can also grow on cliffs, or in crevices and paved areas. Its aggressive root system can impact pavement and foundations, the wood is weak and breaks easily, and infestations crowd out native species. The plant has also helped advance the spread of the spotted lanternfly, an invasive insect also originally from China.

The key to effective control of the tree of heaven, is to prevent establishment through proper land management. Maintain healthy riparian corridors, rights-of-way, and continually monitor your property for new infestations. Tree of heaven is a designated "List C" species in the Colorado Noxious Weed Act. For List C species, the goal is to provide additional education, research, and biological control resources to jurisdictions that choose to require management of the List C species. The following page provides management recommendations. For more information please visit: www.colorado.gov/ag/weeds or call the CDA at 303-869-9000, and ask to speak with staff in the Noxious Weed Program.



Ian Trueman



Richard Gardner



Annemarie Smith



Annemarie Smith

Key ID Points

1. Leaf is pinnately compound (1'-4' long) with 10 to 41 leaflets (2"-7" long).
2. Produces clusters of small, yellow-green flowers.
3. When crushed, the leaves and all plant parts give off a strong, offensive smell

Integrated Weed Management Recommendations

Effective integrated management means using a variety of eradication methods in the same site along with restoration, prevention of seed production and dispersal, and monitoring. Maintain robust healthy native landscapes. Restore degraded sites. Avoid soil disturbance. Prevent seed production and seed dispersal, e.g. on contaminated equipment. Rest sites until restored. Modify land use practices. Use methods appropriate for the site, including land use practices.



Jan Samanek

CULTURAL

Replace tree of heavens with native trees. Prevent establishment of new trees by removing seedlings and saplings before they mature. Contact your local Natural Resources Conservation Service for recommendations of alternative trees or shrubs.



BIOLOGICAL

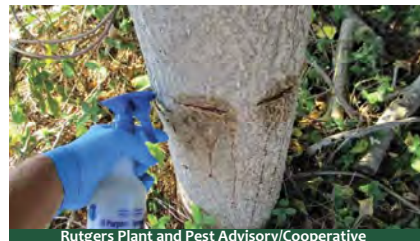
There is not yet a biocontrol agent approved for tree of heaven, although the eriophyid mite, *Aculus taihangensis*, is being researched and shows promise. It is possible in some situations to utilize goat grazing, especially in combination with chemical application. For more information on the use of biocontrol agents to control weeds in Colorado, please contact the Palisade Insectary of the Colorado Department of Agriculture at 970-464-7916.



Richard Gardner

MECHANICAL

Very young seedlings can be pulled fairly easily by hand or with a weed-wrench, especially in moist soil conditions. Seedlings are distinguished from root sprouts by their more slender stems, trifoliate leaflets, and cotyledons. Cutting trees without chemical application often leads to significant basal and root sprouting. Mechanical methods alone are not recommended for older trees. Treating cut-stumps with herbicide is more effective than cutting alone and can eliminate sprouting.



Rutgers Plant and Pest Advisory/Cooperative

CHEMICAL

Methods include foliar application, basal bark spray, cut stump, and stem injection. For mature trees, apply undiluted herbicide into cuts made in bark by a girdling or drilling method. Make cuts all around the trunk, through the cambium layer into nonliving layers. Girdle or drill in June and early July. Always read, understand, and follow the label directions, and use herbicides approved for the site and species. The herbicide label is the law.

HERBICIDE	RATE	APPLICATION TIMING
Triclopyr (Garlon 3A, Garlon 4 Ultra, Pathfinder II)	Foliar spot treatment: 1-2% v/v solution in water plus 0.5% v/v non-ionic surfactant	Best when leaves are fully expanded
	Cut stump/girdling: 20-30% solution in oil or water carrier, depending on chemical	Can be used anytime but best in late summer or early fall
Glyphosate (Roundup, Accord XRT II, etc.)	Foliar spot treatment: 2-4% v/v solution in water, plus 0.5% v/v non-ionic surfactant	Best when leaves are fully expanded; thoroughly wet leaves
	Stem injection: 1 cut per 3" diameter; 1ml undiluted herbicide to each cut	Best when applied mid-June to mid-September (fall color)



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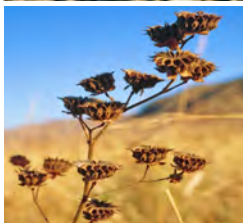


Velvetleaf

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Key ID Points

Identification and Management



Identification and Impacts

Velvetleaf (*Abutilon theophrasti*) is an annual forb native to Asia. This summer annual's seedling is formed with one heart-shaped and one round cotyledon. These cotyledons are hairy on both the upper and lower surface. As the plant grows, the stems become erect and can range in heights of 2 to 7 feet tall. Fine and soft hairs are present along the unbranched stem. Leaves form alternate from one and another. They range in size from 2 inches to 6 inches in width and length. Both surfaces of the leaves are densely covered in soft, "velvet" hairs. Leaves are heart-shaped with toothed margins and taper to a point. Single flowers are born on individual stalks at the leaf axils. They are yellow-orange in color, and are 1/2 to 1 inch in size. The flowers have 5 petals and the stamens of the flower form a tube. Flowering occurs in late June to October. The seed capsule is round in shape about 1 inch in diameter. The seed capsule has 9 to 15 prickly seed pockets, arranged in a disk. Each seed pocket contains 3 to 9 egg-shaped seeds. Seed viability can last up to 50 years in the soil. The plant has a fibrous taproot.

Habitats for Velvetleaf are cultivated fields, roadsides, gardens, fencerows, and waste areas.

Velvetleaf thrives in nutrient rich soils. Velvetleaf is detrimental in croplands, outcompeting the strongest row crops for nutrients and water. It will appear generally after the last cultivation, growing quickly and vigorously.

The key to effective control of Velvetleaf is preventing the establishment of plants by keeping seed production in check. Mechanical, chemical, and cultural control options are effective if used in an integrated weed management approach. Hand pulling is most effective when plants are young, prior to flower production. Once established, control options diminish due to seed longevity. Details on the back of this sheet can help to create a management plan compatible with your site ecology.

Velvetleaf is designated as a "List C" species on the Colorado Noxious Weed Act. It is required to be either eradicated, contained, or suppressed depending on the local jurisdictions managing this species. For more information, visit www.colorado.gov/ag/weeds or call the State Weed Coordinator at the Colorado Department of Agriculture, Conservation Services Division, 303-239-4100.



Photos © From Bottom left; (First 2) Steve Dewey, Utah State University; Charles Bryson, USDA Agricultural Research Service; Dan Tengalia, missouriplants.com; Jan Samanek, State Phytosanitary Administration; All Bugwood.org

Abutilon theophrasti

**CULTURAL**

Since Velvetleaf is generally found in cultivated fields, utilizing a proper crop rotation regiment can prove to be effective. Planting competitive grasses and forbs in native pastures can assist in slowing establishment of Velvetleaf. For specific seed recommendations contact your local Natural Resources Conservation Services for seed mixes.

**BIOLOGICAL**

There is studies being conducted on proper biological control for Velvetleaf. Currently though there has not been any approved for use in Colorado. For more information please contact the Palisade Insectary of the Colorado Department of Agriculture at 970-464-7916.

**MECHANICAL**

Hand pull or dig when soil is moist, and before plants flower and go to seed. Bag specimens carefully so as not to scatter seeds. Mowing very close to the ground can also be effective. The key to effective control is to prevent seed production and/or spread.

Integrated Weed Management:

Preventing the establishment of plant populations is the key to effective control of Velvetleaf. If plants are present preventing flower and seed production is the best option for control. Cultural, mechanical and chemical options are effective methods in controlling plant populations. Velvetleaf is hard to eradicate due to seed viability of 50 years once populations become established.

Velvetleaf

HERBICIDES

NOTE: The following are recommendations for herbicides that can be applied to range and pasturelands. Rates are approximate and based on equipment with an output of 30 gal/acre. Please read label for exact rates. Always read, understand, and follow the label directions. The herbicide label is the LAW!

HERBICIDE	RATE	APPLICATION TIMING
2,4-D + Dicamba (Banvel+2,4-D)	1 to 2 pts/acre	Apply to early growth stages. Add non-ionic surfactant @ 0.32 oz/gal of water or 1 pt/100 gal of water.
Glyphosate (Roundup) *Non-Selective herbicide*	22 oz/acre if < 6" in height - 1 to 2.7 qt/acre in > 6" in height	Apply to early growth stages.
Quinclorac (Paramount)	5.3 to 8 oz/acre	Apply to early growth stages.
Pendimethalin (Pendulum)	2.4 to 4.8 qts/acre	Apply pre-emergence of weed species.

Photos©Top to Bottom; Jan Samanek, State Phytosanitary Administration, Bugwood.org; Whitney Cranshaw, Colorado State University, Bugwood.org; Kelly Uhing, Colorado Department of Agriculture



© Irene Shonle, Colorado State University Extension

involucre or bractlets in the involucre, or they are tiny. Flowers are usually white to pale pink, and when viewed up close, are very distinct. Each flower is made up of five petals that are obcordate with the center cupped inward forming a hook. Five stamens surround two stylopodia. The fruits are oblong, compressed laterally and prominently ribbed evenly. Their size ranges from 3 to 4.5 mm long and are about half as wide. Even with a slight movement, mature seeds shatter and disperse. In Colorado, wild caraway flowers from May through July, sets fruit through September.

Wild caraway (*Carum carvi* L.) is a biennial to perennial forb in the Apiaceae family, also known as caraway, not to be confused with cumin (*Cuminum cyminum*). It grows up to 70 cm tall.

Leaves are primarily basal, however stem leaves are also present in fewer numbers and smaller in size comparatively. The overall shape of the basal leaves is ovate with a tripinnate form. Stem leaves are fine and filliform; each leaflet is less than 1 mm wide. Stem leaves are opposite. Stems and leaves are glabrous. Tap roots are fusiform, similar to a carrot, and up to 25 cm long. Like other plants in the carrot family, the inflorescence is a compound umbel. Peduncles range from 5 to 13 cm long. On each umbel, there can be 7 to 14 rays, usually an unequal number, each measuring about 2 to 4 cm long in an upright position. The pedicel holding each umbellet is about 1 to 12 mm wide. Usually there are no bracts in the

Its origin is distributed from Europe, North Africa, Middle East, Central Asia, Himalayas in India and West Pakistan (eFloras 2018). It is very common in its native range. Worldwide its fruits are used as a culinary spice and explored for medicinal properties due to its aromatic essential oils, carvone and limonene (Solberg et al. 2016).

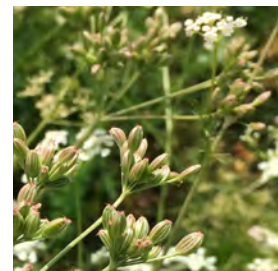
In 1893, James H. Cowen collected the first Colorado wild caraway specimen from a street in Fort Collins (SEINet 2018). In Utah, wild caraway was likely introduced by Mormon settlers (Pammel 1910). Currently in Colorado, it is found in mountain valleys, and occasionally in the eastern plains. It prefers moist soil, such as irrigated fields and pastures, ditches, riparian corridors, wetlands, wet meadows, swales and roadsides. It can tolerate dry soils, such as montane grasslands, abandoned lands, montane woodlands, subalpine forests and stony fields.

Elevation ranges from 1500 to 4300 meters.

From a distance, wild caraway can be confused with Queen Anne's lace (*Daucus carota*) or common yarrow (*Achillea millefolium*). Queen Anne's lace has distinct three-pronged linear bracts subtending the inflorescence and the rays of the inflorescence form a nest-like structure as they curve inward.



© Botanic Gardens in the Netherlands



Wild Caraway
Carum carvi L.

wild caraway
Carum carvi
2016 Statewide Distribution in Colorado
Based on 2016 Quarterquad and EDDMapS Field Survey Data
Up to Approximately 1,695 Infested Acres



Acres estimated to nearest whole acre by county weed supervisors and other data sources; compiled by Colorado Department of Agriculture
COLORADO Department of Agriculture
0 30 60 Miles

- Key ID Points**
1. Flowers compound umbel, 5 white obcordate petals cupped inward, 5 stamens, & 2 stylopodia
 2. Tripinnate stem leaves
 3. Evenly ribbed seeds 3 mm long
 4. Carrot-like brown taproot

Integrated Weed Management Recommendations

Effective integrated management means using a variety of eradication methods along with restoration, prevention of seed production and dispersal, and monitoring. Maintain robust healthy native landscapes. Restore degraded sites. Avoid soil disturbance. Prevent seed production and seeds from dispersing, e.g. on contaminated equipment. Rest sites until restored. Modify land use practices. Use methods appropriate for the site, other plants present and land uses.



© Brian Randall, Sage-grouse Initiative

CULTURAL

Since wild caraway prefers moist soil, modify irrigation or water regimes if possible to make sites less hospitable. In irrigated fields, switch to grass/monocots until control is established. In wildland settings, maintain or restore a competitive assemblage of shrubs, forbs, cool and warm season grasses, annuals and perennials. Use locally adapted species that are ecologically appropriate for the site to improve competitiveness. Incorporate soil amendments, soil microbes and mycorrhizal fungi to boost desired species when appropriate. Aim to reduce above and below ground space and nutrients to make them unavailable to wild caraway. Minimize soil compaction and disturbance, especially in wetlands and moist soil. Acquire permits for wetland restoration, if required.



© Harris and Ewing, Library of Congress

BIOLOGICAL

Wild caraway is toxic to horses but is highly palatable to other livestock in spring before bolting. Its reported as a possible dewormer and source of minerals (Schmit et al. 2012, Walter et al. 2001). Properly managed grazing can improve vigor of desired species and directly reduce wild caraway. Currently there are no biological control agents for wild caraway authorized in Colorado. For more biocontrol information, visit the Colorado Department of Agriculture's Palisade Insectary website at: www.colorado.gov/ag/biocontrol



MECHANICAL

Mechanical methods are best for residential areas and small infestations. Sever roots below the soil surface early in the season before the plant stores energy, and before seed production. Mowing, chopping and deadheading leaves roots behind, stimulates more flower production; these methods require consecutive years of season-long treatments. Mowing, especially when timed near flowering or seeding phases, often disperses flowers and seeds, which expands the size of the infested area. Collect, bag, and dispose of or destroy flowers; seeds could mature and germinate if left on the ground. Prescribed fire temperatures would need to be very hot to carry in moist soil conditions; this type of fire would smolder for long durations and kill microbes and native plant roots and may leave wild caraway roots moderately damaged.



© Wyoming Bureau of Land Management

CHEMICAL

NOTE: Herbicide recommendations to control wild caraway in pastures and rangeland are found at: <https://goo.gl/TvWnv9>. Rates are approximate and based on equipment with an output of 30 gal/acre. Follow the label for exact rates. Consult local turf and ornamental experts for herbicides appropriate for residential settings. Always read, understand, and follow the label directions. The herbicide label is the LAW!

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Wild proso millet

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Key ID Points

Identification and Management



Identification and Impacts

Wild proso millet (*Panicum miliaceum*) is an annual grass that is native to Asia or middle Europe. This grass grows an erect stem, that branches near the base. It can grow 2 to 6 feet tall. Leaf blades are 1/2 to 3/4 inches wide, with stiff hairs on both the upper and lower surfaces of the blade. Leaf sheaths contain and open with long spreading hairs. Fused at the base of the leaf, are the ligules that are a fringe of 1/16 of an inch long dense hairs. The inflorescence grows to be a 4 to 12 inches long spreading panicle that is nodding or erect when mature. The panicle is usually not fully extended from the leaf sheath. Spikelets on the panicle are 1/4 inch to 1/2 inch long and are two-flowered. The upper flower of the spikelet is fertile and the lower spikelet is sterile. The glumes are pointed at the tip, ovate and strongly nerved. At the plants maturity the seeds shed. The seeds are brown to black in color, shiny, and smooth. Plants can be easily identified by the seed coat that stays attached to the fibrous root system.

Habitats for Wild proso millet are cultivated fields, waste places,

roadsides, and disturbed sites. Wild proso millet is easily spread through its prolific seed production. Seeds can be spread by harvesting equipment, birds, manure, irrigation water, and small animals.

The key to effective control of Wild proso millet preventing the establishment of plant populations and limiting seed production. Since Wild proso millet likes to grow in cultivated fields, identifying the plant in early growth stages is imperative. Control options include, mechanical, cultural and chemical. Details on the back of this sheet can help to create a management plan compatible with your site ecology.

Wild proso millet is designated as a "List C" species on the Colorado Noxious Weed Act. It is required to be either eradicated, contained, or suppressed depending on the local jurisdictions managing this species. For more information, visit www.colorado.gov/ag/weeds or call the State Weed Coordinator at the Colorado Department of Agriculture, Conservation Services Division, 303-239-4100.



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Panicum miliaceum

**CULTURAL**

Within cultivated fields Wild proso millet can be effectively controlled using a rotational crops system. Minimizing disturbance in native pastures can assist in preventing establishment, and planting native grasses and forbs. For specific seed recommendations contact your local Natural Resources Conservation Services for seed mixes.

**BIOLOGICAL**

Currently there is not any biocontrol available for Wild proso millet. Biocontrol takes many years of research and development. For more information contact the Palisade Insectary of the Colorado Department of Agriculture at 970-464-7916 .

**MECHANICAL**

Hand pull or dig when soil is moist, can be an effective control method. Bag specimens carefully so as not to scatter seeds. Mowing and tilling can contribute to the spread of seeds. The key to effective control is to prevent seed production and/or spread.

Integrated Weed Management:

Preventing the establishment and seed production is the key to effectively controlling Wild proso millet. Once the plant is established and depending on site features, an integrated weed management approach can be effective.

HERBICIDES

NOTE: The following are recommendations for herbicides that can be applied to range and pasturelands. Rates are approximate and based on equipment with an output of 30 gal/acre. Please read label for exact rates. Always read, understand, and follow the label directions. The herbicide label is the LAW!

HERBICIDE	RATE	APPLICATION TIMING
Glyphosate (Roundup Promax)	16 - 32 oz/acre	Apply to early growth stages to plant bolting stages.
2,4-D + Glyphosate (Recoil)	1.2 to 1.8 qts/acre	Apply to early growth stages to plant bolting stages. Add non-ionic surfactant @ 0.32 oz/gal of water or 1 pt/100 gal of water.
Pendimethalin (Prowl)	Up to 4.8 pts/acre	Apply to early growth stages. Add non-ionic surfactant @ 0.32 oz/gal of water or 1 pt/100 gal of water.

Wild proso millet





© John Cardina, OSU

beans, and corn. It reduces crop yield and quality by competing for light, water, and nutrients. Yellow nutsedge is a serious invader because it cannot be controlled by common grass herbicides and is extremely difficult to eliminate from cropland sites once it invades. Yellow nutsedge favors moist areas, irrigated croplands, and forms dense colonies. It can also be found on disturbed sites within: pastures, floodplains, dams, ditches, streambanks, roadsides, wet fields, wet prairies, turf, landscaped areas, and around lakes and ponds. It has been sighted in elevations up to 8,200 feet. Once yellow nutsedge establishes, it is drought tolerant.

Yellow nutsedge (*Cyperus esculentus*) is a warm season, perennial species that is native to Europe. Plants range from 6 to 30 inches tall. Leaves originate from the base of each stem and are grass-like, smooth, glossy, and folded lengthwise. The stems are pithy and triangular in cross-section. The flower inflorescence is umbrella-shaped, has up to 40 florets per flattened spikelet, and subtended by 3 to 9, long, leaf-like bracts. Flowers are yellowish-brown in color and appear from June to October. The root system on each plant can produce hundreds to thousands of hard, round, brown-black tubers in a season; the tubers can survive 3 to 4 years. Yellow nutsedge is particularly noticeable in July and August when it grows more quickly than native species and stands out visually.

Yellow nutsedge is very damaging to crops like onions, potatoes,

The key to effective control of yellow nutsedge is prevention. It is especially important to clean dirt and tubers from potentially contaminated farm and construction equipment. It can also be introduced with nursery activities and contaminated transplants. New infestations must be treated early, before tubers form and the plant becomes established.. Hand pulling plants, when they first appear and have less than 6 leaves, help deplete carbohydrates that supply the tubers growth. In the spring, when plants are young, herbicide treatments are an option. Details on the back of this sheet can help you create a management plan compatible with your site ecology.

It is illegal to plant any variety of yellow nutsedge in Colorado, including chufa (*Cyperus esculentus* var. *sativus*) which is sometimes used to attract wildlife, such as turkeys.

Yellow nutsedge is designated as a “List B” species in the Colorado Noxious Weed Act. It is required to be either eliminated, contained, or suppressed depending on the local infestations. For more information visit www.colorado.gov/ag/weeds or call the State Weed Coordinator at the Colorado Department of Agriculture, Conservation Services Division, (303) 869-9030.



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Yellow nutsedge

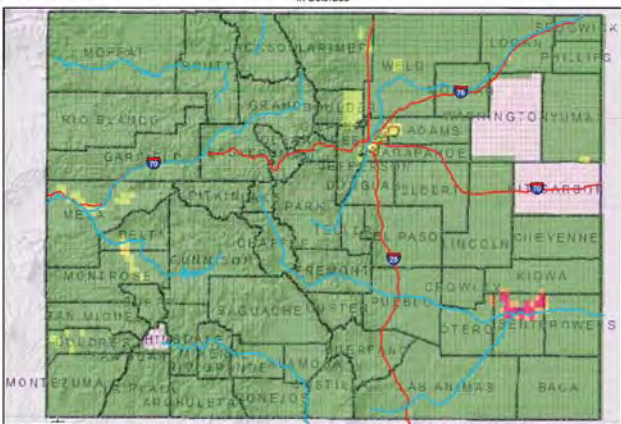
Cyperus esculentus

2013 Quarter Quad Survey

Yellow Nutsedge
Cyperus esculentus

2013 Quarterquad Survey
Distribution and Abundance
in Colorado

15,049+ Infested Acres



Areage estimates supplied by County Weed Coordinators and compiled by the Colorado Department of Agriculture.

Key ID Points

1. Stout triangular stem with grass-like leaves.
2. Brown to black, round tubers at the ends of slender rhizomes.
3. Yellowish, triangular, flattened, and oblong seeds.
4. Leave-like bracts under the inflorescence.

Integrated Weed Management Recommendations

Prevention is the best control for yellow nutsedge. Avoid soil disturbances and introduction from contaminated equipment or nursery material. Once established, it is difficult to eliminate because herbicides don't effectively kill the plant or tubers. Young plants can be hand pulled before they form tubers and pulling can deplete energy stored in the roots.



© John D. Byrd, MSU



CULTURAL

The best control method is preventing the establishment of new infestations by minimizing disturbance, preventing tuber and seed dispersal by cleaning equipment, carefully inspecting plantings from nurseries, eliminating seed production, and maintaining healthy native communities. Yellow nutsedge can penetrate and grow through black polyethylene plastic.

BIOLOGICAL

In cultivated field, pigs and chickens can effectively grub and feed on tubers. However, there are no other biocontrol agents available for yellow nutsedge. Biocontrol takes many years of research and development. For more information on biocontrols, contact the Colorado Department of Agriculture's Insectary in Palisade, Colorado at 970-464-7916.

MECHANICAL

Hand pull small nutsedge plants when they have less than 6 leaves, which is before tubers form. This is approximately every 2 to 3 weeks during the growing season; over time, this will deplete energy reserves in the roots. Tilling can potentially spread tubers.

CHEMICAL

Not many herbicides are effective at controlling yellow nutsedge because they lack selectivity or uptake, and most are not effective on tubers. The table below includes recommendations for herbicides that can be applied to turf, range, and pastures. Always read, understand, and follow the label directions. The herbicide label is the LAW!

Herbicide	Rate	Application Timing
Aminocyclopyrachlor + Chlorsulfuron (Perspective)	4.75-8 oz. product/acre + 0.25% non-ionic surfactant	Apply at bolting to bud growth stages. (Spring to early summer) IMPORTANT: Applications greater than 5.5 oz. product/acre exceeds the threshold for selectivity. DO NOT treat in the root zone of desirable trees and shrubs. Not permitted for use in the San Luis Valley. Not for use on grazed or feed forage.
Aminopyralid + Metsulfuron (Opensight)	2.5-3 oz. product/acre + 0.25% non-ionic surfactant	Apply at bolting to bud growth stages. (Spring to early summer) Not permitted for use in the San Luis Valley. See label regarding grazed or feed forage.
Metsulfuron (Escort XP) + 2,4-D	1 oz. product/acre + 1 qt. 2,4-D/acre + 0.25 % v/v non-ionic surfactant	Apply at bolting to bud growth stages. (Spring to early summer) May stunt grass growth.

Additional herbicide recommendations for this and other species can be found at:
www.colorado.gov/agconservation/CSUHerbicideRecommendations.pdf

Yellow nutsedge

Cyperus esculentus

Yellow toadflax

Colorado Department of
Agriculture

305 Interlocken Pkwy
Broomfield, CO 80021

(303) 869-9030
weeds@state.co.us



Key ID Points

1. Yellow flowers that are like snapdragons with deep orange centers.
2. Stems that are woody at the base and smooth to the top.

Updated on:
07/2015

Yellow toadflax Identification and Management



Identification and Impacts

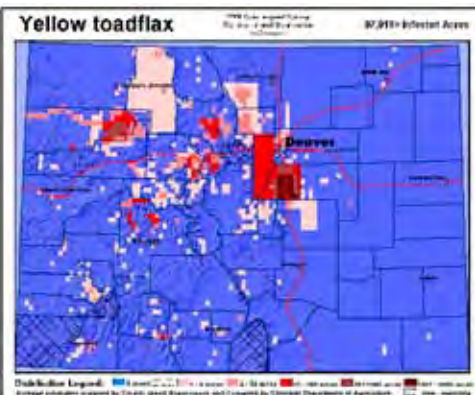
Yellow toadflax (*Linaria vulgaris*) is a perennial escaped ornamental plant that is native to the Mediterranean region. The leaves are narrow, linear, and 1 to 2 inches long. The stems are woody at the base and smooth toward the top. Sparingly branched and 1 to 3 feet tall. The showy snapdragon-like flowers are bright yellow with a deep orange center and have a spur as long as the entire flower. It develops an extensive root system, making control options varied. Yellow toadflax displaces desirable plant communities reducing ecological diversity and rangeland value. Decreases forage for domestic livestock, some big game species and decreases habitat for associated animal communities. The plant is known to be mildly poisonous to cattle. Goats and sheep have been known to graze the plants with little effect.

Habitats for Yellow toadflax include roadsides, vacant lots, gravel pits, fields, waste areas, other disturbed sites and rangeland. It has adapted to a variety of site conditions, from moist to dry and does well in all types of soil. The plant can even establish in areas of excellent

condition in natural disturbances or small openings.

The key to effective control of Yellow toadflax is prevention and integrating as many management strategies as possible. Prevention is always desirable when dealing with Yellow toadflax. Early detection and eradication can keep populations from exploding, making more management options available. With the plants varying genetically using many different approaches is important such as; herbicide, mechanical, cultural and biological methods. Details on the back of this sheet can help to create a management plan compatible with your site ecology.

Yellow toadflax is designated as a "List B" species in the Colorado Noxious Weed Act. It is required to be either eradicated, contained, or suppressed depending on the local infestations. For more information visit www.colorado.gov/ag/weeds and click on the Noxious Weed Management Program. Or call the State Weed Coordinator at the Colorado Department of Agriculture, Conservation Services Division, 303-239-4100.



Infestation photo, above, © John M. Randall, The Nature Conservancy. Infestation map, Crystal Andrews, Colo. Dept. of Agriculture. Flower photo, top, © Missouri Extension. Flower bract photo, left, © Paul Slichter, University of Wisconsin, Stevens Point. Leaves photo © Gary Fewless, University of Wisconsin, Stevens Point.

Linaria vulgaris

**CULTURAL**

Establish select grasses and forbs as an effective cultural control of Yellow toadflax. Contact your local Natural Resources Conservation Service for seed mix recommendations. Bareground is prime habitat for weed invasions, so maintain healthy pastures and prevent bare spots caused by overgrazing.

**BIOLOGICAL**

Calophasia lunula, a predatory noctuid moth, feeds on leaves and flowers of Yellow toadflax. *Eteobalea intermediella*, a root boring moth and *Mecinus janthinus* a stem boring weevil are also available. For more information, contact the Colorado Department of Agriculture's Insectary in Palisade, Colorado at 970-464-7916.

**MECHANICAL**

Handpulling or digging is not recommended for eradication of Yellow toadflax because it's unlikely that the entire root will be excavated and a new plant is likely to occur. A single new plant might be an exception. Tillage is not recommended due to the creeping root system.

Integrated Weed Management:

Because of the high genetic variability of the toadflax species it is critical to integrate as many management strategies as possible into the control program. Two local populations may respond differently to the same herbicides.

Keys to management are to prevent seed formation and vegetative spread by roots. Controlling is expensive and difficult to treat toadflaxes, prevention is the best option.

HERBICIDES

NOTE: The following are recommendations for herbicides that can be applied to range and pasturelands. Rates are approximate and based on equipment with an output of 30 gallons per acre. Always read, understand, and follow the label directions. The herbicide label is the LAW!

Herbicide	Rate	Application Timing
Aminocyclopyrachlor + Chlorsulfuron (Perspective)*	4 oz. product/acre + 0.5% v/v methylated seed oil	Apply <u>at flowering through fall post-flower into senescence</u> . IMPORTANT: Applications greater than 5.5 oz. product/acre exceeds the threshold for selectivity. DO NOT treat in the root zone of desirable trees and shrubs. Not for use on grazed or feed forage.
Picloram* (Tordon/Picloram 22K - Restricted use pesticide) + Chlorsulfuron (Telar)	1 qt./acre Tordon + 1.25 oz./acre Telar + 0.25% v/v non-ionic surfactant	Apply <u>at flowering through fall post-flower into senescence</u> . Typically late August through September application timing has shown best results. Re-treatment may be necessary. Refer to label for grazing restrictions on Telar. DO NOT use near trees, desirable shrubs, water, or high water table.

Note: *Product not permitted for use in the San Luis Valley.

Additional herbicide recommendations for this and other species can be found at:
www.colorado.gov/agconservation/CSUHerbicideRecommendations.pdf

Yellow toadflax



APPENDIX C PRELIMINARY DECOMMISSIONING PLAN

Decommissioning Plan for Hanks Crossing Energy, LLC Project

Adams County, Colorado

Prepared for:



Prepared By:



L O G A N S I M P S O N

April 2024

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Introduction

Hanks Crossing Energy, LLC (“Hanks Crossing”), a subsidiary of Novis Renewables, LLC (“Novis”) is proposing to develop, own and operate the Hanks Crossing Energy Project (the “Project”), a large-scale solar energy facility in unincorporated Adams County, Colorado. The Project is located entirely on privately-owned land consisting of approximately 2,638 acres. Primary access to the Project site is from Hanks Crossing Road, approximately five miles north of State Highway 36.

The Project consists of a 355-megawatt (MW) photovoltaic (PV) system and 178 megawatt (MW) battery energy storage system (“BESS”), along with internal access roads, inverters and transformer equipment, an electrical collection system, a collection substation, an operations and maintenance building, and other associated facilities. The Project is located adjacent to an existing high voltage transmission corridor owned by Public Service Company of Colorado (“PSCO”), facilitating immediate connection to the electrical grid. A preliminary layout has been developed for the Project; however, final design of the Project, and total acreage required, will be determined following additional site engineering and surveys along with feedback from resource agencies.

Purpose of Plan

This Decommissioning Plan (“Plan”) outlines the process and procedures for the decommissioning of the Hanks Crossing Energy Project. As required by the Adams County Development Standards and Regulations (“Regulations”) (4-10-02-06-01 (11[a-c])), any solar energy system which has ceased producing energy or has been abandoned shall be removed. The purpose of this Plan is to ensure the safe, efficient, and environmentally responsible removal of Project facilities at the end of the Project’s operational life and ensure the property is reasonably restored to its preconstruction conditions. All decommissioning activities will be conducted in accordance with local, state, and federal regulations.

Scope of Decommissioning

The decommissioning of the Project encompasses both the physical dismantling of equipment and the restoration of the site to its original condition. In accordance with Section 4-10-02-06-01 of the Regulations, decommissioning will consist of:

1. Physical removal of all Project facilities, structures, and equipment from the site (4-10-02-06-01 (11 [a])).
2. Disposal of all solid and hazardous waste in accordance with local, state, and federal waste disposal regulations (4-10-02-06-01 (11 [b])).
3. Stabilization, or re-vegetation of the site as necessary to minimize erosion. Adams County may allow the owner or operator to leave landscaping or designated below-grade foundations in order to minimize erosion and disruption to vegetation (4-10-02-06-01 (11 [c])).

Removal of Facilities

Triggering Events and Expected Lifetime of Project

In accordance with Section 4-10-02-06-01 (11) of the Regulations, decommissioning of the entire Project shall commence after 150 consecutive days of discontinued operations (excepting a natural disaster, or other emergency/catastrophic event which results in the loss of power generation for 150 days, in which case Hanks Crossing would develop a repowering plan and submit it to the County). Hanks Crossing will notify Adams County Community & Economic Development Department by certified mail within 30 calendar days of the proposed date of discontinued operations and plans for removal. Project facilities will be removed from the site in accordance with a timeframe agreed upon by Hanks Crossing and the County and may include continued beneficial use of any components to be left on site. Decommissioning is anticipated to take approximately 6-12 months from notice to completion. Site monitoring and restoration may extend beyond this period to ensure successful revegetation and rehabilitation.

If properly maintained, it is anticipated that the operational life of the Project will be for an initial term of at least 40 years, with the potential to extend the performance period up to 80 years or longer with equipment refurbishment, replacement and repowering.

Description of Project Facilities

Project facilities that would be subject to decommissioning include the following:

- Solar panels and tracking systems
- Inverters and transformers
- Electrical cabling and conduits
- Project substation
- O&M building
- BESS
- Perimeter fencing

Project facilities that would be left in place include:

- Underground components such as electrical cabling, conduits, foundations and steel piles
- Private access roads

Decommissioning Activities

Decommissioning will include disassembly and removal of all aboveground structures. A professional salvaging company will be contracted to disassemble, remove, and recycle major project components and materials off site.

The process of decommissioning generally follows the sequence below; however, Hanks Crossing will follow the most efficient process, based on professional judgement:

1. Prepare site for component removal, including reinforcement of any access roads.
2. Installation of erosion control fencing and other erosion control Best Management Practices (BMPs) to protect sensitive environmental resources.
3. Power down solar arrays, dismantle panels and racking, and remove frames.
4. Remove aboveground portions of structural foundations.
5. Remove inverters/transformers and aboveground foundations.
6. Remove substation and BESS.
7. Stabilization and revegetation of disturbed areas.

PV Solar Panels, Tracking Systems, and Foundations

Decommissioning of the PV solar panels and tracking systems involves a methodical dismantling and removal process. The PV solar panels, supports, and aboveground conductors will be safely taken apart and removed from the site. Demolition debris and components will be processed for transportation and delivery to an off-site recycling for glass and steel. Recycling efforts will prioritize steel, aluminum, and copper to the maximum extent economically viable. The disposal or recycling of PV panels will align with the manufacturer's recycling program and/or best practices based on Novis' professional determination.

Module components in working condition may undergo refurbishment for resale in secondary markets to maximize revenue. The deactivation of solar arrays from the electrical system will ensure a safe disassembly process. Proper disposal or recycling will be carried out for liquid waste, including oils and hydraulic fluids, in compliance with regulations in place at the time of decommissioning. The removal and salvage of electronic components and internal electrical wiring will be conducted. Salvageable materials from supports, tracking systems, and posts may be sold to offset decommissioning costs.

Inverters/Transformers

The combined inverters/transformers typically rest on small concrete footings or piers on steel piles within the array. The decommissioning process includes the deactivation, disassembly, and removal of inverters/transformers. Depending on future conditions, equipment may be sold for refurbishment and re-use, or it will be salvaged or disposed of at an approved waste management facility.

Electric Cabling and Conduits

The Project's underground electrical collection system will be placed at a depth of approximately three to four feet (36-48 inches). Underground cabling and conduits will remain in place and will not be removed during decommissioning.

Project Substation

The substation decommissioning process involves the electrical disconnection and disassembly of the control enclosure and electronic components for safe removal. Transformers, breakers, bus work, and metal dead-end structures will also be disassembled and removed. Aboveground concrete and containment berms/curbs will be broken into pieces, with salvageable substation transformer components potentially sold for re-use or salvage. Unsalvageable components will be transported off-site for disposal at an approved waste management facility.

BESS

The BESS will be dismantled and removed from the site in compliance with applicable federal, state, and local rules that govern the safe transport and disposition of used equipment or waste. Batteries will be refurbished and reused, where possible, with proper disposal managed as “Universal Waste”, following the rules of the Environmental Protection Agency’s (EPA) Resource Conservation and Recovery Act (RCRA), as described in Title 40 of the Code of Federal Regulations (CFR) Part 273. Thus, the Project owner will be considered a hazardous waste generator liable for proper disposal in the event the batteries cannot be reused/recycled.

Access Roads

Access and on-site roads will remain in place during and after decommissioning, as they may add economic value to the land.

Perimeter Fencing

For perimeter fencing, the breakdown and removal of all fencing material will occur, with a focus on recycling. This includes breaking down of material into manageable units and removing them from the project area.

Waste Disposal and Recycling

All demolition procedures will maximize the recycling of materials to the greatest extent possible. Nonhazardous waste will be collected and disposed of in specific and appropriate waste areas. Hazardous waste will be disposed of according to applicable laws, ordinances, regulations, and standards (LORS). Demolition debris will be placed in temporary on-site storage area(s), prior to transport to an off-site recycling center.

Stabilization or Revegetation

Following removal of the existing structures and ancillary facilities within the Project, the subsequent phase will involve site restoration activities. The objective of site restoration is to restore vegetative cover and stabilize the site to minimize erosion. Site stabilization will also be subject to any redevelopment plans that Hanks Crossing or the then current owner may have underway.

Prior to structure removal, topsoil will be removed from all work areas to the extent reasonably possible, then stockpiled in designated areas, separate from other excavated materials. Soils impacted by decommissioning activities will undergo de-compaction as needed. Revegetation, in adherence to the Project’s Revegetation Plan and in coordination with the County, will be implemented using agreed-upon seed mixes at the conclusion of the decommissioning process. Limited grading or recontouring may be needed in areas to minimize erosion.

Responsibility

Hanks Crossing (or any successor owner of the Project) will be responsible for decommissioning the facility and bear all costs associated with decommissioning the Project in accordance with existing legal requirements, County Regulations and Permit conditions.

APPENDIX D FEDERAL AVIATION ADMINISTRATION COORDINATION

FEDERAL AVIATION ADMINISTRATION COORDINATION SUMMARY

The Applicant has coordinated with the Federal Aviation Administration (FAA) to ensure that the Project does not adversely affect aviation operations. The FAA Notice of Proposed Construction was filed on January 16, 2024, resulting in a Determination of No Effect issued on January 22, 2024.

Additionally, a meeting was conducted with FAA coordinator, Steven Landry, on February 6, 2024. During this meeting, it was confirmed that no further coordination with Denver International Airport is necessary because the Airport District Office was informed of the Hanks Crossing Energy Project request through the FAA screening tool submission. A glint and glare study was deemed unnecessary since no request was received from the Airport District Office following the FAA screening tool submittal. The Applicant is exempt from notifying the FAA of construction status due to the distance of the substation from the airport (approximately 32 miles).

The following documents are included in this appendix:

- Hanks Crossing – FAA Coordination Communication Notes
- Obstruction Evaluation Project Submission Success Receipt
- Hanks Crossing – FAA Meeting Coordination Emails
- Status of FAA Filing Notification
- Seven FAA Letters Indicating Determinations of No Effect

From: [Emily Bitler](#)
To: [Sara Stribley](#); [Paul Gascoigne](#)
Cc: [Jeremy Call](#); [Sarah Smith](#)
Subject: Hanks Crossing FAA Coordination Notes
Date: Tuesday, February 6, 2024 10:40:12 AM

General overview

Steve states, "Nothing extraordinary about the project" and that we are "good to go"

FAA review expiration and extension request process

Need to start construction by July 2025. If not, then we need to request an 18-mo extension 15 days prior to July 22, 2025, but Steven recommends a 45-day notification by May 2025. He's never seen one not approved. Only allowed one extension. Will get an email in June 2025 requesting an update. An extension is the appropriate thing to ask for when construction has not started and will not start by the July 2025 date. The extension request is on the FAA website. No requirement to notify FAA of construction status, as the distance from the airport is too far.

Additional Airport Review

FAA does not review Glint and Glare needs or have the authority to deny construction. Local airports may request this (DIA). No outreach to DIA necessary as the Airport District Office (ADO) is already aware that we requested the solar array through the FAA screening tool and they would have reached out if there was a problem.

FAA can study/review the project. Needs about 45 days.

Additional screening likely necessary

Use "Notice Criteria Tool" on FAA website if any utility poles or structures planned are above 20 feet high. Twenty feet was the limit in the original FAA review. The tool will provide results to inform if further filing with the FAA is necessary.

Emily Bitler

Logan Simpson
P 970-449-4100
C 970-222-0846
ebitler@logansimpson.com
www.logansimpson.com

From: Sara Stribley <sstribley@logansimpson.com>
Sent: Monday, February 5, 2024 10:41 AM
To: Emily Bitler <ebitler@logansimpson.com>; Paul Gascoigne <paul.gascoigne@novisrenew.com>
Cc: Jeremy Call <JCall@LOGANSIMPSON.COM>; Sarah Smith <ssmith@logansimpson.com>
Subject: RE: Hanks Crossing FAA Coordination

Good morning Paul,

Just wanted to let you know that I've asked Emily Bitler to join the FAA call tomorrow as my backup. I will be in Laramie at a public hearing tomorrow morning, and hope that I will be done by 10:00 to jump on the call.... but just in case the agenda runs long, I've asked her to be available on the call as well.

It should be a pretty quick call, and our main purpose is to communicate that we are just doing some additional due diligence to ensure that DIA doesn't have any concerns with the Project. We can communicate that we've filed the FAA 7460-1 forms for the project, which came back with a determination of no effect, and that the project *is not* planning to conduct a glint and glare study. It would be good to have documentation that DIA has confirmed that no glint and glare study would be required.

Thanks,

Sara Stribley

Logan Simpson
C 970.231.9026

-----Original Appointment-----

From: Sarah Smith <ssmith@logansimpson.com>

Sent: Wednesday, January 31, 2024 2:16 PM

To: Sarah Smith; Sarah Smith; Sara Stribley; Paul Gascoigne; Steven.L-CTR.Landry@faa.gov

Cc: Jeremy Call; david.powell@novisrenew.com; kiersten.stanley@novisrenew.com

Subject: Hanks Crossing FAA Coordination

When: Tuesday, February 6, 2024 10:00 AM-11:00 AM (UTC-07:00) Mountain Time (US & Canada).

Where: Microsoft Teams Meeting

Hi All,

We likely only need 30 minutes. Steve, please see the attached letter describing the Hanks Crossing project.

Thank you for your time and we look forward to speaking with you!

Microsoft Teams meeting

Join on your computer, mobile app or room device

[Click here to join the meeting](#)

Meeting ID: 221 591 760 063

Passcode: VgeV5T

[Download Teams](#) | [Join on the web](#)

Or call in (audio only)

[+1 480-645-9961,,765618660#](#) United States, Phoenix

Phone Conference ID: 765 618 660#

[Find a local number](#) | [Reset PIN](#)

[Learn More](#) | [Meeting options](#)



Project Submission Success
Project Name: NOVIS-000837883-24

Project NOVIS-000837883-24 has been submitted successfully to the FAA.

Your filing is assigned Aeronautical Study Number (ASN):

2024-ANM-488-OE
2024-ANM-489-OE
2024-ANM-490-OE
2024-ANM-491-OE
2024-ANM-492-OE
2024-ANM-493-OE
2024-ANM-494-OE

Please refer to the assigned ASN on all future inquiries regarding this filing.

Please return to the system at a later date for status updates.

It is the responsibility of each e-filer to exercise due diligence to determine if coordination of the proposed construction or alteration is necessary with their state aviation department. Please use the link below to contact your state aviation department to determine their requirements:

[State Aviation Contacts](#)

To ensure e-mail notifications are delivered to your inbox please add noreply@faa.gov to your address book. Notifications sent from this address are system generated FAA e-mails and replies to this address will NOT be read or forwarded for review. Each system generated e-mail will contain specific FAA contact information in the text of the message.

From: [Landry, Steven L-CTR \(FAA\)](#)
To: [Sara Stribley](#)
Subject: RE: Proposed Hanks Crossing Solar Project - Adams County
Date: Wednesday, January 31, 2024 11:06:14 AM
Attachments: [image001.png](#)

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Hello Sara,

Great. Please send me a TEAMS invitation for the time on Tuesday that works best for your team. I'm in Atlanta, Georgia, so I'm on Eastern Time. Currently I'm available on Tuesday anytime between the hours 8:00 AM (ET) / 6:00 AM (CT) through 1:00 PM (ET) / 11:00 AM (CT). Thank you.

Regards,
Steve

Steven Landry | FAA Obstruction Evaluation Technician

Office: 404-305-6249

Steven.L-ctr.Landry@faa.com



From: Sara Stribley <sstribley@logansimpson.com>
Sent: Wednesday, January 31, 2024 12:21 PM
To: Landry, Steven L-CTR (FAA) <Steven.L-CTR.Landry@faa.gov>
Subject: RE: Proposed Hanks Crossing Solar Project - Adams County

Hi Steven –

Thank you so much for your quick response! Let me touch base with the developer and let you know when we could meet, but I think Tuesday might be the best option!

Sara Stribley

Logan Simpson

C 970.231.9026

From: Landry, Steven L-CTR (FAA) <Steven.L-CTR.Landry@faa.gov>
Sent: Wednesday, January 31, 2024 4:52 AM
To: Sara Stribley <sstribley@logansimpson.com>
Subject: RE: Proposed Hanks Crossing Solar Project - Adams County

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Hello Sara,

I'd be happy to speak with you about your Colorado project. I have meetings for most of today except for 1:30 PM (ET) / 11:30 AM (MT) to 2:00 PM (ET) /12:00 PM (CT). Are you available for a TEAMS meeting in that half hour? If not, I'll be out of the office tomorrow, Friday, and Monday. We could have a TEAMS meeting on Tuesday. I'll be available all that day.

Regards,
Steve

Steven Landry | FAA Obstruction Evaluation Technician

Office: 404-305-6249

Steven.L-ctr.Landry@faa.com



From: Sara Stribley <sstribley@logansimpson.com>
Sent: Tuesday, January 30, 2024 3:26 PM
To: Landry, Steven L-CTR (FAA) <Steven.L-CTR.Landry@faa.gov>
Subject: FW: Proposed Hanks Crossing Solar Project - Adams County

Hi Steve –

I received your contact information from a colleague who had worked with you on a previous solar project in Adams County! I am trying to determine the appropriate contact to discuss a new utility scale solar project in eastern Adams County. We have received DNE from our FAA filings, but wanted to confirm some additional questions/due diligence for the project?

Thanks!

Sara Stribley

Logan Simpson

C 970.231.9026

From: Sara Stribley
Sent: Saturday, January 27, 2024 10:17 AM
To: John.bauer@faa.gov
Subject: Proposed Hanks Crossing Solar Project - Adams County

Good Morning John,

I am working with a client on a proposed utility-scale solar facility located in eastern unincorporated Adam's County and I'm reaching out to determine who might be the correct individual within your organization to contact regarding some questions/due diligence for the project?

Thanks for your help!

Sara Stribley

Senior Environmental Planner

Logan Simpson

213 Linden Street, Suite 300

Fort Collins, Colorado 80524

C 970.231.9026

sstribley@logansimpson.com

www.logansimpson.com

Please note: My current work schedule is Mon-Thurs

From: noreply@faa.gov
To: [Sara Stribley](#); [Paul Gascoigne](#)
Subject: Status of FAA Filing
Date: Thursday, January 18, 2024 6:24:26 AM

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Your filing is assigned Aeronautical Study Number(s) (ASN): 2024-ANM-492-OE, 2024-ANM-488-OE, 2024-ANM-490-OE, 2024-ANM-491-OE, 2024-ANM-489-OE, 2024-ANM-493-OE, 2024-ANM-494-OE.

To review your electronic record, go to our website oeaaa.faa.gov and select the Search Archives link to locate your case using the assigned Aeronautical Study Number (ASN).

The FAA verified your filing and an aeronautical study has been initiated. Please allow a minimum 45 days for the FAA to complete the study. Please refer to the assigned ASN on all future inquiries regarding this filing.

For Wind Turbine proposals only, please ensure Wind Turbine Data as described on the project summary page in your registered e-filing account has been uploaded to your filing.

To ensure e-mail notifications are delivered to your inbox please add noreply@faa.gov to your address book. Notifications sent from this address are system generated FAA e-mails and replies to this address will NOT be read or forwarded for review. Each system generated e-mail will contain specific FAA contact information in the text of the message.



Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2024-ANM-494-OE

Issued Date: 01/22/2024

Paul Gascoigne
Novis Renewables, LLC
1 Bridge Street, Suite 11
Irvington, NY 10533

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Solar Panel Corner 4
Location:	Byers, CO
Latitude:	39-48-41.60N NAD 83
Longitude:	103-59-56.56W
Heights:	5005 feet site elevation (SE) 20 feet above ground level (AGL) 5025 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure does not exceed obstruction standards and would not be a hazard to air navigation provided the following condition(s), if any, is(are) met:

Based on this evaluation, marking and lighting are not necessary for aviation safety. However, if marking/lighting are accomplished on a voluntary basis, we recommend it be installed in accordance with FAA Advisory circular 70/7460-1 M.

This determination expires on 07/22/2025 unless:

- (a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
- (b) extended, revised, or terminated by the issuing office.
- (c) the construction is subject to the licensing authority of the Federal Communications Commission (FCC) and an application for a construction permit has been filed, as required by the FCC, within 6 months of the date of this determination. In such case, the determination expires on the date prescribed by the FCC for completion of construction, or the date the FCC denies the application.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO

SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is based, in part, on the foregoing description which includes specific coordinates, heights, frequency(ies) and power. Any changes in coordinates, heights, and frequencies or use of greater power, except those frequencies specified in the Colo Void Clause Coalition; Antenna System Co-Location; Voluntary Best Practices, will void this determination. Any future construction or alteration, including increase to heights, power, or the addition of other transmitters, requires separate notice to the FAA. This determination includes all previously filed frequencies and power for this structure.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

If we can be of further assistance, please contact our office at (817) 222-5933, or andrew.hollie@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2024-ANM-494-OE.

Signature Control No: 609615720-610163948

(DNE)

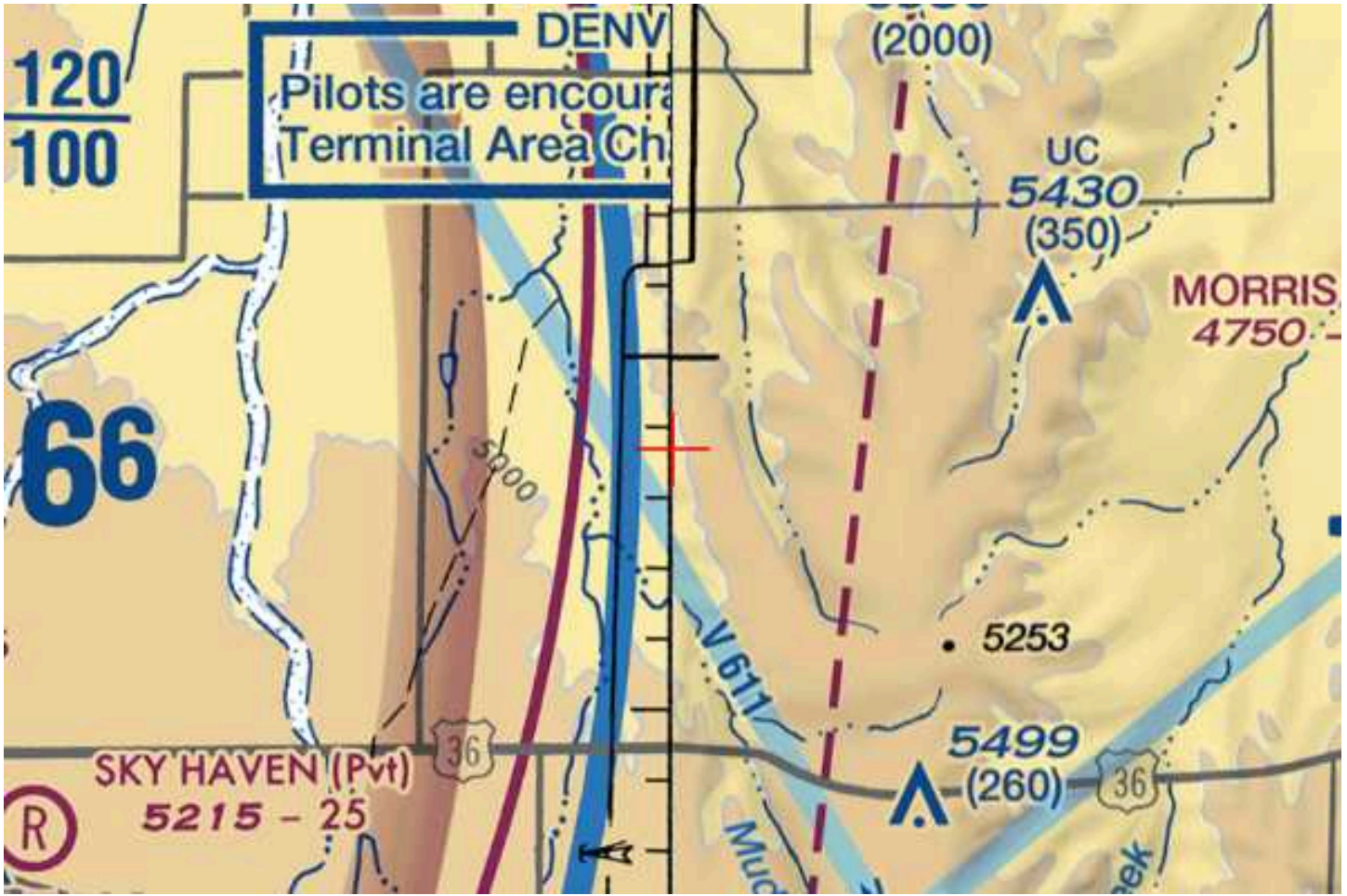
Andrew Hollie
Specialist

Attachment(s)
Case Description
Map(s)

Case Description for ASN 2024-ANM-494-OE

Utility Scale PV Solar Project and BESS facility consisting of approximately 355MW PV and 178MW battery storage.







Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2024-ANM-491-OE

Issued Date: 01/22/2024

Paul Gascoigne
Novis Renewables, LLC
1 Bridge Street, Suite 11
Irvington, NY 10533

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Solar Panel Corner 1
Location:	Byers, CO
Latitude:	39-51-19.78N NAD 83
Longitude:	104-01-06.70W
Heights:	4952 feet site elevation (SE) 20 feet above ground level (AGL) 4972 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure does not exceed obstruction standards and would not be a hazard to air navigation provided the following condition(s), if any, is(are) met:

Based on this evaluation, marking and lighting are not necessary for aviation safety. However, if marking/lighting are accomplished on a voluntary basis, we recommend it be installed in accordance with FAA Advisory circular 70/7460-1 M.

This determination expires on 07/22/2025 unless:

- (a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
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If we can be of further assistance, please contact our office at (817) 222-5933, or andrew.hollie@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2024-ANM-491-OE.

Signature Control No: 609615717-610163949

(DNE)

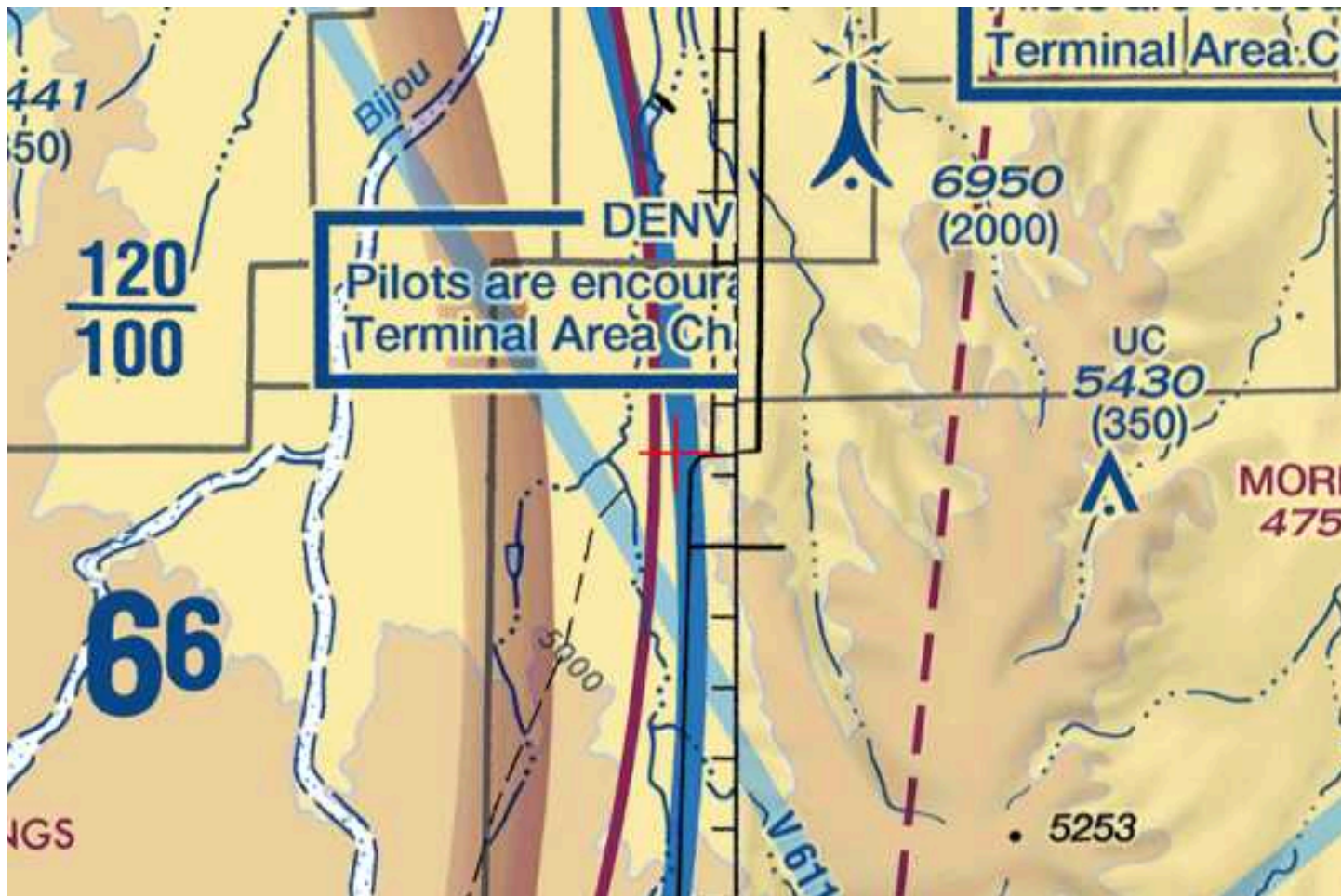
Andrew Hollie
Specialist

Attachment(s)
Case Description
Map(s)

Case Description for ASN 2024-ANM-491-OE

Utility Scale PV Solar Project and BESS facility consisting of approximately 355MW PV and 178MW battery storage.







Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2024-ANM-493-OE

Issued Date: 01/22/2024

Paul Gascoigne
Novis Renewables, LLC
1 Bridge Street, Suite 11
Irvington, NY 10533

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Solar Panel Corner 3
Location:	Byers, CO
Latitude:	39-48-41.12N NAD 83
Longitude:	104-01-05.88W
Heights:	4897 feet site elevation (SE) 20 feet above ground level (AGL) 4917 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure does not exceed obstruction standards and would not be a hazard to air navigation provided the following condition(s), if any, is(are) met:

Based on this evaluation, marking and lighting are not necessary for aviation safety. However, if marking/lighting are accomplished on a voluntary basis, we recommend it be installed in accordance with FAA Advisory circular 70/7460-1 M.

This determination expires on 07/22/2025 unless:

- (a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
- (b) extended, revised, or terminated by the issuing office.
- (c) the construction is subject to the licensing authority of the Federal Communications Commission (FCC) and an application for a construction permit has been filed, as required by the FCC, within 6 months of the date of this determination. In such case, the determination expires on the date prescribed by the FCC for completion of construction, or the date the FCC denies the application.

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If we can be of further assistance, please contact our office at (817) 222-5933, or andrew.hollie@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2024-ANM-493-OE.

Signature Control No: 609615719-610163950

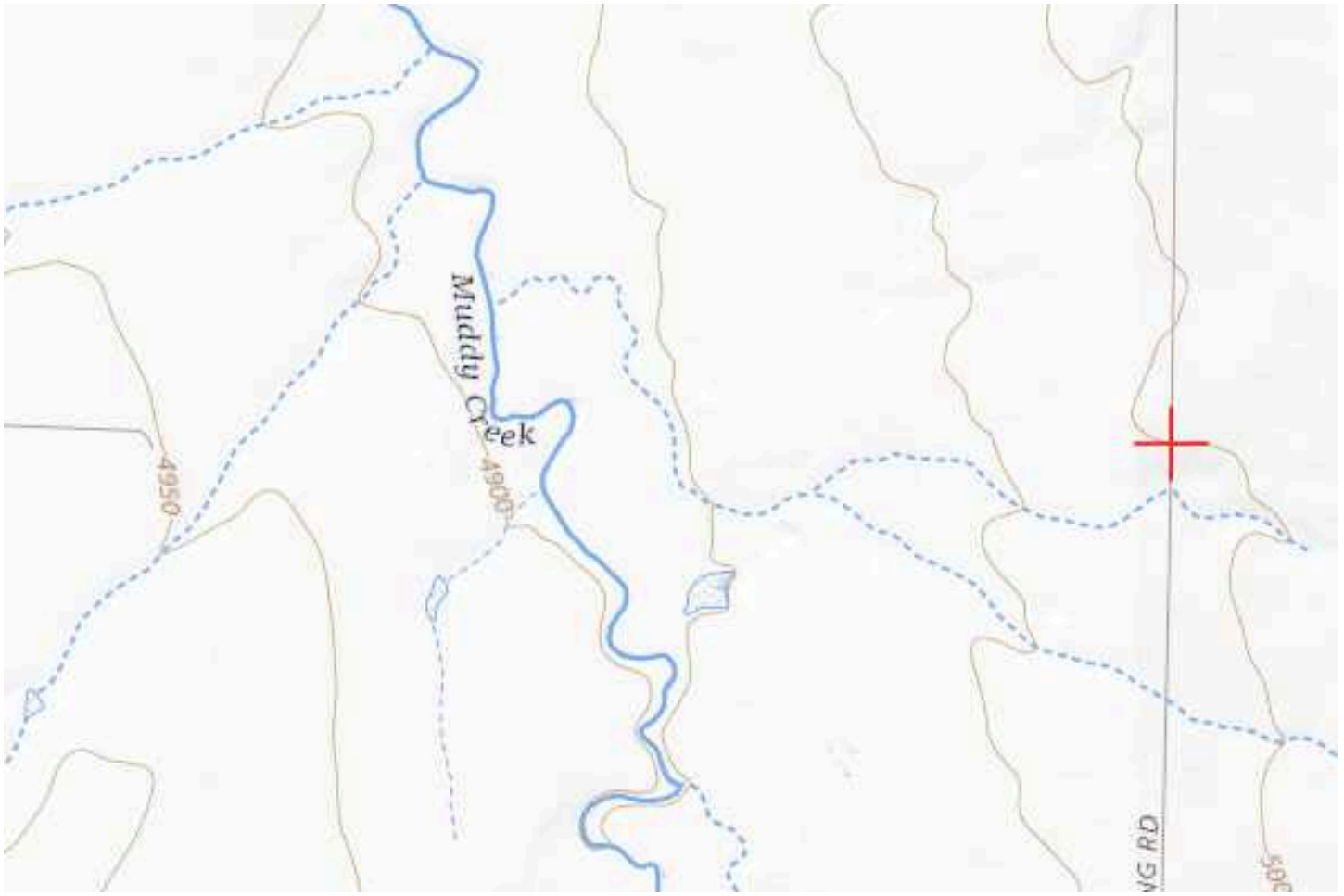
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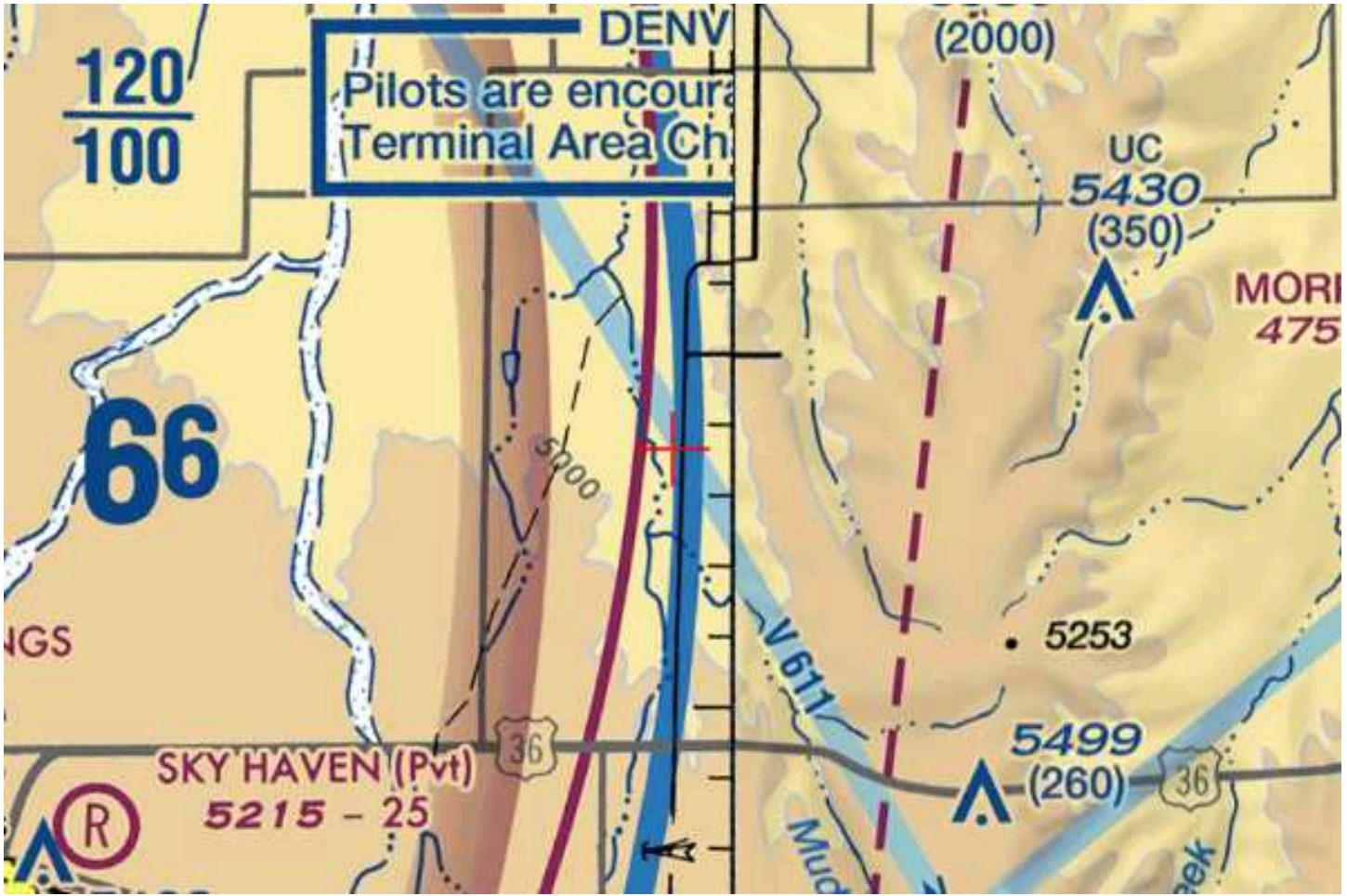
Andrew Hollie
Specialist

Attachment(s)
Case Description
Map(s)

Case Description for ASN 2024-ANM-493-OE

Utility Scale PV Solar Project and BESS facility consisting of approximately 355MW PV and 178MW battery storage.







Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2024-ANM-489-OE

Issued Date: 01/22/2024

Paul Gascoigne
Novis Renewables, LLC
1 Bridge Street, Suite 11
Irvington, NY 10533

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Solar Panel Substation
Location:	Byers, CO
Latitude:	39-51-06.84N NAD 83
Longitude:	104-01-13.21W
Heights:	4934 feet site elevation (SE) 40 feet above ground level (AGL) 4974 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure does not exceed obstruction standards and would not be a hazard to air navigation provided the following condition(s), if any, is(are) met:

Based on this evaluation, marking and lighting are not necessary for aviation safety. However, if marking/lighting are accomplished on a voluntary basis, we recommend it be installed in accordance with FAA Advisory circular 70/7460-1 M.

This determination expires on 07/22/2025 unless:

- (a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
- (b) extended, revised, or terminated by the issuing office.
- (c) the construction is subject to the licensing authority of the Federal Communications Commission (FCC) and an application for a construction permit has been filed, as required by the FCC, within 6 months of the date of this determination. In such case, the determination expires on the date prescribed by the FCC for completion of construction, or the date the FCC denies the application.

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If we can be of further assistance, please contact our office at (817) 222-5933, or andrew.hollie@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2024-ANM-489-OE.

Signature Control No: 609615715-610163951

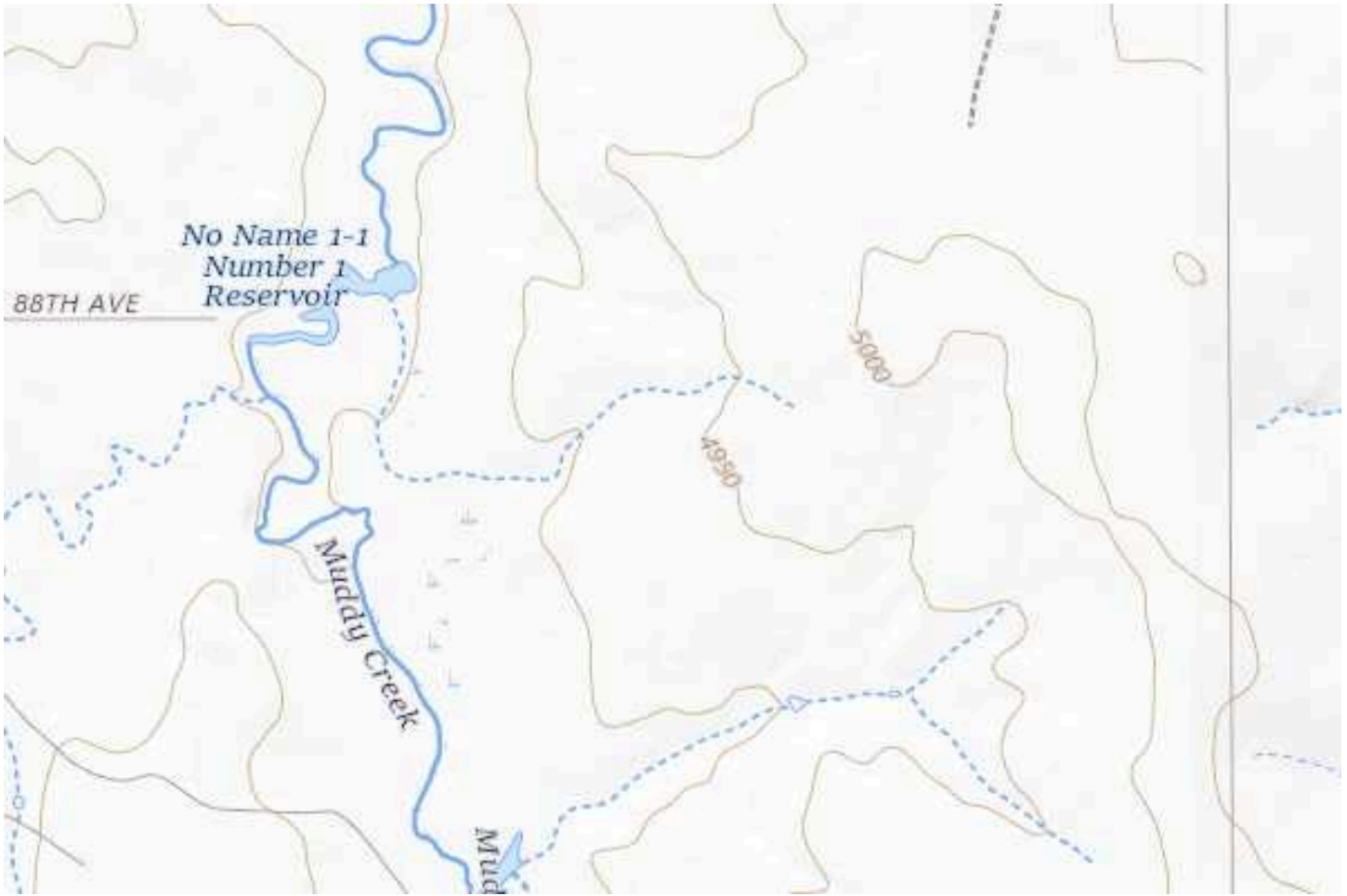
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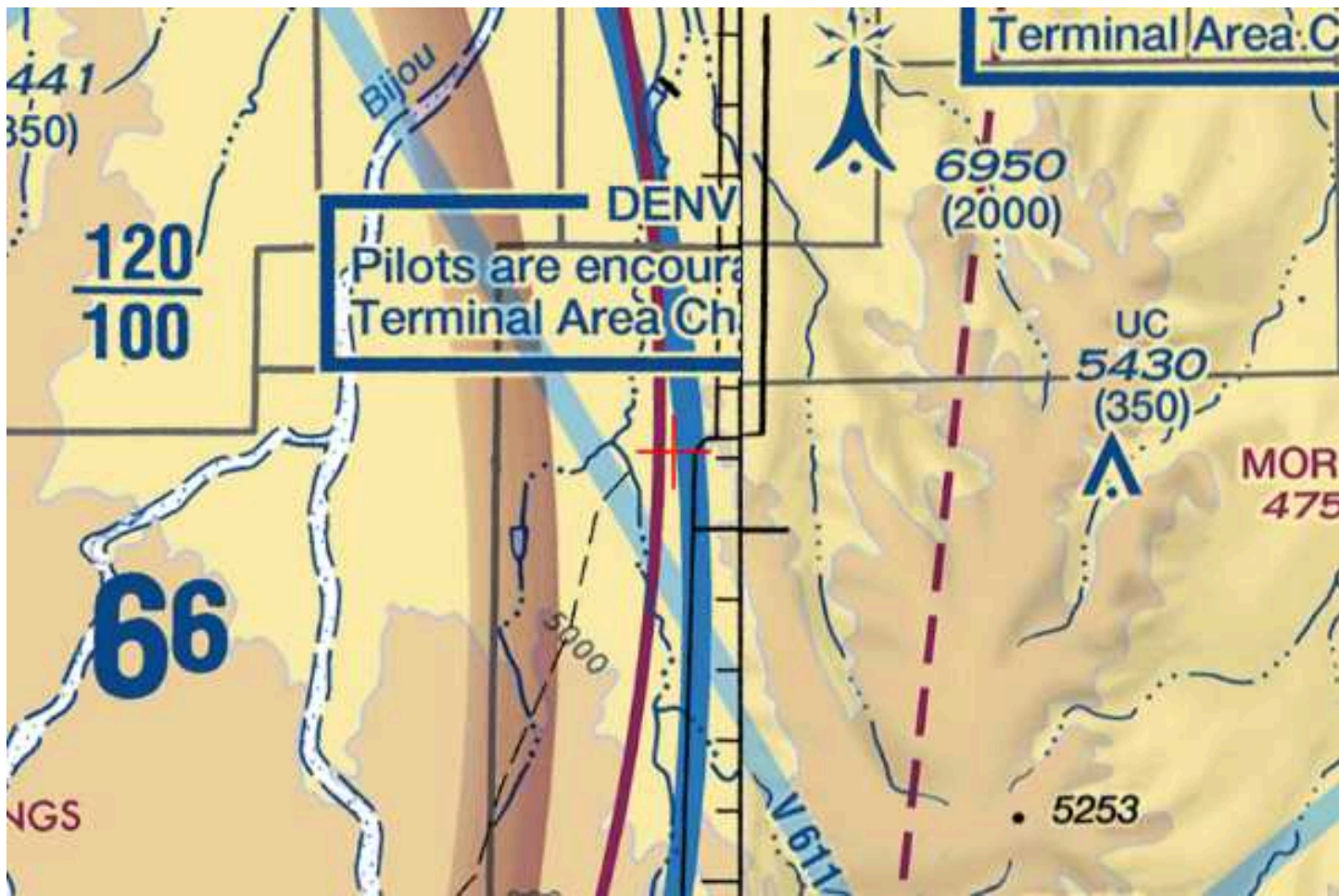
Andrew Hollie
Specialist

Attachment(s)
Case Description
Map(s)

Case Description for ASN 2024-ANM-489-OE

Utility Scale PV Solar Project and BESS facility consisting of approximately 355MW PV and 178MW battery storage.







Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2024-ANM-492-OE

Issued Date: 01/22/2024

Paul Gascoigne
Novis Renewables, LLC
1 Bridge Street, Suite 11
Irvington, NY 10533

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Solar Panel Corner 2
Location:	Byers, CO
Latitude:	39-51-17.71N NAD 83
Longitude:	103-59-56.31W
Heights:	4986 feet site elevation (SE) 20 feet above ground level (AGL) 5006 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure does not exceed obstruction standards and would not be a hazard to air navigation provided the following condition(s), if any, is(are) met:

Based on this evaluation, marking and lighting are not necessary for aviation safety. However, if marking/lighting are accomplished on a voluntary basis, we recommend it be installed in accordance with FAA Advisory circular 70/7460-1 M.

This determination expires on 07/22/2025 unless:

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If we can be of further assistance, please contact our office at (817) 222-5933, or andrew.hollie@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2024-ANM-492-OE.

Signature Control No: 609615718-610163952

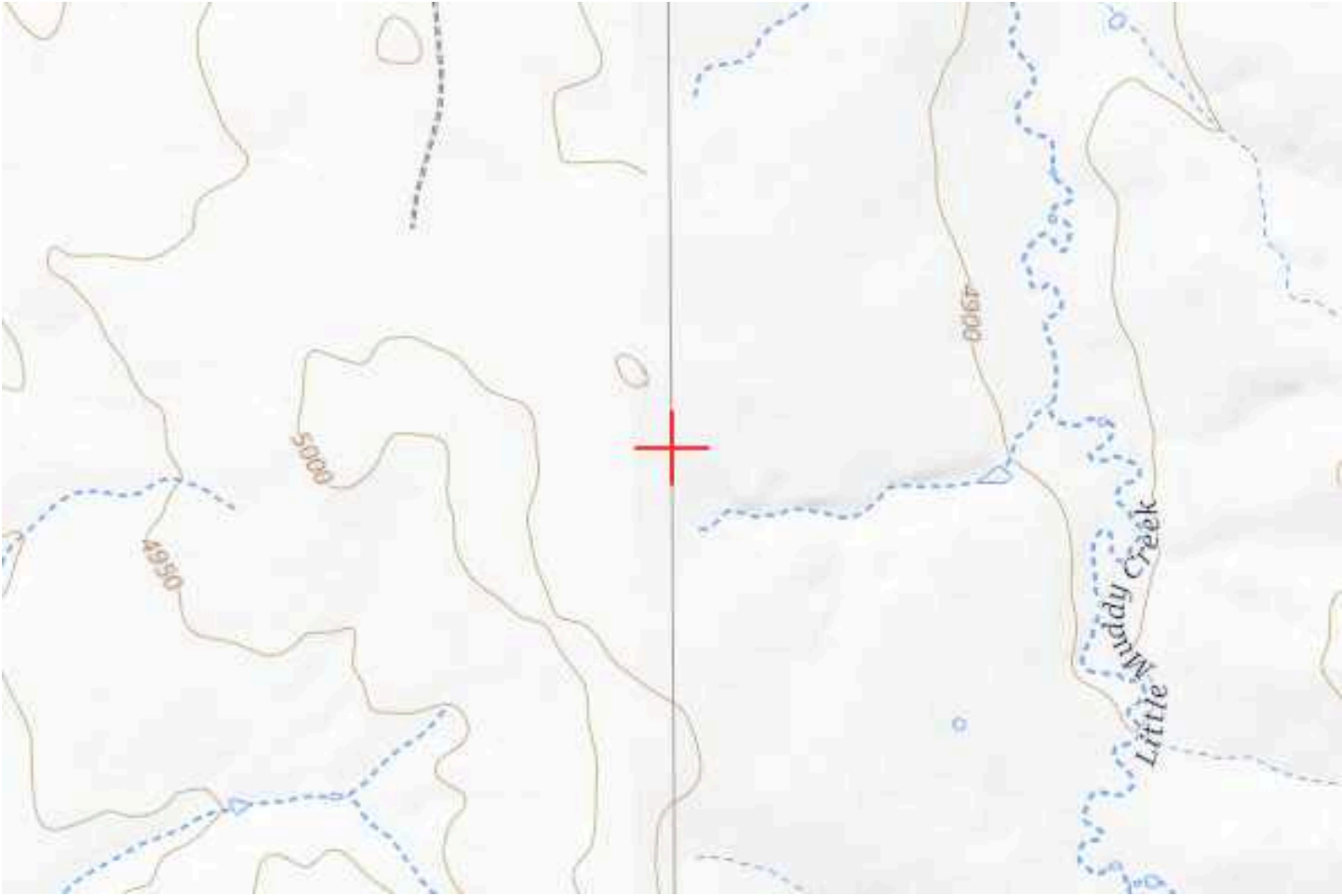
(DNE)

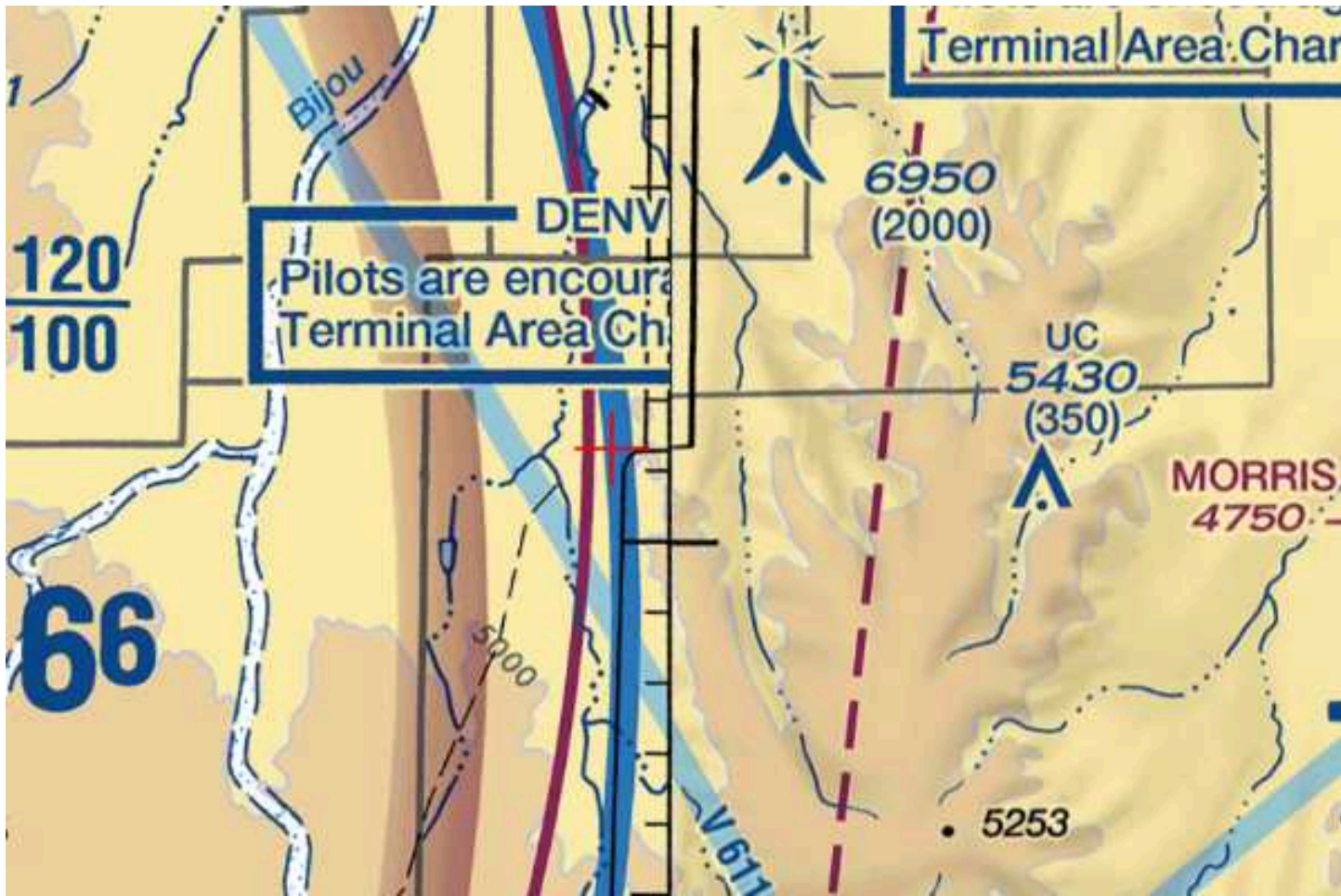
Andrew Hollie
Specialist

Attachment(s)
Case Description
Map(s)

Case Description for ASN 2024-ANM-492-OE

Utility Scale PV Solar Project and BESS facility consisting of approximately 355MW PV and 178MW battery storage.







Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2024-ANM-488-OE

Issued Date: 01/22/2024

Paul Gascoigne
Novis Renewables, LLC
1 Bridge Street, Suite 11
Irvington, NY 10533

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure: Solar Panel N Expansion Area
Location: Byers, CO
Latitude: 39-50-51.51N NAD 83
Longitude: 103-59-38.53W
Heights: 4975 feet site elevation (SE)
20 feet above ground level (AGL)
4995 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure does not exceed obstruction standards and would not be a hazard to air navigation provided the following condition(s), if any, is(are) met:

Based on this evaluation, marking and lighting are not necessary for aviation safety. However, if marking/lighting are accomplished on a voluntary basis, we recommend it be installed in accordance with FAA Advisory circular 70/7460-1 M.

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Signature Control No: 609615714-610163953

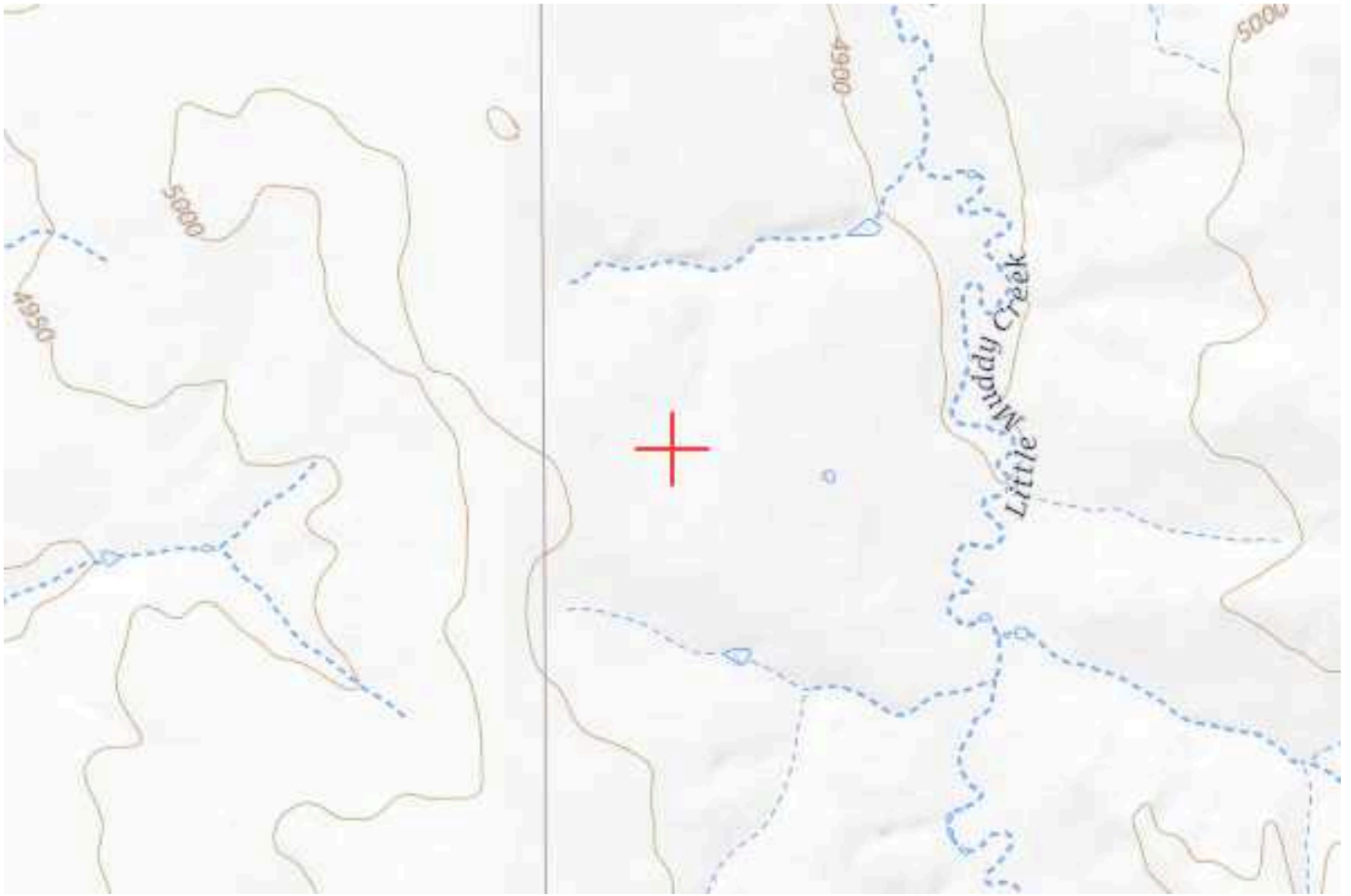
(DNE)

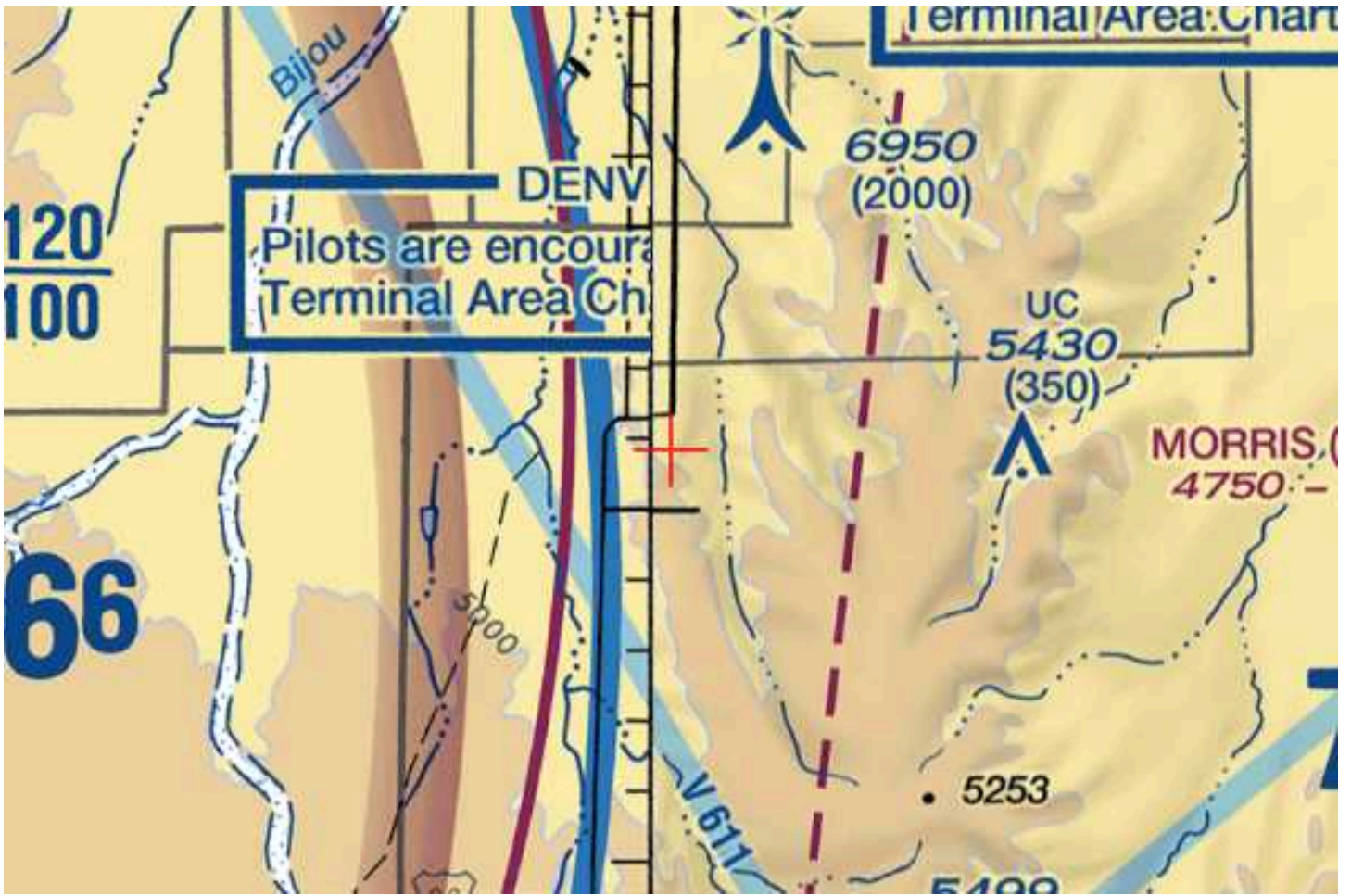
Andrew Hollie
Specialist

Attachment(s)
Case Description
Map(s)

Case Description for ASN 2024-ANM-488-OE

Utility Scale PV Solar Project and BESS facility consisting of approximately 355MW PV and 178MW battery storage.







Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2024-ANM-490-OE

Issued Date: 01/22/2024

Paul Gascoigne
Novis Renewables, LLC
1 Bridge Street, Suite 11
Irvington, NY 10533

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure: Solar Panel New 320 Acres
Location: Byers, CO
Latitude: 39-49-20.23N NAD 83
Longitude: 103-59-22.06W
Heights: 5016 feet site elevation (SE)
20 feet above ground level (AGL)
5036 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure does not exceed obstruction standards and would not be a hazard to air navigation provided the following condition(s), if any, is(are) met:

Based on this evaluation, marking and lighting are not necessary for aviation safety. However, if marking/lighting are accomplished on a voluntary basis, we recommend it be installed in accordance with FAA Advisory circular 70/7460-1 M.

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NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO

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Signature Control No: 609615716-610163954

(DNE)

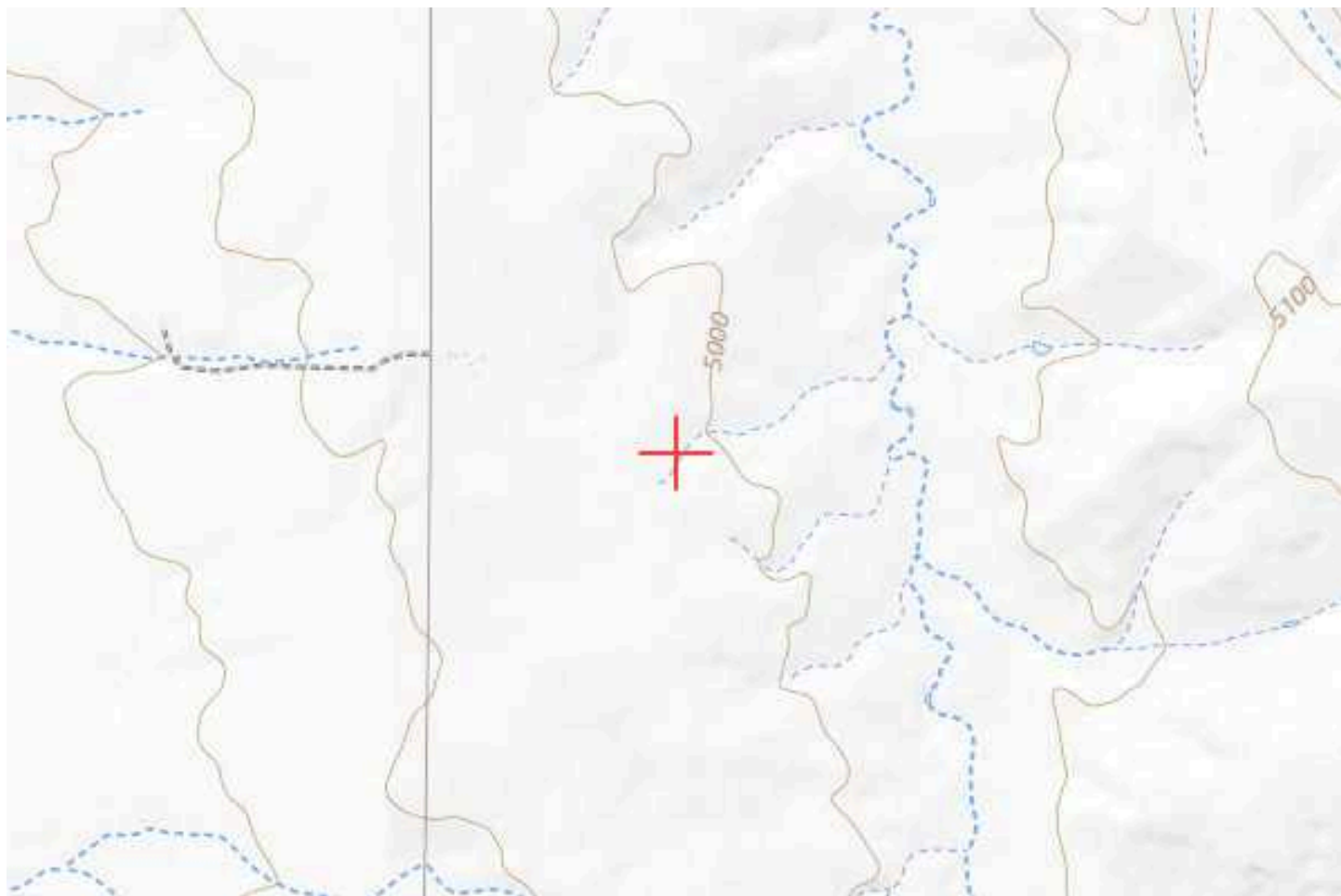
Andrew Hollie
Specialist

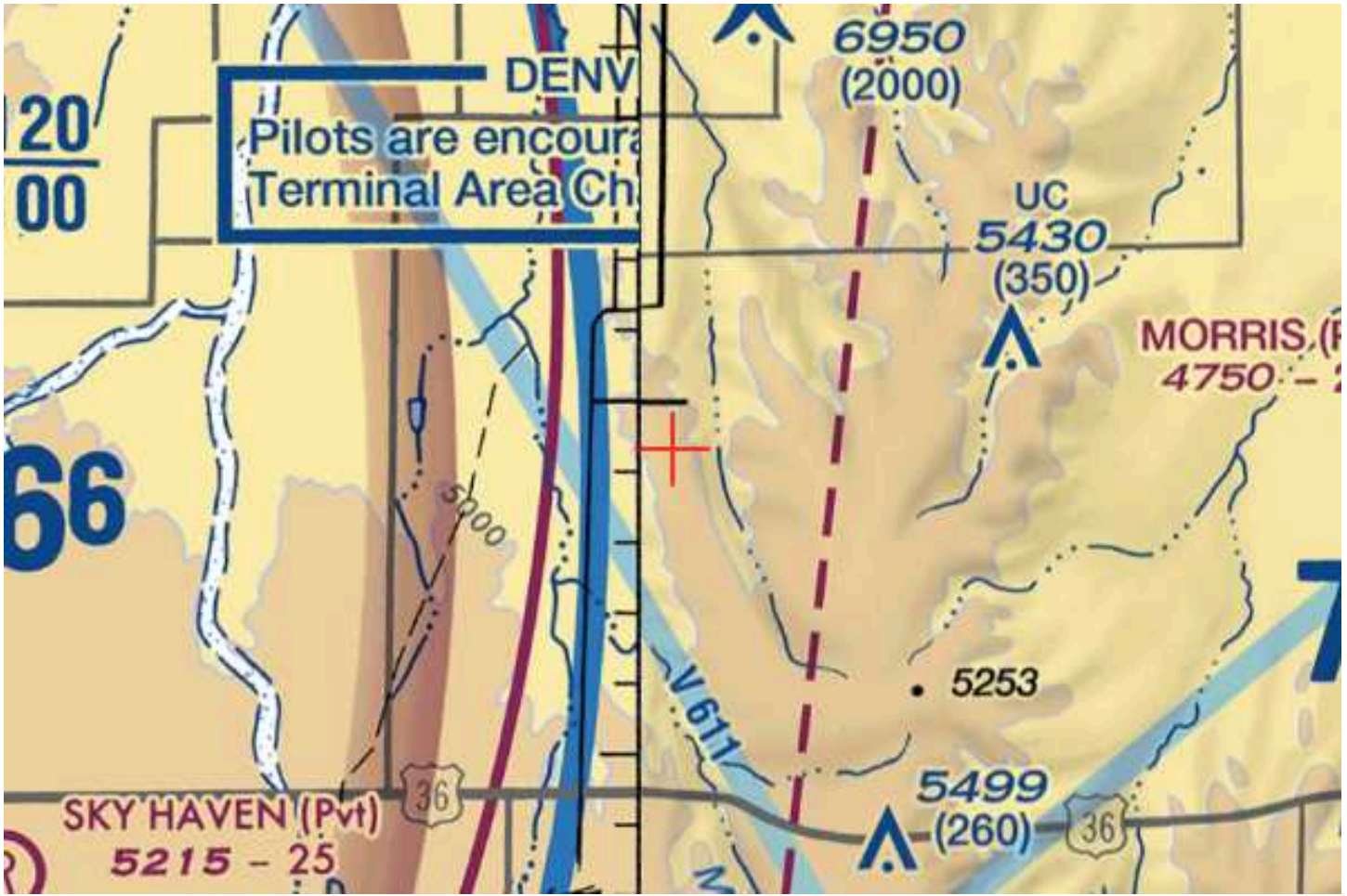
Attachment(s)
Case Description
Map(s)

Case Description for ASN 2024-ANM-490-OE

Utility Scale PV Solar Project and BESS facility consisting of approximately 355MW PV and 178MW battery storage.

TOPO Map for ASN 2024-ANM-490-OE





Agency Outreach Summary

Communications with local, state and federal agencies have been conducted by Hanks Crossing Energy, LLC (“Applicant”) to present and discuss the proposed Project. Project informational letters were distributed via first class mail and email to local referral agency representatives in February of 2024 to solicit feedback and to identify and address any potential concerns regarding the proposed Project. The applicant proactively contacted the following organizations and referral agencies that may be impacted by the Project:

- Adams County Sheriff’s Office
- Byers Fire District
- CORE Electric
- Deer Trail School District
- Deer Trail Conservation District
- Adams County Conservation District
- Morgan County Rural Electric Association
- Arapahoe County Public Works

Informational letters included a description of the Project, its location, the expected Project timeline, contact information and Project maps. Supporting materials have been included behind Table 1 of this appendix.

The Deer Trail school district provided feedback regarding a general concern for the road conditions along Hanks Crossing Road and a request for the Applicant to coordinate road maintenance activities with the County. As discussed under Section 3.11, the Applicant will coordinate all Project-related road use with the County and will execute a Road Use Agreement for construction activities, if necessary, to ensure that road maintenance related to project activity is addressed and to minimize impacts to local traffic. As of the date of this application submittal, the Applicant has not received any additional direct feedback from referral agencies expressing concerns regarding the Project.

Additional coordination has occurred via emails or virtual meetings with agency representatives to solicit additional input regarding Project impacts. Communication and outreach with the Byers Fire Department has been initiated to discuss preliminary input on the Project design. Additional coordination will occur with the Fire Department to develop an Emergency Response Plan to identify and mitigate specific site hazards prior to the initiation of construction.

The Applicant has coordinated with the Federal Aviation Administration (FAA) to ensure that the Project does not adversely affect aviation operations. A meeting was conducted with FAA coordinator, Steven Landry, on February 6, 2024. See **Appendix D: Federal Aviation Administration Coordination** for additional details.

The Applicant has been coordinating with the Public Works Department regarding approval of a section line setback waiver and road vacancy request. A meeting with David Dittmer, County ROW Agent, Public Works Department, was held on March 26, 2024, to discuss the section line setback and road vacation process. An email from Janet Lundquist, Deputy Director, Public Works Department, was received on May 22, 2024, providing approval for Applicant to move forward with the official requests (see attached).

Resource-specific information for the Project was obtained through coordination with Colorado Parks and Wildlife (CPW) and U.S. Fish and Wildlife Service (USFWS). The USFWS responded that they had no concerns with the Project resulting in impacts to species listed as candidate, proposed, threatened, or endangered. A Project introduction letter was provided to CPW on January 12, 2024, which summarized the results of a desktop review and field surveys of biological resources within the Project area and requesting review of the Project for potential impacts to protected and sensitive species. The Applicant participated in a Project call with CPW staff on February 5, 2024, to review Project information and discuss survey and design recommendations and best management practices (BMPs) from CPW. As a result of this discussion, greater prairie chicken (*Tympanuchus cupido*) lek surveys were conducted for the Project in April, and a significant wildlife movement corridor has been incorporated into the Project design. Hanks Crossing will continue to coordinate with CPW regarding design details and Project BMPs to avoid and minimize potential impacts to protected and sensitive species and their habitats.

Table E-1 provides a summary of the primary outreach and coordination conducted for the Project. Sample notifications, email communications and official letters have been included following the table.

Table E-1. Agency Outreach Summary Table

Agency	Address	Description
Adam’s County Sheriff’s Office	2550 Strasburg Rd. Strasburg, CO 80136	2/2/24 – Project information letter sent via email and first-class mail requesting input and feedback on proposed Project.
Arapahoe County Public Works	6924 South Lima Street Centennial, CO 80112	2/2/24 – Project information letter sent via email and first-class mail requesting input and feedback on proposed Project.
Byers Fire District	100 N Main Street Byers, CO 80103	2/2/24 – Project information letter sent via email and first-class mail requesting input and feedback on proposed Project. 4/1/24 – Email to Byers Fire Department to request additional coordination. 5/4/24 – Preliminary Project review letter provided by

Agency	Address	Description
		Strasburg Fire (on behalf of Byers Fire Department).
CPW, Northeast Region	6060 Broadway Denver, CO 80216	1/12/24 – Project coordination letter requesting technical assistance for the proposed Hanks Crossing Energy Project. 1/12/24 – Email transmittal of Coordination letter. 2/4/24 - Project call with CPW staff to discuss agency avoidance and minimization recommendations for the Project.
Deer Trail and East Adams Conservation District	133 West Bijou Ave Byers, CO 80103	1/30/24 – Project information letter sent via first class mail requesting input and feedback on proposed Project.
CORE Electric	PO Drawer A Sedalia, CO 80103	1/30/24 – Project information letter sent via email and first-class mail requesting input and feedback on proposed Project.
Federal Aviation Administration	NA	See Appendix D
Morgan County Rural Electric Association	PO Box 738 Fort Morgan, CO 80701-0738	1/30/24 – Project information letter sent via email and first-class mail requesting input and feedback on proposed Project.
State Land Board North Central District Office	360 Oak Avenue, Suite 110 Eaton, CO 80615	1/30/24 – Project information letter sent via email and first-class mail requesting input and feedback on proposed Project.
School District 26 – Deer Trail	PO Box 129 Deer Trail, CO 80105	2/16/24 – Project information letter sent via email and first-class mail requesting input and feedback on proposed Project.
USFWS		1/12/24 – Transmittal email sending coordination letter to USFWS. 1/12/24 - Project coordination letter requesting technical assistance for the proposed Hanks Crossing Energy Project. 1/30/24 – USFWS response letter provided to Hanks Crossing.

Sara Stribley

From: Sarah Smith
Sent: Friday, February 2, 2024 10:43 AM
To: communityconnections@adcogov.org
Cc: Sara Stribley; Paul Gascoigne; David Powell; Kiersten Stanley; Jeremy Call
Subject: Hanks Crossing Solar Project - Project Information and Request for Feedback
Attachments: Hanks Crossing Solar_Adams County Sheriff Office Letter.pdf

Good Morning Sheriff Claps and Mr. Sigman

We are supporting Novis Renewables with the Hanks Crossing Energy Project, a proposed utility-scale solar and battery energy storage project located in your district in unincorporated Adams County. As part of Novis's outreach and due diligence efforts for the project, we are reaching out to you with details of the Project. Attached is an informational letter providing an overview of the Project, including maps of the project location and a preliminary site plan.

We appreciate you taking the time to review the attached information and providing us with your concerns or feedback. Please reach out to us if you have any questions and we look forward to hearing from you!

Thank you,

Sarah J. Smith
Associate Ecologist, CERP

Logan Simpson
213 Linden St., Ste. 300
Fort Collins, CO 80524
C 904-629-2774
ssmith@logansimpson.com
www.logansimpson.com





February 2, 2024

Adams County Sheriff's Office

2550 Strasburg Rd.
Strasburg, CO 80136
(303) 654-1850

Dear Sheriff Gene R. Claps and Staff,

Hanks Crossing Energy, LLC, a subsidiary of Novis Renewables, LLC (“Novis”) is proposing to construct and operate the Hanks Crossing Energy Project (“Project”) located approximately 13 miles northeast of the town of Byers in unincorporated Adams County (see Figure 1). The development site consists of approximately 1,959 acres with options to incorporate an additional 679 acres into the Project for added siting flexibility (see Figure 2). The Project sits entirely on privately-owned land adjacent to an existing high-voltage transmission corridor owned by Public Service Company of Colorado. The proposed Project consists of a 355-megawatt (MW) photovoltaic (PV) system and 178 MW battery energy storage system (BESS), along with internal access roads, inverters and transformer equipment, an underground electrical collection system, one collection substation, an operations and maintenance building, and other associated facilities. Novis has completed preliminary environmental diligence for the Project and is working closely with regulatory agencies to identify additional concerns or constraints that may need to be addressed in the preliminary design. The Project will be fully decommissioned at the end of its operational life, which is estimated between 40 and 80 years.

Novis will secure all required local, state and federal permits prior to commencement of construction, and utilize best management practices and other avoidance and mitigation measures to develop the Project in a way that reduces impacts to sensitive resources. Novis anticipates submitting a Conditional Use Permit application to Adams County for approval of the Project in the second quarter of 2024.

As part of our initial due diligence efforts, we are reaching out to your agency to solicit feedback to help us identify and address any potential concerns that you might have regarding the Project. Following your review of the included information, if you have any comments or concerns, please contact Paul Gascoigne, Senior Manager, by email (paul.gascoigne@novisrenew.com) or directly by phone (508.505.0890). If preferred, a meeting can be scheduled to discuss the Project with you directly.



February 2, 2024

Thank you in advance for your feedback and we look forward to hearing from you. If possible, please respond with any comments or requests **by Friday, February 9, 2024**, to ensure we have sufficient time to address your concerns.

Thank you,

Paul Gascoigne
Senior Manager, Site Acquisition & Strategy
Novis Renewables
508.505.0890
paul.gascoigne@novisrenew.com

Cc:

Kiersten Stanley, Novis Renewables
David Powell, Novis Renewables
Sara Stribley, Logan Simpson
Jeremy Call, Logan Simpson

Attachments –

Figure 1. Project Location Map

Figure 2. Preliminary Site Layout

Figure 1. Project Location Map

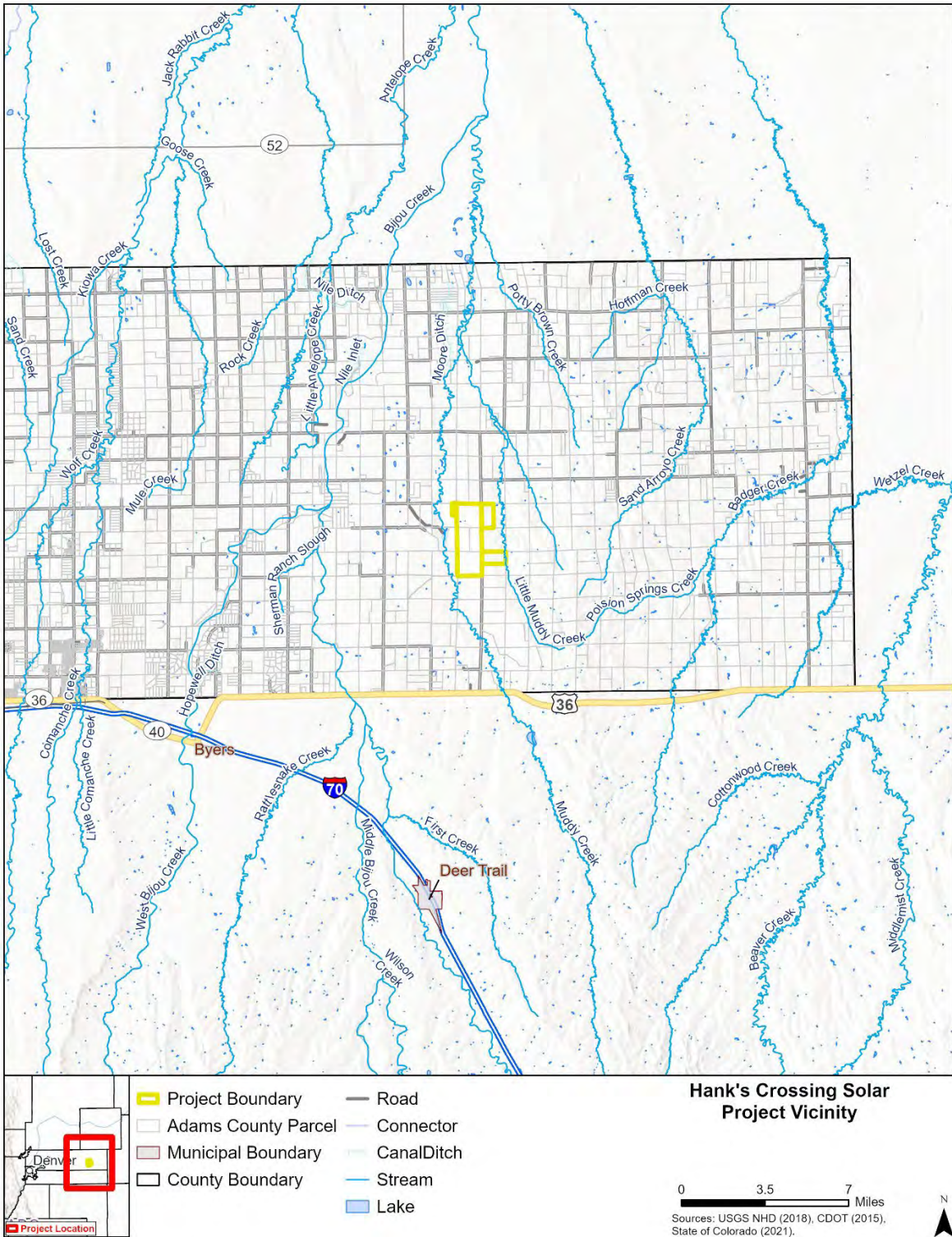
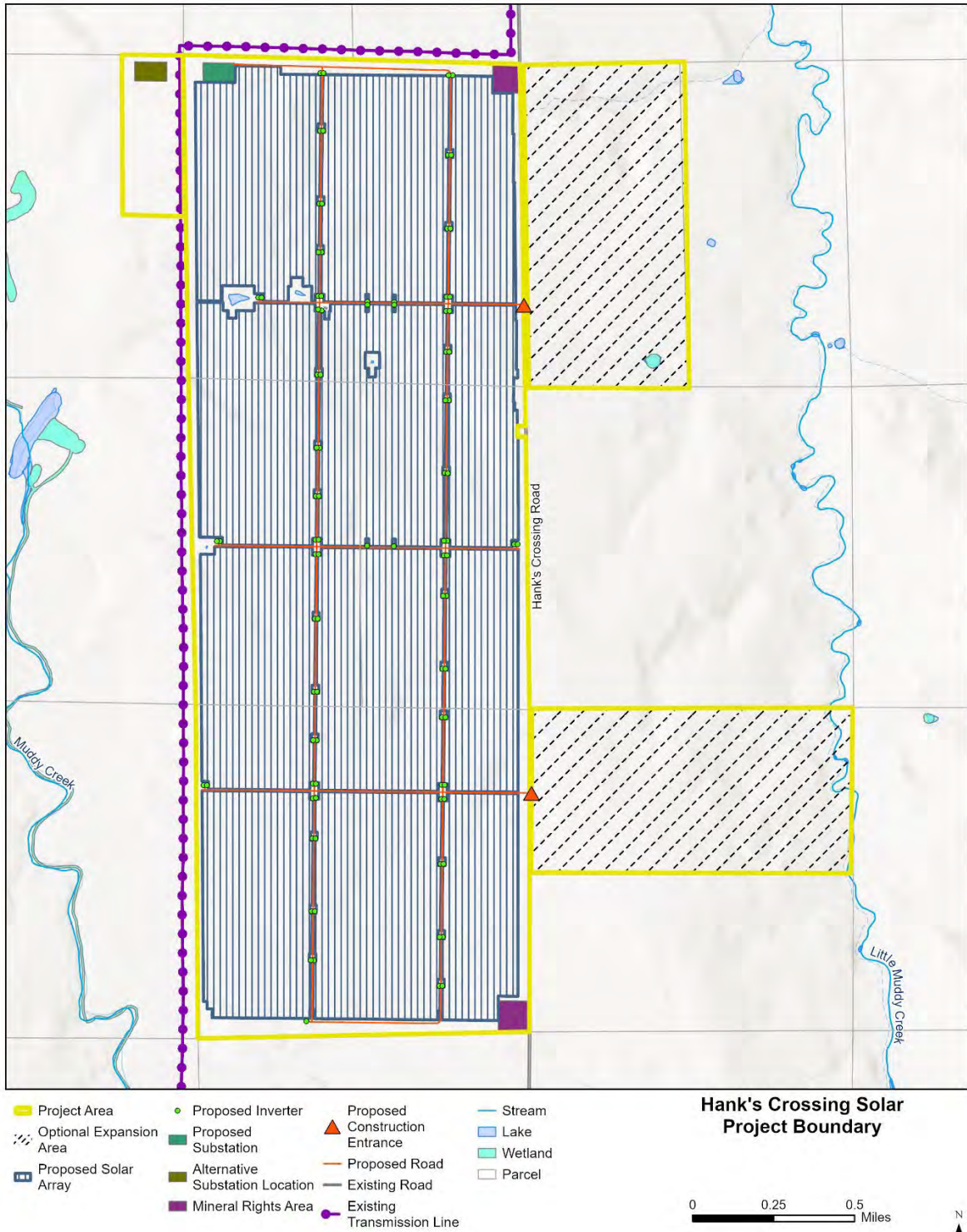


Figure 2. Preliminary Site Layout



Sara Stribley

From: Sarah Smith
Sent: Friday, February 2, 2024 10:43 AM
To: bweimer@arapahoegov.com
Cc: Sara Stribley; Paul Gascoigne; David Powell; Kiersten Stanley; Jeremy Call
Subject: Hanks Crossing Solar Project - Project Information and Request for Feedback
Attachments: Hanks Crossing Solar_Arapahoe County Public Works Letter.pdf

Good Morning Mr. Weimer,

We are supporting Novis Renewables with the Hanks Crossing Energy Project, a proposed utility-scale solar and battery energy storage project located in unincorporated Adams County. As part of Novis's outreach and due diligence efforts for the project, we are reaching out to you with details of the Project. Attached is an informational letter providing an overview of the Project, including maps of the project location and a preliminary site plan.

We appreciate you taking the time to review the attached information and providing us with your concerns or feedback. Please reach out to us if you have any questions and we look forward to hearing from you!

Thank you,

Sarah J. Smith
Associate Ecologist, CERP

Logan Simpson
213 Linden St., Ste. 300
Fort Collins, CO 80524
C 904-629-2774
ssmith@logansimpson.com
www.logansimpson.com





February 2, 2024

Arapahoe County Public Works

6924 S. Lima St.
Centennial, CO 80112
(720) 874-6500

Dear Bryan D. Weimer,

Hanks Crossing Energy, LLC, a subsidiary of Novis Renewables, LLC (“Novis”) is proposing to construct and operate the Hanks Crossing Energy Project (“Project”) located approximately 13 miles northeast of the town of Byers in unincorporated Adams County (see Figure 1). The development site consists of approximately 1,959 acres with options to incorporate an additional 679 acres into the Project for added siting flexibility (see Figure 2). The Project sits entirely on privately-owned land adjacent to an existing high-voltage transmission corridor owned by Public Service Company of Colorado. The proposed Project consists of a 355-megawatt (MW) photovoltaic (PV) system and 178 MW battery energy storage system (BESS), along with internal access roads, inverters and transformer equipment, an underground electrical collection system, one collection substation, an operations and maintenance building, and other associated facilities. Novis has completed preliminary environmental diligence for the Project and is working closely with regulatory agencies to identify additional concerns or constraints that may need to be addressed in the preliminary design. The Project will be fully decommissioned at the end of its operational life, which is estimated between 40 and 80 years.

Novis will secure all required local, state and federal permits prior to commencement of construction, and utilize best management practices and other avoidance and mitigation measures to develop the Project in a way that reduces impacts to sensitive resources. Novis anticipates submitting a Conditional Use Permit application to Adams County for approval of the Project in the second quarter of 2024.

As part of our initial due diligence efforts, we are reaching out to your agency to solicit feedback to help us identify and address any potential concerns that you might have regarding the Project. Following your review of the included information, if you have any comments or concerns, please contact Paul Gascoigne, Senior Manager, by email (paul.gascoigne@novisrenew.com) or directly by phone (508.505.0890). If preferred, a meeting can be scheduled to discuss the Project with you directly.



February 2, 2024

Thank you in advance for your feedback and we look forward to hearing from you. If possible, please respond with any comments or requests **by Friday, February 9, 2024**, to ensure we have sufficient time to address your concerns.

Thank you,

Paul Gascoigne
Senior Manager, Site Acquisition & Strategy
Novis Renewables
508.505.0890
paul.gascoigne@novisrenew.com

Cc:

Kiersten Stanley, Novis Renewables
David Powell, Novis Renewables
Sara Stribley, Logan Simpson
Jeremy Call, Logan Simpson

Attachments –

Figure 1. Project Location Map

Figure 2. Preliminary Site Layout

Figure 1. Project Location Map

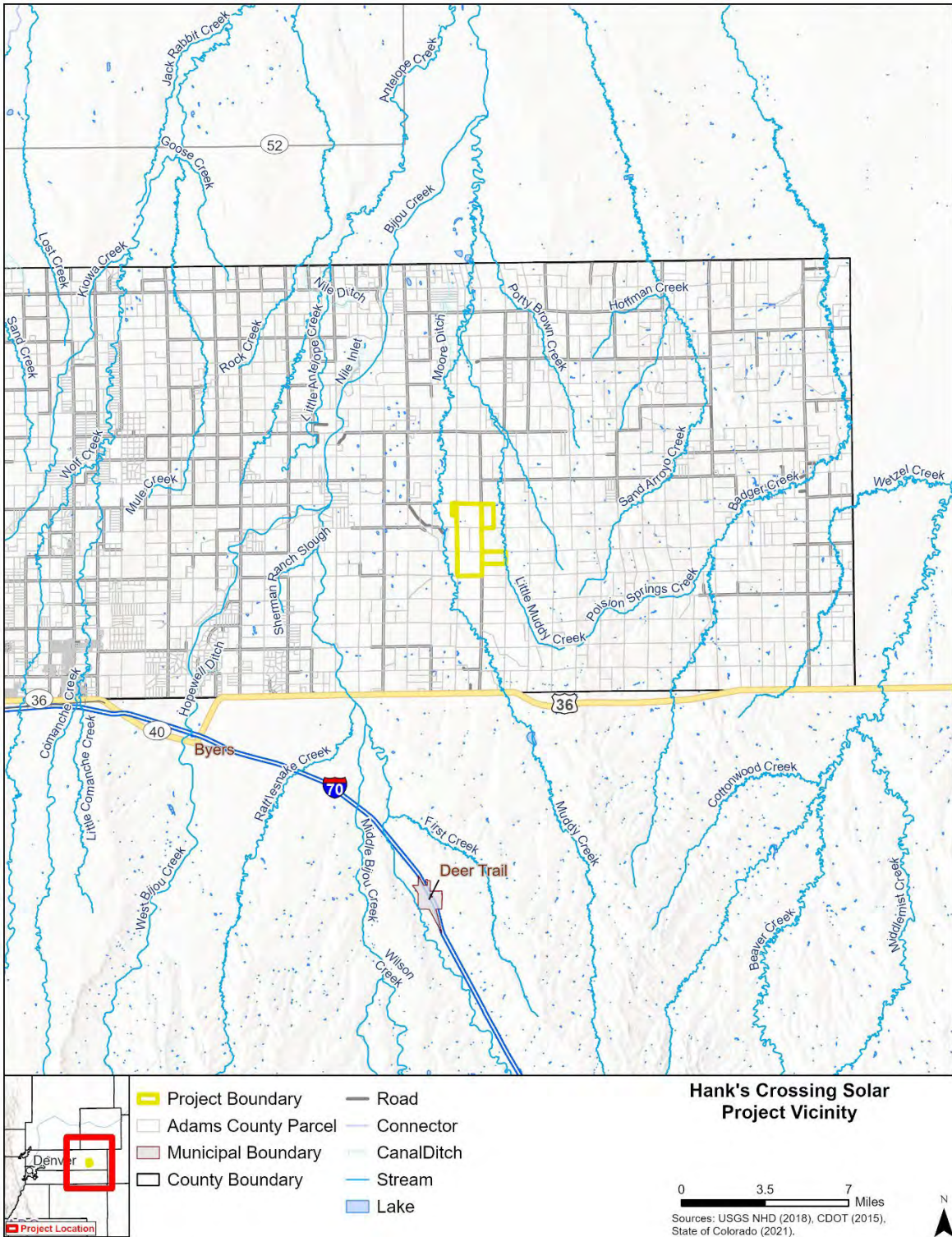
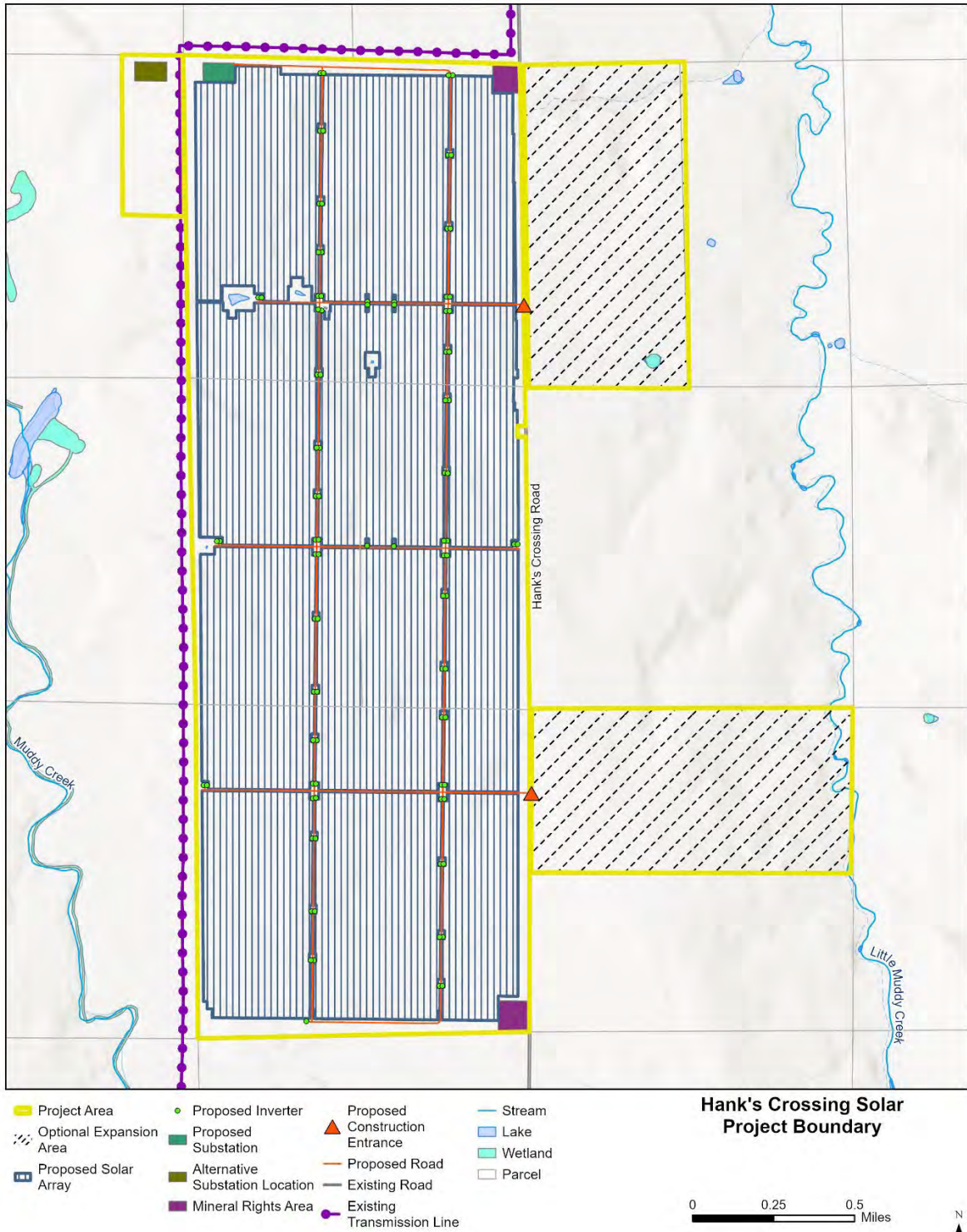


Figure 2. Preliminary Site Layout



Sara Stribley

From: Sarah Smith
Sent: Friday, February 2, 2024 10:43 AM
To: tanderson@byersfire.org
Cc: Sara Stribley; Paul Gascoigne; David Powell; Kiersten Stanley; Jeremy Call
Subject: Hanks Crossing Solar Project - Project Information and Request for Feedback
Attachments: Hanks Crossing Solar_Byers Fire District Letter.pdf

Good Morning Ms. Anderson,

We are supporting Novis Renewables with the Hanks Crossing Energy Project, a proposed utility-scale solar and battery energy storage project located in your district in unincorporated Adams County. As part of Novis's outreach and due diligence efforts for the project, we are reaching out to you with details of the Project. Attached is an informational letter providing an overview of the Project, including maps of the project location and a preliminary site plan.

We appreciate you taking the time to review the attached information and providing us with your concerns or feedback. Please reach out to us if you have any questions and we look forward to hearing from you!

Thank you,

Sarah J. Smith
Associate Ecologist, CERP

Logan Simpson
213 Linden St., Ste. 300
Fort Collins, CO 80524
C 904-629-2774
ssmith@logansimpson.com
www.logansimpson.com





February 2, 2024

Byers Fire District

100 N Main St.
Byers, CO 80103
(720) 392-5009

Dear Ms. Anderson and the entire Byers Fire District,

Hanks Crossing Energy, LLC, a subsidiary of Novis Renewables, LLC (“Novis”) is proposing to construct and operate the Hanks Crossing Energy Project (“Project”) located approximately 13 miles northeast of the town of Byers in unincorporated Adams County (see Figure 1). The development site consists of approximately 1,959 acres with options to incorporate an additional 679 acres into the Project for added siting flexibility (see Figure 2). The Project sits entirely on privately-owned land adjacent to an existing high-voltage transmission corridor owned by Public Service Company of Colorado. The proposed Project consists of a 355-megawatt (MW) photovoltaic (PV) system and 178 MW battery energy storage system (BESS), along with internal access roads, inverters and transformer equipment, an underground electrical collection system, one collection substation, an operations and maintenance building, and other associated facilities. Novis has completed preliminary environmental diligence for the Project and is working closely with regulatory agencies to identify additional concerns or constraints that may need to be addressed in the preliminary design. The Project will be fully decommissioned at the end of its operational life, which is estimated between 40 and 80 years.

Novis will secure all required local, state and federal permits prior to commencement of construction, and utilize best management practices and other avoidance and mitigation measures to develop the Project in a way that reduces impacts to sensitive resources. Novis anticipates submitting a Conditional Use Permit application to Adams County for approval of the Project in the second quarter of 2024.

As part of our initial due diligence efforts, we are reaching out to your agency to solicit feedback to help us identify and address any potential concerns that you might have regarding the Project. Following your review of the included information, if you have any comments or concerns, please contact Paul Gascoigne, Senior Manager, by email (paul.gascoigne@novisrenew.com) or directly by phone (508.505.0890). Additionally, we would like to schedule a meeting to discuss the Project with you directly.



February 2, 2024

Thank you in advance for your feedback and we look forward to hearing from you. If possible, please respond with any comments or requests **by Friday, February 9, 2024**, to ensure we have sufficient time to address your concerns.

Thank you,

Paul Gascoigne
Senior Manager, Site Acquisition & Strategy
Novis Renewables
508.505.0890
paul.gascoigne@novisrenew.com

Cc:

Kiersten Stanley, Novis Renewables
David Powell, Novis Renewables
Sara Stribley, Logan Simpson
Jeremy Call, Logan Simpson

Attachments –

Figure 1. Project Location Map

Figure 2. Preliminary Site Layout

Figure 1. Project Location Map

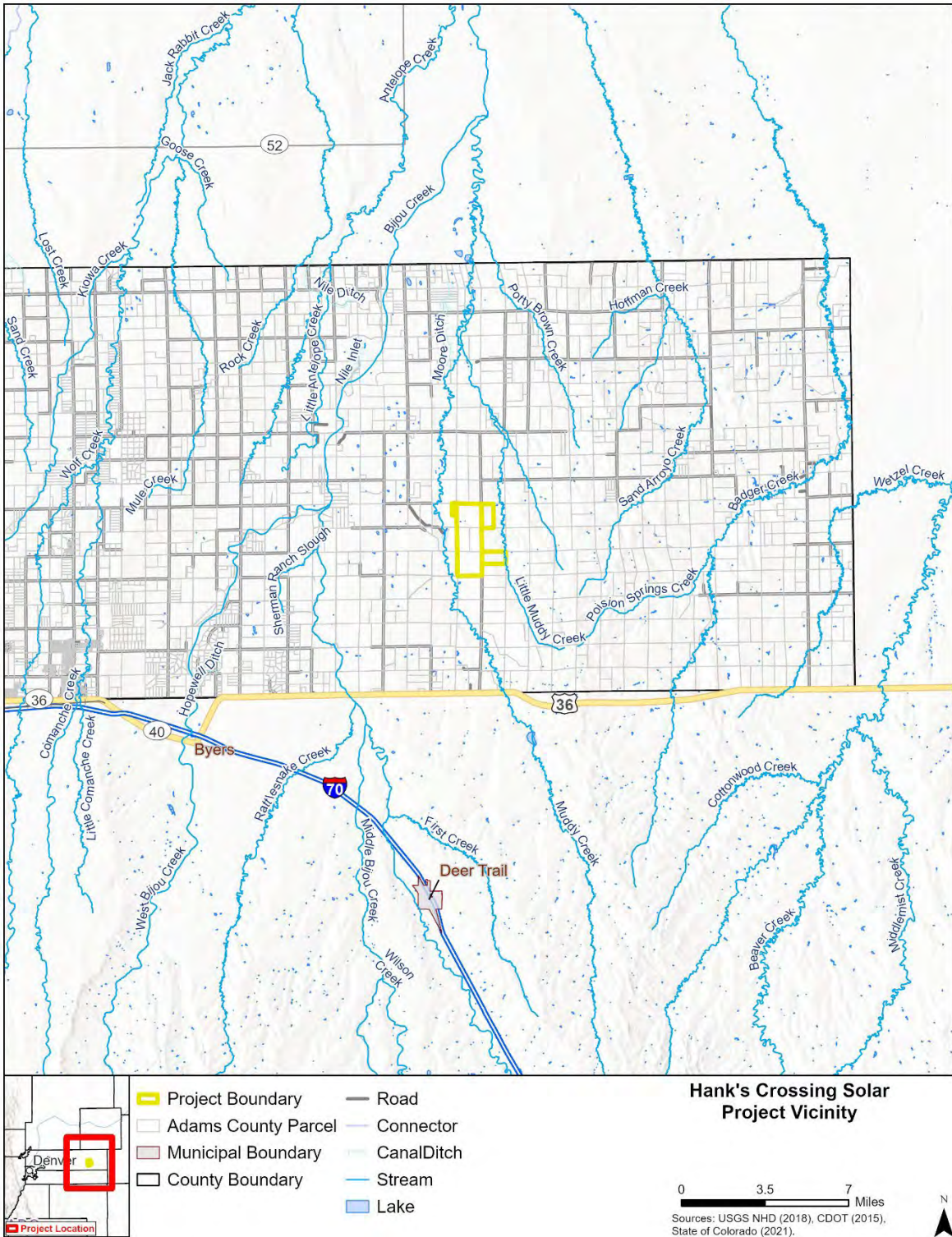
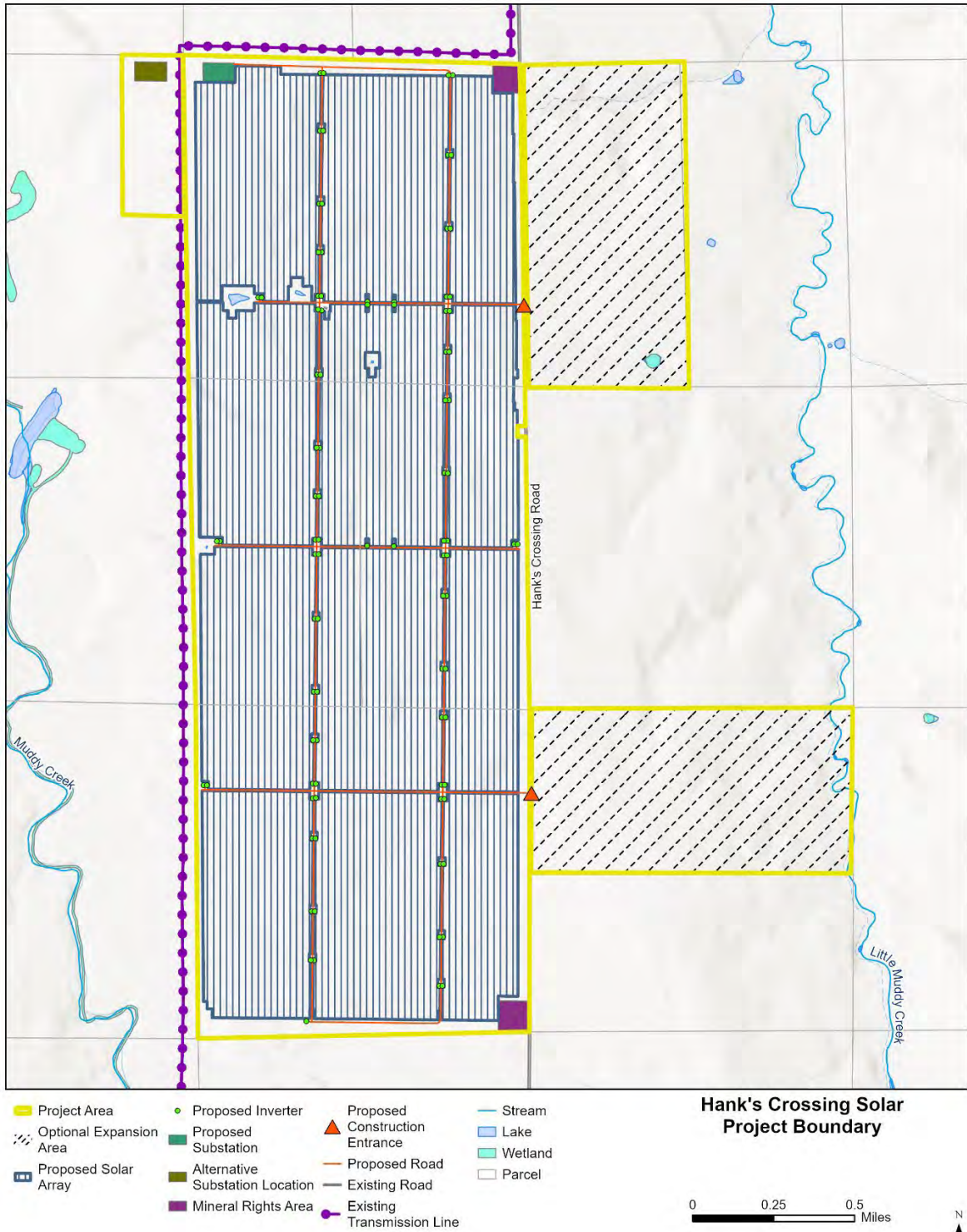


Figure 2. Preliminary Site Layout



From: [Sara Stribley](#)
To: tanderson@byersfire.org
Cc: [Paul Gascoigne](#)
Subject: Hanks Crossing Energy Project - Project Review Meeting
Date: Monday, April 1, 2024 2:19:00 PM

Good Afternoon Ms. Anderson,

My name is Sara Stribley with Logan Simpson, and we are supporting Novis Renewables with the Hanks Crossing Energy Project, a proposed large-scale solar facility located in unincorporated Adams County, which also falls within the Byers Fire District jurisdiction. Previously, we had reached out to the Byers Fire District via email and mail to share a Project introductory letter which included site location maps and project overview details. We hope you received this initial communication. As additional follow-up, the Project team would like to schedule a Project review meeting with your agency. This meeting will provide an opportunity to discuss any issues or feedback you may have regarding the Project.

The Project team is currently working on the site plan design and anticipates having it ready in the next few weeks. Additionally, we anticipate submitting a Conditional Use Permit to Adams County in late May. Considering the timing of these key dates, we are requesting your input on an ideal timeframe to schedule a meeting with your Department.

Thank you very much for your feedback, and we look forward to your response! Please feel free to reach out via email or give me a call at 970.231.9026 to coordinate the meeting details.

Kind regards,

Sara Stribley

Senior Environmental Planner

Logan Simpson
213 Linden Street, Suite 300
Fort Collins, Colorado 80524
C 970.231.9026
sstribley@logansimpson.com
www.logansimpson.com

Please note: My current work schedule is Mon-Thurs

From: [Patrick Conroy](#)
To: [Sara Stribley](#); [Mike Disher](#)
Cc: [Tanisha Anderson](#)
Subject: Re: Project meeting
Date: Saturday, May 4, 2024 6:38:51 AM

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Sorry for the delay on this. Busy time recently.

Here are some draft comments for you. Since you will be going through the Conditional Use Permit process Adams County will include the Fire Department in that process.

The inclusion of the referenced support buildings and structure, as well as the BESS, certainly complicates the project. Please feel free to include myself and Chief Disher in any applicable conceptual design meetings that you may have, so they we can help as much as possible on the front end of this project.

Thanks.

Pat



Patrick Conroy, MS, EMT-P, NAFI-CFEI, IAAI-CFI®
Fire Chief
ICC Certified Fire Marshal
ICC Certified Building Code Official
Colorado Fire Plans Examiner

From: Patrick Conroy <pconroy@svfd8.org>
Sent: Thursday, April 25, 2024 4:42 PM
To: Sara Stribley <sstribley@logansimpson.com>; Mike Disher <mdisher@byersfire.org>
Cc: Tanisha Anderson <tanderson@byersfire.org>
Subject: Re: Project meeting

Hi Sara. My name is Patrick Conroy, Fire Chief and Fire Marshal for Strasburg Fire , which is the District that borders Byers Fire to the west. In my Fire Marshal role at Strasburg, we have a MOU with

Byers for me to assist in plan reviews and construction inspections for their District. Chief Disher has recently forwarded me the general documents that he has on this project to date that I should be able to get reviewed to provide some initial comments back to you hopefully next week.

Talk with you soon.

Pat



Patrick Conroy, MS, EMT-P, NAFI-CFEI, IAAI-CFI®

Fire Chief

ICC Certified Fire Marshal

ICC Certified Building Code Official

Colorado Fire Plans Examiner

From: Sara Stribley <sstribley@logansimpson.com>

Sent: Wednesday, April 3, 2024 9:22 AM

To: Mike Disher <mdisher@byersfire.org>

Cc: Patrick Conroy <pconroy@svfd8.org>; Tanisha Anderson <tanderson@byersfire.org>

Subject: RE: Project meeting

Sounds great, Mike! Thank you for the response and we look forward to hearing back from you!

Sara Stribley

Logan Simpson

C 970.231.9026

From: Mike Disher <mdisher@byersfire.org>

Sent: Monday, April 1, 2024 2:45 PM

To: Sara Stribley <sstribley@logansimpson.com>

Cc: Patrick Conroy <pconroy@svfd8.org>; Tanisha Anderson <tanderson@byersfire.org>

Subject: Project meeting

CAUTION: This email originated from outside the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Sara, thanks for reaching out, I'm sure there will be some questions that come up and we can

set up a meeting. I will cc my plan reviewer and see what his availability is and we can go from there. Thanks and have a great day

--



Chief Mike Disher
Byers Fire Rescue
303-475-6505



Strasburg Fire Protection District

PO Box 911
56281 E Colfax Ave
Strasburg, CO 80136
(303)-622-4444

BUILDING AND DEVELOPMENT SERVICES

Commercial Project Fire Code Plan Review Comments

Date: May 4, 2024

From: Patrick Conroy – Fire Marshal
Colorado Fire Plans Examiner # 166304939

Project: Hanks Crossing Energy Project

Permit #: N/A

Note: This review has been prepared by the Strasburg Fire Protection District on behalf of the Byers Fire Protection District., who is the legal “Authority Having Jurisdiction” for this project. Any question or concerns shall be submitted to the Strasburg Plan Reviewer and the Byers Fire Chief.

I have completed a Fire Code Plan review for the above referenced project and offer the following comments. The review was done in accordance with the requirements of the 2018 International Fire Code (IFC), Adams County local amendments and applicable National Fire Protection Association Codes and Standards.

1. Note that Adams County is in the process of adopting the 2024 International Building and Fire Code, thus it is not clear as to which version of the IFC will apply to this project.
2. Broadly speaking compliance with Chapter 12 of the 2018 IFC will be required.
3. The same Chapter will apply out of the 2024 IFC should that be the controlling Code at time of permitting.
4. The operations and maintenance building and other associated facilities shall be designed and constructed in accordance with the applicable occupancy classification as determined by the International Building Code (IBC) and the corresponding requirements out of the IFC.
5. Access gates around the perimeter fencing to be determined. Knox padlocks shall be required at these gates for Fire Department access.
6. The 10-foot clear, brush free area around ground-mounted photovoltaic arrays in Section 1204.4 shall apply to all aisles and arrays within the perimeter fence of the project. The brush-

free zone separating the perimeter fence from surrounding prairie/grasslands shall be increased to 30-feet or the lot line, whichever is greater.

7. Chapter 1206 for Electrical Stored Energy Systems shall apply to the proposed BESS. As the proposed system exceeds the values shown in Table 1206.2 of the IFC the requirements of Section 1206.2.1 through 1206.2.12.6 shall apply as applicable.
8. NFPA 855 for Installation of Stationary Energy Storage Systems – 2020 Edition shall also apply to this project.
9. Potential water supply needs for fire department operations to be determined.

Sherman, Amy

From: Sherman, Amy
Sent: Friday, January 12, 2024 1:55 PM
To: Marette - DNR, Brandon
Cc: Paul Gascoigne; David Powell
Subject: CPW Request for Project Review and Comment - Hanks Crossing Energy Project, Adams County
Attachments: Hanks Crossing Energy CPW Coordination Letter_011224.docx; Hanks Crossing Project Boundary _121323.kmz

Hello Brandon –

On behalf of Novis Renewables LLC, please see the attached request for CPW’s project review and comment for the Hanks Crossing Energy Project located in Adams County, Colorado. A KMZ showing the proposed Project boundary is also attached.

Please do not hesitate to contact me with any questions or additional information requests. We appreciate your time, and look forward to your comments.

Thanks much-

Amy Sherman | Biologist/Project Manager, Rockies Team Lead

Mobile (785) 764-0698 | amy.sherman@tetrattech.com

Pronouns: she, her, hers

Tetra Tech | Complex World, Clear Solutions™ | Science

7222 Commerce Center Drive Ste.150, Colorado Springs, CO 80919 | tetrattech.com

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January 12, 2024

Colorado Parks and Wildlife, Northeast Region
6060 Broadway, Denver, CO 80216
Attention: Brandon Marette

Subject: Environmental Review Request for the Proposed Hanks Crossing Energy Project in Adams County, Colorado

Dear Mr. Marette:

Hanks Crossing Energy, LLC, a subsidiary of Novis Renewables, LLC (Novis), is currently planning to develop a solar and battery energy storage facility, Hanks Crossing Energy (Project). The Project would be sited on approximately 2,659 acres of private lands (Project Area) in Adams County currently used for dryland farming and pastureland. The KMZ file submitted with this letter shows the preliminary Project Area. On behalf of Novis, we request that you treat this information as Confidential Business Information.

Tetra Tech conducted a desktop review and field surveys of biological resources within the Project Area. According to the National Land Cover Database, the dominant land cover type within the Project Area is grassland/herbaceous (approximately 53 percent) and cultivated crops (approximately 45.8 percent). Vegetation observed during the field surveys was consistent with that of the National Land Cover Database for the Project. The primary crop observed in the Project Area is wheat (*Triticum* sp.). Grassland/herbaceous land cover is dominated by needle-and-thread grass (*Hesperostipa comata*) with some kochia (*Bassia scoparia*), Russian thistle (*Salsola* sp.), and sand sagebrush (*Artemisia filifolia*). Cattle troughs and excavated cattle ponds are scattered throughout the Project Area.

Initial onsite water resource mapping completed for the Project identified one small emergent wetland, six excavated stock ponds, and a segment of Little Muddy Creek. All these features have been heavily impacted by active and/or historic agricultural production.

Tetra Tech queried the U.S. Fish and Wildlife Service (USFWS) Information for Planning and Consultation (IPaC) online tool and the Colorado Parks and Wildlife (CPW) All Species Activity Mapping (SAM) Data and High Priority Habitats (HPH) Data to obtain a list of special status species with the potential to occur within the Project Area. The results of the query identified the following potentially occurring federally and state-listed species:

- Gray wolf (*Canis lupus*) – Federally Endangered, State Endangered
- Preble's meadow jumping mouse (*Zapus hudsonius preblei*)- Federally Threatened, State Threatened
- Tricolored bat (*Perimyotis subflavus*)- Federal Proposed Endangered (overall range)
- Piping plover (*Charadrius melodus*)- Federally Threatened, State Threatened
- Burrowing owl (*Athene cunicularia*)- State Threatened (breeding range)
- Whooping crane (*Grus americana*)- Federally Endangered, State Endangered
- Pallid sturgeon (*Scaphirhynchus albus*)- Federally Endangered, State Endangered
- Monarch butterfly (*Danaus plexippus*) – Federal Candidate

- Ute ladies'-tresses (*Spiranthes diluvialis*)- Federally Threatened
- Western prairie fringed orchid (*Plantathera praeclara*)- Federally Threatened

In addition, the CPW SAM database and HPH data identified the following species of special concern, big game species, and species protected by the Bald and Golden Eagle Protection Act (BGEPA) with the potential to occur within the Project Area:

- Bald eagle (*Haliaeetus leucocephalus*)- State Special Concern, BGEPA (winter range)
- Black-tailed prairie dog (*Cynomys ludovicianus*) – State Special Concern (overall range, High Potential for Colony Occurrence range)
- Ferruginous hawk (*Buteo regalis*) – State Special Concern (breeding range)
- Golden eagle (*Aquila chrysaetos*)- BGEPA (breeding range)
- Long-billed curlew (*Numenius americanus*) – State Special Concern (breeding range)
- Mountain plover (*Charadrius montanus*) – State Special Concern (breeding range)
- Mule deer (*Odocoileus hemionus*) – Big Game Species
- Pronghorn (*Antilocapra americana*) – Big Game Species
- White-tailed deer (*Odocoileus virginianus*) – Big Game Species

Based on the desktop analysis of land cover data, aerial imagery, range maps, and observations during the field survey, the following federally and state-listed or protected species may occur within the Project Area: bald eagle, golden eagle, burrowing owl, and monarch butterfly.

The Project Area lacks large, open water bodies, large trees, or cliff faces that would provide suitable nesting habitat for bald or golden eagles; however, due to a nearby small reservoir (Bramkamp Reservoir), as well as the observation of active prairie dog colonies within the Project Area, bald and golden eagles have a moderate likelihood of foraging within the Project Area.

Potential burrowing owl sign (whitewash, pellets, and feather spots) were observed in several black-tailed prairie dog colonies within the Project Area during the field surveys. Given the observation of burrowing owl sign, and the presence of active black-tailed prairie dog colonies, burrowing owls have a high likelihood of occurrence within the Project Area.

Monarch butterflies were observed during the July 2023 field survey in proximity to milkweed plants, which are present throughout the grassland/herbaceous land cover within the Project Area. Therefore, the likelihood of the species occurring within the Project Area is high.

Based on review of available desktop data and the field surveys, Tetra Tech determined that there is potentially suitable nesting habitat within the Project Area for the following CPW Special Concern species: ferruginous hawk, long-billed curlew, and mountain plover. In addition, several active and potentially active black-tailed prairie dog colonies were observed within the Project Area during the field surveys.

Mapped game species habitat within the Project Area includes overall range, concentration areas, and winter range for mule deer, pronghorn, and white-tailed deer. In addition, a mule deer winter concentration area (a CPW High Priority Habitat) is located along the easternmost portion of the Project Area. Pronghorn and mule deer were observed within or near the Project Area during field surveys. Based on observations and habitat, mule deer, pronghorn, and white-tailed deer all have a high likelihood of occurrence within the Project Area.

While limited raptor nesting habitat is present within the Project Area and 1-mile vicinity, one active Swainson's hawk (*Buteo swainsoni*) nest and one inactive stick nest were observed during the field surveys in small trees.

Novis is familiar with the CPW Best Management Practices (BMPs) for Solar Development and will consider and incorporate BMPs into Project planning efforts. On behalf of Novis, we kindly request your review of this Project and a written response summarizing:

1. Known occurrences of protected species, as well as other species targeted for special conservation efforts, within the Project area and vicinity.
2. Known locations of eagle and raptor nests in the Project area and vicinity.
3. Concerns and recommendations regarding impacts to wildlife and their habitats.
4. Any other information you would like us to consider during the early stages of project planning.

Thank you for your assistance with this request. Please let me know if you have any questions.

Sincerely,



Amy Sherman, Senior Biologist
Tetra Tech Project Manager

Cc: Paul Gascoigne, Sr. Mgr., Site Acquisition & Strategy, Novis Renewables, LLC

Attachments: Hanks Crossing Energy Project Boundary KMZ

From: [Sara Stribley](#)
To: deertraileastadams@gmail.com
Cc: [Paul Gascoigne](#); [David Powell](#); [Kiersten Stanley](#); [Jeremy Call](#)
Subject: Hanks Crossing Solar Project - Project Information and Request for Feedback
Date: Tuesday, January 30, 2024 5:03:00 PM
Attachments: [Hanks Crossing Solar Conservation Districts.pdf](#)

Good Afternoon Mr. Lindsay and Ms. Croghan,

We are supporting Novis Renewables with the Hanks Crossing Energy Project, a proposed utility-scale solar and battery energy storage project located in your district in unincorporated Adams County. As part of Novis's outreach and due diligence efforts for the project, we are reaching out to you with details of the Project. Attached is an informational letter providing an overview of the Project, including maps of the project location and a preliminary site plan.

We appreciate you taking the time to review the attached information and providing us with your concerns or feedback. Please reach out to us if you have any questions and we look forward to hearing from you!

Thank you,

Sara Stribley

Senior Environmental Planner

Logan Simpson
213 Linden Street, Suite 300
Fort Collins, Colorado 80524
C 970.231.9026
sstribley@logansimpson.com
www.logansimpson.com

Please note: My current work schedule is Mon-Thurs



January 30, 2024

Deer Trail and East Adams Conservation District

Attn: Joe Lindsay, Deer Trail Conservation District President
And Sharon Croghan, East Adams Conservation District President
133 West Bijou Ave
Byers, CO 80103

Dear District Representatives,

Hanks Crossing Energy, LLC, a subsidiary of Novis Renewables, LLC (“Novis”) is proposing to construct and operate the Hanks Crossing Energy Project (“Project”) located approximately 13 miles northeast of the town of Byers in unincorporated Adams County (see Figure 1). The development site consists of approximately 1,959 acres with options to incorporate an additional 679 acres into the Project for added siting flexibility (see Figure 2). The Project sits entirely on privately-owned land adjacent to an existing high-voltage transmission corridor owned by Public Service Company of Colorado. The proposed Project consists of a 355-megawatt (MW) photovoltaic (PV) system and 178 MW battery energy storage system (BESS), along with internal access roads, inverters and transformer equipment, an underground electrical collection system, one collection substation, an operations and maintenance building, and other associated facilities. Novis has completed preliminary environmental diligence for the Project and is working closely with regulatory agencies to identify additional concerns or constraints that may need to be addressed in the preliminary design. The Project will be fully decommissioned at the end of its operational life, which is estimated between 40 and 80 years.

Novis will secure all required local, state and federal permits prior to commencement of construction, and utilize best management practices and other avoidance and mitigation measures to develop the Project in a way that reduces impacts to sensitive resources. Novis anticipates submitting a Conditional Use Permit application to Adams County for approval of the Project in the second quarter of 2024.

As part of our initial due diligence efforts, we are reaching out to your agency to solicit feedback to help us identify and address any potential concerns that you might have regarding the Project. Following your review of the included information, if you have any comments or concerns, please contact Paul Gascoigne, Senior Manager, by email (paul.gascoigne@novisrenew.com) or directly by phone (508.505.0890). If preferred, a meeting can be scheduled to discuss the Project with you directly.

Thank you in advance for your feedback and we look forward to hearing from you. If possible, please respond with any comments or requests **by Friday, February 9, 2024**, to ensure we have sufficient time to address your concerns.



January 30, 2024

Thank you,

Paul Gascoigne
Senior Manager, Site Acquisition & Strategy
Novis Renewables
508.505.0890
paul.gascoigne@novisrenew.com

Cc:
Kiersten Stanley, Novis Renewables
David Powell, Novis Renewables
Sara Stribley, Logan Simpson
Jeremy Call, Logan Simpson

Attachments –

Figure 1. Project Location Map

Figure 2. Preliminary Site Layout

Figure 1. Project Location Map

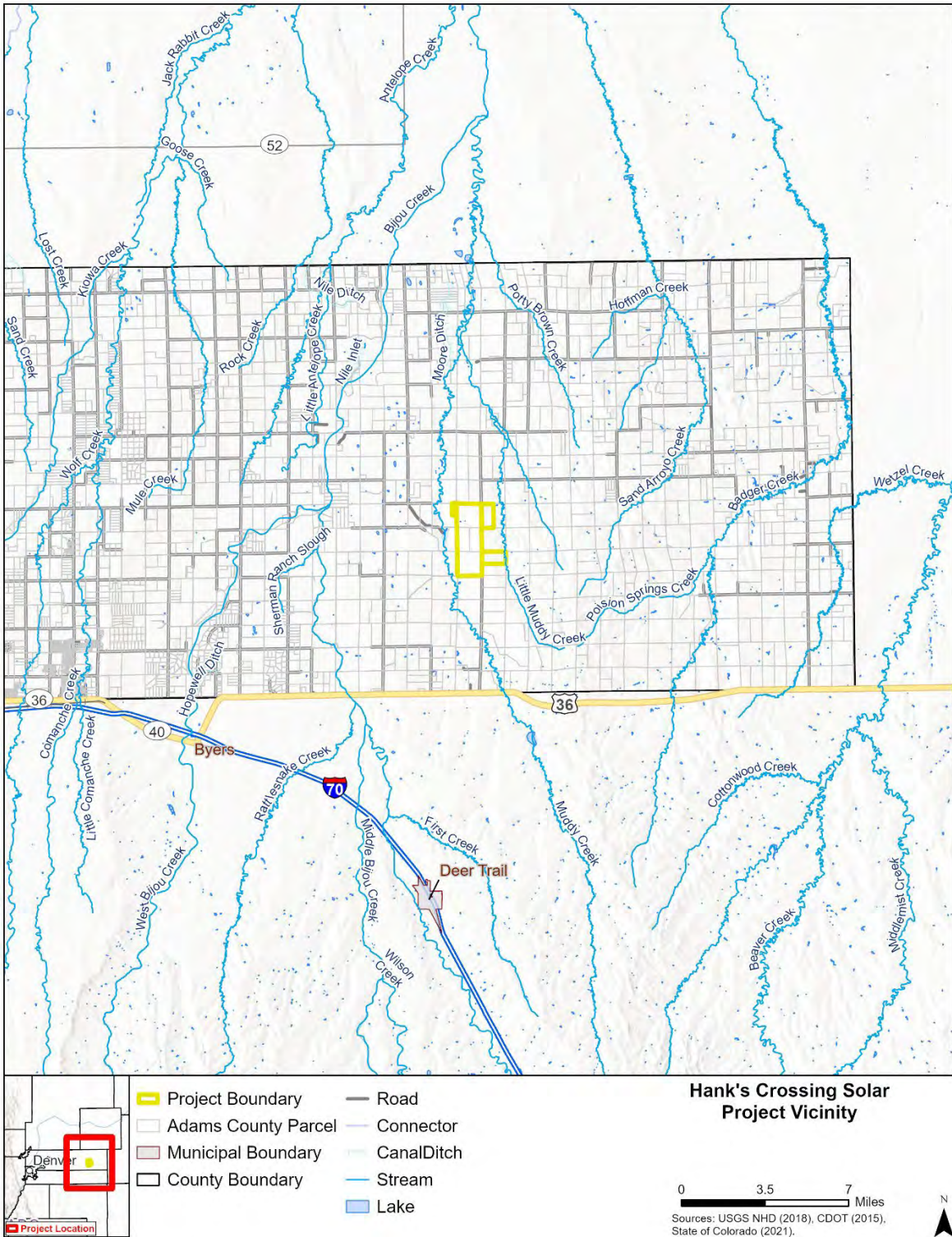
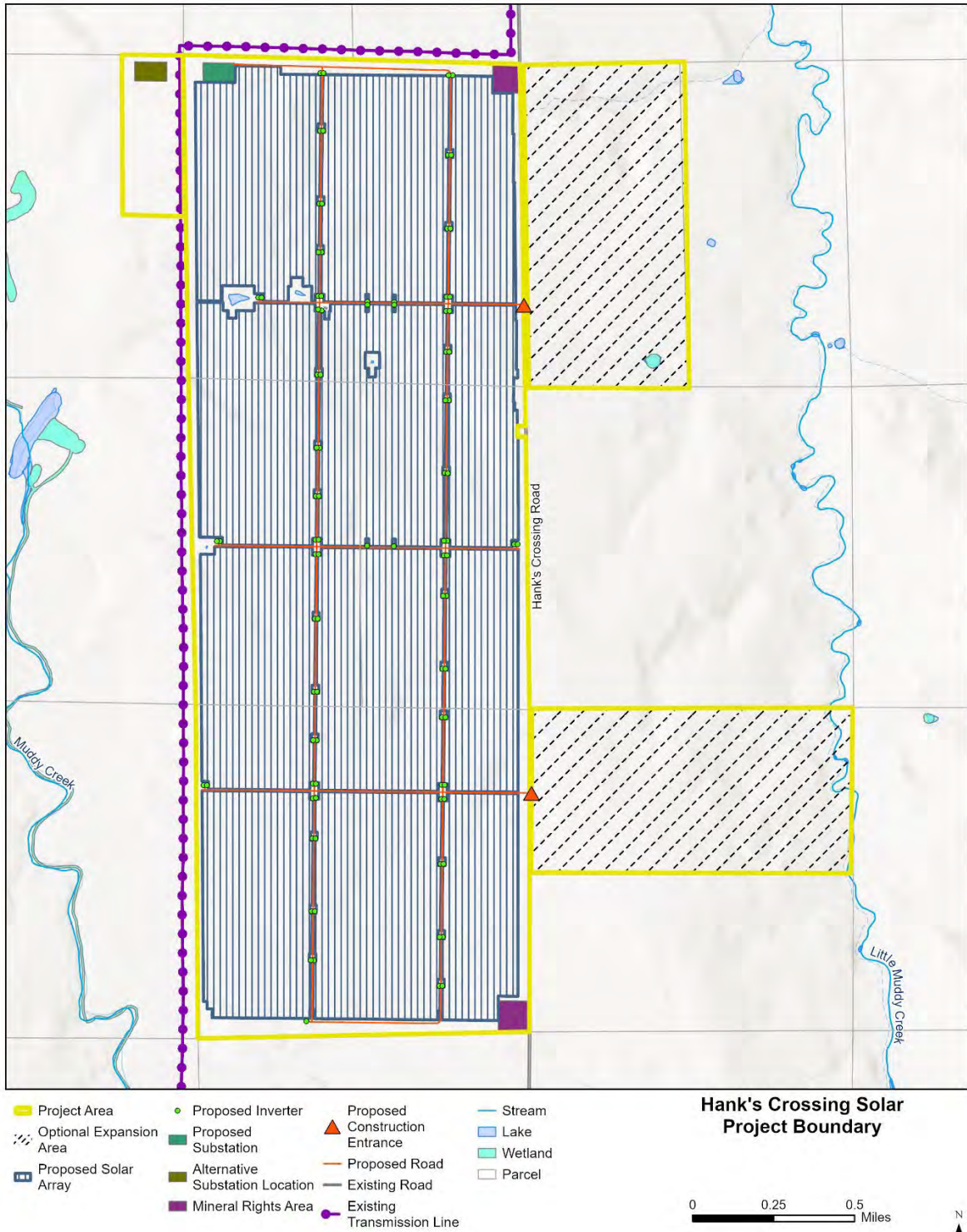


Figure 2. Preliminary Site Layout



From: [Sara Stribley](#)
To: twhite@core.coop
Cc: [Paul Gascoigne](#); [David Powell](#); [Kiersten Stanley](#); [Jeremy Call](#)
Subject: Hanks Crossing Solar Project - Project Information and Request for Feedback
Date: Tuesday, January 30, 2024 4:35:00 PM
Attachments: [Hanks Crossing Solar - CORE Electric Letter.pdf](#)

Good Afternoon Mr. White,

We are supporting Novis Renewables with the Hanks Crossing Energy Project, a proposed utility-scale solar and battery energy storage project located in your service district in unincorporated Adams County. As part of Novis's outreach and due diligence efforts for the project, we are reaching out to you with details of the Project. Attached is an informational letter providing an overview of the Project, including maps of the project location and a preliminary site plan.

We appreciate you taking the time to review the attached information and providing us with your concerns or feedback. Please reach out to us if you have any questions and we look forward to hearing from you!

Thank you,

Sara Stribley

Senior Environmental Planner

Logan Simpson
213 Linden Street, Suite 300
Fort Collins, Colorado 80524
C 970.231.9026
sstribley@logansimpson.com
www.logansimpson.com

Please note: My current work schedule is Mon-Thurs

Sara Stribley

Senior Environmental Planner

Logan Simpson
213 Linden Street, Suite 300
Fort Collins, Colorado 80524
C 970.231.9026
sstribley@logansimpson.com
www.logansimpson.com

Please note: My current work schedule is Mon-Thurs



January 30, 2024

CORE Electric

Attention: Timothy White, Board President
P.O. Drawer A
Sedalia, CO 80135-0220
(303) 688-3100

Dear Mr. White,

Hanks Crossing Energy, LLC, a subsidiary of Novis Renewables, LLC (“Novis”) is proposing to construct and operate the Hanks Crossing Energy Project (“Project”) located approximately 13 miles northeast of the town of Byers in unincorporated Adams County (see Figure 1). The development site consists of approximately 1,959 acres with options to incorporate an additional 679 acres into the Project for added siting flexibility (see Figure 2). The Project sits entirely on privately-owned land adjacent to an existing high-voltage transmission corridor owned by Public Service Company of Colorado. The proposed Project consists of a 355-megawatt (MW) photovoltaic (PV) system and 178 MW battery energy storage system (BESS), along with internal access roads, inverters and transformer equipment, an underground electrical collection system, one collection substation, an operations and maintenance building, and other associated facilities. Novis has completed preliminary environmental diligence for the Project and is working closely with regulatory agencies to identify additional concerns or constraints that may need to be addressed in the preliminary design. The Project will be fully decommissioned at the end of its operational life, which is estimated between 40 and 80 years.

Novis will secure all required local, state and federal permits prior to commencement of construction, and utilize best management practices and other avoidance and mitigation measures to develop the Project in a way that reduces impacts to sensitive resources. Novis anticipates submitting a Conditional Use Permit application to Adams County for approval of the Project in the second quarter of 2024.

As part of our initial due diligence efforts, we are reaching out to your agency to solicit feedback to help us identify and address any potential concerns that you might have regarding the Project. Following your review of the included information, if you have any comments or concerns, please contact Paul Gascoigne, Senior Manager, by email (paul.gascoigne@novisrenew.com) or directly by phone (508.505.0890). If preferred, a meeting can be scheduled to discuss the Project with you directly.



January 30, 2024

Thank you in advance for your feedback and we look forward to hearing from you. If possible, please respond with any comments or requests **by Friday, February 9, 2024**, to ensure we have sufficient time to address your concerns.

Thank you,

Paul Gascoigne
Senior Manager, Site Acquisition & Strategy
Novis Renewables
508.505.0890
paul.gascoigne@novisrenew.com

Cc:

Kiersten Stanley, Novis Renewables
David Powell, Novis Renewables
Sara Stribley, Logan Simpson
Jeremy Call, Logan Simpson

Attachments –

Figure 1. Project Location Map

Figure 2. Preliminary Site Layout

Figure 1. Project Location Map

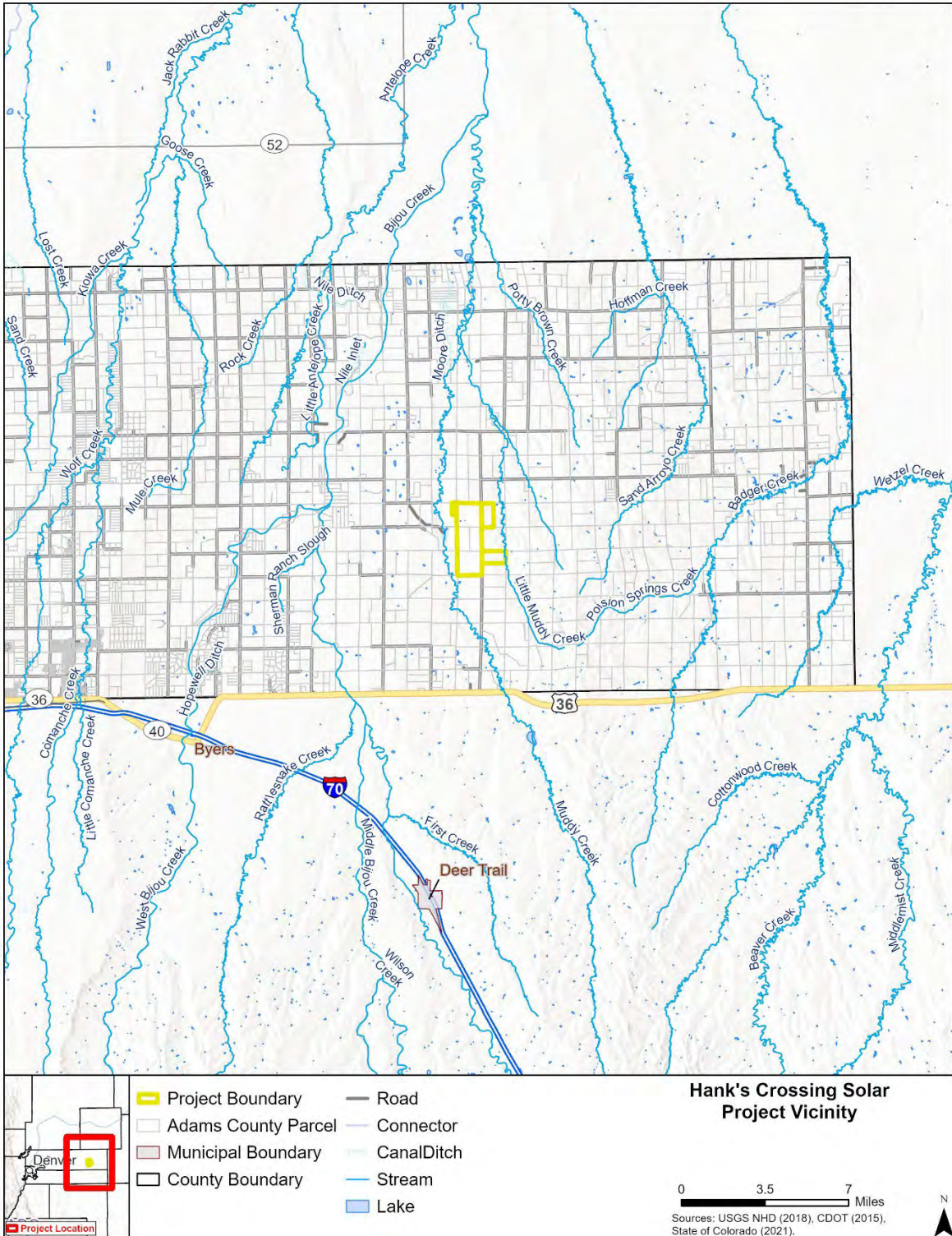
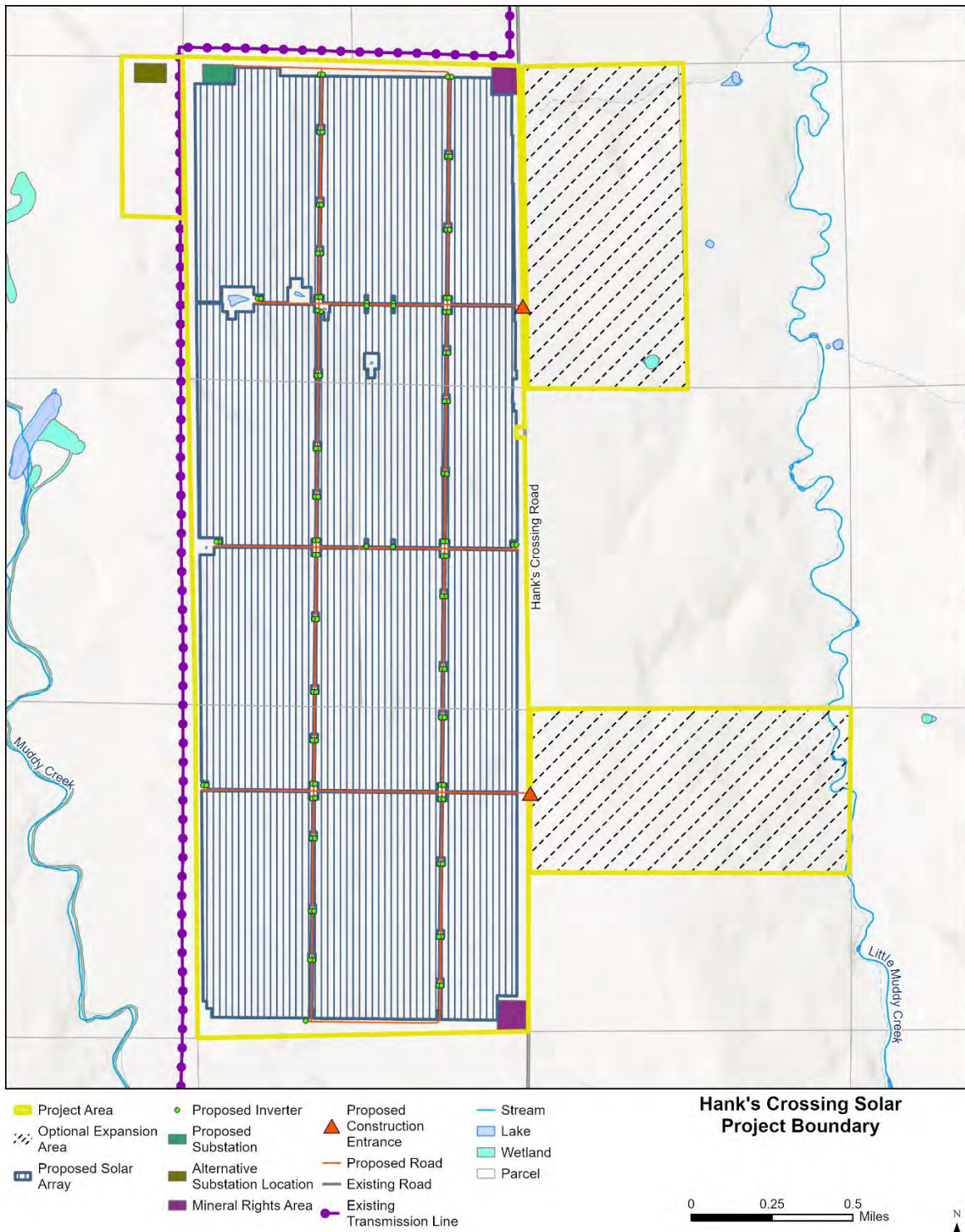


Figure 2. Preliminary Site Layout



From: [Sara Stribley](#)
To: "caryw@mcrea.org"
Cc: [Paul Gascoigne](#); [David Powell](#); [Kiersten Stanley](#); [Jeremy Call](#)
Subject: FW: Hanks Crossing Solar Project - Project Information and Request for Feedback
Date: Tuesday, January 30, 2024 4:46:00 PM
Attachments: [Hanks Crossing Solar Morgan County Rural Electric Association Letter.pdf](#)

Good Afternoon Ms. Whickstrom,

We are supporting Novis Renewables with the Hanks Crossing Energy Project, a proposed utility-scale solar and battery energy storage project located in your service district in unincorporated Adams County. As part of Novis's outreach and due diligence efforts for the project, we are reaching out to you with details of the Project. Attached is an informational letter providing an overview of the Project, including maps of the project location and a preliminary site plan.

We appreciate you taking the time to review the attached information and providing us with your concerns or feedback. Please reach out to us if you have any questions and we look forward to hearing from you!

Thank you,

Sara Stribley

Senior Environmental Planner

Logan Simpson
213 Linden Street, Suite 300
Fort Collins, Colorado 80524
C 970.231.9026
sstribley@logansimpson.com
www.logansimpson.com

Please note: My current work schedule is Mon-Thurs



January 30, 2024

Morgan County Rural Electric Association

Attention: Cary Wickstrom, President

P.O. Box 738

Fort Morgan, CO 80701-0738

(970) 867-5688

Dear Cary Wickstrom,

Hanks Crossing Energy, LLC, a subsidiary of Novis Renewables, LLC (“Novis”) is proposing to construct and operate the Hanks Crossing Energy Project (“Project”) located approximately 13 miles northeast of the town of Byers in unincorporated Adams County (see Figure 1). The development site consists of approximately 1,959 acres with options to incorporate an additional 679 acres into the Project for added siting flexibility (see Figure 2). The Project sits entirely on privately-owned land adjacent to an existing high-voltage transmission corridor owned by Public Service Company of Colorado. The proposed Project consists of a 355-megawatt (MW) photovoltaic (PV) system and 178 MW battery energy storage system (BESS), along with internal access roads, inverters and transformer equipment, an underground electrical collection system, one collection substation, an operations and maintenance building, and other associated facilities. Novis has completed preliminary environmental diligence for the Project and is working closely with regulatory agencies to identify additional concerns or constraints that may need to be addressed in the preliminary design. The Project will be fully decommissioned at the end of its operational life, which is estimated between 40 and 80 years.

Novis will secure all required local, state and federal permits prior to commencement of construction, and utilize best management practices and other avoidance and mitigation measures to develop the Project in a way that reduces impacts to sensitive resources. Novis anticipates submitting a Conditional Use Permit application to Adams County for approval of the Project in the second quarter of 2024.

As part of our initial due diligence efforts, we are reaching out to your agency to solicit feedback to help us identify and address any potential concerns that you might have regarding the Project. Following your review of the included information, if you have any comments or concerns, please contact Paul Gascoigne, Senior Manager, by email (paul.gascoigne@novisrenew.com) or directly by phone (508.505.0890). If preferred, a meeting can be scheduled to discuss the Project with you directly.

Thank you in advance for your feedback and we look forward to hearing from you. If possible, please respond with any comments or requests **by Friday, February 9, 2024**, to ensure we have sufficient time to address your concerns.



January 30, 2024

Thank you,

Paul Gascoigne
Senior Manager, Site Acquisition & Strategy
Novis Renewables
508.505.0890
paul.gascoigne@novisrenew.com

Cc:
Kiersten Stanley, Novis Renewables
David Powell, Novis Renewables
Sara Stribley, Logan Simpson
Jeremy Call, Logan Simpson

Attachments –

Figure 1. Project Location Map

Figure 2. Preliminary Site Layout

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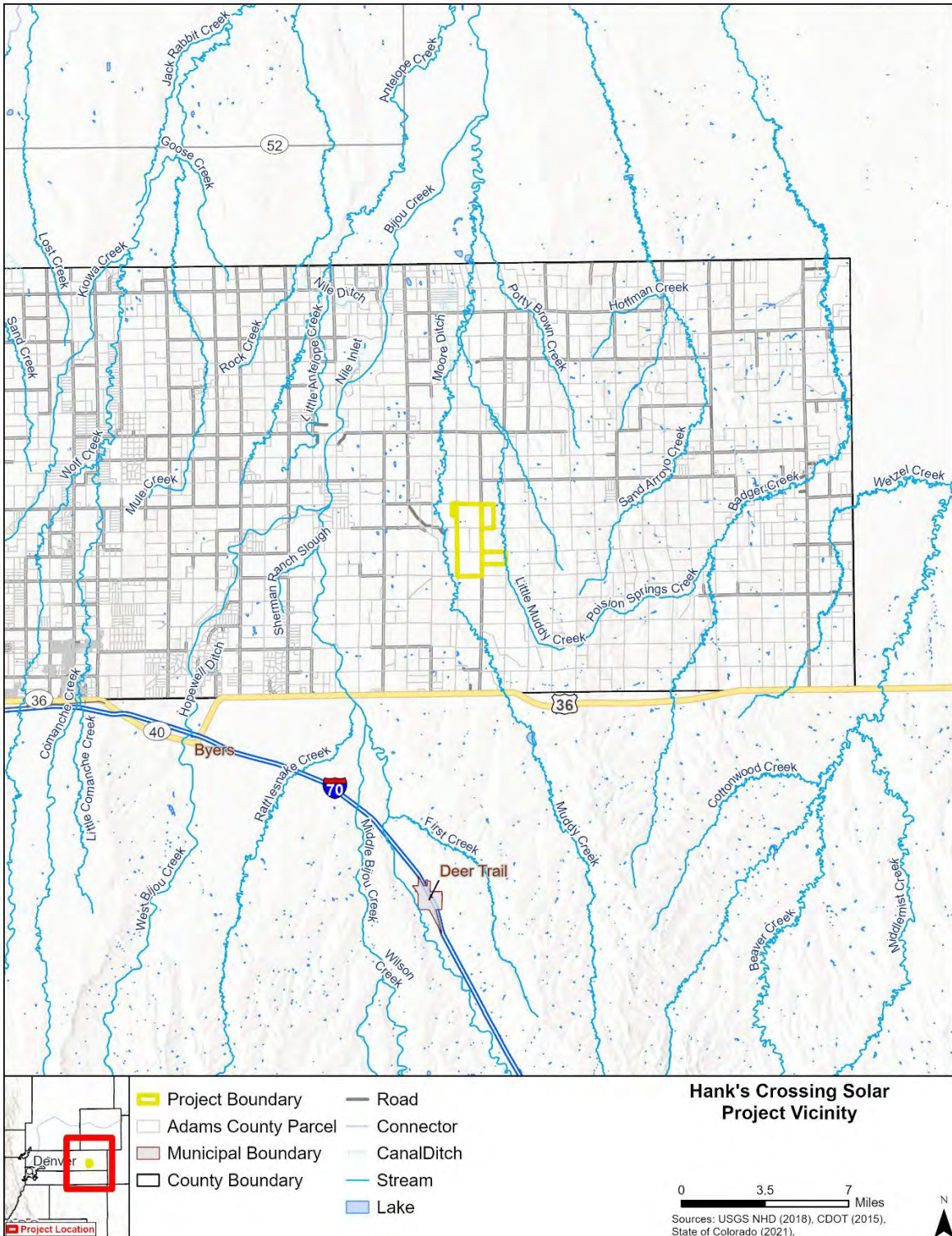
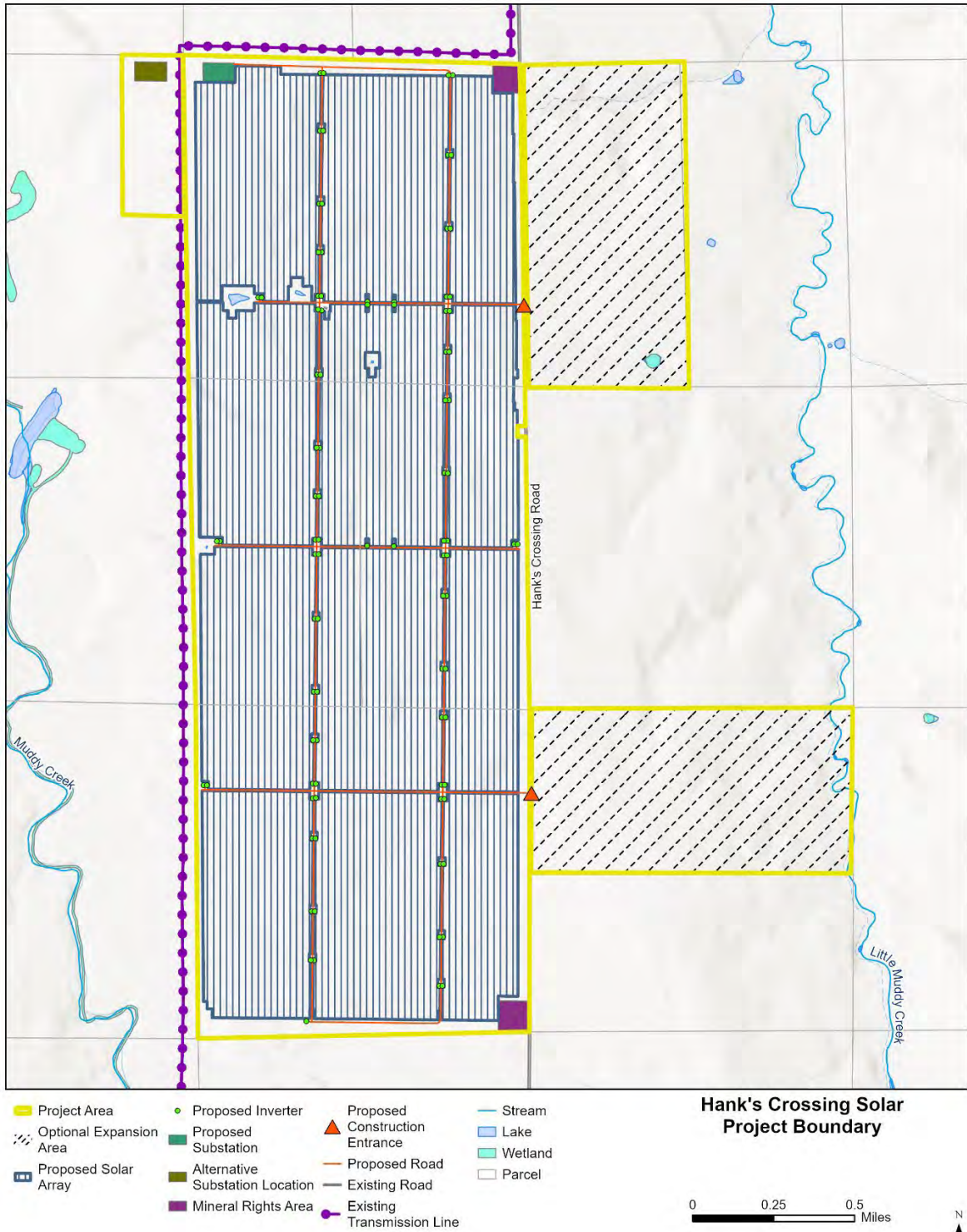


Figure 2. Preliminary Site Layout



From: [Sara Stribley](#)
To: rachel.turner@state.co.us
Cc: [Paul Gascoigne](#); [David Powell](#); [Kiersten Stanley](#); [Jeremy Call](#)
Subject: Hanks Crossing Solar Project - Project Information and Request for Feedback
Date: Tuesday, January 30, 2024 5:12:00 PM
Attachments: [Hanks Crossing Solar - State Land Board Letter.pdf](#)

Good Afternoon Ms. Turner,

We are supporting Novis Renewables with the Hanks Crossing Energy Project, a proposed utility-scale solar and battery energy storage project located in your district in unincorporated Adams County. As part of Novis's outreach and due diligence efforts for the project, we are reaching out to you with details of the Project. Attached is an informational letter providing an overview of the Project, including maps of the project location and a preliminary site plan.

We appreciate you taking the time to review the attached information and providing us with your concerns or feedback. Please reach out to us if you have any questions and we look forward to hearing from you!

Thank you,

Sara Stribley

Senior Environmental Planner

Logan Simpson
213 Linden Street, Suite 300
Fort Collins, Colorado 80524
C 970.231.9026
sstribley@logansimpson.com
www.logansimpson.com

Please note: My current work schedule is Mon-Thurs



January 30, 2024

State Land Board North Central District Office

Attention: Rachel Turner
360 Oak Avenue
Suite 110
Eaton, CO 80615
(970) 454-5279

Dear Rachel Turner,

Hanks Crossing Energy, LLC, a subsidiary of Novis Renewables, LLC (“Novis”) is proposing to construct and operate the Hanks Crossing Energy Project (“Project”) located approximately 13 miles northeast of the town of Byers in unincorporated Adams County (see Figure 1). The development site consists of approximately 1,959 acres with options to incorporate an additional 679 acres into the Project for added siting flexibility (see Figure 2). The Project sits entirely on privately-owned land adjacent to an existing high-voltage transmission corridor owned by Public Service Company of Colorado. The proposed Project consists of a 355-megawatt (MW) photovoltaic (PV) system and 178 MW battery energy storage system (BESS), along with internal access roads, inverters and transformer equipment, an underground electrical collection system, one collection substation, an operations and maintenance building, and other associated facilities. Novis has completed preliminary environmental diligence for the Project and is working closely with regulatory agencies to identify additional concerns or constraints that may need to be addressed in the preliminary design. The Project will be fully decommissioned at the end of its operational life, which is estimated between 40 and 80 years.

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As part of our initial due diligence efforts, we are reaching out to your agency to solicit feedback to help us identify and address any potential concerns that you might have regarding the Project. Following your review of the included information, if you have any comments or concerns, please contact Paul Gascoigne, Senior Manager, by email (paul.gascoigne@novisrenew.com) or directly by phone (508.505.0890). If preferred, a meeting can be scheduled to discuss the Project with you directly.

Thank you in advance for your feedback and we look forward to hearing from you. If possible, please respond with any comments or requests **by Friday, February 9, 2024**, to ensure we have sufficient time to address your concerns.



January 30, 2024

Thank you,

Paul Gascoigne
Senior Manager, Site Acquisition & Strategy
Novis Renewables
508.505.0890
paul.gascoigne@novisrenew.com

Cc:
Kiersten Stanley, Novis Renewables
David Powell, Novis Renewables
Sara Stribley, Logan Simpson
Jeremy Call, Logan Simpson

Attachments –

Figure 1. Project Location Map

Figure 2. Preliminary Site Layout

Figure 1. Project Location Map

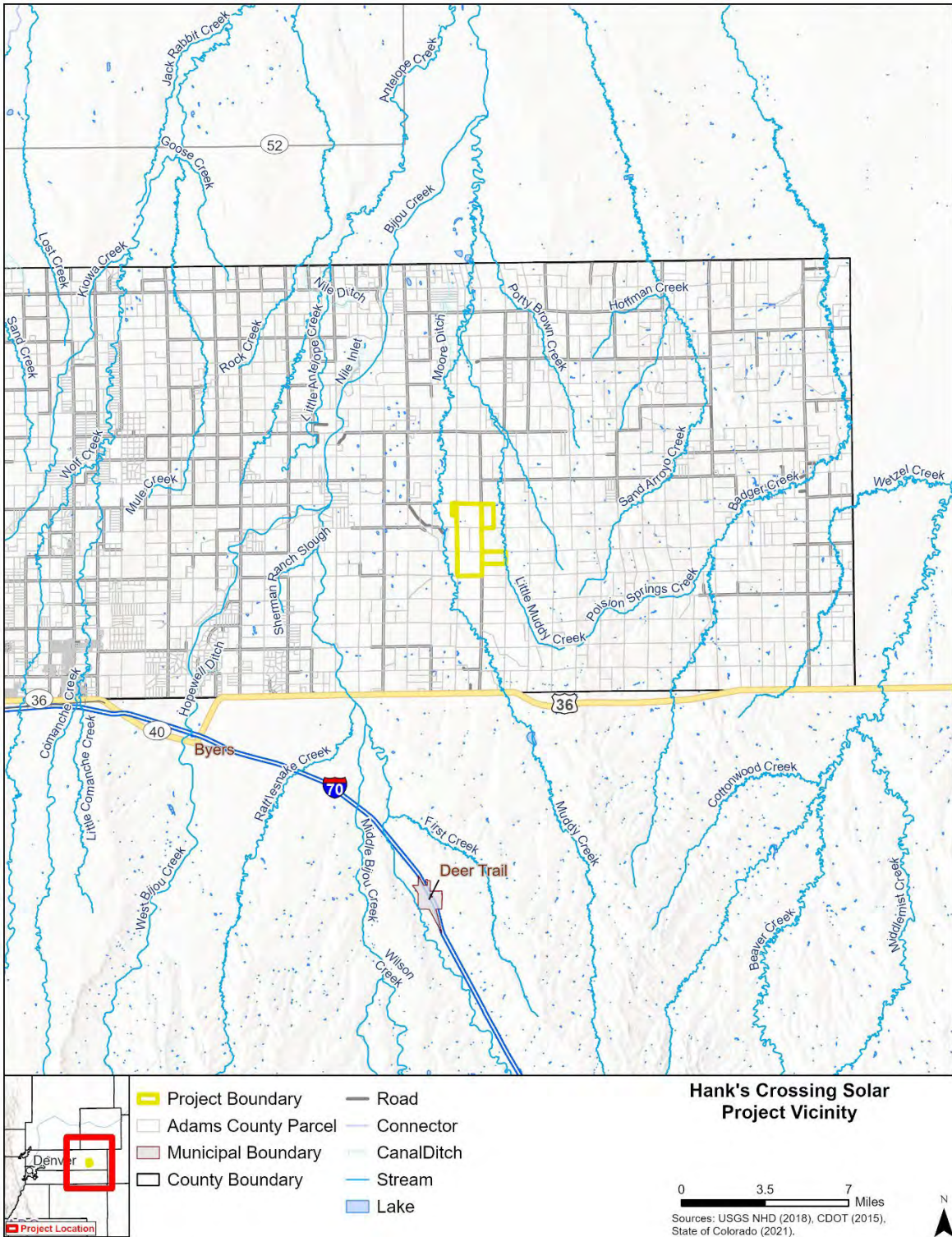
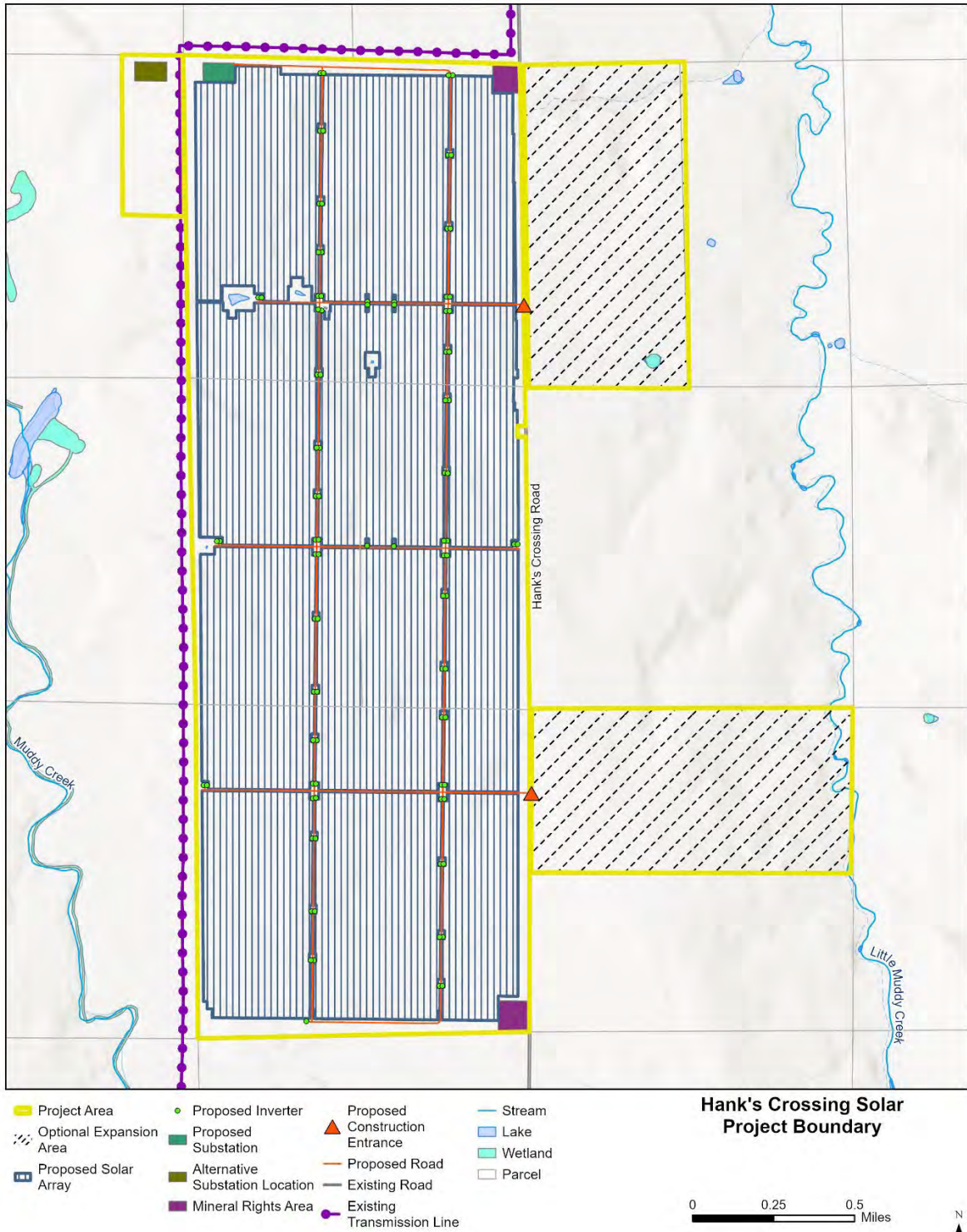


Figure 2. Preliminary Site Layout



Sara Stribley

From: Sarah Smith
Sent: Tuesday, February 13, 2024 3:37 PM
To: mwoodard@dt26j.com
Cc: Sara Stribley; Paul Gascoigne; Kiersten Stanley; David Powell
Subject: Hanks Crossing Solar Project - Project Information and Request for Feedback
Attachments: Hanks Crossing Solar_Deer Trail School District Letter.pdf

Good Afternoon Superintendent Jobman,

We are supporting Novis Renewables with the Hanks Crossing Energy Project, a proposed utility-scale solar and battery energy storage project located in your district in unincorporated Adams County. As part of Novis's outreach and due diligence efforts for the project, we are reaching out to you with details of the Project. Attached is an informational letter providing an overview of the Project, including maps of the project location and a preliminary site plan.

We appreciate you taking the time to review the attached information and providing us with your concerns or feedback. Please reach out to us if you have any questions and we look forward to hearing from you!

Thank you,

Sarah J. Smith
Associate Ecologist, CERP

Logan Simpson
213 Linden St., Ste. 300
Fort Collins, CO 80524
C 904-629-2774
ssmith@logansimpson.com
www.logansimpson.com





February 13, 2024

School District 26 – Deer Trail

Attention: Michael Jobman, Superintendent
P.O. Box 129
Deer Trail, CO 80105
(303) 769-4421

Dear Superintendent Jobman,

Hanks Crossing Energy, LLC, a subsidiary of Novis Renewables, LLC (“Novis”) is proposing to construct and operate the Hanks Crossing Energy Project (“Project”) located approximately 13 miles northeast of the town of Byers in unincorporated Adams County (see Figure 1). The development site consists of approximately 1,959 acres with options to incorporate an additional 679 acres into the Project for added siting flexibility (see Figure 2). The Project sits entirely on privately-owned land adjacent to an existing high-voltage transmission corridor owned by Public Service Company of Colorado. The proposed Project consists of a 355-megawatt (MW) photovoltaic (PV) system and 178 MW battery energy storage system (BESS), along with internal access roads, inverters and transformer equipment, an underground electrical collection system, one collection substation, an operations and maintenance building, and other associated facilities. Novis has completed preliminary environmental diligence for the Project and is working closely with regulatory agencies to identify additional concerns or constraints that may need to be addressed in the preliminary design. The Project will be fully decommissioned at the end of its operational life, which is estimated between 40 and 80 years.

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As part of our initial due diligence efforts, we are reaching out to your agency to solicit feedback to help us identify and address any potential concerns that you might have regarding the Project. Following your review of the included information, if you have any comments or concerns, please contact Paul Gascoigne, Senior Manager, by email (paul.gascoigne@novisrenew.com) or directly by phone (508.505.0890). If preferred, a meeting can be scheduled to discuss the Project with you directly.



February 13, 2024

Thank you in advance for your feedback and we look forward to hearing from you. If possible, please respond with any comments or requests **by Friday, March 1, 2024**, to ensure we have sufficient time to address your concerns.

Thank you,

Paul Gascoigne
Senior Manager, Site Acquisition & Strategy
Novis Renewables
508.505.0890
paul.gascoigne@novisrenew.com

Cc:

Kiersten Stanley, Novis Renewables
David Powell, Novis Renewables
Sara Stribley, Logan Simpson
Jeremy Call, Logan Simpson

Attachments –

Figure 1. Project Location Map

Figure 2. Preliminary Site Layout

Figure 1. Project Location Map

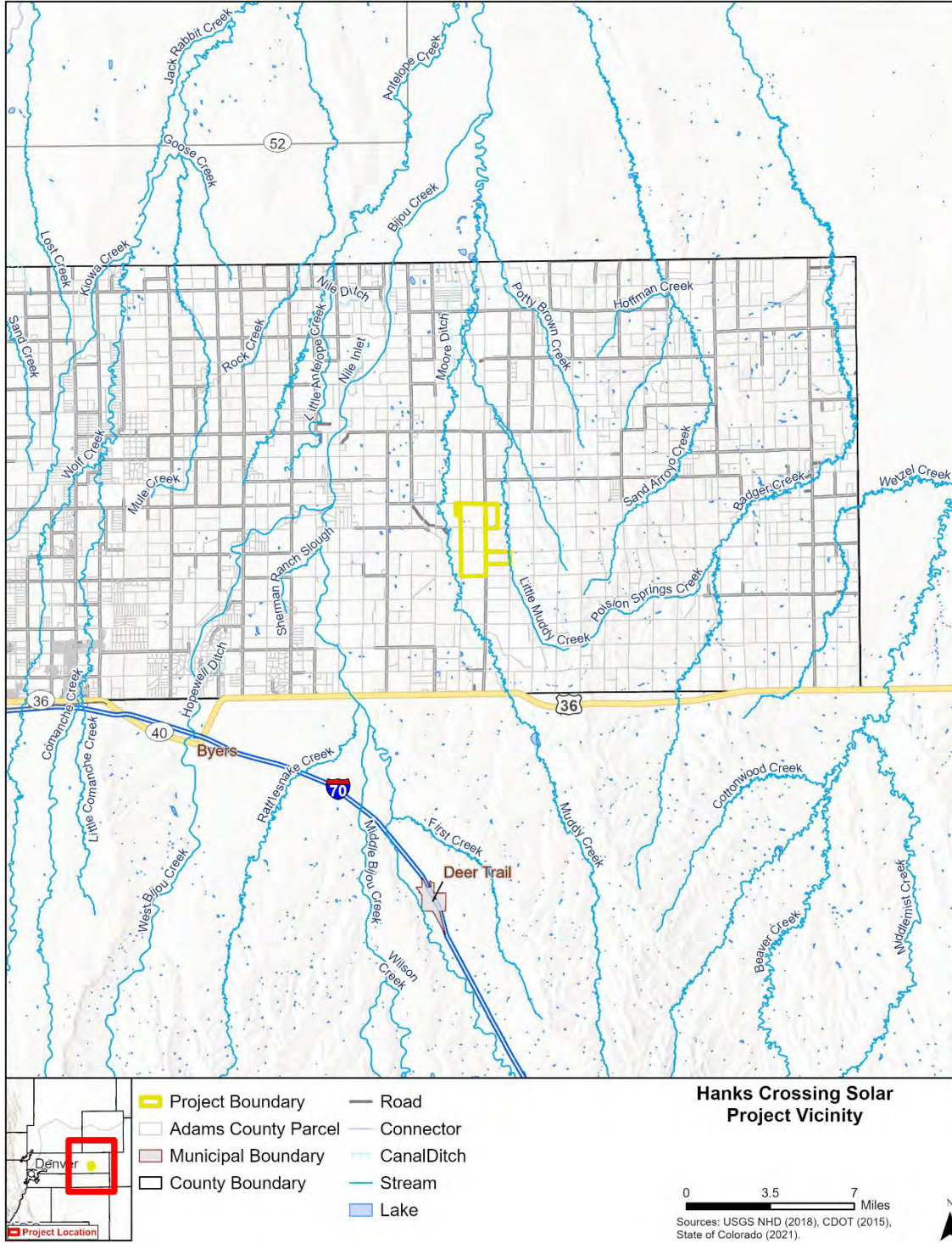
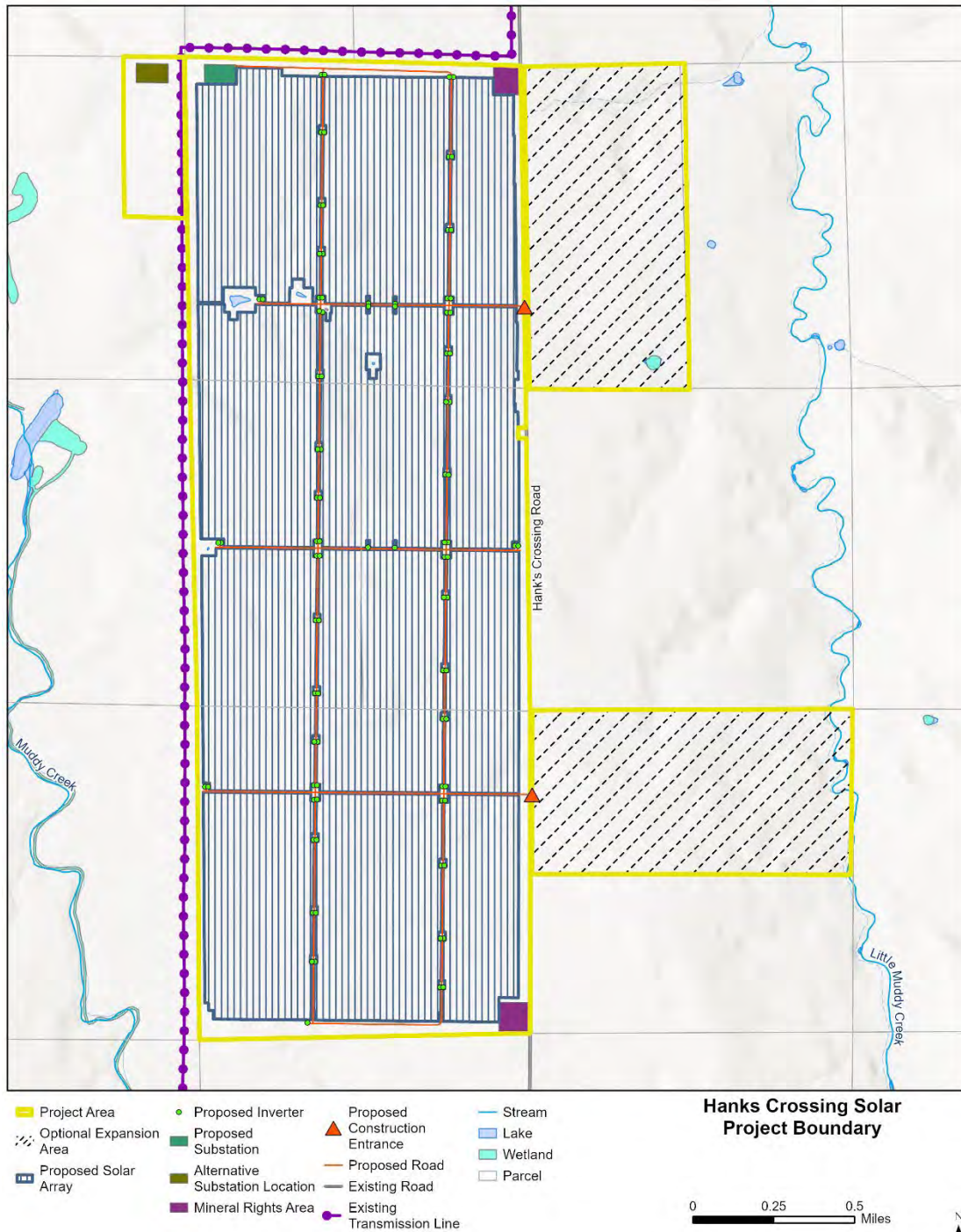


Figure 2. Preliminary Site Layout



Sherman, Amy

From: Sherman, Amy
Sent: Friday, January 12, 2024 1:57 PM
To: ColoradoES@fws.gov
Cc: Paul Gascoigne; David Powell
Subject: USFWS Request for Project Review and Comment - Hanks Crossing Energy Project, Adams County, CO
Attachments: Hanks Crossing Project Boundary _121323.kmz; Hanks Crossing Energy USFWS Coordination Letter_011224.docx

Hello USFWS –

On behalf of Novis Renewables LLC, please see the attached request for USFWS’s project review and comment for the Hanks Crossing Energy Project located in Adams County, Colorado. A KMZ showing the proposed Project boundary is also attached.

Please do not hesitate to contact me with any questions or additional information requests. We appreciate your time, and look forward to your comments.

Thanks much-

Amy Sherman | Biologist/Project Manager, Rockies Team Lead
Mobile (785) 764-0698 | amy.sherman@tetrattech.com
Pronouns: she, her, hers
Tetra Tech | **Complex World, Clear Solutions™** | Science
7222 Commerce Center Drive Ste.150, Colorado Springs, CO 80919 | tetrattech.com

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January 12, 2024

U.S. Fish and Wildlife Service
Colorado Ecological Services Field Office
134 Union Boulevard, Suite 670
Lakewood, CO 80228-1807

Subject: Environmental Review Request for the Proposed Hanks Crossing Energy Project in Adams County, Colorado

Dear USFWS:

Hanks Crossing Energy, LLC, a subsidiary of Novis Renewables, LLC (Novis), is currently planning to develop a solar and battery energy storage facility, Hanks Crossing Energy (Project). The Project would be sited on approximately 2,659 acres of private lands (Project Area) in Adams County currently used for dryland farming and pastureland. The KMZ file submitted with this letter shows the preliminary Project Area. On behalf of Novis, we request that you treat this information as Confidential Business Information.

Tetra Tech conducted a desktop review and field surveys of biological resources within the Project Area. According to the National Land Cover Database, the dominant land cover type within the Project Area is grassland/herbaceous (approximately 53 percent) and cultivated crops (approximately 45.8 percent). Vegetation observed during the field surveys was consistent with that of the National Land Cover Database for the Project. The primary crop observed in the Project Area is wheat (*Triticum* sp.). Grassland/herbaceous land cover is dominated by needle-and-thread grass (*Hesperostipa comata*) with some kochia (*Bassia scoparia*), Russian thistle (*Salsola* sp.), and sand sagebrush (*Artemisia filifolia*). Cattle troughs and excavated cattle ponds are scattered throughout the Project Area.

Initial onsite water resource mapping completed for the Project identified one small emergent wetland, six excavated stock ponds, and a segment of Little Muddy Creek. All these features have been heavily impacted by active and/or historic agricultural production.

Tetra Tech queried the U.S. Fish and Wildlife Service (USFWS) Information for Planning and Consultation (IPaC) online tool and the Colorado Parks and Wildlife (CPW) All Species Activity Mapping (SAM) Data to obtain a list of special status species with the potential to occur within the Project Area. The results of the query identified the following potentially occurring federally-listed species:

- Gray wolf (*Canis lupus*) – Federally Endangered
- Preble's meadow jumping mouse (*Zapus hudsonius preblei*) - Federally Threatened
- Tricolored bat (*Perimyotis subflavus*) - Federal Proposed Endangered
- Piping plover (*Charadrius melodus*) - Federally Threatened
- Whooping crane (*Grus americana*) - Federally Endangered
- Pallid sturgeon (*Scaphirhynchus albus*) - Federally Endangered
- Monarch butterfly (*Danaus plexippus*) – Federal Candidate

- Ute ladies'-tresses (*Spiranthes diluvialis*)- Federally Threatened
- Western prairie fringed orchid (*Plantathera praeclara*)- Federally Threatened

In addition, the CPW SAM database identified bald eagles (*Haliaeetus leucocephalus*) and golden eagles (*Aquila chrysaetos*), both protected by the Bald and Golden Eagle Protection Act (BGEPA), as having the potential to occur within the Project area.

Based on review of available desktop data and the field survey, Tetra Tech determined that, due to the overwhelming agricultural nature of the Project area, lack of natural habitat, and no anticipated downstream depletion impacts to Platte River species, the monarch butterfly was the only federally-listed species found to have a potential to be impacted by the Project. Monarch butterflies were observed during the July 2023 field survey in proximity to milkweed plants (*Asclepias* sp.), which are present throughout the grassland/herbaceous land cover within the Project area. Therefore, the likelihood of the species occurring within the Project area is high.

The nearest known bald eagle nest is located approximately 19 miles west of the Project area along Kiowa Creek, and no bald or golden eagles or potential eagle nests have been observed within 0.5-mile of the Project area. The Project area lacks large, open water bodies, large trees, or cliff faces that would provide suitable nesting habitat for bald or golden eagles; however, due to a nearby small reservoir (Bramkamp Reservoir), as well as the observation of active prairie dog colonies within the Project Area, bald and golden eagles have a moderate likelihood of foraging within the Project Area.

Novis is familiar with the USFWS Nationwide Standard Conservation Measures and CPW Best Management Practices (BMPs) for Solar Development and will consider and incorporate BMPs into project planning efforts. On behalf of Novis, we kindly request your review of this Project and a written response summarizing:

1. Known occurrences of protected species, as well as other species targeted for special conservation efforts, within the Project area and vicinity.
2. Concerns and recommendations regarding impacts to wildlife and their habitats.
3. Any other information you would like us to consider during the early stages of project planning.

Thank you for your assistance with this request. Please let me know if you have any questions.

Sincerely,



Amy Sherman, Senior Biologist
Tetra Tech Project Manager

Cc: Paul Gascoigne, Sr. Mgr., Site Acquisition & Strategy, Novis Renewables, LLC

Attachments: Hanks Crossing Energy Project Boundary KMZ

From: [ColoradoES, FW6](#)
To: [Sherman, Amy](#)
Subject: Re: [EXTERNAL] USFWS Request for Project Review and Comment - Hanks Crossing Energy Project, Adams County, CO
Date: Tuesday, January 30, 2024 8:48:42 AM

You don't often get email from coloradoes@fws.gov. [Learn why this is important](#)

CAUTION: This email originated from an external sender. Verify the source before opening links or attachments.

Hello Amy Sherman,

Thank you for contacting the U.S. Fish and Wildlife Service (Service). The Service has reviewed the Hanks Crossing energy project and has no concerns with this project resulting in impacts to species listed as candidate, proposed, threatened, or endangered.

We appreciate your efforts to ensure the conservation of threatened and endangered species. Thank you for contacting us and please let me know if you have any further questions.

Sincerely,

Emily Berchem

U.S. Fish and Wildlife Service
Colorado Ecological Services Field Office
1 Denver Federal Center, Building 25
Denver, CO 80225

From: Sherman, Amy <Amy.Sherman@tetrattech.com>
Sent: Friday, January 12, 2024 1:56 PM
To: ColoradoES, FW6 <ColoradoES@fws.gov>
Cc: Paul Gascoigne <paul.gascoigne@novisrenew.com>; David Powell <david.powell@novisrenew.com>
Subject: [EXTERNAL] USFWS Request for Project Review and Comment - Hanks Crossing Energy Project, Adams County, CO

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Hello USFWS –

On behalf of Novis Renewables LLC, please see the attached request for USFWS's project review and comment for the Hanks Crossing Energy Project located in Adams County, Colorado. A KMZ showing the proposed Project boundary is also attached.

Please do not hesitate to contact me with any questions or additional information requests. We appreciate your time, and look forward to your comments.

Thanks much-

Amy Sherman | Biologist/Project Manager, Rockies Team Lead

Mobile (785) 764-0698 | amy.sherman@tetrattech.com

Pronouns: she, her, hers

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APPENDIX F WETLAND DELINEATION REPORT

Wetlands and Other Waters of the U.S. Delineation Report

Hanks Crossing Energy
Adams County, Colorado

April 2024



Prepared for



Hanks Crossing Energy, LLC
One Bridge Street, Suite 11
Irvington, NY 10533

Prepared by



390 Union Blvd, Suite 400
Lakewood, CO 80228

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1.0 INTRODUCTION

Hanks Crossing Energy, LLC, a subsidiary of Novis Renewables, LLC (Novis), is proposing to develop Hanks Crossing Energy (Project; formerly known as the Deer Trail Solar Project), a proposed 355-megawatt photovoltaic (PV) and 178-megawatt battery energy storage system (BESS) utility-scale project encompassing approximately 2,659 acres of private land (Project Area) in unincorporated Adams County, Colorado, approximately 13 miles northeast of the town of Byers (Figure 1). At the request of Novis, Tetra Tech, Inc. (Tetra Tech) conducted a wetlands and other waters of the U.S. (WOTUS) delineation to identify and map potential wetlands and/or other WOTUS boundaries within the Project Area in order to support micro-siting of Project features to avoid and minimize potential impacts to WOTUS features.

Tetra Tech has prepared this Wetlands and Other WOTUS Delineation Report to identify potentially jurisdictional wetlands and other WOTUS occurring in the Project Area. This report includes a summary of the methods used to delineate WOTUS, field survey results, and recommendations, along with associated figures, field data forms, and photographs of resources identified during the delineation. This report was prepared to meet the Minimum Standards for Acceptance of Preliminary Wetland Delineations established by the U.S. Army Corps of Engineers (USACE; USACE 2016).

2.0 REGULATORY POLICY

2.1 Federal Regulations

2.1.1 Section 404 of the Clean Water Act

The principal federal laws affecting wetlands and streams are Section 404 of the Clean Water Act (CWA) of 1977 as amended and Section 10 of the Rivers and Harbors Act of 1899. However, all water features in the Project Area would be subject to the CWA rather than the Rivers and Harbors Act because no navigable water features are present in the Project Area. Therefore, this section focuses on Section 404 of the CWA.

Section 404 of the CWA is administered jointly by the U.S. Army Corp of Engineers (USACE) and the U.S. Environmental Protection Agency (EPA) and authorizes USACE to regulate the discharge of dredge/fill materials into WOTUS, including wetlands and streams. According to 33 Code of Federal Regulations (CFR) 328.3(c)(4), the term wetlands is defined as those areas that “are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions” (USACE 1987). Wetlands generally include swamps, marshes, bogs, and similar areas (33 CFR 328.39b); USACE 1987).

Several classes of water bodies are subject to federal jurisdiction under the CWA, including traditional navigable waters (TNWs); non-navigable tributaries of TNWs that are perennial or seasonal relatively permanent waters (RPWs); and wetlands that directly abut RPWs (USACE 2007). In the absence of adjacent wetlands, lateral jurisdiction over nontidal waters extends to the ordinary high-water mark (OHWM). The definition of the OHWM is “that line on the shore established by the fluctuations of water and indicated by physical characteristics such as a clear natural line impressed on the bank, shelving,

changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas” (33 CFR 328.3(e)).

On January 18, 2023, the EPA and the United States Department of the Army published the final rule in the federal register establishing a revised definition of WOTUS (88 FR 3004), effective March 20, 2023. This rule vacated and remanded the previous Navigable Waters Protection Rule (NWPR; USEPA 2021) and the interim pre-2015 regulatory regime that define aquatic resources subject to federal jurisdiction including the guidance issued in the United State Supreme Court decisions in *Rapanos v. United States*, *Carabell v. United States*, and *Solid Waste Agency of Northern Cook County v. United States*.

On May 25, 2023, the United States Supreme Court issued its opinion in *Sackett v. Environmental Protection Agency* (Sackett decision; U.S. Supreme Court 2023) The opinion addresses the definition of WOTUS pursuant to the CWA, indicating that any adjacent wetland that is part of a “waters of the United States” must be “indistinguishable” via “a continuous surface connection to bodies that are ‘waters of the United States’ in their own right, so that there is no clear demarcation between ‘waters’ and wetlands” 547 U. S., at 742. The implications of the Sackett decision were put into official guidance by EPA on August 29, 2023. This guidance is known as the Conforming Rule (USACE 2023). The conforming rule, "Revised Definition of 'Waters of the United States'; Conforming," was published in the Federal Register and became effective on September 8, 2023. As a result of ongoing litigation on the January 2023 Rule, the agencies are implementing the January 2023 Rule, as amended by the Conforming Rule, in 23 states, including Colorado.

If the Project impacts WOTUS, a general permit or Individual Permit (IP) will need to be obtained from the USACE Denver Regulatory Office. General permits (e.g., NWP) are often issued by USACE for categories of activities that are similar in nature and would have only minimal individual or cumulative adverse environmental effects. NWP authorization is intended to be more streamlined than an IP and is issued within 45 days of receipt of a complete Pre-Construction Notification (PCN; required if impacts exceed the NWP disturbance threshold); however, the timelines can shift based on impacts and consultations with agencies.

The USACE has reissued 52 NWP and issued 5 new NWP issued in the January 2021 and December 2021 final rules through March 14, 2026 (86 FR 73522). Of particular note for energy projects, the revised version of NWP 12, which previously was used for “Utility Line Activities,” is being reissued to apply solely to oil and natural gas activities.

If the only project activity requiring USACE authorization is a utility line, then the newly issued NWP 57, Electric Utility and Telecommunications Activities, could be used. Renewable energy facilities may also use NWP 51, Land Based Renewable Energy Facilities, or NWP 14, Linear Transportation Projects, if the activity requiring authorization involves road creation or enhancement. All three NWP have similar disturbance thresholds of no more than 0.5 acre of loss.

A PCN would likely be required if impacts from the Project exceed thresholds identified within the NWP or the general and regional conditions are not met. If an NWP is required, the most appropriate

NWP will be determined by coordination from a wetland specialist and USACE. USACE will determine whether the activity qualifies under one or more NWPs or if an IP is required.

2.1.2 Section 401 of the Clean Water Act

An application for a federal permit (such as a CWA Section 404 permit), including the construction or operation of facilities that may result in any discharge into navigable waters, requires water quality certification (WQC) under Section 401 of the CWA. WQC under Section 401 of the CWA falls under the delegated purview of the Colorado Department of Public Health and Environment (CDPHE). A Joint Application is required for Section 404 and Section 401 permits only if USACE issues IP. If USACE issues an NWP, the state automatically issues a WQC under Section 401 of the CWA.

2.2 State Regulations

2.2.1 Colorado Water Quality Control Act

In accordance with the Water Quality Control Act (WQCA), discharge of any pollutant into any state waters from a point source requires a permit from the CDPHE Water Quality Control Division (WQCD) for such discharge (§ 25-8-501[1], C.R.S). Permits issued under the federal Clean Water Act are recognized under the WQCA.

In lieu of the recent Sackett decision, CDPHE issued an implementation policy in July 2023 for enforcement of unpermitted discharges of dredged and fill material into state waters that is intended to protect state waters impacted by discharges of dredged or fill material that are outside of federal Clean Water Act jurisdiction as a result of the Sackett decision (Sackett gap waters; CDPHE 2023a). Discharges of dredged or fill material that proceed in accordance with the terms of valid 404 permits (including nationwide and general permits that do not require pre-construction notifications) will be recognized as being in compliance with the WQCA. In addition, this policy would not cover unpermitted discharges of dredged or fill material into state waters resulting from activities that have historically been exempted by federal law or for discharges to water features excluded from the pre-2015 definition of WOTUS.

Under this policy (CPDHE 2023a), CDPHE would not take enforcement action for unpermitted discharges of dredged or fill material into state waters if:

- notification is provided to the division;
- the discharges would have been eligible for coverage under a USACE NWP or general permit in effect, and based on the scope of federal jurisdiction, prior to the date of the Sackett decision;
- the division is able to conduct effective oversight of the project; and
- the activities resulting in the discharge of dredged or fill materials are undertaken in accordance with the protective conditions set forth in the policy, including the condition that either:
 - the project will not result in a combined loss of Sackett Gap Waters and WOTUS that exceed 0.1 acres of wetlands or 0.03 acres of streambed; or

- the project would have not required a PCN prior to the date of the Sackett decision.

Notification of unpermitted discharges can be submitted to CDPHE using the online notification form on WQCD’s website (CDPHE 2023b). The applicant is not expected to wait for division review or response prior to the discharge.

3.0 DESKTOP ANALYSIS

A Tetra Tech biologist conducted a desktop analysis of the Project Area to identify potential jurisdictional wetlands and other WOTUS that may be present. The desktop analysis was based on the following sources of information:

- EPA Level IV Ecoregions (Chapman et al. 2016)
- U.S. Geological Survey (USGS) quadrangles and contour lines for recognition of topographic drainage patterns (USGS 2023b)
- National Agriculture Imagery Program aerial photography for the presence of surface water and associated patterns in hydrology and vegetation
- Natural Resources Conservation Service (NRCS) soil surveys for the presence of hydric soils (USDA-NRCS 2023)
- USGS National Hydrography Dataset (NHD) for the mapped distribution and extent of perennial and intermittent water features (USGS 2023a)
- U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) for the previously mapped extent of wetlands (USFWS 2023)
- Federal Emergency Management Agency (FEMA) mapped floodplain data (FEMA 2020)

3.1 Ecoregion

The Project Area lies within the Moderate Relief Plains Level IV Ecoregion (Chapman et al. 2006). This ecoregion consists of smooth to slightly irregular plains having a high percentage of cropland and slopes greater than the surroundings. In contrast to the surrounding cropland dominated ecoregions, the land use in the area is predominantly rangeland. Soils are silty and clayey loams that are shallower than the more upland areas of the surrounding ecoregions. Blue grama (*Bouteloua gracilis*) and buffalograss (*Bouteloua dactyloides*) are grasses typical of prairie in the region (Chapman et al. 2006).

3.2 Land Cover

A query of the National Land Cover Database (USGS 2019) revealed that the land cover in the Project Area is primarily composed of grassland/herbaceous (1,394.4 acres, 52 percent) and cultivated crops (1,233.4 acres, 46.4 percent; Table 1).

Table 1. Land Cover Present within the Project Area

Land Cover Type	Acres	Percent of Project Area
Grassland/Herbaceous	1,394.4	52.4%
Cultivated Crops	1,233.4	46.4%
Developed, Open Space	25.6	1.0%

Land Cover Type	Acres	Percent of Project Area
Pasture/Hay	5.5	0.2%
TOTAL	2,658.9	100%

3.3 Soils

There are 19 soil units mapped in the Project Area (Figure 2; USDA-NRCS 2023). None of these soils were classified as hydric soils. The soils and associated hydric ratings within the Project Area are listed in Table 2.

Table 2. NRCS Soils Identified within the Project Area

Soil Map Unit	Soil Map Unit Symbol	Hydric or Non-Hydric
Adena-Colby association, gently sloping	AcC	Non-Hydric (0%)
Arvada loam, 0 to 3 percent slopes	AdB	Non-Hydric (0%)
Ascalon sandy loam, 0 to 3 percent slopes	AsB	Non-Hydric (0%)
Ascalon sandy loam, 3 to 5 percent slopes	AsC	Non-Hydric (0%)
Ascalon-Vona sandy loams, 1 to 5 percent slopes	AvC	Non-Hydric (0%)
Colby loam, 6 to 15 percent slopes	CgE	Non-Hydric (0%)
Loamy alluvial land	Lu	Predominantly Non-Hydric (5%)
Nunn clay loam, 1 to 3 percent slopes	NuB	Non-Hydric (0%)
Nunn loam, 1 to 3 percent slopes	NIB	Non-Hydric (0%)
Renohill loam, 3 to 9 percent slopes	ReD	Non-Hydric (0%)
Stoneham loam, 3 to 5 percent slopes	StD	Non-Hydric (0%)
Terry fine sandy loam, 3 to 9 percent slopes	TeD	Non-Hydric (0%)
Terry-Tassel-Ulm complex, 3 to 20 percent slopes	TrE	Non-Hydric (0%)
Terry-Vona-Tassel complex, 3 to 20 percent slopes	TsE	Non-Hydric (0%)
Valent loamy sand, 3 to 9 percent slopes	VaD	Non-Hydric (0%)
Vona loamy sand, 3 to 9 percent slopes	VnD	Non-Hydric (0%)
Vona-Ascalon loamy sands, 3 to 9 percent slopes	VsD	Non-Hydric (0%)
Water	WmB	Predominantly Non-Hydric (10%)
Weld loam, 1 to 3 percent slopes	WmB	Non-Hydric (0%)

Source: USDA-NRCS 2023

3.4 Water Resources

There are no major streams or TNWs found in the Project Area. The western portion of the Project Area drains via unnamed drainages west into Muddy Creek, a stream with perennial flow. The eastern portion of the Project Area drains via unnamed drainages east into Little Muddy Creek, which also flows through the southeastern portion of the Project Area. Little Muddy Creek drains north into Muddy Creek. Muddy Creek then drains north to Bijou Creek, which drains to the South Platte River.

Land within the Project Area appears to have been subjected to historic modification of landform and hydrology. Most of the modification was conducted to facilitate agricultural production by alteration and/or realignment of the drainage contours and stormwater discharge.

3.4.1 National Wetlands Inventory

The NWI dataset identifies wetlands and waterbodies using high altitude imagery in conjunction with other data sources and field surveys (USFWS 2023). The data are remotely sensed and are often inconsistent when field verified. Therefore, NWI is only used as a guide for the location of likely wetlands and other waters.

1.28 acres of freshwater emergent wetlands and 0.33 acre of riverine wetlands were identified within the Project Area (Table 3; Figure 3). These wetland features are associated with stock ponds and Little Muddy Creek, respectively.

Table 3. NWI-Mapped Wetlands in the Project Area

NWI Wetland Type	Cowardin Type	Acres
Freshwater Emergent Wetland	PEM1A	0.99
Freshwater Emergent Wetland	PEM1F	0.29
Riverine	R5UBH	0.33
TOTAL		1.61

Source: USFWS 2023

3.4.2 National Hydrography Dataset

The NHD dataset identifies surface water and surface water flow locations as mapped at a 1:24,000 scale (USGS 2023a). Like NWI data, the NHD data are often inconsistent when field verified and therefore are used only as a guide for the location of streams, waterbodies, and other WOTUS.

Review of the NHD dataset identified 1.2 acres of intermittent lakes/ponds within the Project Area, associated with stock ponds and excavated impoundments located long drainages within the Project Area (Table 4; Figure 3). In addition, 5.1 miles of unnamed intermittent tributary drainages were identified within the Project Area, as well as 0.5 mile of the intermittent Little Muddy Creek (Table 4; Figure 3).

Table 4. NHD-Mapped Waters in the Project Area

NHD Waters Name	Feature Type	Acres / Linear Feet
Unnamed	Intermittent Lake/Pond	1.5 acres
Unnamed	Intermittent Stream/River	5.1 miles
Little Muddy Creek	Intermittent Stream/River	0.5 mile

Source: USGS 2023a

3.5 Floodplains

FEMA Flood Insurance Rate Map (FIRM) data were reviewed to determine whether 100-year (1 percent Annual Chance Flood Hazard) or 500-year (0.2 percent Annual Chance Flood Hazard) floodplains are present in the Project Area (FEMA 2020). A review of FEMA-mapped floodplains determined there is one Zone A (100-year) floodplain associated with Muddy Creek that intersects the very southwestern corner of the Project Area (Figure 3).

4.0 DELINEATION METHODOLOGY

Tetra Tech conducted a formal delineation of the Project Area July 18-19, October 19, November 30, and December 19, 2023, to identify potential wetlands and other WOTUS present within the Project Area. Wetland delineations followed the methods described in the USACE Wetland Delineation Manual (USACE 1987) and the Regional Supplement to the USACE Wetland Delineation Manual: Great Plains Region (Version 2.0) (USACE 2010). The delineation method was used to document dominant vegetation, soils, and hydrology in areas of interest (i.e., areas with potential intersections between the Project Area and potential wetland ecosystems). For a site to be considered a wetland, there must be a dominance of hydrophytic vegetation, hydric soils, and characteristic wetland hydrology. In normal conditions, if a sample plot lacks any one of these three criteria, it is considered upland. To determine these three variables, the qualified wetland scientist designated paired sample plots placed at discrete (typically less than 25 feet) distances from one another—one to represent wetland conditions and the other to represent uplands. Each sample plot featured a hand-dug soil pit averaging 20 inches in depth.

4.1 Wetland Delineation

4.1.1 Hydrophytic Vegetation

The dominant vegetation at each sample plot was keyed to species level and assigned each species a wetland indicator status using the National Wetland Plant List (USACE 2020). Hydrophytic vegetation, or plants that are indicators of wetlands, include those species designated obligate (OBL), facultative wetland (FACW), or facultative (FAC). As a general rule, hydrophytes dominate a sample plot when greater than 50 percent of the evaluated species are OBL, FACW, or FAC. Upland plants include those listed with facultative upland (FACU) or upland (UPL) status. Table 5 provides descriptions of these indicators.

Table 5. Wetland Indicator Status

Indicator Status	Occurrence in Wetlands
Obligate (OBL)	Almost always occur in wetlands under natural conditions (estimated probability >99%).
Facultative Wetland (FACW)	Usually occur in wetlands (estimated probability 67%–99%), but occasionally found in non-wetlands (estimated probability 1%–33%).
Facultative (FAC)	Equally likely to occur in wetlands or non-wetlands (estimated probability 34%–66%).
Facultative Upland (FACU)	Usually occur in non-wetlands (estimated probability 67%–99%), but occasionally found in wetlands (estimated probability 1%–33%).
Upland (UPL)	Usually occur in non-wetlands but occasionally found in wetlands. (estimated probability 1%–33%).

Source: USACE 2010

Based on the type of vegetation present, potential wetlands were subsequently classified in accordance with the Classification of Wetlands and Deepwater Habitats of the United States (Cowardin et al. 1979). Wetlands were identified as palustrine (non-tidal) emergent wetlands (PEM) or palustrine scrub/shrub wetlands (PSS). Emergent wetlands consist of rooted herbaceous and graminoid (i.e., grass like) wetland plants that stand erect above the water or ground surface. Scrub/shrub wetlands consist of wetlands dominated by woody vegetation less than 20 feet tall with 20 percent or greater scrub/shrub cover.

4.1.2 Hydric Soils

Soil from each soil pit was evaluated for hue, value, and chroma in each observable horizon using Munsell Soil Color Charts (Munsell Soil Color 2009). Each soil horizon was also checked for texture and for the presence of redoximorphic features, depleted matrix, saturation, and other specific criteria used to document hydric conditions.

4.1.3 Hydrology

Hydrology was analyzed for primary and secondary wetland indicators, including saturation, algal mat, geomorphic position, oxidized root channels associated with living roots, water-stained leaves, and soil cracks. Once dug, the soil pits were left open for a length of time sufficient to allow the apparent high-water table, if present, to stabilize.

4.2 Other WOTUS Delineation

Potentially jurisdictional non-wetland WOTUS include streams, lakes, and ponds. Potentially jurisdictional streams were identified in the field by the presence of a continuous channel that exhibited evidence of frequent or reoccurring water flow such as a defined bed, bank, and an OHWM (USACE 2007 and USACE 2022). Potentially jurisdictional open waterbodies (e.g., ponds and lakes) were identified in the field by the presence of an OHWM and the relatively permanent presence of standing water (USACE 2007).

4.3 Data Collection

Once vegetation, soils, and hydrology had been assessed, a delineation was conducted to identify the zone of transition between the WOTUS feature and upland conditions. The wetland scientist accomplished the delineation by walking the outer limit of the visibly identifiable WOTUS feature with a handheld GPS unit. The limit of the WOTUS feature was defined in the field by a change in vegetation and hydrologic indicators (i.e., OHWM, surface water, and soil texture). For each wetland and stream identified and delineated, a dataform (Appendix A) and associated photos (Appendix B) were captured.

5.0 DELINEATION RESULTS

Tetra Tech conducted field surveys of the Project Area July 18-19, October 19, November 30, and December 19, 2023. Wetlands and other WOTUS identified during the delineation are depicted in Figure 4. As outlined in Table 6, one wetland feature, six waterbodies (ponds), and one stream (Little Muddy Creek) were identified within the Project Area.

Table 6. Wetlands and Other WOTUS Delineated Within the Project Area

Feature Name	Cowardin Type ¹ /NHD Feature	Description	Area (acres/linear feet)
Wetlands			
W-01	Palustrine Emergent	Herbaceous wetland associated with vegetated swale	0.02 acre
Ponds			
Pond 01	Excavated Impoundment	Stock pond	0.36 acre
Pond 02	Excavated Impoundment	Stock pond	0.04 acre

Feature Name	Cowardin Type ¹ /NHD Feature	Description	Area (acres/linear feet)
Pond 03	Excavated Impoundment	Stock pond	0.01 acre
Pond 04	Excavated Impoundment	Stock pond	0.01 acre
Pond 05	Excavated Impoundment	Stock pond	0.20 acre
Pond 06	Excavated Impoundment	Stock pond	0.94 acre
Streams			
S-01	Intermittent Stream	Little Muddy Creek	2895.7 linear feet

Source: Cowardin et al. 1979

5.1 Wetlands

Tetra Tech delineated one wetland feature, W-01, identified as a palustrine emergent wetland totaling 0.02 acres within the Project Area (Table 6, Figure 4). A wetland determination data form for wetland W-01 is provided in Appendix A, and representative photographs are found in Appendix B. Wetland W-01 is associated with a vegetated swale associated with three ponds (Pond 01, Pond 02, and Pond 03). The wetland feature is fed from ephemeral flows draining northwest between Pond 03 and Pond 02. Wetland W-01 was likely formed from high rainfall during the past year. Given its isolation from a regular permanent water source (intermittent or perennial water source), wetland W-01 would likely be considered a non-jurisdictional wetland by USACE, and therefore not be subject to Section 404 of the CWA.

5.2 Other WOTUS

Tetra Tech delineated six ponds (Pond 01, Pond 02, Pond 03, Pond 04, Pond 05, and Pond 06), all identified as stock ponds, totaling 1.56 acres within the Project Area (Table 6, Figure 4). Representative photographs of these ponds are found in Appendix B. All six are associated with vegetated swales with no OHWM that either drain west to Muddy Creek or drain east to Little Muddy Creek. None of the six ponds had constructed outlets for downstream flow, but rather, featured indistinct spillways or overflow channels. Given the ponds' isolation from a regular permanent water source (intermittent or perennial water source), all six would likely be considered non-jurisdictional by USACE, and therefore would not be subject to Section 404 of the CWA.

In addition, Tetra Tech delineated three segments totaling approximately 2,895.7 linear feet of Little Muddy Creek (S-01), an intermittent stream which flows through the southeastern portion of the Project Area. Area (Table 6, Figure 4). Stream delineation forms for these S-01 segments are provided in Appendix A, and representative photographs are found in Appendix B. Within the Project Area, Little Muddy Creek is an intermittent stream draining north with an OHWM varying from 3 to 8 feet wide and no associated fringe wetland. Although Little Muddy Creek has been heavily modified along its course due to historic farming activities within the area, it likely maintains a surface water connection downstream to Muddy Creek, which drains north to Bijou Creek, which drains to the South Platte River. Therefore, S-01 could be considered a jurisdictional WOTUS by USACE, and therefore be subject to Section 404 of the CWA.

6.0 CONCLUSIONS AND RECOMMENDATIONS

One wetland (W-01) was identified within the Project Area that is likely to be considered non-jurisdictional by USACE due to its lack of connection to a regular permanent water source (intermittent or perennial flows). Six ponds (Pond 01, Pond 02, Pond 03, Pond 04, Pond 05, and Pond 06) identified within the Project Area showed signs of being excavated in uplands and isolated in nature, with no consistent downstream connection (no OHWM) to a potential WOTUS; they are therefore likely to be considered non-jurisdictional by USACE. Although S-01, the intermittent stream delineated within the Project Area (Little Muddy Creek) has been heavily modified along its course due to historic farming activities within the area, it likely maintains a surface water connection downstream to Muddy Creek, which drains north to Bijou Creek, which drains to the South Platte River. Therefore, S-01 could be considered a jurisdictional WOTUS by USACE, and therefore be subject to Section 404 of the CWA.

There are no other major streams or TNWs found in the Project Area. The majority of the Project Area drains via vegetated swales (Appendix B) west into Muddy Creek and east into Little Muddy Creek, streams with perennial and intermittent flow, respectively. Land within the Project Area appears to have been subjected to historic modification of landform and hydrology. Most of the modification was conducted to facilitate agricultural production by alteration and/or realignment of the drainage contours and stormwater discharge.

Assuming impacts to Little Muddy Creek can be avoided during construction and operation of the Project, it appears that the Project should be able to avoid impacts to jurisdictional wetland and other WOTUS resources from development of the Project.

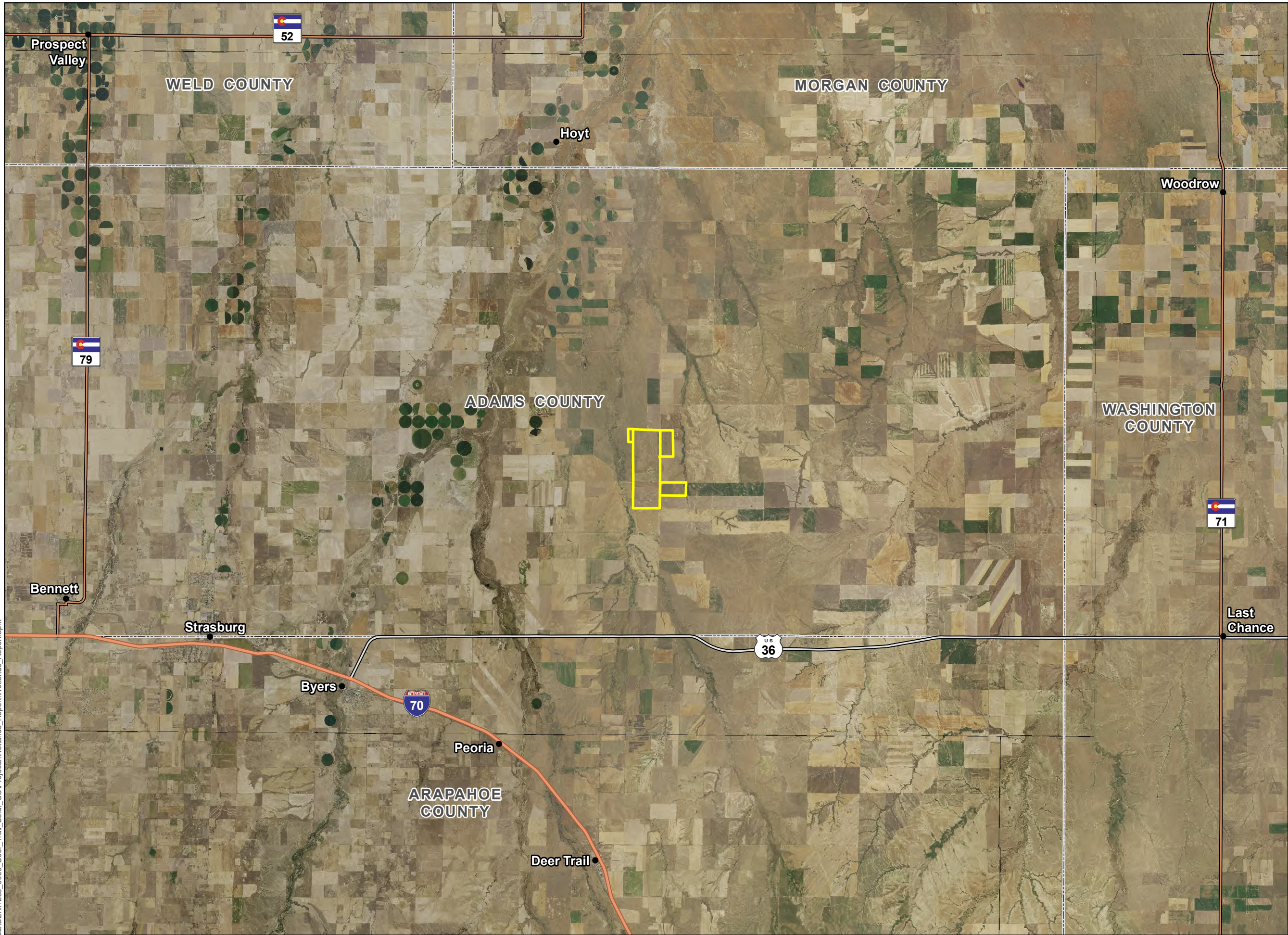
All discharges of dredged or fill material that result in permanent or temporary losses of jurisdictional WOTUS are regulated by USACE under Section 404 of the CWA. The jurisdictional status of the features delineated are the preliminary opinions of the wetland scientist based on professional judgement; only USACE can make jurisdictional determinations for potential wetlands and other WOTUS. For this reason, Tetra Tech recommends avoiding impacts to all features to avoid coordination with USACE to determine jurisdiction. Impacts to features resulting in less than a loss of 0.1 acre of WOTUS (including wetlands) would likely be covered under a non-notifying NWP so long as all general and regional conditions are met. Impacts to WOTUS greater than 0.1 acre but less than 0.5 acre would require that a PCN be submitted to USACE.

7.0 REFERENCES

- Chapman, S.S., G.E. Griffith, J.M. Omernik, A.B. Price, J. Freeouf, and D.L. Schrupp, 2006. Ecoregions of Colorado (color poster with map, descriptive text, summary tables, and photographs): Reston, Virginia, U.S. Geological Survey (map scale 1:1,200,000). Available online at: https://store.usgs.gov/assets/MOD/StoreFiles/Ecoregion/205792_co_front.pdf. Accessed August 2023.
- CDPHE (Colorado Department of Public Health and Environment). 2023a. CDPHE Water Quality Control Division Implementation Policy CW-17. Unpermitted Discharges of Dredged and Fill Material into State Waters. July 6, 2023. Available online at: <https://drive.google.com/file/d/1EyAEk-ABtIIC4mV66CR5KwUrkDybQOrH/view>. Accessed August 2023.
- CDPHE. 2023b. Discharges of Dredged and Fill Material into State Waters. Available online at: <https://cdphe.colorado.gov/dredge-and-fill>. Accessed August 2023.
- Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe, 1979. Classification of Wetlands and Deepwater Habitats of the United States. U.S. Government Printing Office. Washington, D.C. GPO024-010-00524-6.
- FEMA (Federal Emergency Management Agency). 2020. National Flood Hazard Layer, Washington State. Federal Emergency Management Agency. Available online at: <https://msc.fema.gov>. Accessed December 2023.
- Munsell Soil Color. 2009. Munsell® Soil Color Charts. Grand Rapids, Michigan.
- USACE (U.S. Army Corps of Engineers). 1987. Corps of Engineers Wetland Delineation Manual. Wetlands Research Program Technical Report Y-87-1. Pp.143.
- USACE. 2007. RGL 07-01 Practices for Documenting Jurisdiction under Section 9 & 10 of the Rivers & Harbors Act (RHA) of 1899 and Section 404 of the Clean Water Act (CWA).
- USACE. 2010. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Great Plains Region (Version 2.0), ed. J.S. Wakeley, R.W. Lichvar, and C.V. Noble. ERDC/EL TR-10-3. Vicksburg, MS: U.S. Army Engineer Research and Development Center.
- USACE. 2016. Minimum Standards for Acceptance of Aquatic Resources Delineation Reports. January 2016. Available online at: https://www.spk.usace.army.mil/Portals/12/documents/regulatory/jd/minimum-standards/Minimum_Standards_for_Delineation_with_Template-final.pdf. Accessed July 2023.
- USACE. 2020. National Wetland Plant List. Available online at: https://cwbi-app.sec.usace.army.mil/nwpl_static/v34/home/home.html. Accessed July 2023.
- USACE. 2022. National Ordinary High Water Mark Field Delineation Manual for Rivers and Streams (Interim Version), ed. Gabriella C. L. David, Ken M. Fritz, Tracie-Lynn Nadeau, Brian J. Topping, Aaron O. Allen, Patrick H. Trier, Steven L. Kichefski, L. Allan James, Ellen Wohl, and Daniel

- Hamill. ERDC/CRRELL TR-22-26. Vicksburg, MS: U.S. Army Engineer Research and Development Center.
- USACE. 2023. 27 June 2023 - UPDATE Supreme Court Ruling in Sackett v. Environmental Protection Agency. Available online at: <https://www.usace.army.mil/Media/Announcements/Article/3440421/27-june-2023-update-supreme-court-ruling-in-sackett-v-environmental-protection/>. Accessed August 2023.
- USDA-NRCS (U.S. Department of Agriculture-Natural Resources Conservation Service). 2023. Web Soil Survey. Available online at: <https://websoilsurvey.nrcs.usda.gov/app/>. Accessed December 2023.
- USEPA. 2021. Overview of the Navigable Waters Protection Rule. Available online at: https://www.epa.gov/sites/production/files/2020-01/documents/nwpr_fact_sheet_-_overview.pdf. Accessed August 2023.
- USFWS (U.S. Fish and Wildlife Service). 2023. National Wetlands Inventory. Available online at: <https://www.fws.gov/program/national-wetlands-inventory/wetlands-mapper>. Accessed December 2023.
- USGS (U.S. Geological Survey). 2019. Land Cover Database. Multi-Resolution Land Characteristics Consortium. Available online at: <https://www.mrlc.gov/viewer/>. Accessed July 2023.
- USGS. 2023a. National Hydrography Dataset. Available online at: <http://nhd.usgs.gov/data.html>. Accessed December 2023.
- USGS. 2023b. National Map Downloader. Available online at: <https://apps.nationalmap.gov/downloader/#/>. Accessed August 2023.
- U.S. Supreme Court. 2023. Supreme Court Of The United States Syllabus, Sackett Et Ux. V. Environmental Protection Agency et al. May 25, 2023. Available online at: https://www.supremecourt.gov/opinions/22pdf/21-454_4g15.pdf. Accessed August 2023.

FIGURES



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**Figure 1
Project Location**

Adams County, CO

Project Features

Project Area

Transportation

Interstate Highway

US Highway

State Highway

Boundaries

County Boundary



Updated: 12/15/2023

NOT FOR CONSTRUCTION

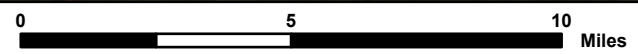
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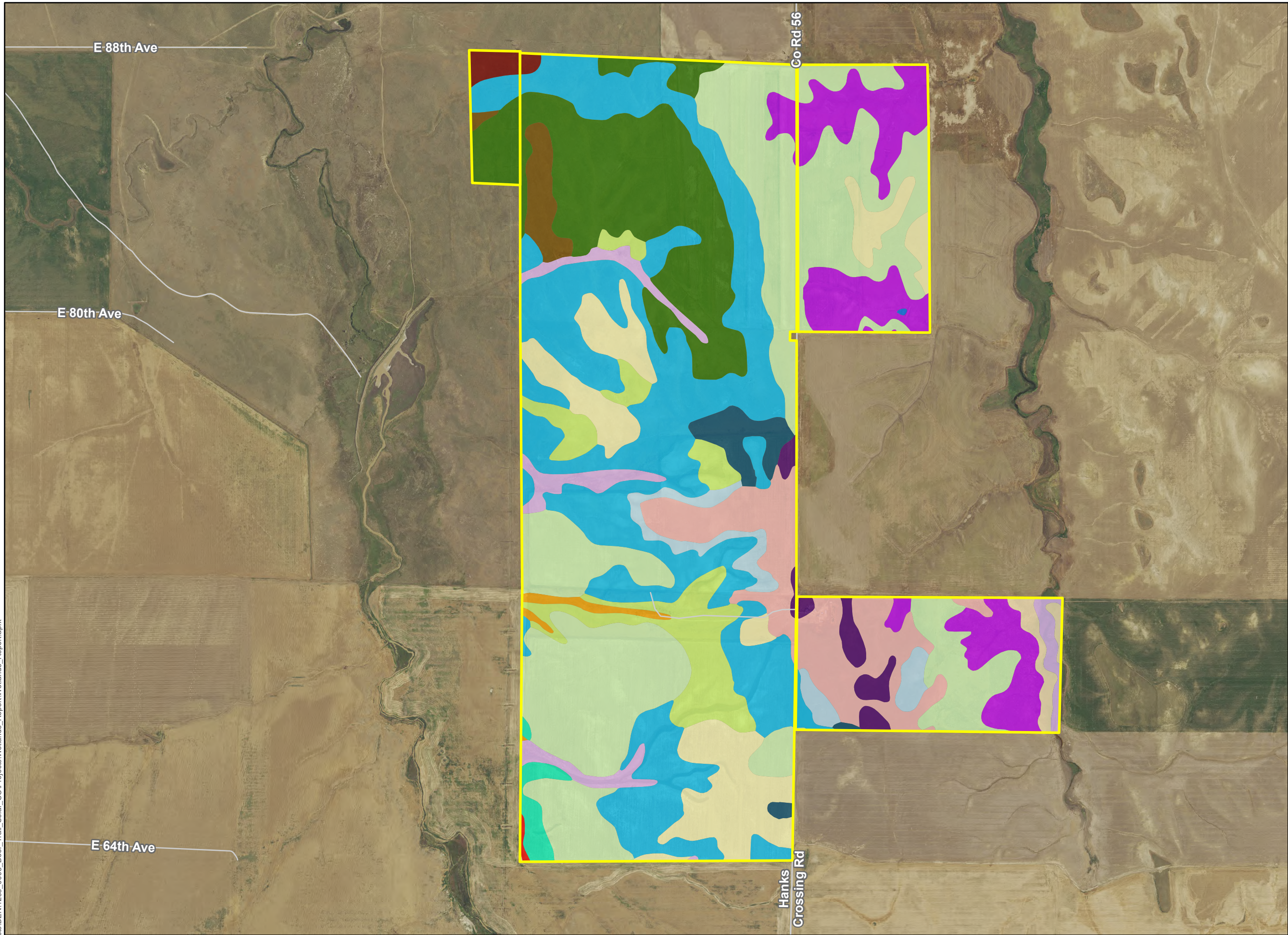
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1:225,000 NAD 1983 StatePlane Colorado North FIPS 0501 Feet



Source: ESRI, USDA NAIP, US CENSUS, BTS



Hanks Crossing Energy, LLC

Figure 2 NRCS Soil Types

Adams County, CO

- Project Features**
- Project Area
- Transportation**
- Local Road
- NRCS Soil Type**
- Adena-Colby association, gently sloping
 - Arvada loam, 0-3% slopes
 - Ascalon sandy loam, 0 -5% slopes
 - Ascalon-Vona sandy loams, 1-5% slopes
 - Colby loam, 6-15% slopes
 - Loamy alluvial land
 - Nunn clay loam, 1-3% slopes
 - Nunn loam, 1-3% slopes
 - Renohill loam, 3-9% slopes
 - Stoneham loam, 3-5% slopes
 - Terry fine sandy loam, 3-9% slopes
 - Terry-Tassel-Ulm complex, 3-20% slopes
 - Terry-Vona-Tassel complex, 3-20% slopes
 - Valent loamy sand, 3-9% slopes
 - Vona loamy sand, 3-9% slopes
 - Vona-Ascalon loamy sands, 3-9% slopes
 - Water
 - Weld loam, 1-3% slopes



Updated: 12/15/2023

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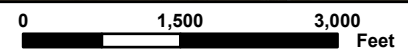
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Source: ESRI, USDA NAIP, US CENSUS, BTS, USDA NRCS

Hanks Crossing Energy, LLC

Figure 3 NWI Wetlands, NHD Waters, and FEMA Floodplains

Adams County, CO

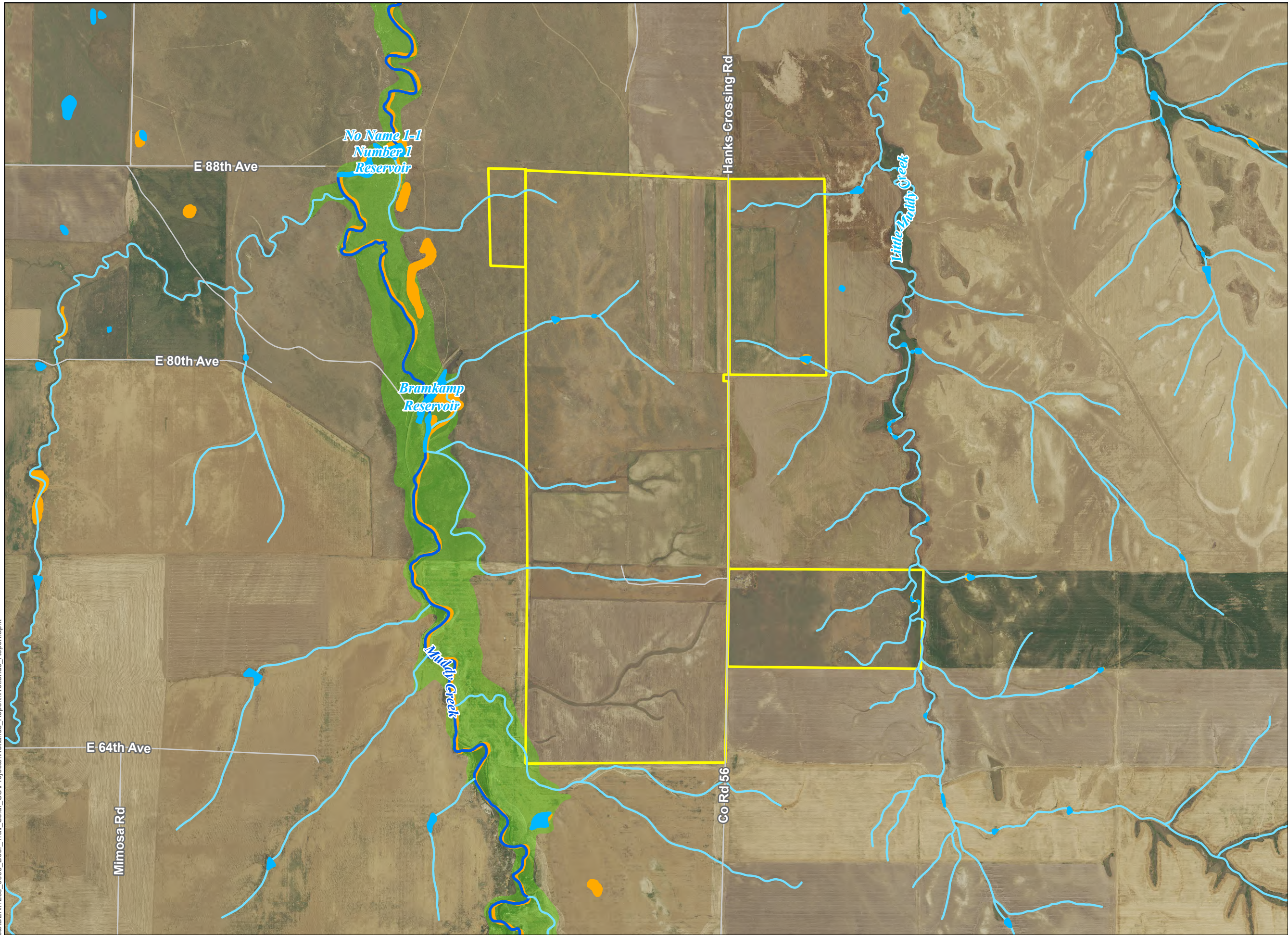
- Project Features**
- Project Area
- Transportation**
- Local Road
- Floodplains, Wetlands, and WOTUS**
- Intermittent Stream/River
 - Perennial Stream/River
 - Lake/Pond
 - NWI Wetland
 - 100-year Floodplain



Updated: 12/15/2023

NOT FOR CONSTRUCTION

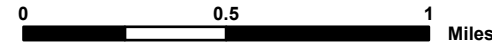
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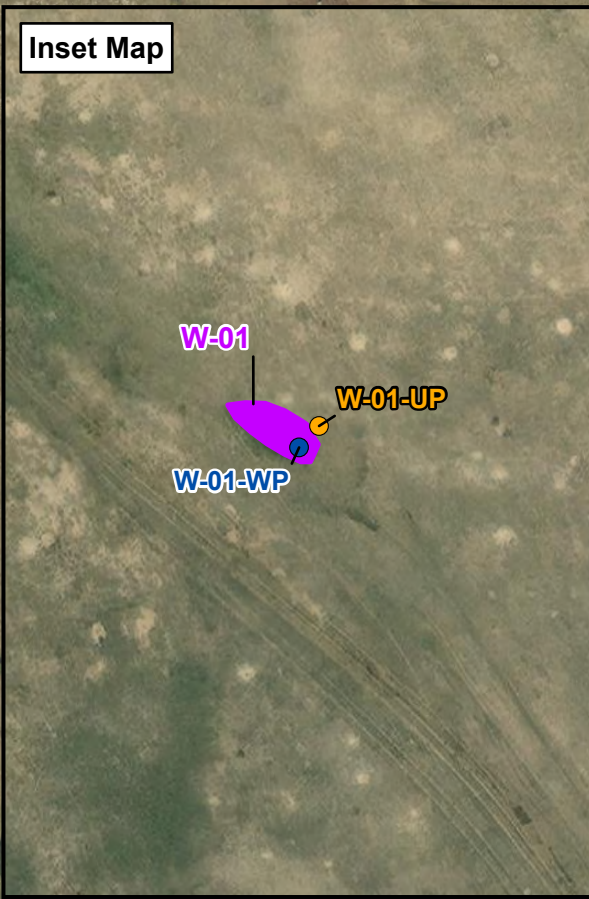


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Source: ESRI, USDA NAIP, US CENSUS, BTS, NHD, NWI, FEMA

Inset Map



Hanks Crossing Energy, LLC

Figure 4 Wetland Delineation Results Map 1 of 5

Adams County, CO

Project Features

Project Area

Transportation

Local Road

Wetlands Delineation Results*

Upland Sample Pit

Wetland Sample Pit

Wetland

Pond

Pond 01

Pond 02

See Inset Map

Pond 03

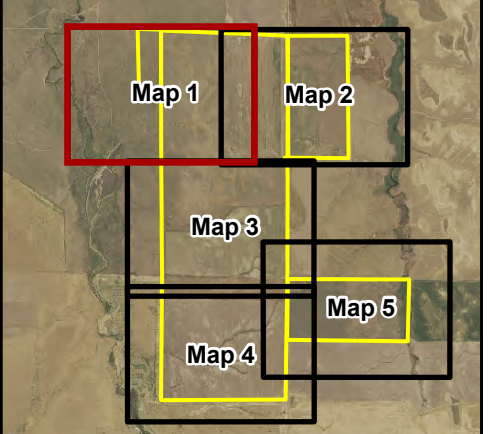
*No wetland or open waters found on Map 4



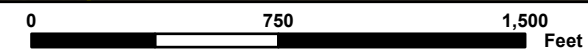
Updated: 1/8/2024

NOT FOR CONSTRUCTION

Reference Map



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Source: ESRI, USDA NAIP, US CENSUS, BTS, TETRA TECH

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Figure 4 Wetland Delineation Results Map 2 of 5

Adams County, CO

Project Features

 Project Area

Transportation

 Local Road

Wetlands Delineation Results*

 Pond

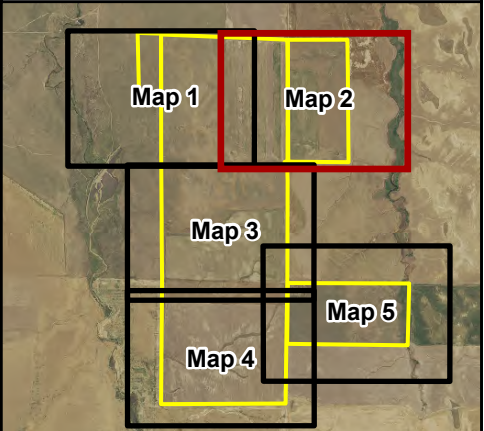
*No wetland or open waters found on Map 4



Updated: 1/8/2024

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Reference Map

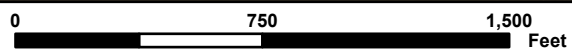


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NAD 1983 StatePlane Colorado North FIPS 0501 Feet



Source: ESRI, USDA NAIP, US CENSUS, BTS, TETRA TECH

Hanks Crossing Energy, LLC


Figure 4 Wetland Delineation Results Map 3 of 5

Adams County, CO

Project Features

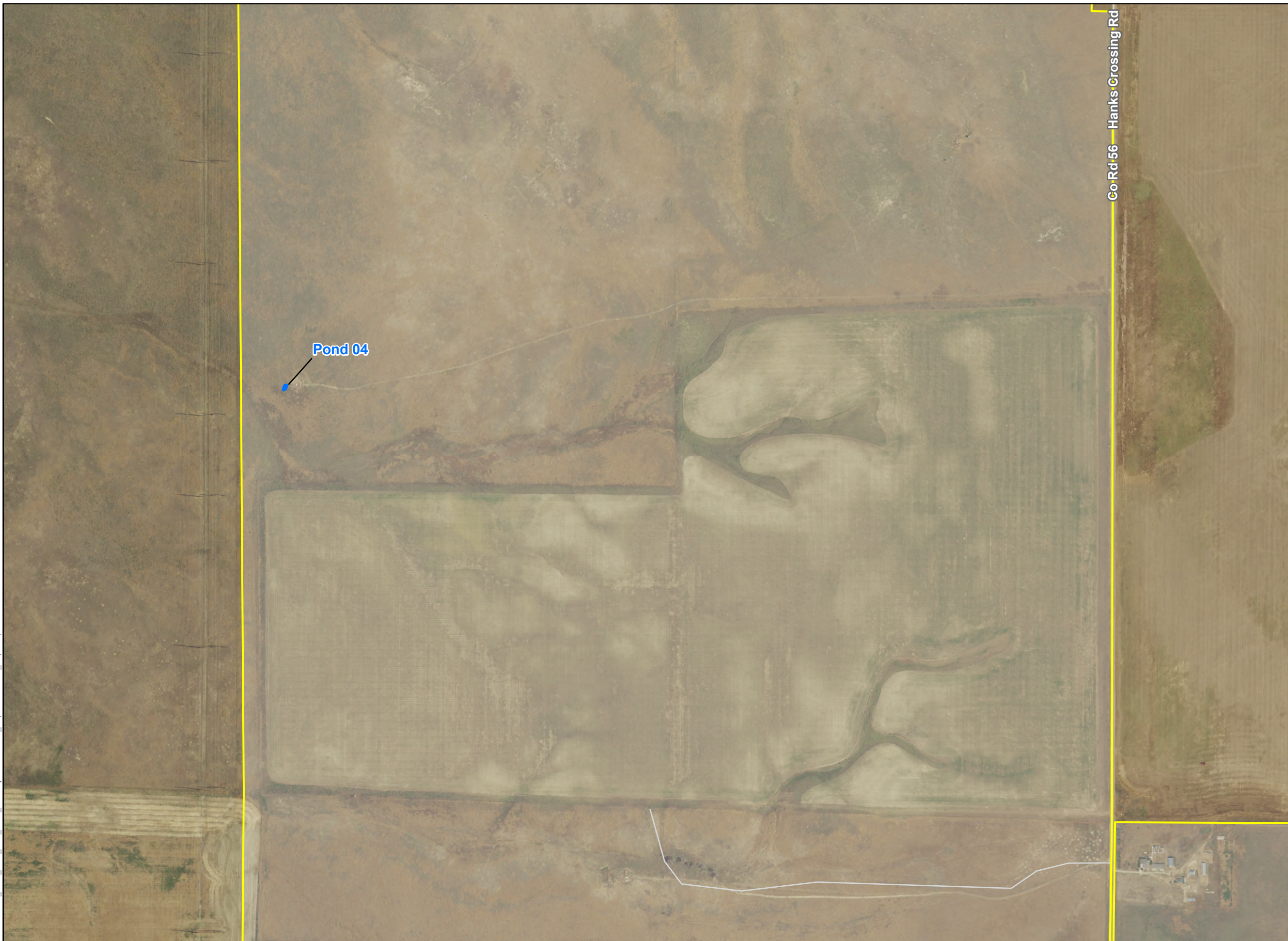
 Project Area

Transportation

 Local Road

Wetlands Delineation Results*

 Pond



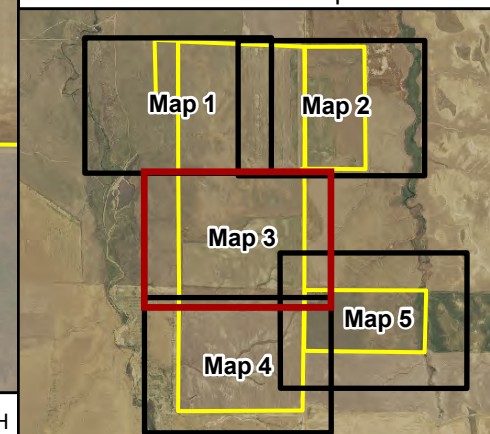
*No wetland or open waters found on Map 4



Updated: 1/8/2024

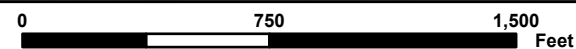
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NAD 1983 StatePlane Colorado North FIPS 0501 Feet



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**Hanks Crossing
Energy, LLC**


**Figure 4
Wetland Delineation
Results
Map 4 of 5**

Adams County, CO

Project Features

 Project Area

Transportation

 Local Road

Wetlands Delineation Results*

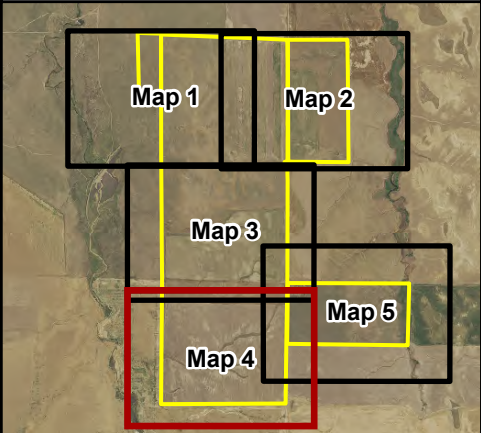
*No wetland or open waters found on Map 4



Updated: 1/8/2024

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Reference Map

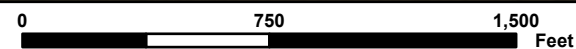


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Source: ESRI, USDA NAIP, US CENSUS, BTS, TETRA TECH

Hanks Crossing Energy, LLC


Figure 4 Wetland Delineation Results Map 5 of 5

Adams County, CO

Project Features

 Project Area

Transportation

 Local Road

Wetlands Delineation Results*

 Stream

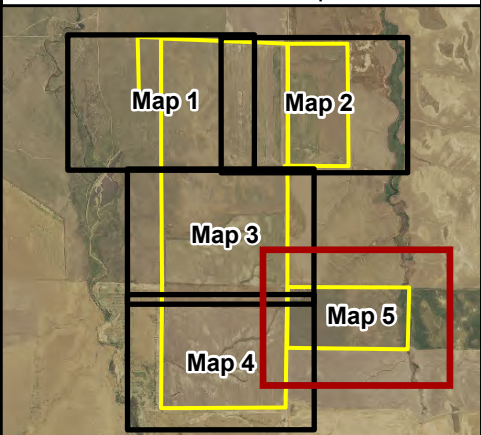
*No wetland or open waters found on Map 4



Updated: 1/8/2024

NOT FOR CONSTRUCTION

Reference Map



Co Rd 56

Hanks Crossing Rd

S-01

S-01a

S-01b



1:7,000

NAD 1983 StatePlane Colorado North FIPS 0501 Feet

0 750 1,500 Feet

Source: ESRI, USDA NAIP, US CENSUS, BTS, TETRA TECH

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APPENDIX A: WETLAND AND STREAM DETERMINATION DATA FORMS

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Deer Trail City/County: Adams County Sampling Date: 7/18/23
 Applicant/Owner: Novis Renewables State: _____ Sampling Point: W-01-W
 Investigator(s): LH, CC Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Drainage Local relief (concave, convex, none): concave Slope (%): 3
 Subregion (LRR): _____ Lat: _____ Long: _____ Datum: _____
 Soil Map Unit Name: _____ NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes _____ No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____
Remarks: Flood year with high flows throughout the region.	

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: <u>30ft.</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:																
1. _____	_____	_____	_____	Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): <u>1</u> (A) Total Number of Dominant Species Across All Strata: <u>1</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)																
2. _____	_____	_____	_____																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
0 = Total Cover				Prevalence Index worksheet: <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;">Total % Cover of:</td> <td style="width: 50%;">Multiply by:</td> </tr> <tr> <td>OBL species <u>1</u></td> <td>x 1 = <u>1</u></td> </tr> <tr> <td>FACW species <u>N/A</u></td> <td>x 2 = _____</td> </tr> <tr> <td>FAC species <u>N/A</u></td> <td>x 3 = _____</td> </tr> <tr> <td>FACU species <u>N/A</u></td> <td>x 4 = _____</td> </tr> <tr> <td>UPL species <u>N/A</u></td> <td>x 5 = _____</td> </tr> <tr> <td>Column Totals: <u>1</u> (A)</td> <td><u>1</u> (B)</td> </tr> <tr> <td colspan="2" style="text-align: center;">Prevalence Index = B/A = <u>1/1</u></td> </tr> </table>	Total % Cover of:	Multiply by:	OBL species <u>1</u>	x 1 = <u>1</u>	FACW species <u>N/A</u>	x 2 = _____	FAC species <u>N/A</u>	x 3 = _____	FACU species <u>N/A</u>	x 4 = _____	UPL species <u>N/A</u>	x 5 = _____	Column Totals: <u>1</u> (A)	<u>1</u> (B)	Prevalence Index = B/A = <u>1/1</u>	
Total % Cover of:	Multiply by:																			
OBL species <u>1</u>	x 1 = <u>1</u>																			
FACW species <u>N/A</u>	x 2 = _____																			
FAC species <u>N/A</u>	x 3 = _____																			
FACU species <u>N/A</u>	x 4 = _____																			
UPL species <u>N/A</u>	x 5 = _____																			
Column Totals: <u>1</u> (A)	<u>1</u> (B)																			
Prevalence Index = B/A = <u>1/1</u>																				
Sapling/Shrub Stratum (Plot size: <u>15ft.</u>) 1. _____ 2. _____ 3. _____ 4. _____ 5. _____ 0 = Total Cover																				
Herb Stratum (Plot size: <u>5ft.</u>) 1. <u>Eleocharis palustris</u> <u>90</u> <u>Y</u> <u>OBL</u> 2. _____ 3. _____ 4. _____ 5. _____ 6. _____ 7. _____ 8. _____ 9. _____ 10. _____ 90 = Total Cover																				
Woody Vine Stratum (Plot size: <u>30ft.</u>) 1. _____ 2. _____ 0 = Total Cover																				
% Bare Ground in Herb Stratum <u>10</u> 0 = Total Cover																				
Remarks:																				

Hydrophytic Vegetation Indicators:
 1 - Rapid Test for Hydrophytic Vegetation
 2 - Dominance Test is >50%
 3 - Prevalence Index is ≤3.0¹
 ___ 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
 ___ Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes No _____

SOIL

Sampling Point: W-01-W

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-18	7.5 YR 3/2	80	5 YR 4/6	20	C	PL/M	SCL	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5) **(LRR F)**
- 1 cm Muck (A9) **(LRR F, G, H)**
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- 2.5 cm Mucky Peat or Peat (S2) **(LRR G, H)**
- 5 cm Mucky Peat or Peat (S3) **(LRR F)**
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Loamy Mucky Mineral (F1)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)
- High Plains Depressions (F16)

Indicators for Problematic Hydric Soils³:

- 1 cm Muck (A9) **(LRR I, J)**
 - Coast Prairie Redox (A16) **(LRR F, G, H)**
 - Dark Surface (S7) **(LRR G)**
 - High Plains Depressions (F16)
 - (LRR H outside of MLRA 72 & 73)**
 - Reduced Vertic (F18)
 - Red Parent Material (TF2)
 - Very Shallow Dark Surface (TF12)
 - Other (Explain in Remarks)
- ³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes No

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- Surface Water (A1)
- High Water Table (A2)
- Saturation (A3)
- Water Marks (B1)
- Sediment Deposits (B2)
- Drift Deposits (B3)
- Algal Mat or Crust (B4)
- Iron Deposits (B5)
- Inundation Visible on Aerial Imagery (B7)
- Water-Stained Leaves (B9)
- Salt Crust (B11)
- Aquatic Invertebrates (B13)
- Hydrogen Sulfide Odor (C1)
- Dry-Season Water Table (C2)
- Oxidized Rhizospheres on Living Roots (C3)
- (where not tilled)**
- Presence of Reduced Iron (C4)
- Thin Muck Surface (C7)
- Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- Surface Soil Cracks (B6)
- Sparsely Vegetated Concave Surface (B8)
- Drainage Patterns (B10)
- Oxidized Rhizospheres on Living Roots (C3)
- (where tilled)**
- Crayfish Burrows (C8)
- Saturation Visible on Aerial Imagery (C9)
- Geomorphic Position (D2)
- FAC-Neutral Test (D5)
- Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present? Yes No Depth (inches): 12
 Water Table Present? Yes No Depth (inches): _____
 Saturation Present? Yes No Depth (inches): _____
 (includes capillary fringe)

Wetland Hydrology Present? Yes No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Deer Trail City/County: Adams County Sampling Date: 7/18/23
 Applicant/Owner: Novis Renewables State: CO Sampling Point: W-01-up
 Investigator(s): LH, CC Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Drainage Local relief (concave, convex, none): concave Slope (%): 3
 Subregion (LRR): _____ Lat: _____ Long: _____ Datum: _____
 Soil Map Unit Name: _____ NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes _____ No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes _____ No _____ Hydric Soil Present? Yes _____ No _____ Wetland Hydrology Present? Yes _____ No _____	Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/>
Remarks: Lots of rain	

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: <u>30ft.</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
0 = Total Cover				
Sapling/Shrub Stratum (Plot size: <u>15ft.</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
0 = Total Cover				
Herb Stratum (Plot size: <u>5ft.</u>)				
1. <u>Elymus smithii</u>	<u>95</u>	<u>Y</u>	<u>UPL</u>	
2. <u>Cirsium undulatum</u>	<u>2</u>	<u>N</u>	<u>UPL</u>	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
97 = Total Cover				
Woody Vine Stratum (Plot size: <u>30ft.</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
0 = Total Cover				
% Bare Ground in Herb Stratum <u>3</u>				

Dominance Test worksheet:
 Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): _____ (A)
 Total Number of Dominant Species Across All Strata: _____ (B)
 Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

Prevalence Index worksheet:
 Total % Cover of: _____ Multiply by: _____
 OBL species _____ x 1 = _____
 FACW species _____ x 2 = _____
 FAC species _____ x 3 = _____
 FACU species _____ x 4 = _____
 UPL species _____ x 5 = _____
 Column Totals: _____ (A) _____ (B)
 Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:
 ___ 1 - Rapid Test for Hydrophytic Vegetation
 ___ 2 - Dominance Test is >50%
 ___ 3 - Prevalence Index is ≤3.0¹
 ___ 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
 ___ Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No _____

Remarks:

STREAM ID <u>S-01 Trib-01</u>	STREAM NAME <u>Little Muddy Creek</u>
CLIENT <u>NextEra</u> <u>Novis</u>	PROJECT NAME <u>Nimrodah Flats</u> <u>Mank's Crossing</u>
LAT <u>39.819185</u> LONG <u>-103.980389</u>	DATE <u>12/19/2023</u> COUNTY <u>Adams</u>
INVESTIGATORS <u>Z. Isleib + C. Carver</u>	
WATER TYPE TNW <input type="checkbox"/> RPW <input type="checkbox"/> NRPW <input checked="" type="checkbox"/>	FLOW REGIME Perennial <input type="checkbox"/> Intermittent <input type="checkbox"/> Ephemeral <input checked="" type="checkbox"/>

CHANNEL FEATURES	Estimate Measurements Top of Bank Width: <u>4</u> ft Top of Bank Height: LB <u>2</u> ft RB <u>2</u> ft Water Depth: <u>0</u> in Water Width: <u>0</u> ft Ordinary High Water Mark (Width): <u>3</u> ft Ordinary High Water Mark (Height): <u>1</u> in Flow Direction: <u>N</u> <input checked="" type="checkbox"/>	Sinuosity <input checked="" type="checkbox"/> Low <input type="checkbox"/> Medium <input type="checkbox"/> High Gradient <input checked="" type="checkbox"/> Flat <input type="checkbox"/> Moderate <input type="checkbox"/> Severe (0.5 ft/100 ft) (2 ft/100 ft) (10 ft/100 ft) Stream Erosion <input checked="" type="checkbox"/> None <input type="checkbox"/> Moderate <input type="checkbox"/> Heavy Artificial, Modified or Channellized <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Within Roadside Ditch <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Culvert Present <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Culvert Material: <u>N/A</u> <input checked="" type="checkbox"/> Culvert Size: <u>0</u> in
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FLOW CHARACTERISTICS	Water Present <input type="checkbox"/> No water, stream bed dry <input checked="" type="checkbox"/> Stream bed moist <input type="checkbox"/> Standing water <input type="checkbox"/> Flowing water Velocity <input type="checkbox"/> Fast <input type="checkbox"/> Moderate <input checked="" type="checkbox"/> Slow	Proportion of Reach Represented by Stream Morphology Types (Only enter if water present) Riffle <input checked="" type="checkbox"/> % Run <input checked="" type="checkbox"/> % Pool <input checked="" type="checkbox"/> % Turbidity <input type="checkbox"/> Clear <input checked="" type="checkbox"/> Slightly turbid <input type="checkbox"/> Turbid <input type="checkbox"/> Other
----------------------	--	---

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)			ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)		
Substrate Type	Diameter	% Composition in Sampling Reach	Substrate Type	Characteristic	% Composition in Sampling Area
Bedrock		<input checked="" type="checkbox"/>	Detritus	sticks, wood, coarse plant materials (CPOM)	<input checked="" type="checkbox"/>
Boulder	> 256 mm (10")	<input checked="" type="checkbox"/>	Muck-Mud	black, very fine organic (FPOM)	<u>100</u> <input checked="" type="checkbox"/>
Cobble	64-256 mm (2.5"-10")	<input checked="" type="checkbox"/>	Marl	grey, shell fragments	<input checked="" type="checkbox"/>
Gravel	2-64 mm (0.1"-2.5")	<input checked="" type="checkbox"/>			
Sand	0.06-2mm (gritty)	<u>40</u> <input checked="" type="checkbox"/>			
Silt	0.004-0.06 mm	<u>40</u> <input checked="" type="checkbox"/>			
Clay	< 0.004 mm (slick)	<u>20</u> <input checked="" type="checkbox"/>			

WATERSHED FEATURES	Predominant Surrounding Landuse <input type="checkbox"/> Forest <input type="checkbox"/> Commercial <input checked="" type="checkbox"/> Field/Pasture <input type="checkbox"/> Industrial <input checked="" type="checkbox"/> Agricultural <input type="checkbox"/> Residential <input type="checkbox"/> ROW <input type="checkbox"/> Other: Logging	Floodplain Width <input type="checkbox"/> Wide > 30ft <input type="checkbox"/> Moderate 15-30ft <input checked="" type="checkbox"/> Narrow < 15ft
	Canopy Cover <input checked="" type="checkbox"/> Open <input type="checkbox"/> Partly shaded <input type="checkbox"/> Shaded	

MACROINVERTEBRATES/OTHER WILDLIFE OBSERVED OR OTHER NOTES AND OBSERVATIONS <u>No macros.</u> <u>Lots of milkweed - suitable Monarch Habitat</u>
--

STREAM ID <u>S-01 Trib-02</u>	STREAM NAME <u>Little Muddy Creek</u>
CLIENT NextEra <u>Novis</u>	PROJECT NAME Nipawash Falls <u>Hank's Crossing</u>
LAT <u>39.820754</u> LONG <u>-103.980291</u>	DATE <u>12/19/2023</u> COUNTY <u>Adams</u>
INVESTIGATORS <u>Z. Isleib</u> : <u>C. Carver</u>	
WATER TYPE TNW <input type="checkbox"/> RPW <input type="checkbox"/> NRPW <input checked="" type="checkbox"/>	FLOW REGIME Perennial <input type="checkbox"/> Intermittent <input type="checkbox"/> Ephemeral <input checked="" type="checkbox"/>

CHANNEL FEATURES	Estimate Measurements Top of Bank Width: <u>6</u> ft Top of Bank Height: LB <u>1</u> ft RB <u>1</u> ft Water Depth: <u>0</u> in Water Width: <u>0</u> ft Ordinary High Water Mark (Width): <u>5</u> ft Ordinary High Water Mark (Height): <u>4</u> in Flow Direction: <u>N</u>	Sinuosity <input checked="" type="checkbox"/> Low <input type="checkbox"/> Medium <input type="checkbox"/> High Gradient <input checked="" type="checkbox"/> Flat (0.5 ft/100 ft) <input type="checkbox"/> Moderate (2 ft/100 ft) <input type="checkbox"/> Severe (10 ft/100 ft) Stream Erosion <input checked="" type="checkbox"/> None <input type="checkbox"/> Moderate <input type="checkbox"/> Heavy Artificial, Modified or Channelized <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Within Roadside Ditch <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Culvert Present <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Culvert Material: <u>N/A</u> Culvert Size: <u>N/A</u> in
	FLOW CHARACTERISTICS Water Present <input type="checkbox"/> No water, stream bed dry <input checked="" type="checkbox"/> Stream bed moist <input type="checkbox"/> Standing water <input type="checkbox"/> Flowing water Velocity <input type="checkbox"/> Fast <input type="checkbox"/> Moderate <input checked="" type="checkbox"/> Slow	Proportion of Reach Represented by Stream Morphology Types (Only enter if water present) Riffle <input checked="" type="checkbox"/> % Run <input checked="" type="checkbox"/> % Pool <input checked="" type="checkbox"/> % Turbidity <input type="checkbox"/> Clear <input type="checkbox"/> Slightly turbid <input type="checkbox"/> Turbid <input type="checkbox"/> Other

Substrate Type	Diameter	% Composition in Sampling Reach	Substrate Type	Characteristic	% Composition in Sampling Area
Bedrock		<input checked="" type="checkbox"/>	Detritus	sticks, wood, coarse plant materials (CPOM)	<input checked="" type="checkbox"/>
Boulder	> 256 mm (10")	<input checked="" type="checkbox"/>	Muck-Mud	black, very fine organic (FPOM)	<u>100</u> <input checked="" type="checkbox"/>
Cobble	64-256 mm (2.5"-10")	<input checked="" type="checkbox"/>	Marl	grey, shell fragments	<input checked="" type="checkbox"/>
Gravel	2-64 mm (0.1"-2.5")	<input checked="" type="checkbox"/>			
Sand	0.06-2mm (gritty)	<u>40</u> <input checked="" type="checkbox"/>			
Silt	0.004-0.06 mm	<u>40</u> <input checked="" type="checkbox"/>			
Clay	< 0.004 mm (slick)	<u>20</u> <input checked="" type="checkbox"/>			

WATERSHED FEATURES	Predominant Surrounding Landuse <input type="checkbox"/> Forest <input type="checkbox"/> Commercial <input checked="" type="checkbox"/> Field/Pasture <input type="checkbox"/> Industrial <input checked="" type="checkbox"/> Agricultural <input type="checkbox"/> Residential <input type="checkbox"/> ROW <input type="checkbox"/> Other: Logging	Floodplain Width <input type="checkbox"/> Wide > 30ft <input type="checkbox"/> Moderate 15-30ft <input checked="" type="checkbox"/> Narrow <15ft
	Canopy Cover <input checked="" type="checkbox"/> Open <input type="checkbox"/> Partly shaded <input type="checkbox"/> Shaded	

MACROINVERTEBRATES/OTHER WILDLIFE OBSERVED OR OTHER NOTES AND OBSERVATIONS

No macros.
lots of milkweed - suitable Monarch habitat

STREAM ID <u>S-01</u>	STREAM NAME <u>Little Muddy Creek</u>
CLIENT NovisEco <u>Novis</u> <input checked="" type="checkbox"/>	PROJECT NAME Missouri Falls <u>Hank's Crossing</u>
LAT <u>39.823035</u> LONG <u>-103.980435</u>	DATE <u>12/19/2023</u> COUNTY <u>Adams</u>
INVESTIGATORS <u>Z. Isleib + C. Carver</u>	
WATER TYPE TNW <input type="checkbox"/> RPW <input type="checkbox"/> NRPW <input checked="" type="checkbox"/>	FLOW REGIME Perennial <input type="checkbox"/> Intermittent <input checked="" type="checkbox"/> Ephemeral <input type="checkbox"/>

CHANNEL FEATURES	Estimate Measurements Top of Bank Width: <u>10</u> ft Top of Bank Height: LB <u>2.5</u> ft RB <u>3</u> ft Water Depth: <u>2</u> in Water Width: <u>3</u> ft Ordinary High Water Mark (Width): <u>8</u> ft Ordinary High Water Mark (Height): <u>6</u> in Flow Direction: <u>N</u> <input checked="" type="checkbox"/>	Sinuosity <input checked="" type="checkbox"/> Low <input type="checkbox"/> Medium <input type="checkbox"/> High Gradient <input checked="" type="checkbox"/> Flat <input type="checkbox"/> Moderate <input type="checkbox"/> Severe (0.5/100 ft) (2 ft/100 ft) (10 ft/100 ft) Stream Erosion <input type="checkbox"/> None <input checked="" type="checkbox"/> Moderate <input type="checkbox"/> Heavy Artificial, Modified or Channelized <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Within Roadside Ditch <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Culvert Present <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Culvert Material: <u>N/A</u> <input checked="" type="checkbox"/> Culvert Size: <u>0</u> in
	FLOW CHARACTERISTICS Water Present <input type="checkbox"/> No water, stream bed dry <input checked="" type="checkbox"/> Stream bed moist <input checked="" type="checkbox"/> Standing water <input type="checkbox"/> Flowing water Velocity <input type="checkbox"/> Fast <input type="checkbox"/> Moderate <input checked="" type="checkbox"/> Slow	Proportion of Reach Represented by Stream Morphology Types (Only enter if water present) Riffle <u>0</u> <input checked="" type="checkbox"/> % Run <u>0</u> <input checked="" type="checkbox"/> % Pool <u>1</u> <input checked="" type="checkbox"/> % Turbidity <input type="checkbox"/> Clear <input checked="" type="checkbox"/> Slightly turbid <input type="checkbox"/> Turbid <input type="checkbox"/> Other

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)			ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)		
Substrate Type	Diameter	% Composition in Sampling Reach	Substrate Type	Characteristic	% Composition in Sampling Area
Bedrock		<input checked="" type="checkbox"/>	Detritus	sticks, wood, coarse plant materials (CPOM)	<u>10</u> <input checked="" type="checkbox"/>
Boulder	> 256 mm (10")	<input checked="" type="checkbox"/>			
Cobble	64-256 mm (2.5"-10")	<input checked="" type="checkbox"/>	Muck-Mud	black, very fine organic (FPOM)	<u>90</u> <input checked="" type="checkbox"/>
Gravel	2-64 mm (0.1"-2.5")	<input checked="" type="checkbox"/>			
Sand	0.06-2mm (gritty)	<u>40</u> <input checked="" type="checkbox"/>	Marl	grey, shell fragments	<input checked="" type="checkbox"/>
Silt	0.004-0.06 mm	<u>40</u> <input checked="" type="checkbox"/>			
Clay	< 0.004 mm (slick)	<u>20</u> <input checked="" type="checkbox"/>			

WATERSHED FEATURES	Predominant Surrounding Landuse <input type="checkbox"/> Forest <input type="checkbox"/> Commercial <input checked="" type="checkbox"/> Field/Pasture <input type="checkbox"/> Industrial <input checked="" type="checkbox"/> Agricultural <input type="checkbox"/> Residential <input type="checkbox"/> ROW <input type="checkbox"/> Other: Logging	Floodplain Width <input checked="" type="checkbox"/> Wide > 30ft <input type="checkbox"/> Moderate 15-30ft <input type="checkbox"/> Narrow < 15ft
	Canopy Cover <input checked="" type="checkbox"/> Open <input type="checkbox"/> Partly shaded <input type="checkbox"/> Shaded	

MACROINVERTEBRATES/OTHER WILDLIFE OBSERVED OR OTHER NOTES AND OBSERVATIONS
<p><u>No macros</u></p> <p><u>Lots of milkweeds (100+) - suitable Monarch habitat</u></p>

SOIL

Sampling Point: W-01-up

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-5	7.5 YR 5/3	65	5 YR 5/8	20	C	PL	SL	
5-18	10 YR 2/2	100					SCL	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5) **(LRR F)**
- 1 cm Muck (A9) **(LRR F, G, H)**
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- 2.5 cm Mucky Peat or Peat (S2) **(LRR G, H)**
- 5 cm Mucky Peat or Peat (S3) **(LRR F)**
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Loamy Mucky Mineral (F1)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)
- High Plains Depressions (F16) **(MLRA 72 & 73 of LRR H)**

Indicators for Problematic Hydric Soils³:

- 1 cm Muck (A9) **(LRR I, J)**
 - Coast Prairie Redox (A16) **(LRR F, G, H)**
 - Dark Surface (S7) **(LRR G)**
 - High Plains Depressions (F16) **(LRR H outside of MLRA 72 & 73)**
 - Reduced Vertic (F18)
 - Red Parent Material (TF2)
 - Very Shallow Dark Surface (TF12)
 - Other (Explain in Remarks)
- ³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____
Depth (inches): _____

Hydric Soil Present? Yes _____ No

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- Surface Water (A1)
- High Water Table (A2)
- Saturation (A3)
- Water Marks (B1)
- Sediment Deposits (B2)
- Drift Deposits (B3)
- Algal Mat or Crust (B4)
- Iron Deposits (B5)
- Inundation Visible on Aerial Imagery (B7)
- Water-Stained Leaves (B9)
- Salt Crust (B11)
- Aquatic Invertebrates (B13)
- Hydrogen Sulfide Odor (C1)
- Dry-Season Water Table (C2)
- Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- Presence of Reduced Iron (C4)
- Thin Muck Surface (C7)
- Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- Surface Soil Cracks (B6)
- Sparsely Vegetated Concave Surface (B8)
- Drainage Patterns (B10)
- Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- Crayfish Burrows (C8)
- Saturation Visible on Aerial Imagery (C9)
- Geomorphic Position (D2)
- FAC-Neutral Test (D5)
- Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present? Yes _____ No Depth (inches): _____
 Water Table Present? Yes _____ No Depth (inches): _____
 Saturation Present? (includes capillary fringe) Yes _____ No Depth (inches): _____

Wetland Hydrology Present? Yes _____ No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

APPENDIX B: PHOTOLOG



Photo 1: Representative swale within western portion of Project Area.



Photo 2: Representative swale within western portion of Project Area.



Photo 3: Pond 1- Excavated impoundment/stock pond.



Photo 4: Pond 1- Excavated impoundment/stock pond.



Photo 5: Pond 2- Stock pond with seeps from a pump.



Photo 6: Pond 2- Stock pond with seeps from a pump.



Photo 7: Pond 3- Small pond associated with the overflow from windmill.



Photo 8: Pond 3- Small pond associated with the overflow from windmill.



Photo 9: Pond 4- Small stock pond fed by runoff from pump.



Photo 10: WL-1- Wetland sample point.



Photo 11: WL-1- Upland sample point.



Photo 12: WL-1- Small emergent wetland associated with swale drainage in western portion of Project Area.



Photo 13: WL-1- Small emergent wetland associated with swale drainage in western portion of Project Area.



Photo 14: Pond 5- Small impounded stock pond.



Photo 15: Pond 6- Large impounded stock pond.



Photo 16: Representative swale within northeastern portion of Project Area.



Photo 17 : Representative swale within northeastern portion of Project Area.



Photo 18: Representative swale within southeastern portion of Project Area.



Photo 19: Representative swale within southeastern portion of Project Area.



Photo 20: S-01- Segment of Little Muddy Creek, intermittent stream located along southeastern boundary of Project Area.



Photo 21: Segment of Little Muddy Creek, intermittent stream located along southeastern boundary of Project Area.



Photo 22: Segment of Little Muddy Creek, intermittent stream located along southeastern boundary of Project Area.



Photo 23: Segment of Little Muddy Creek, intermittent stream located along southeastern boundary of Project Area.

APPENDIX G WILDLIFE HABITAT CHARACTERIZATION AND SITE
RECONNAISSANCE

Wildlife Habitat Assessment

Hanks Crossing Energy

April 2024

Prepared for:

Hanks Crossing Energy, LLC

One Bridge Street, Suite 11
Irvington, NY 10533

Prepared by:

Tetra Tech, Inc.

390 Union Blvd., Suite 400
Lakewood, CO 80228



TETRA TECH

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- Appendix B Photo Log
- Appendix C Species Observed During Field Survey

1.0 INTRODUCTION

Hanks Crossing Energy, LLC, a subsidiary of Novis Renewables, LLC (Novis), is proposing to develop Hanks Crossing Energy (Project; formerly known as the Deer Trail Solar Project), a proposed 355-megawatt photovoltaic (PV) and 178-megawatt battery energy storage system (BESS) utility-scale project encompassing approximately 2,659 acres of private land (Project Area) in unincorporated Adams County, Colorado, approximately 13 miles northeast of the town of Byers (Figure 1). At the request of Novis, Tetra Tech, Inc. (Tetra Tech) has prepared a wildlife habitat assessment consisting of a desktop review and field survey for the Project to document existing habitat and biological resources, including special status species and raptor nests, that may be impacted by Project development.

2.0 REGULATORY FRAMEWORK

This section outlines the applicable federal and state regulations, polices, and related permits and approvals relative to biological resources that may be required for development of the Project.

2.1 FEDERAL REGULATIONS

2.1.1 Endangered Species Act

The Endangered Species Act (ESA) directs the U.S. Fish and Wildlife Service (USFWS) to identify and protect threatened and endangered (T&E) species and their critical habitat, and to provide a means to conserve their ecosystems. Among its other provisions, the ESA requires the USFWS to assess civil and criminal penalties for violations of the Act or its regulations. Section 9 of the ESA makes it unlawful to knowingly violate the “take” provisions of the ESA. “Take” is defined as “harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct” 16 United States Code (U.S.C.) 1532. Significant modification or degradation of listed species’ habitats within which the modification kills or injures wildlife by significantly impairing essential behavioral patterns is considered “harm” under ESA regulations. Projects involving federal lands, funding, or authorizations require consultation between the federal agency and the USFWS, pursuant to Section 7 of the ESA. Projects without a federal nexus work directly with the USFWS to avoid adversely impacting listed species and their critical habitats.

2.1.2 Bald and Golden Eagle Protection Act

Bald eagles (*Haliaeetus leucocephalus*) and golden eagles (*Aquila chrysaetos*) are afforded legal protection under authority of the Bald and Golden Eagle Protection Act (BGEPA; 16 U.S.C. 668–668d). The BGEPA prohibits the take, sale, purchase, offer of sale, purchase or barter, transport, export, or import, at any time or in any manner of any bald or golden eagle, alive or dead, or any part, nest, or egg thereof, 16 U.S.C. 668. The BGEPA also defines take to include “pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest, or disturb,” 16 U.S.C. 668c, and includes criminal and civil penalties for violating the statute (see 16 U.S.C. 668). The term “disturb” is defined as agitating or bothering an eagle to a degree that causes, or is likely to cause, injury to an eagle, or either a decrease in productivity or nest abandonment by substantially interfering with normal breeding, feeding, or sheltering behavior, 50 Code of Federal Regulations (CFR) § 22.3.

2.1.3 Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) implements the United States' obligations under four international treaties for the protection of migratory birds—more than 1,000 species (Federal Register; 50 CFR §10 and §21), including the bald eagle and golden eagle. The MBTA is administered by the USFWS and prohibits “take” of migratory birds—their parts, eggs, or nests “at any time, by any means.” “Take” is defined by the MBTA as “to pursue, hunt, shoot, wound, kill, trap, capture, or collect, or any attempt to carry out these activities.” There has been varying guidance on the prohibition of incidental take under the MBTA. A rulemaking on October 4, 2021, reestablished incidental take as prohibited under the MBTA. This regulation took effect on December 3, 2021.

2.2 STATE REGULATIONS

2.2.1 Colorado Parks and Wildlife Coordination

Colorado Parks and Wildlife (CPW), a branch of the Colorado Department of Natural Resources, has the statutory charge for managing and conserving wildlife resources within state borders, for hunted, fished, and non-game wildlife, including state-listed T&E species (Colorado Revised Statutes [CRS] §33-1-101). Agency coordination with CPW will identify potential impacts to state-listed T&E species as well as habitat. Permits such as the Areas and Activities of State and Local Interest (“1041”) and other County special use permits and U.S. Army Corp of Engineers (USACE) Section 404 permits generally require documentation that impacts to these resources have been evaluated, such as a letter from CPW citing their recommendations to minimize impacts. Consultation with CPW is required if state lands would be crossed by the Project.

2.2.2 State Listed Threatened and Endangered Species

CPW is required to establish and maintain a list of species of wildlife indigenous to the state of Colorado that have been determined to be endangered or threatened within Colorado (CRS §§ 33-1-101–33-60-114). It is unlawful for any person to take, possess, transport, export, process, sell or offer for sale, or ship and for any common or contract carrier to knowingly transport or receive for shipment any species or subspecies of wildlife appearing on the list of wildlife indigenous to this state determined to be endangered within Colorado.

3.0 METHODOLOGY

3.1 DESKTOP ANALYSIS

Tetra Tech conducted a desktop analysis to identify potential federally and state-listed T&E species and their associated habitats that have the potential to occur within the Project Area. Tetra Tech reviewed the following publicly available data:

- USFWS Information for Planning and Consultation (IPaC) online tool (Appendix A; USFWS 2023a)
- CPW State Species List (CPW 2023a)
- CPW Species Activity Mapping Data (CPW 2023b)
- CPW High Priority Habitats Data (COGCC 2023)
- CPW Raptor Nest Database (CPW 2022)

- National Land Cover Database (USGS 2019)
- USFWS Critical Habitat Portal (USFWS 2023b)
- U.S. Department of Agriculture (USDA) Farm Service National Agricultural Imagery Program aerial imagery (USDA 2018)

3.2 FIELD SURVEY

Tetra Tech conducted field surveys on July 18-19, November 30, and December 19, 2023, to assess wildlife habitat within the Project Area. The wildlife habitat assessment field surveys were conducted by a qualified biologist who drove along public roads adjacent to the Project Area and by foot within the Project Area. The biologist documented habitat types, assessed the area for potentially suitable habitat for federally and state-listed T&E species and other special status species, and mapped observed species occurrences with a GPS-enabled tablet. Representative photographs of habitat within the Project Area were also collected (Appendix B). All wildlife and plant species observed during the field surveys were identified to the extent possible and documented (Figure 3; Appendix C).

Tetra Tech identified raptor nests within a 0.5-mile buffer of the Project Area (Raptor Nest Survey Area; RNSA; Figure 3). Surveys were conducted by foot within the Project Area and by vehicle using existing public roads within the 0.5-mile buffer of the Project Area. Using binoculars and a spotting scope, the biologist scanned trees and other tall structures for raptor nests. The biologist visited potential black-tailed prairie dog (*Cynomys ludovicianus*) colonies to assess the potential for burrowing owl (*Athene cunicularia*) presence. Nests and potential burrowing owl presence were documented using a GPS-enabled tablet.

4.0 RESULTS

4.1 ECOREGION

The Project Area is located in the U.S. Environmental Protection Agency's Moderate Relief Plains level IV ecoregion (Chapman et al. 2006). The Moderate Relief Plains ecoregion is characterized by irregular plains with moderate slope plains. The natural vegetation is shortgrass prairie, including blue grama (*Bouteloua gracilis*), buffalograss (*Bouteloua dactyloides*), threadleaf sedge (*Carex filifolia*), fringed sage (*Artemisia frigida*), Junegrass (*Koeleria macrantha*), and western wheatgrass (*Pascopyrum smithii*). Riparian areas contain cottonwood/shrub/herbaceous species. Mean annual precipitation in the region varies from 12 to 18 inches, and mean annual temperature varies from 14 to 92 degrees Fahrenheit. Soils in this region are predominately silty and clayey loams substrates. Land use in the region is predominantly rangeland.

4.2 VEGETATION

A query of the National Land Cover Database (NLCD; USGS 2019) revealed that the land cover in the Project Area is primarily composed of grassland/herbaceous (1,394.4 acres, 52 percent) and cultivated crops (1,233.4 acres, 46.4 percent; Figure 2; Table 1).

Table 1. Land Cover Present within the Project Area

Land Cover Type	Acres	Percent of Project Area
Grassland/Herbaceous	1,394.4	52.4%
Cultivated Crops	1,233.4	46.4%

Land Cover Type	Acres	Percent of Project Area
Developed, Open Space	25.6	1.0%
Pasture/Hay	5.5	0.2%
TOTAL	2,658.9	100%

Land cover observed within the Project Area was consistent with that of the NLCD. The primary crop observed in the Project Area was wheat (*Triticum* sp.; Appendix B, Photos 3 and 10).

Grassland/herbaceous land cover was dominated by needle-and-thread grass (*Hesperostipa comata*) with some kochia (*Bassia scoparia*), Russian thistle (*Salsola* sp.), and sand sagebrush (*Artemisia filifolia*; Appendix B, Photos 4 and 9). Cattle troughs and excavated cattle ponds were scattered throughout the Project Area (Appendix B, Photo 8).

There are no major streams found in the Project Area. The western portion of the Project Area drains via unnamed drainages west into Muddy Creek, a stream with perennial flow. The eastern portion of the Project Area drains via unnamed drainages east into Little Muddy Creek, which also flows through the southeastern portion of the Project Area (Appendix B, Photo 12). Land within the Project Area appears to have been subjected to historic modification of landform and hydrology. Most of the modification was conducted to facilitate agricultural production by alteration and/or realignment of the drainage contours and stormwater discharge.

4.3 SPECIAL STATUS SPECIES

The USFWS IPaC online tool (Appendix A; USFWS 2023a) and CPW online databases and datasets (CPW 2022, 2023a, 2023b) were used to identify federally and state-listed species and other special status species (e.g., special concern species, game species, and species protected by the BGEPA) that may occur within or near the vicinity of the Project Area (Table 2).

4.3.1 Listed Threatened and Endangered Species

No USFWS-designated critical habitat is present within the Project Area (Appendix A; USFWS 2023b). Based on the results of the USFWS IPaC online tool (Appendix A; USFWS 2023a) and CPW online databases and datasets (CPW 2022, 2023a, 2023b), the federally and state-listed species that have a moderate or high likelihood of occurrence within the Project Area are discussed further in the sections below.

Table 2. Federally and State-Listed Species with a Likelihood of Occurrence Within the Project Area

Common Name	Scientific Name	Status ¹	Habitat Associations	Likelihood of Occurrence ²
Mammals				
Gray wolf	<i>Canis lupus</i>	FE; SE	Found in temperate forests, mountains, tundra, taiga, grasslands, and deserts. This species is extirpated from Colorado.	Unlikely—This species only needs to be considered for projects that include predator management.

Common Name	Scientific Name	Status ¹	Habitat Associations	Likelihood of Occurrence ²
Preble's meadow jumping mouse	<i>Zapus hudsonius preblei</i>	FT; ST	Heavily vegetated, shrub-dominated riparian habitats and immediately adjacent upland habitats along the eastern edge of the Front Range of Colorado.	Unlikely—The Project Area does not lie within the overall range of the species (CPW 2023b; Figure 4). In addition, wetland habitat surveyed within the Project Area supports only emergent vegetation and does not support the riparian shrub structure required for the species.
Tricolored bat	<i>Perimyotis subflavus</i>	PE	Found in open woodlands near water sources. Roost in trees, rock crevices, caves, and occasionally in buildings.	Unlikely—While the Project Area lies within overall range for the species (CPW 2023b; Figure 4), no woodland habitat occurs within the Project Area.
Birds				
Bald eagle	<i>Haliaeetus leucocephalus</i>	BGEPA	Cottonwood and other large deciduous forest galleries near large bodies of water.	Unlikely—Breeding. Project Area is not located near large waterbodies or forest galleries that would provide breeding habitat. Moderate—Foraging. Active black-tailed prairie dog colonies were observed within the Project Area, and a small reservoir (Bramkamp Reservoir) with large fish was observed approximately 0.3 mile west of the Project Area. Project Area lies within species winter range (CPW 2023b; Figure 4).
Golden eagle	<i>Aquila chrysaetos</i>	BGEPA	Partly open country with native grassland vegetation.	Unlikely—Breeding. Although the Project Area lies within this species' predicted breeding range (CPW 2023b; Figure 4), the likelihood of nesting within the Project Area is unlikely based on the lack of available nesting habitat (trees, cliff features, or uneven terrain). Moderate—Foraging. Active black-tailed prairie dog colonies were observed within the Project Area.
Whooping crane	<i>Grus americana</i>	FE, SE	Estuarine marshes, shallow bays, emergent herbaceous wetlands.	Unlikely—Only considered if the Project involves water-related activities within the Platte River Basin that could cause a depletion to downstream waters where the species is known to occur.
Piping plover	<i>Charadrius melodus</i>	FT, ST	Shorelines around small lakes, reservoir beaches, river islands, sand pits, and beaches on large lakes for breeding.	Unlikely—Only considered if the Project involves water-related activities within the Platte River Basin that could cause a depletion to downstream waters where the species is known to occur.

Common Name	Scientific Name	Status ¹	Habitat Associations	Likelihood of Occurrence ²
Burrowing owl	<i>Athene cunicularia</i>	ST	Typically found in prairie dog colonies in open areas with short grass. Also is known to use burrows of ground squirrels and badgers. Can be found where suitable burrows exist on golf courses, cemeteries, airports, vacant lots, and pastures.	High—During the July and December 2023 field surveys, active black-tailed prairie dog colonies were observed within the Project Area, and sign of burrowing owls were observed at several prairie dog burrow entrances (Figure 3; Appendix B, Photo 1). The Project Area is located within the species' breeding range (CPW 2023b; Figure 4).
Fish				
Pallid sturgeon	<i>Scaphirhynchus albus</i>	FE	Occurs in main channels of large rivers, often in area with swift flowing water over sandy substrate. In Kansas, the species is only known to occur in the main stem of the Missouri River.	Unlikely—Only considered if the Project involves water-related activities within the Platte River Basin that could cause a depletion to downstream waters where the species is known to occur.
Insect				
Monarch butterfly	<i>Danaus plexippus</i>	FC	Found throughout the United States in open fields and meadows with milkweed (primarily <i>Asclepias</i> spp.). Milkweed is an obligate host plant for monarch larvae. There are several milkweed species that occur in Colorado in a variety of habitats such as grasslands, disturbed areas, wetlands, and irrigation ditches. Adults feed on milkweed and other flowering plants.	High—Milkweed is present throughout the grassland/herbaceous land cover (Appendix B, Photo 2). Monarch butterflies were observed during the July 2023 field survey.
Flowering Plant				
Ute ladies'-tresses	<i>Spiranthes diluvialis</i>	FT	Occurs in moist meadows associated with perennial stream terraces, floodplains, and oxbows at elevations ranging from 4,300 feet to 6,850 feet above sea level.	Unlikely—While the Project Area lies within overall range for the species (USFWS 2023b), no perennial streams occur within the Project Area.
Western prairie fringed orchid	<i>Plantathera praeclara</i>	FT	Commonly found in full sun on moist to wet calcareous (calcium-rich, or alkaline) tallgrass prairies and sedge meadows (many flooded for 1 to 2 weeks per year). It most often grows in relatively undisturbed grassland but can also be found in moderately disturbed sites such as roadside ditches.	Unlikely—Only considered if the Project involves water-related activities within the Platte River Basin that could cause a depletion to downstream waters where the species is known to occur.

¹ BGEPA = Bald and Golden Eagle Protection Act; FE = Federally Listed Endangered; FT = Federally Listed Threatened; FC = Candidate for Federal Listing (not a statutory category); SE = State Endangered; ST = State Threatened; PE = Proposed Endangered

² Likelihood of Occurrence: Unlikely—there is no suitable habitat present in the Project; Low –marginally suitable habitat in Project vicinity; Moderate –suitable habitat present in Project, or species known to occur in habitat similar to Project Area; High—highly suitable habitat present in Project, or known populations exist in Project vicinity.

Based on the desktop analysis of land cover data, aerial imagery, range maps, and observations during the field survey, the following federally and state-listed or protected species may occur within the Project Area: bald eagle, golden eagle, burrowing owl, and monarch butterfly. All other species listed in Table 2 are not likely to occur in the Project Area due to the absence of suitable habitat or lack of anticipated downstream impacts to Platte River species.

4.3.1.1 Bald Eagle

Bald eagles typically nest near large bodies of open water with adequate prey and tall trees for nesting and roosting, such as lakes, marshes, seacoasts, and rivers (Buehler 2022). Bald eagles are opportunistic foragers that prey primarily on fish but also feed on other aquatic and terrestrial vertebrates and carrion (Buehler 2022). Wintering locations are also typically associated with aquatic areas that contain open water for foraging on fish, with wintering bald eagles roosting up to 20 miles from foraging sites depending on the abundance of prey.

The nearest known bald eagle nest is located approximately 19 miles west of the Project Area along Kiowa Creek (CPW 2022; Figure 4). No bald eagles or potential bald eagle nests were observed within the RNSA during the survey. The Project Area lacks large, open water bodies or large trees that would provide suitable nesting habitat. There is a small reservoir (Bramkamp Reservoir) located approximately 0.3 mile west of the Project Area that supports fish, and active black-tailed prairie dog colonies were observed within the Project Area during the July and December 2023 field surveys that could provide potentially suitable foraging for the species. The Project Area is also located within the CPW-mapped winter range of bald eagles (CPW 2023b; Figure 4). Based on lack of potentially suitable habitat, bald eagles are unlikely to nest within the Project Area. However, due to the nearby reservoir, as well as the observation of active prairie dog colonies within the Project Area, bald eagles have a moderate likelihood of foraging within the Project Area.

4.3.1.2 Golden Eagle

Golden eagles are common in western North America, and small populations are also present in the eastern portions of Canada and the United States (Katzner et al. 2020). Western golden eagle populations may be migratory or residents year-round (Katzner et al. 2020). Golden eagles are year-round residents in eastern Colorado (Sibley 2014). Golden eagles in the western United States are commonly associated with open and semi-open habitats such as shrublands, grasslands, woodland-brushlands, and coniferous forests as well as in farmland and riparian habitats (Katzner et al. 2020). Golden eagles nest on cliff faces or in large trees, and their breeding areas vary by region, but they are generally associated with mountainous canyon land, rimrock terrain of open desert, grassland areas, riparian habitats, and occasionally in forested areas (Katzner et al. 2020). Wintering habitat includes open areas with native vegetation such as sagebrush communities, riparian areas, grasslands, and rolling oak savanna (Katzner et al. 2020). The wintering or non-nesting period is from approximately October to March (Katzner et al. 2020). The species feeds upon a wide variety of prey species but tends to hunt small- to medium-sized mammals such as hares (*Lepus* spp.), rabbits (*Oryctolagus* spp.), ground squirrels (*Urocitellus* spp.), and prairie dogs (*Cynomys* spp.) depending upon local availability (Katzner et al. 2020). Golden eagles are also known to opportunistically forage on carrion (Katzner et al. 2020).

There are no mapped golden eagle nests within 10 miles of the Project Area (CPW 2022b; Figure 4). No golden eagles or potential golden eagle nests were observed within the RNSA during the survey. Although the Project Area is located within the CPW-mapped breeding range of golden eagles (CPW 2023b; Figure 4), there are no large trees or cliffs present within the Project Area that could support a golden eagle nest. Therefore, golden eagles are unlikely to nest within the Project Area. Active black-tailed prairie dog colonies were observed within the Project Area during the July and December 2023 field

surveys that could provide potentially suitable foraging for the species. Therefore, golden eagles have a moderate likelihood of foraging within the Project Area.

4.3.1.3 Burrowing Owl

Burrowing owls occur in open areas with low-growing and/or sparse vegetation, usually on gently sloping terrain. The species is found in well-drained grasslands, steppes, deserts, prairies, and agricultural lands, often associated with high densities of burrowing mammals such as prairie dog colonies and ground squirrel burrows (CPW 2023c). The species nests in an abandoned burrow, and the breeding pair occupies the area until young have fledged.

Potential burrowing owl sign (whitewash, pellets, and feather spots) were observed at several burrow locations within the black-tailed prairie dog colonies identified within the Project Area during the July and December 2023 field surveys (Figure 3; Appendix B, Photos 1 and 11). Given the observation of burrowing owl sign, and the presence of active black-tailed prairie dog colonies, burrowing owls have a high likelihood of occurrence within the Project Area.

4.3.1.4 Monarch Butterfly

The monarch butterfly is a federal candidate species that was proposed for listing in 2020. The monarch butterfly depends on milkweed (*Asclepias* spp.) species for a larvae food source (Monarch Joint Venture 2023). Flowering plants provide suitable nectar sources for adults.

Monarch butterflies were observed during the July 2023 field survey in proximity to milkweed plants, which are present throughout the grassland/herbaceous land cover within the Project Area (Appendix B, Photo 2). Therefore, the likelihood of the species occurring within the Project Area is high.

4.3.2 CPW Special Concern and Game Species

In addition to listed species, CPW tracks and maps data for game species and special concern wildlife species in their Species Activity Mapping data (CPW 2023b) and High Priority Habitats dataset (COGCC 2023). The Project Area is located within the breeding range for the following CPW special concern species: ferruginous hawk (*Buteo regalis*), long-billed curlew (*Numenius americanus*), and mountain plover (*Charadrius montanus*). Potentially suitable nesting habitat for these avian species exists within the Project Area.

As noted above, the Project Area is located within the wintering range for the bald eagle, a CPW special concern species, and the Project Area may provide suitable foraging habitat for the species. Also, as noted above, the Project Area is located within the overall range for tri-colored bat, a CPW special concern species. However, due to the lack of woodland habitat within the Project Area, this species is unlikely to occur.

The Project Area is also located within the overall range and High Potential for Colony Occurrence range for black-tailed prairie dog, and CPW special concern species. The Project Area was evaluated for potential presence of black-tailed prairie dog colonies during the field surveys, and several active colonies were observed during the July and December 2023 field surveys that appear to also support burrowing owls (Figure 3; Appendix B, Photos 1 and 11). An additional colony was also observed within the Project Area during the July 2023 field survey that appears to be inactive (Figure 3; Appendix B, Photo 7).

Mapped game species habitat within the Project Area includes overall range, concentration areas, and winter range for mule deer (*Odocoileus hemionus*), pronghorn (*Antilocapra americana*), and white-tailed deer (*Odocoileus virginianus*; Figure 5). In addition, a mule deer winter concentration area (a CPW High Priority Habitat) is located along the easternmost portion of the Project Area (Figure 6; COGCC 2023). No

big game severe winter range areas are located within the Project Area. Pronghorn were observed within the Project Area during the July 2023 field survey, and mule deer were observed approximately 1.5 miles south of the Project Area during the July 2023 field survey. Based on the existing habitat and observations within and in the vicinity of the Project Area, mule deer, pronghorn, and white-tailed deer have a high likelihood of occurrence within the Project Area.

4.3.3 Raptors

Two raptor nests were observed within the RNSA during the field surveys (Figure 3; Table 3; Appendix B, Photos 5 and 6). Nest 01 was an unknown, inactive, small nest observed during all field surveys. Nest 02 was an active Swainson's hawk (*Buteo swainsoni*) nest during the July 2023 field survey, and inactive during the November and December 2023 field surveys.

Table 3. Raptor Nest Survey Results

Nest #	Species	Status	Nest Size	Nest Substrate	Survey notes
Nest 01	Unknown	Inactive (July and November 2023)	Small	Broadleaf Tree	Nest was in poor condition (Photo 5)
Nest 02	Swainson's hawk	Active (July 2023); Inactive (November 2023)	Small	Broadleaf Tree	No nestlings observed (Photo 6)

5.0 CONCLUSIONS AND RECOMMENDATIONS

The Project Area is composed predominately of cultivated croplands and grassland/herbaceous rangeland. The presence of cultivated crops throughout the Project Area has presumably limited the biological diversity of the Project Area. However, potentially suitable habitat for four federally or state-listed species, including bald eagle, golden eagle, burrowing owl, and monarch butterfly, is present in the Project Area, as well as habitat for game species such as mule deer, pronghorn, and white-tailed deer.

Three of these species (bald eagle, golden eagle, and burrowing owl) are also protected by BGEPA and/or MBTA, as are raptor species such as Swainson's hawk, and CPW special concern species such as ferruginous hawk, mountain plover, and long-billed curlew.

To comply with the BGEPA and MBTA, Tetra Tech recommends a follow-up raptor nest survey during the breeding season prior to planned construction activities to identify any active nests within the RNSA. If raptor nests are active, Tetra Tech recommends implementing the species-specific nest avoidance buffers in CPW's Recommended Buffer Zones and Seasonal Restriction for Colorado Raptors (CPW 2020). For Swainson's hawk, CPW recommends no surface occupancy within a 0.25-mile radius of active nests; and no permitted, authorized, or human encroachment activities within a 0.25-mile radius of active nests from April 1 through July 31 (CPW 2020). CPW will likely recommend clearance surveys prior to construction and will recommend that buffers be installed around active nests for all avian species during construction. CPW will also likely recommend focused surveys for burrowing owl within the Project Area, particularly within active prairie dog colonies.

The monarch butterfly has a high potential for occurrence within the Project Area. At the time of this report, the monarch butterfly is a candidate species for protection under the ESA and has not yet been listed or proposed for listing. In general, the USFWS has no regulatory requirements for candidate species. However, Tetra Tech recommends that the Project be sited to minimize impacts to the species' habitat by avoiding impacts to native grasslands that may contain milkweed species to the extent practicable, and utilizing pollinator-friendly seed mixes during revegetation activities.

The CPW special concern designation is a non-regulatory category indicative of management interest that does not carry protection for the species, and there is no take permit process for special concern species. However, CPW provides recommendations on minimizing and avoiding impacts from land use development on game species and other special status species (CPW 2021a). In addition, CPW has also developed CPW Best Management Practices for Solar Energy Development (CPW 2021b), which provides recommendations intended to promote responsible development of large scale solar projects. In addition to recommendations for avoiding impacts to high priority wildlife habitat, CPW may recommend focused surveys to determine whether game species or special concern species (e.g. mountain plover, long-billed curlew, prairie dogs) are present within the Project Area to help inform whether avoidance and minimization measures should be implemented. These measures may include avoidance of impacts to riparian areas and other wildlife corridors such as big game migration corridors, installation of wildlife-friendly fencing, consolidation of project infrastructure to avoid habitat fragmentation, nesting buffers, and avoidance of impacts to prairie dog colonies that may support other special status species. If impacts to prairie dog colonies cannot be avoided, CPW will likely recommend they either be captured alive and moved to another location or humanely euthanized before any earth-moving occurs.

In addition, CPW may recommend best management practices during construction and operation, including vehicle speed restrictions, worker training, lighting considerations, weed management, revegetation, etc., to further minimize potential impacts to wildlife from solar development (CPW 2021b).

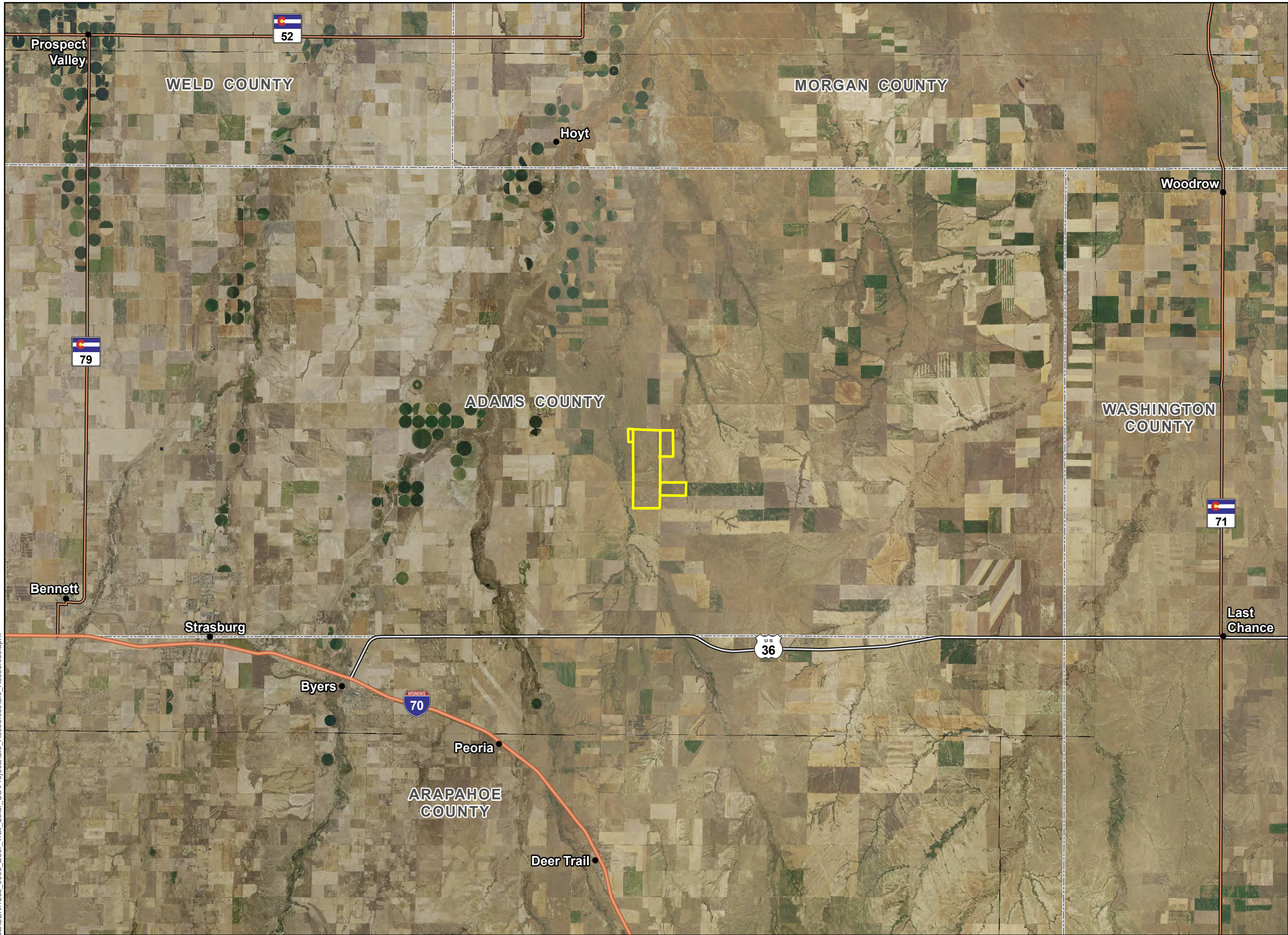
Permits, such as USACE Section 404 permits and/or 1041 or other local special use permits will require documentation that impacts to these resources have been evaluated and agency coordination has been completed, as necessary.

6.0 REFERENCES

- Buehler, D.A. 2022. Bald Eagle (*Haliaeetus leucocephalus*), version 2.0. In Birds of the World (P. G. Rodewald and S. G. Mlodinow, Editors). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online: <https://doi.org/10.2173/bow.baleag.02>. Accessed July 2023.
- Chapman, S.S., Griffith, G.E., Omernik, J.M., Price, A.B., Freeouf, J., and Schrupp, D.L. 2006. Ecoregions of Colorado. Available online at: https://gaftp.epa.gov/EPADDataCommons/ORD/Ecoregions/co/co_front.pdf. Accessed July 2023.
- COGCC (Colorado Oil and Gas Conservation Commission). 2023. High Priority Habitats Mapping Data (effective November 30, 2023). Available online at: https://cogccmap.state.co.us/cogcc_gis_online/. Accessed December 2023.
- CPW (Colorado Parks and Wildlife). 2020. Recommended Buffer Zones and Seasonal Restriction for Colorado Raptors. Available online at: <https://cpw.state.co.us/Documents/WildlifeSpecies/LivingWithWildlife/Raptor-Buffer-Guidelines.pdf>. Accessed July 2023.
- CPW. 2021a. CPW Recommendations to Avoid and Minimize Impacts to Wildlife from Land Use Development in Colorado. Available online at: https://cpw.state.co.us/Documents/Conservation-Resources/Energy-Mining/CPW_HPH-Map-Layers.pdf. Accessed July 2023.
- CPW. 2021b. Colorado Parks and Wildlife Best Management Practices for Solar Energy Development. Available online at: https://cpw.state.co.us/Documents/Commission/2021/June/Item.18-Colorado_Parks_and_Wildlife_Solar_Energy_BMPs_May_2021.pdf. Accessed July 2023.
- CPW. 2022. CPW Raptor Nest Database. Email from Robert Sacco, Colorado Parks and Wildlife GIS Database Specialist, on December 20, 2022. CPWRaptorNests.zip. Accessed July 2023.

- CPW. 2023a. CPW Threatened and Endangered List. Available online at: <https://cpw.state.co.us/learn/pages/soc-threatenedendangeredlist.aspx>. Accessed July 2023.
- CPW. 2023b. All Species Activity Mapping Data. Available online at: <https://hub.arcgis.com/content/190573c5aba643a0bc058e6f7f0510b7/about>. Accessed December 2023.
- CPW. 2023c. Species Profiles: Burrowing Owl. Available online at: <https://hub.arcgis.com/content/190573c5aba643a0bc058e6f7f0510b7/about>. Accessed July 2023.
- Katzner, T.E., M.N. Kochert, K. Steenhof, C.L. McIntyre, E.H. Craig, and T.A. Miller. 2020. Golden Eagle (*Aquila chrysaetos*), version 2.0. In Birds of the World (P.G. Rodewald and B.K. Keeney, Editors). Cornell Lab of Ornithology, Ithaca, NY, USA.
- Monarch Joint Venture. 2023. Monarch Butterfly. Available online at: <https://monarchjointventure.org/monarch-biology/habitat-needs>. Accessed August 2023.
- Sibley, David A. 2014. The Sibley Guide to Birds of North America. 2nd Edition (Sibley Guides). Publisher: Knopf.
- USDA (U.S. Department of Agriculture). 2018. National Agricultural Imagery Program (NAIP). Available online at: <https://naip-usdaonline.hub.arcgis.com/>. Accessed July 2023.
- USFWS. 2023a. Information for Planning and Consultation System. Available online at: <https://www.fws.gov/ipac/>. Accessed December 2023.
- USFWS. 2023b. USFWS Threatened & Endangered Species Active Critical Habitat Report. Available online at: <https://ecos.fws.gov/ecp/report/table/critical-habitat.html>. Accessed July 2023.
- USGS (U.S. Geological Survey). 2019. National Land Cover Database. Multi-Resolution Land Characteristics Consortium. Available online at: <https://www.mrlc.gov/viewer/>. Accessed December 2023.

FIGURES



Hanks Crossing Energy, LLC

**Figure 1
Project Location**

Adams County, CO

Project Features

Project Area

Transportation

Interstate Highway

US Highway

State Highway

Boundaries

County Boundary



Updated: 12/15/2023

NOT FOR CONSTRUCTION

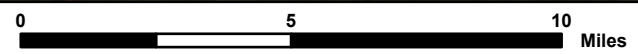
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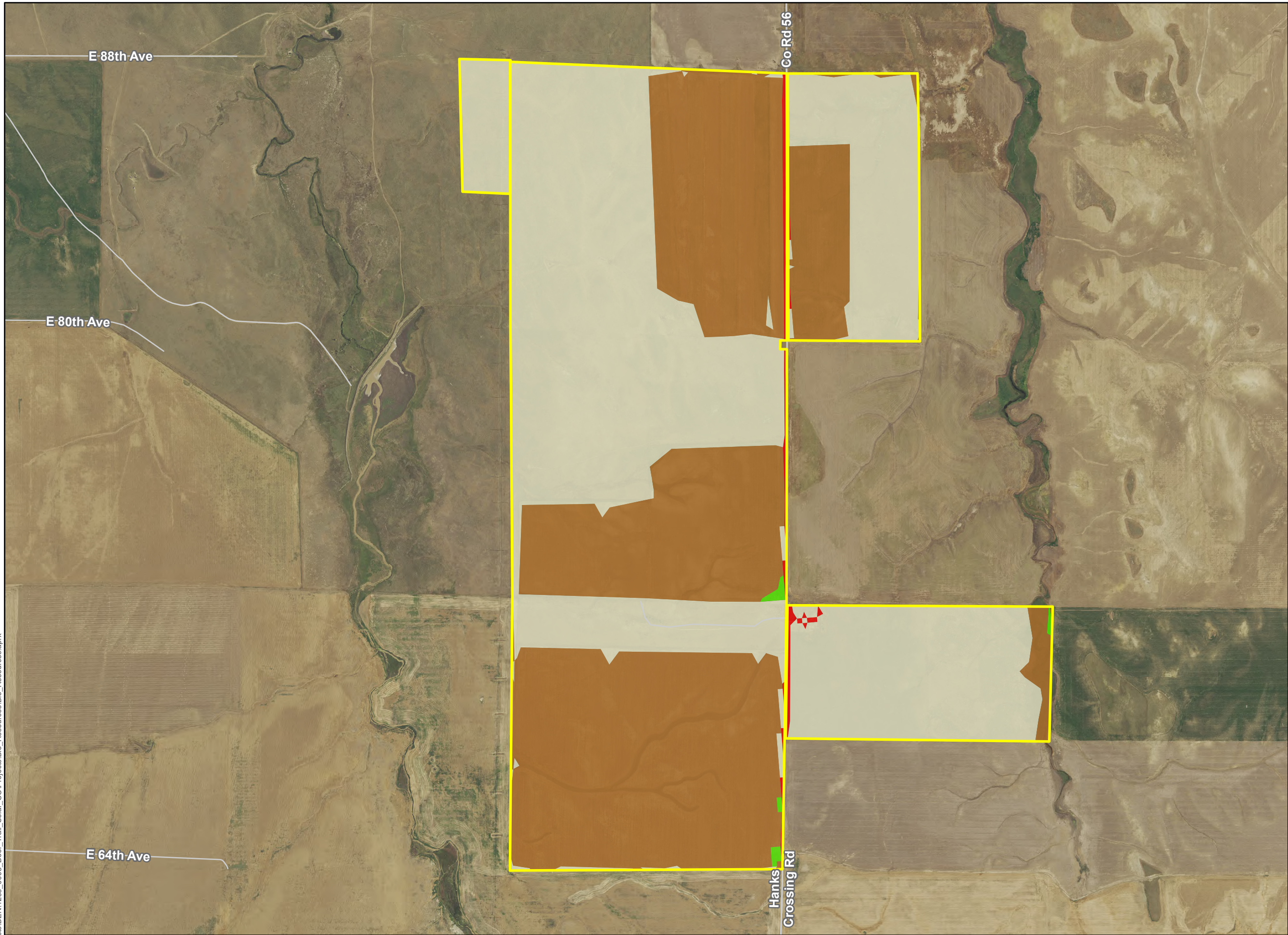
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1:225,000 NAD 1983 StatePlane Colorado North FIPS 0501 Feet



Source: ESRI, USDA NAIP, US CENSUS, BTS



Hanks Crossing Energy, LLC

Figure 2 Land Cover

Adams County, CO

Project Features

Project Area

Transportation
 Local Road

Land Cover Type

- Developed, Open Space
- Grassland/Herbaceous
- Pasture/Hay
- Cultivated Crops



Updated: 12/15/2023
NOT FOR CONSTRUCTION

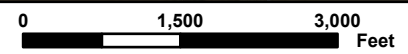
Reference Map



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1:22,000 NAD 1983 StatePlane Colorado North FIPS 0501 Feet



Source: ESRI, USDA NAIP, US CENSUS, BTS, NLCD 2021

Hanks Crossing Energy, LLC


Figure 3 Biological Resources Survey Results

Adams County, CO

Project Features

 Project Area


Transportation


 Local Road


Biological Resources Survey Results

 Active Black-tailed Prairie Dog Colony

 Inactive Prairie Dog Colony

 Inactive Raptor Nest (Unknown Species)

 Swainson's Hawk Nest (Active in July 2023; Inactive in Nov/Dec 2023)

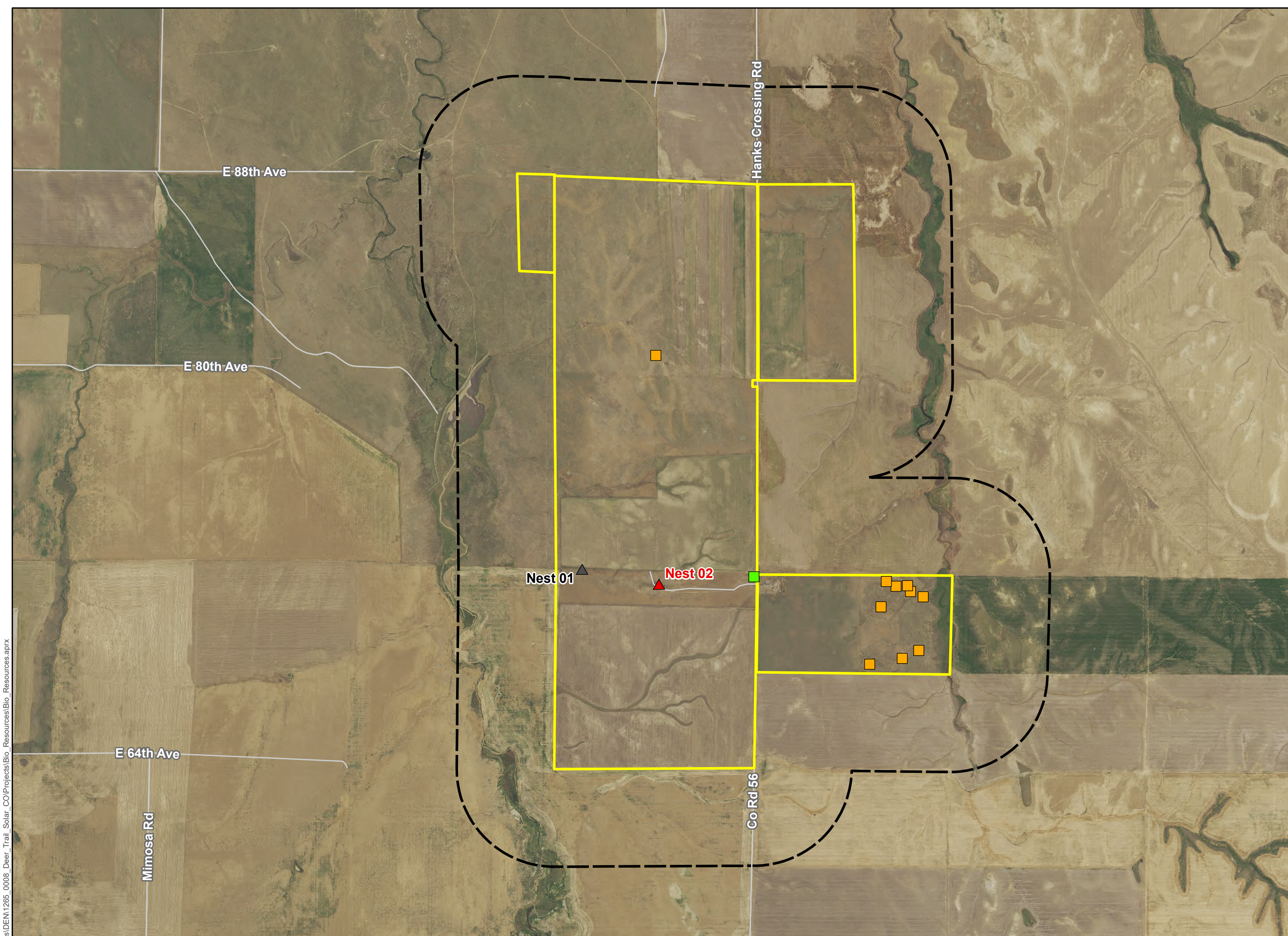
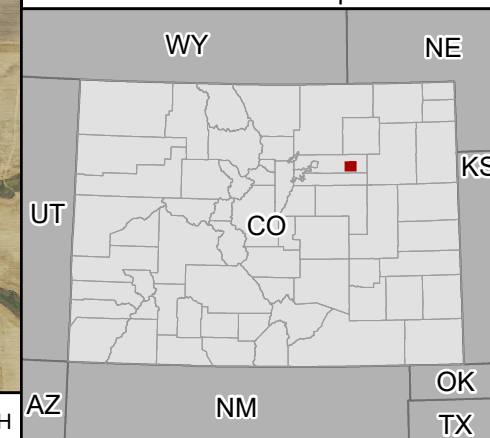
 Raptor Nest Survey Area (0.5-mile)



Updated: 1/8/2024

NOT FOR CONSTRUCTION

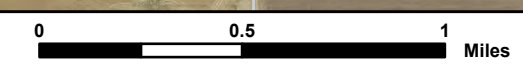
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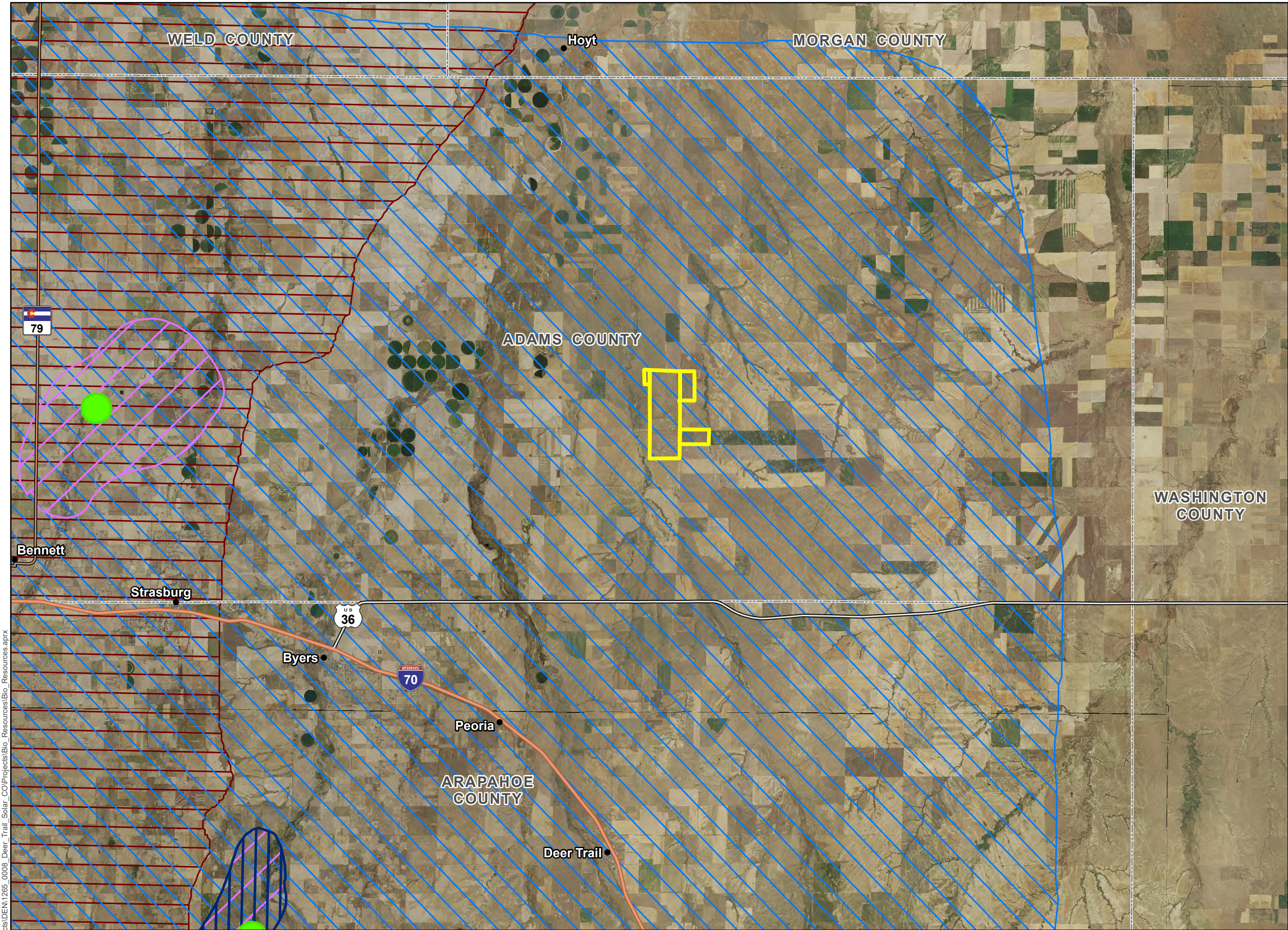
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1:30,000 NAD 1983 StatePlane Colorado North FIPS 0501 Feet



Source: ESRI, USDA NAIP, US CENSUS, BTS, TETRA TECH



Hanks Crossing Energy, LLC

**Figure 4
CPW SAM -
Wildlife Species**

Adams County, CO

- Project Features**
- Project Area
- Transportation**
- Interstate Highway
 - US Highway
- Boundaries**
- County Boundary
- CPW SAM Occurrences***
- Active Bald Eagle Nest
 - Bald Eagle Winter Concentration
 - Bald Eagle Winter Forage
 - Bald Eagle Winter Range
 - Preble's Meadow Jumping Mouse Overall Range

The following occurrences cover the project area and the map frame extent: Burrowing Owl, Ferruginous Hawk, Golden Eagle, Long-billed Curlew, Mountain Plover breeding ranges; Black-tailed Prairie Dog overall range and High Potential for Colony Occurrence; Tri-colored Bat overall range.



Updated: 12/15/2023
NOT FOR CONSTRUCTION

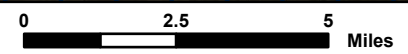
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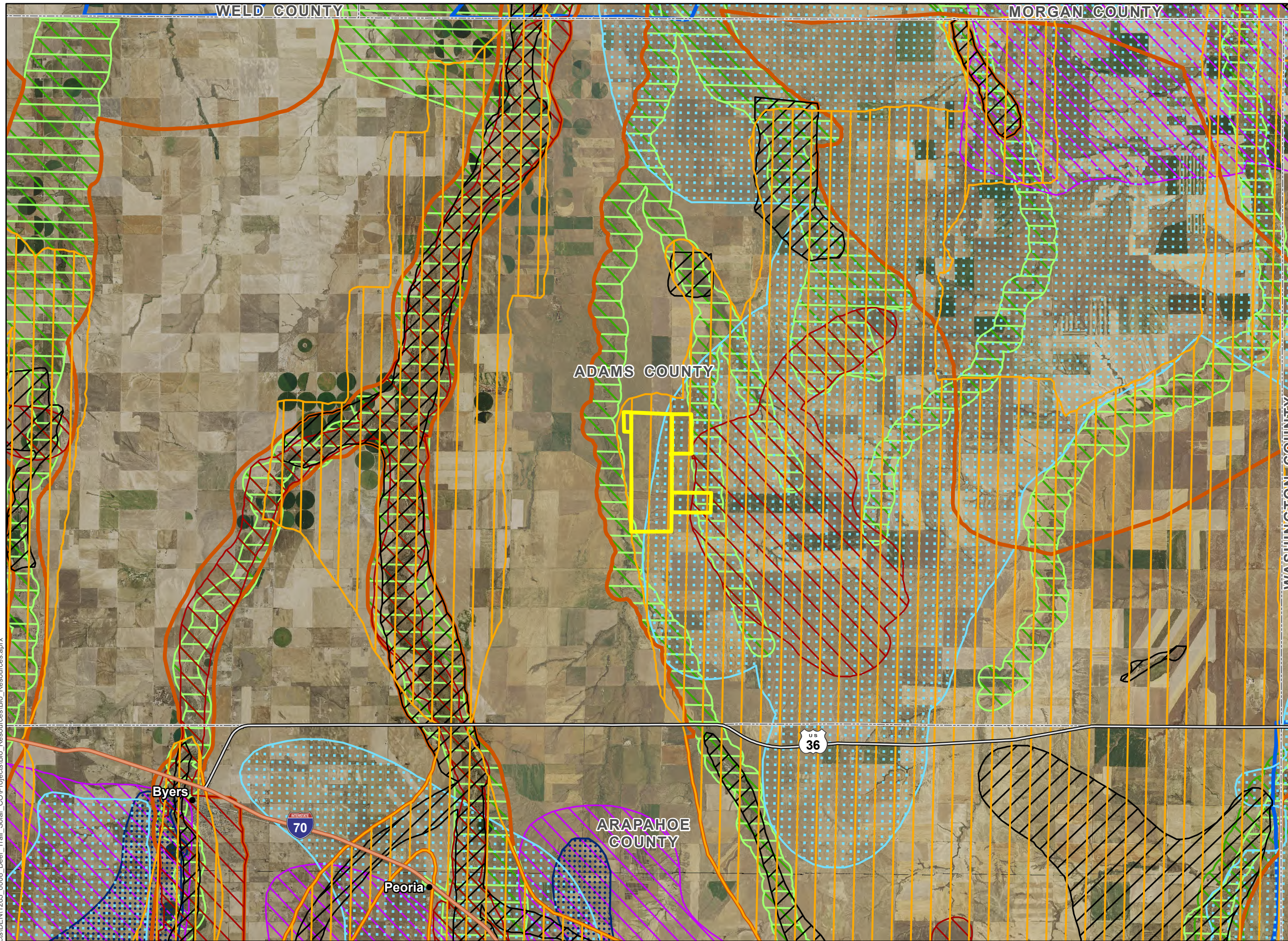
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1:200,000 NAD 1983 StatePlane Colorado North FIPS 0501 Feet



Source: ESRI, USDA NAIP, US CENSUS, BTS, CPW SAM



Hanks Crossing Energy, LLC

**Figure 5
CPW SAM -
Big Game Species**

Adams County, CO

- Project Features**
- Project Area
- Transportation**
- Interstate Highway
 - US Highway
- Boundaries**
- County Boundary
- CPW SAM Occurrences***
- Mule Deer Concentration Area
 - Mule Deer Severe Winter Range
 - Mule Deer Winter Concentration Area
 - Mule Deer Winter Range
 - Pronghorn Concentration Area
 - Pronghorn Severe Winter Range
 - Pronghorn Winter Concentration Area
 - Pronghorn Winter Range
 - White-tailed Deer Concentration Area
 - White-tailed Deer Winter Range

The following occurrences cover the project area and the map frame extent: Mule Deer, Pronghorn, White-tailed Deer Overall Ranges



Updated: 12/15/2023

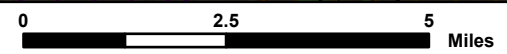
NOT FOR CONSTRUCTION

Reference Map

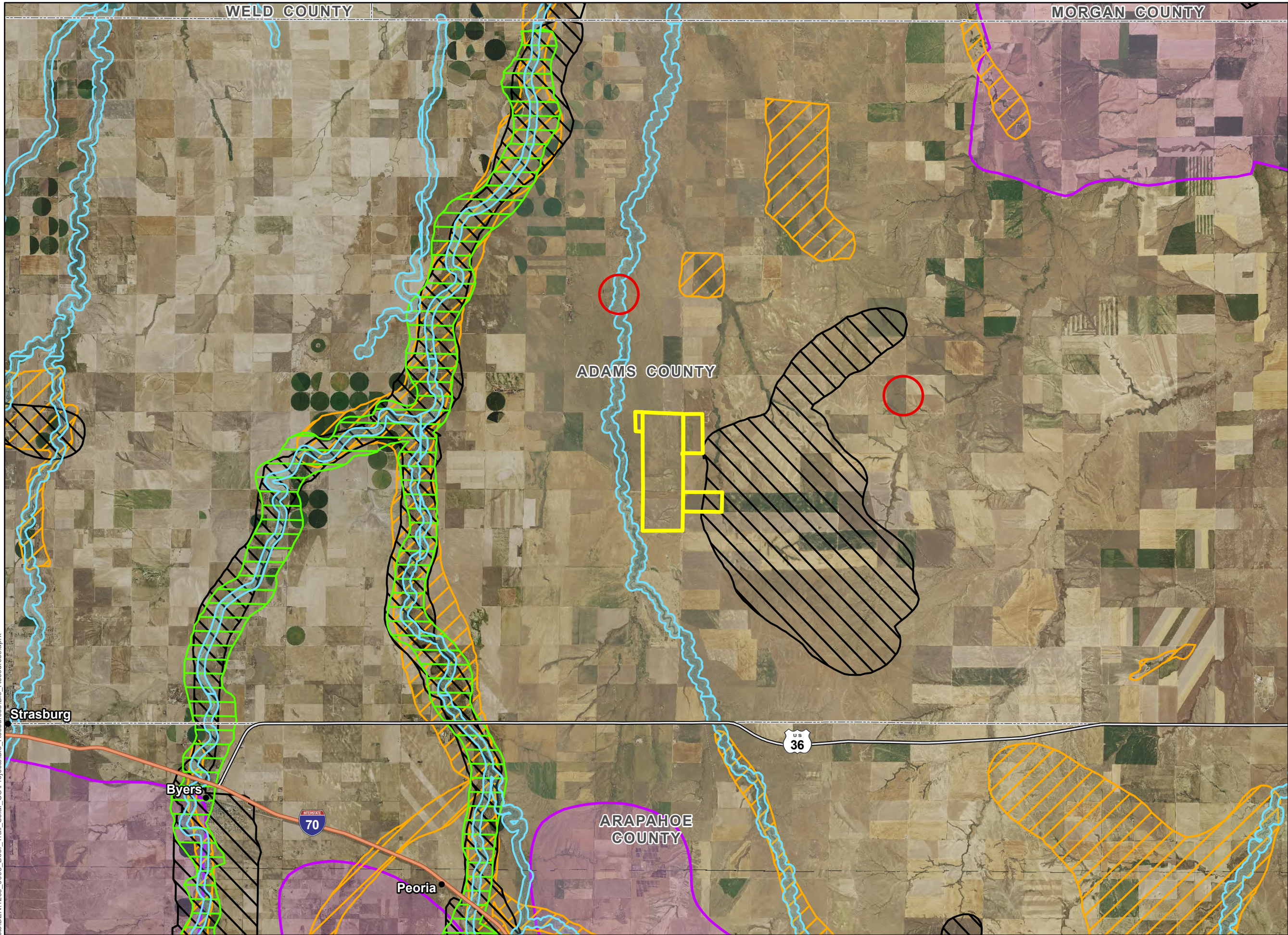


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1:150,000 NAD 1983 StatePlane Colorado North FIPS 0501 Feet



Source: ESRI, USDA NAIP, US CENSUS, BTS, CPW SAM



Hanks Crossing Energy, LLC

**Figure 6
CPW High Priority Habitat**

Adams County, CO

Project Features

Project Area

Transportation

Interstate Highway

US Highway

Boundaries

County Boundary

CPW High Priority Habitat

Ferruginous Hawk Active Nest Site

Aquatic Native Species Conservation Waters

Mule Deer Migration Corridor

Mule Deer Winter Concentration Area

Mule Deer Severe Winter Range

Pronghorn Winter Concentration



Updated: 12/15/2023

NOT FOR CONSTRUCTION

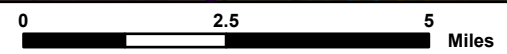
Reference Map



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1:150,000 NAD 1983 StatePlane Colorado North FIPS 0501 Feet



Source: ESRI, USDA NAIP, US CENSUS, BTS, CPW HPH

APPENDIX A
USFWS IPAC

IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Location

Adams County, Colorado



Local office

Colorado Ecological Services Field Office

☎ (303) 236-4773

📅 (303) 236-4005

MAILING ADDRESS

Denver Federal Center
P.O. Box 25486
Denver, CO 80225-0486

PHYSICAL ADDRESS

134 Union Boulevard, Suite 670
Lakewood, CO 80228-1807

NOT FOR CONSULTATION

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species¹ and their critical habitats are managed by the [Ecological Services Program](#) of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries²).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact [NOAA Fisheries](#) for [species under their jurisdiction](#).

-
1. Species listed under the [Endangered Species Act](#) are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the [listing status page](#) for more information. IPaC only shows species that are regulated by USFWS (see FAQ).

2. [NOAA Fisheries](#), also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially affected by activities in this location:

Mammals

NAME	STATUS
<p>Gray Wolf <i>Canis lupus</i></p> <p>This species only needs to be considered if the following condition applies:</p> <ul style="list-style-type: none">Lone, dispersing gray wolves may be present throughout the state of Colorado. If your activity includes a predator management program, please consider this species in your environmental review. <p>There is final critical habitat for this species. https://ecos.fws.gov/ecp/species/4488</p>	Endangered
<p>Preble's Meadow Jumping Mouse <i>Zapus hudsonius preblei</i></p> <p>Wherever found</p> <p>There is final critical habitat for this species. Your location does not overlap the critical habitat. https://ecos.fws.gov/ecp/species/4090</p>	Threatened
<p>Tricolored Bat <i>Perimyotis subflavus</i></p> <p>Wherever found</p> <p>No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/10515</p>	Proposed Endangered

Birds

NAME	STATUS
<p>Piping Plover <i>Charadrius melodus</i></p> <p>This species only needs to be considered if the following condition applies:</p> <ul style="list-style-type: none">Project includes water-related activities and/or use in the N. Platte, S. Platte, and Laramie River Basins which may affect listed species in Nebraska. <p>There is final critical habitat for this species. Your location does not overlap the critical habitat. https://ecos.fws.gov/ecp/species/6039</p>	Threatened

Whooping Crane *Grus americana* Endangered
There is **final** critical habitat for this species. Your location does not overlap the critical habitat.
<https://ecos.fws.gov/ecp/species/758>

Fishes

NAME	STATUS
<p>Pallid Sturgeon <i>Scaphirhynchus albus</i> Wherever found This species only needs to be considered if the following condition applies:</p> <ul style="list-style-type: none">• Project includes water-related activities and/or use in the N. Platte, S. Platte, and Laramie River Basins which may affect listed species in Nebraska. <p>No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/7162</p>	Endangered

Insects

NAME	STATUS
<p>Monarch Butterfly <i>Danaus plexippus</i> Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9743</p>	Candidate

Flowering Plants

NAME	STATUS
<p>Ute Ladies'-tresses <i>Spiranthes diluvialis</i> Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/2159</p>	Threatened
<p>Western Prairie Fringed Orchid <i>Platanthera praeclara</i> Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/1669</p>	Threatened

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

There are no critical habitats at this location.

You are still required to determine if your project(s) may have effects on all above listed species.

Bald & Golden Eagles

There are no documented cases of eagles being present at this location. However, if you believe eagles may be using your site, please reach out to the local Fish and Wildlife Service office.

Additional information can be found using the following links:

- Eagle Management <https://www.fws.gov/program/eagle-management>
- Measures for avoiding and minimizing impacts to birds
<https://www.fws.gov/library/collections/avoiding-and-minimizing-incident-take-migratory-birds>
- Nationwide conservation measures for birds
<https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf>
- Supplemental Information for Migratory Birds and Eagles in IPaC
<https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action>

What does IPaC use to generate the potential presence of bald and golden eagles in my specified location?

The potential for eagle presence is derived from data provided by the [Avian Knowledge Network \(AKN\)](#). The AKN data is based on a growing collection of [survey, banding, and citizen science datasets](#) and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle ([Eagle Act](#) requirements may apply). To see a list of all birds potentially present in your project area, please visit the [Rapid Avian Information Locator \(RAIL\) Tool](#).

What does IPaC use to generate the probability of presence graphs of bald and golden eagles in my specified location?

The Migratory Bird Resource List is comprised of USFWS [Birds of Conservation Concern \(BCC\)](#) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the [Avian Knowledge Network \(AKN\)](#). The AKN data is based on a growing collection of [survey, banding, and citizen science datasets](#) and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle ([Eagle Act](#) requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the [Rapid Avian Information Locator \(RAIL\) Tool](#).

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the [Eagle Act](#) should such impacts occur. Please contact your local Fish and Wildlife Service Field Office if you have questions.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act¹ and the Bald and Golden Eagle Protection Act².

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats³ should follow appropriate regulations and consider implementing appropriate conservation measures, as described in the links below. Specifically, please review the "[Supplemental Information on Migratory Birds and Eagles](#)".

1. The [Migratory Birds Treaty Act](#) of 1918.
2. The [Bald and Golden Eagle Protection Act](#) of 1940.

Additional information can be found using the following links:

- Eagle Management <https://www.fws.gov/program/eagle-management>
- Measures for avoiding and minimizing impacts to birds <https://www.fws.gov/library/collections/avoiding-and-minimizing-incident-take-migratory-birds>
- Nationwide conservation measures for birds <https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf>
- Supplemental Information for Migratory Birds and Eagles in IPaC <https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action>

The birds listed below are birds of particular concern either because they occur on the [USFWS Birds of Conservation Concern \(BCC\)](#) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ [below](#). This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the [E-bird data mapping tool](#) (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found [below](#).

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, see the PROBABILITY OF PRESENCE SUMMARY below to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
Ferruginous Hawk <i>Buteo regalis</i> This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/6038	Breeds Mar 15 to Aug 15
Long-billed Curlew <i>Numenius americanus</i> This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/5511	Breeds Apr 1 to Jul 31
Long-eared Owl <i>asio otus</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/3631	Breeds Mar 1 to Jul 15

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read ["Supplemental Information on Migratory Birds and Eagles"](#), specifically the FAQ section titled "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is $0.25/0.25 = 1$; at week 20 it is $0.05/0.25 = 0.2$.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

Breeding Season (■)

Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)

Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

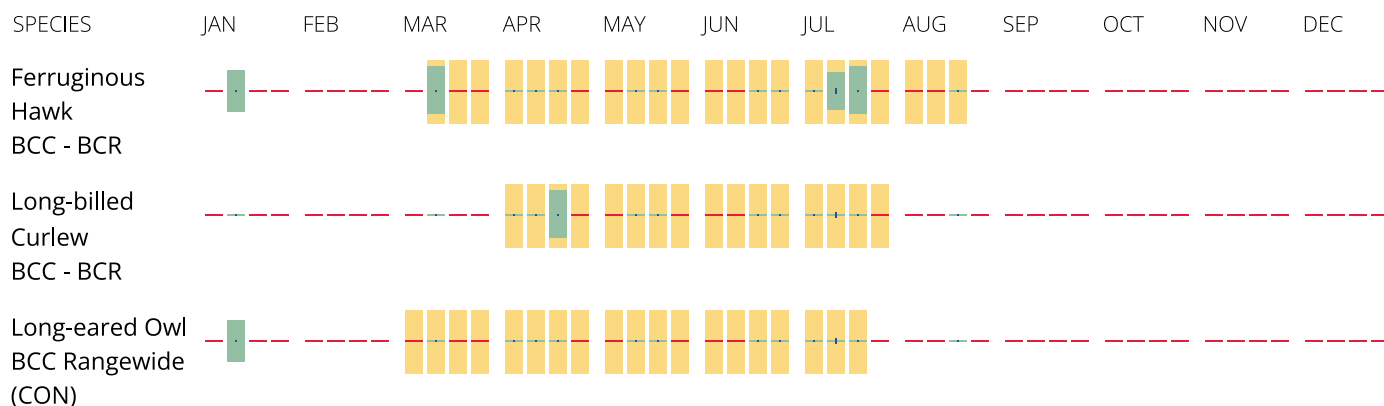
To see a bar's survey effort range, simply hover your mouse cursor over the bar.

No Data (—)

A week is marked as having no data if there were no survey events for that week.

Survey Timeframe

Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.



Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

[Nationwide Conservation Measures](#) describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the [Probability of Presence Summary](#). [Additional measures](#) or [permits](#) may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the list of migratory birds that potentially occur in my specified location?

The Migratory Bird Resource List is comprised of USFWS [Birds of Conservation Concern \(BCC\)](#) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the [Avian Knowledge Network \(AKN\)](#). The AKN data is based on a growing collection of [survey, banding, and citizen science datasets](#) and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle ([Eagle Act](#) requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the [Rapid Avian Information Locator \(RAIL\) Tool](#).

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the [Avian Knowledge Network \(AKN\)](#). This data is derived from a growing collection of [survey, banding, and citizen science datasets](#).

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go to the [Probability of Presence Summary](#) and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering or migrating in my area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may query your location using the [RAIL Tool](#) and look at the range maps provided for birds in your area at the bottom of the profiles provided for each bird in your results. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are [Birds of Conservation Concern](#) (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the [Eagle Act](#) requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the [Northeast Ocean Data Portal](#). The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the [NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf](#) project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the [Diving Bird Study](#) and the [nanotag studies](#) or contact [Caleb Spiegel](#) or [Pam Loring](#).

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to [obtain a permit](#) to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the [National Wildlife Refuge](#) system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

There are no refuge lands at this location.

Fish hatcheries

There are no fish hatcheries at this location.

Wetlands in the National Wetlands Inventory (NWI)

Impacts to [NWI wetlands](#) and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local [U.S. Army Corps of Engineers District](#).

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

This location overlaps the following wetlands:

FRESHWATER EMERGENT WETLAND

[PEM1A](#)

RIVERINE

[R4SBC](#)

[R5UBH](#)

A full description for each wetland code can be found at the [National Wetlands Inventory website](#)

NOTE: This initial screening does **not** replace an on-site delineation to determine whether wetlands occur. Additional information on the NWI data is provided below.

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tubercid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate Federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

NOT FOR CONSULTATION

**APPENDIX B
PHOTO LOG**



Photo 1: Black-tailed prairie dog (*Cynomys ludovicianus*) burrow with burrowing owl sign.



Photo 2: Milkweed (*Asclepias* sp.), the host plant for the monarch butterfly (*Danaus plexippus*), is found throughout the Project Area.



Photo 3: Cultivated crop (wheat) land cover found throughout approximately half of the Project Area.



Photo 4: Grassland/herbaceous land cover found throughout approximately half of the Project Area.



Photo 5: Nest 01, an inactive small nest, found in a broadleaf tree.



Photo 6: Nest 02, active Swainson's hawk (*Buteo swainsoni*) nest found in a broadleaf tree.



Photo 7: Black-tailed prairie dog burrow entrance that has been closed.



Photo 8: Example of water trough present throughout site for cattle-may attract big game species.



Photo 9: Herbaceous grassland vegetation present along western portion of Project Area.



Photo 10: Recently harvested cropland present along eastern portion of Project Area.



Photo 11: Active prairie dog colony located within southeastern portion of the Project Area.



Photo 12: Streambed of Little Muddy Creek, located along southeastern edge of Project Area.

**APPENDIX C
SPECIES OBSERVED DURING FIELD SURVEY**

Species Observed During the Hanks Crossing Solar Project Field Survey

Common Name	Scientific Name
Birds	
American white pelican	<i>Pelecanus erythrorhynchos</i>
Cassin's sparrow	<i>Peucaea cassinii</i>
Grasshopper sparrow	<i>Ammodramus savannarum</i>
Horned lark	<i>Eremophila alpestris</i>
Lapland longspur	<i>Calcarius lapponicus</i>
Lark bunting	<i>Calamospiza melanocorys</i>
Lark sparrow	<i>Chondestes grammacus</i>
Merlin	<i>Falco columbarius</i>
Mourning dove	<i>Zenaida macroura</i>
Northern Harrier	<i>Circus cyaneus</i>
Red-tailed hawk	<i>Buteo jamaicensis</i>
Red-winged blackbird	<i>Agelaius phoeniceus</i>
Swainson's hawk	<i>Buteo swainsoni</i>
Turkey vulture	<i>Cathartes aura</i>
Virginia rail	<i>Rallus limicola</i>
Western kingbird	<i>Tyrannus verticalis</i>
Western meadowlark	<i>Sturnella neglecta</i>
Insects	
Monarch butterfly	<i>Danaus plexippus</i>
Mammals	
Black-tailed jackrabbit	<i>Lepus californicus</i>
Coyote	<i>Canis latrans</i>
Mule deer	<i>Odocoileus hemionus</i>
Pronghorn	<i>Antilocapra americana</i>
Raccoon	<i>Procyon lotor</i>
Plants	
Adonis blazingstar	<i>Mentzelia multiflora</i>
Broom snakeweed	<i>Gutierrezia sarothrae</i>
Buffalo bur	<i>Solanum rostratum</i>
Cheatgrass	<i>Bromus tectorum</i>

Common mullein	<i>Verbascum thapsus</i>
Fendler's hawkweed	<i>Hieracium fendleri</i>
Field bindweed	<i>Convolvulus arvensis</i>
Great bulrush	<i>Schoenoplectus tabernaemontani</i>
Green foxtail	<i>Setaria viridis</i>
Hairy goldenaster	<i>Heterotheca villosa</i>
Horseweed	<i>Erigeron canadensis</i>
Inland rush	<i>Juncus interior</i>
Kochia	<i>Bassia scoparia</i>
Little bluestem	<i>Schizachyrium scoparium</i>
Milkweed	<i>Asclepias spp.</i>
Mutton grass	<i>Poa fendleriana</i>
Needle-and-thread grass	<i>Hesperostipa comata</i>
Plains prickly pear cactus	<i>Opuntia polycantha</i>
Rubber rabbitbrush	<i>Ericameria nauseosa</i>
Russian thistle	<i>Salsola sp.</i>
Sand sagebrush	<i>Artemisia filifolia</i>
Showy goldenrod	<i>Solidago speciosa</i>
Smooth Brome	<i>Bromus inermis</i>
Soapweed yucca	<i>Yucca glauca</i>
Tall tumbled mustard	<i>Sisymbrium altissimum</i>
Upright prairie coneflower	<i>Ratibida columnifera</i>
Western Wheatgrass	<i>Pascopyrum smithii</i>
Woolly milkvetch	<i>Astragalus mollissimus</i>
Yellow salsify	<i>Tragopogon dubius</i>
Yellowspine thistle	<i>Cirsium ochrocentrum</i>
Reptiles	
Western earless lizard	<i>Holbrookia maculata</i>

Cultural Resources Desktop Assessment

Hanks Crossing Energy
Adams County,
Colorado

April 2024



Prepared for

Hanks Crossing Energy, LLC
1 Bridge Street, Suite 11
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1.0 INTRODUCTION

Hanks Crossing Energy, LLC, a subsidiary of Novis Renewables, LLC (Novis), is proposing to develop Hanks Crossing Energy (Project; formerly known as the Deer Trail Solar Project), a proposed 355-megawatt photovoltaic (PV) and 178-megawatt battery energy storage system (BESS) utility-scale project encompassing approximately 2,659 acres of private land (Project Area) in unincorporated Adams County, Colorado, approximately 13 miles northeast of the town of Byers (Figure).

At the request of Novis, a Tetra Tech, Inc. (Tetra Tech) archaeologist conducted a site file search and literature review of the Project Area and a 1-mile buffer surrounding the Project Area, herein referred to as the Research Area, for previously recorded sites and previously conducted surveys. The Project is located within the Poison Springs (1954) and Leader SE (1951) quadrangles. The legal locations of the Research Area within Colorado are listed below in Table 1 and shown in Figures 1 and 2.

Table 1 Legal Locations of the Research Area for Hanks Crossing Energy

Township	Range	Section(s)
2 South	59 West	19-22, 27-34
3 South	59 West	3-10
2 South	60 West	24, 25

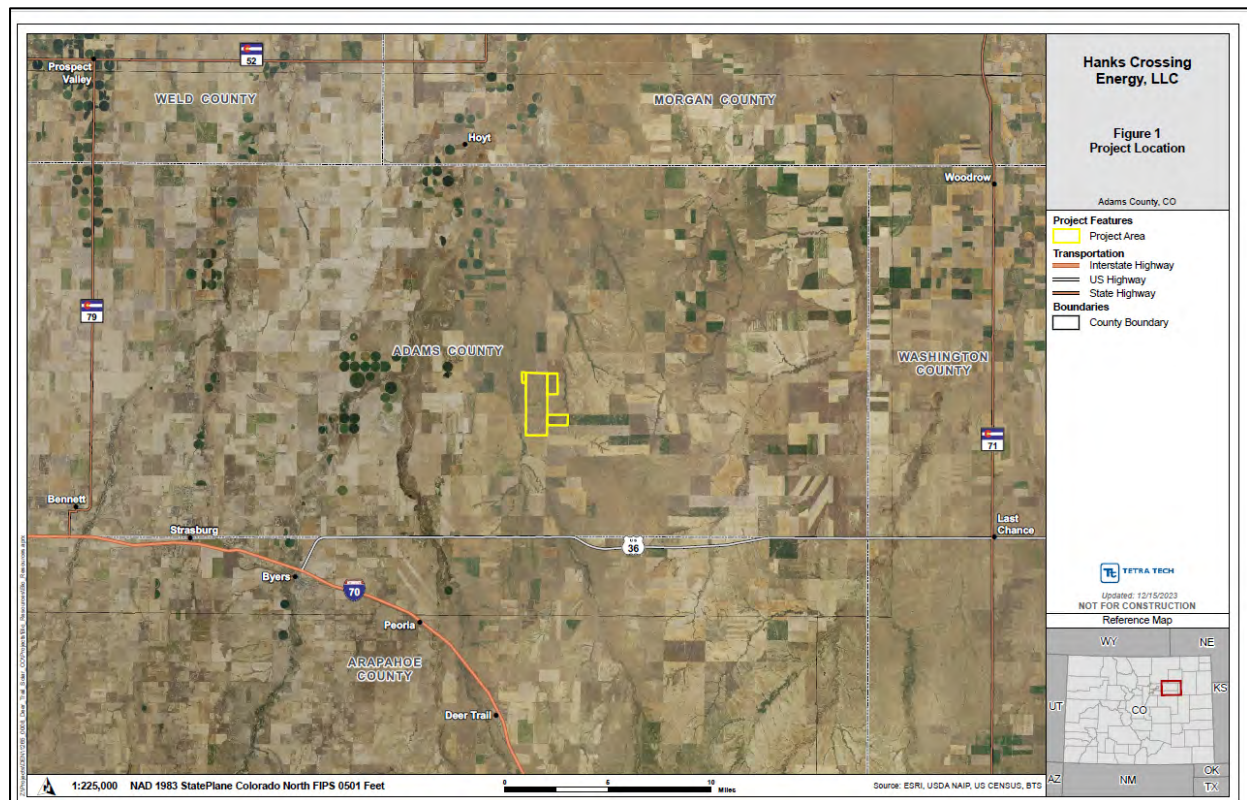


Figure 1 Hanks Crossing Energy Project Location

2.0 CULTURAL RESOURCES REGULATIONS AND POTENTIAL APPLICABILITY

Several state and federal laws intended to protect cultural resources may apply to the proposed Project. The following laws may apply to actions on federal, state, or private land on which federal actions (e.g., federal permitting or funding) are required, or where state and local statutes apply:

Federal: Section 106 of the National Historic Preservation Act (54 U.S.C. § 306108) requires federal agencies to take into account the effects of their undertakings on historic properties and to provide the Advisory Council on Historic Preservation with a reasonable opportunity to comment. In addition, federal agencies are required to consult on the Section 106 process with State Historic Preservation Offices (SHPO), Tribal Historic Preservation Offices, Indian Tribes (to include Alaska Natives) [Tribes], and Native Hawaiian Organizations. At this time no federal nexus exists for the Project.

State: Colorado Revised Statutes (CRS) Title 24—Article 80 Section 4 (CRS 24-80-401 to CRS 24-80-410) was created to “coordinate, encourage, and preserve” Colorado’s archaeological and paleontological resources. It sets in place the permitting system for archaeological survey and excavation on state land, including qualifications of the permitted archaeologists and the reporting requirements. The law makes it a Class 2 misdemeanor to knowingly appropriate, excavate, injure, or destroy any archaeological or historical resource on any land that is considered a political subdivision of the state without a valid permit.

Colorado Revised Statutes Title 24—Article 80 Section 13 (CRS 24-80-1301 to CRS 24-80-1305) provides procedures when an unmarked human burial is discovered and the penalties for knowingly disturbing an unmarked burial. Upon the discovery of human remains, the coroner or chief medical officer must be notified. The state archaeologist will appoint a qualified archaeologist to examine the remains. It is a Class 1 misdemeanor to knowingly disturb human remains.

Local: No known county or municipal statutes pertain to the Project at this time. Local requirements may arise as a part of the Project’s Conditional Use Permit.

3.0 METHODOLOGY

A qualified professional archaeologist from Tetra Tech conducted the site file search through the Colorado Historic Society Office of Archaeology and Historical Preservation (OAHP) Colorado Cultural Resource Online Database (Compass) on December 14, 2023. This database includes records of all archaeological investigations that have been conducted and all cultural resources (prehistoric and historic archaeological sites) that have been previously recorded within the Research Area. Included in the Compass data are records of properties listed on the National Register of Historic Places (NRHP).

Figures 2 and 3 depict the locations of both the previously conducted investigations and the previously recorded cultural resources within the Research Area. The GIS data provided for this Project was produced by digitizing site locations from an electronic map. Although the digitization of these locations may be accurate, it is based upon data collected from multiple sources over a 40-year span and therefore may not accurately represent a given site location or site boundary’s full extent.

4.0 RESULTS OF DESKTOP REVIEW FOR CULTURAL RESOURCES

4.1 Previous Cultural Resource Investigations

Within the Research Area, two prior investigations have been undertaken (Table 2; Figures 2 and 3). One investigation falls within the Project Area (bolded text in Table 2). This investigation was a survey on private land.

Table 2 Previously Conducted Archaeological Investigations within the Research Area

Report Number	Author(s)	Report Title	Date
AM.SC.NR13	Lana Armon	Adams County limited Results Cultural Resources Survey Report on Private Lands (Raymond Morris).	2011
AM.E.R4	Josh McNutt and Gordon C. Tucker Jr.	Leader One Gas Storage Project, Adams County, Colorado: Results of an Intensive Cultural Resource Inventory.	2011
Project Area = Bold			

4.2 Previously Identified Cultural Resources

Within the Research Area, 8 cultural resources have been previously documented (Table 3; Figures 1 and 2). Three of the resources are prehistoric open camps and the remaining are prehistoric lithic scatters. None of the sites have been evaluated for the NRHP, nor are any located within the Project Area.

Table 3 Previously Recorded Archaeological Resources within the Research Area

Site Number	Time Period	Site Type	NRHP ¹ Eligibility
5AM.5	Prehistoric	Open Camp	Unevaluated
5AM.6	Prehistoric	Lithic Scatter	Unevaluated
5AM.7	Prehistoric	Open Camp	Unevaluated
5AM.8	Prehistoric	Open Camp	Unevaluated
5AM.9	Prehistoric	Lithic Scatter	Unevaluated
5AM.10	Prehistoric	Lithic Scatter	Unevaluated
5AM.11	Prehistoric	Lithic Scatter	Unevaluated
5AM.2763	Prehistoric	Lithic Scatter	Unevaluated

A review of the historic General Land Office (GLO) maps for the legal locations provided in Table 1 did not reveal any potential cultural resources.

4.3 National Register of Historic Places Properties and Districts

No listed NRHP properties or districts are located within the Research Area.

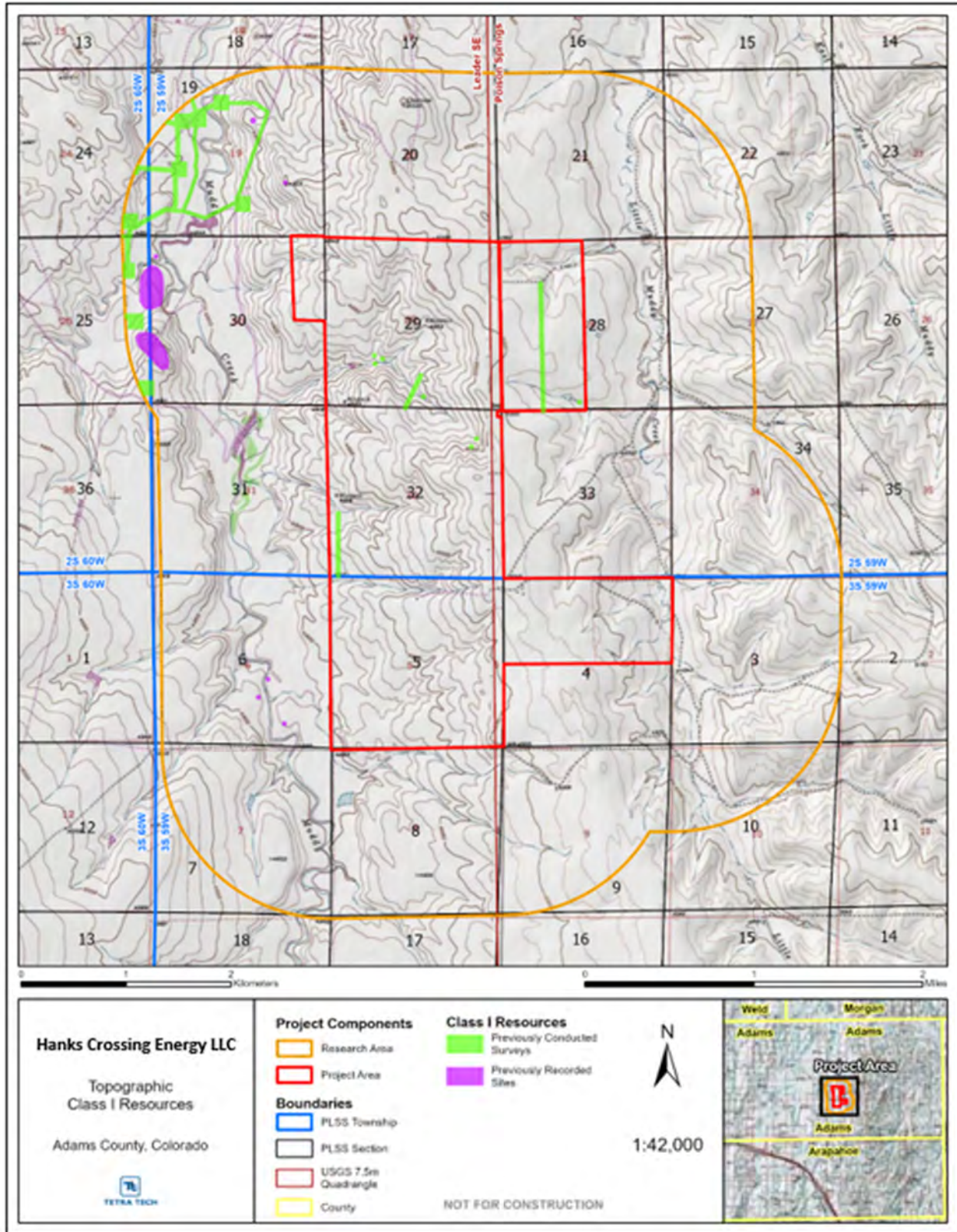


Figure 2 USGS Topographic Map of Research Area and Project Area for Hanks Crossing Energy

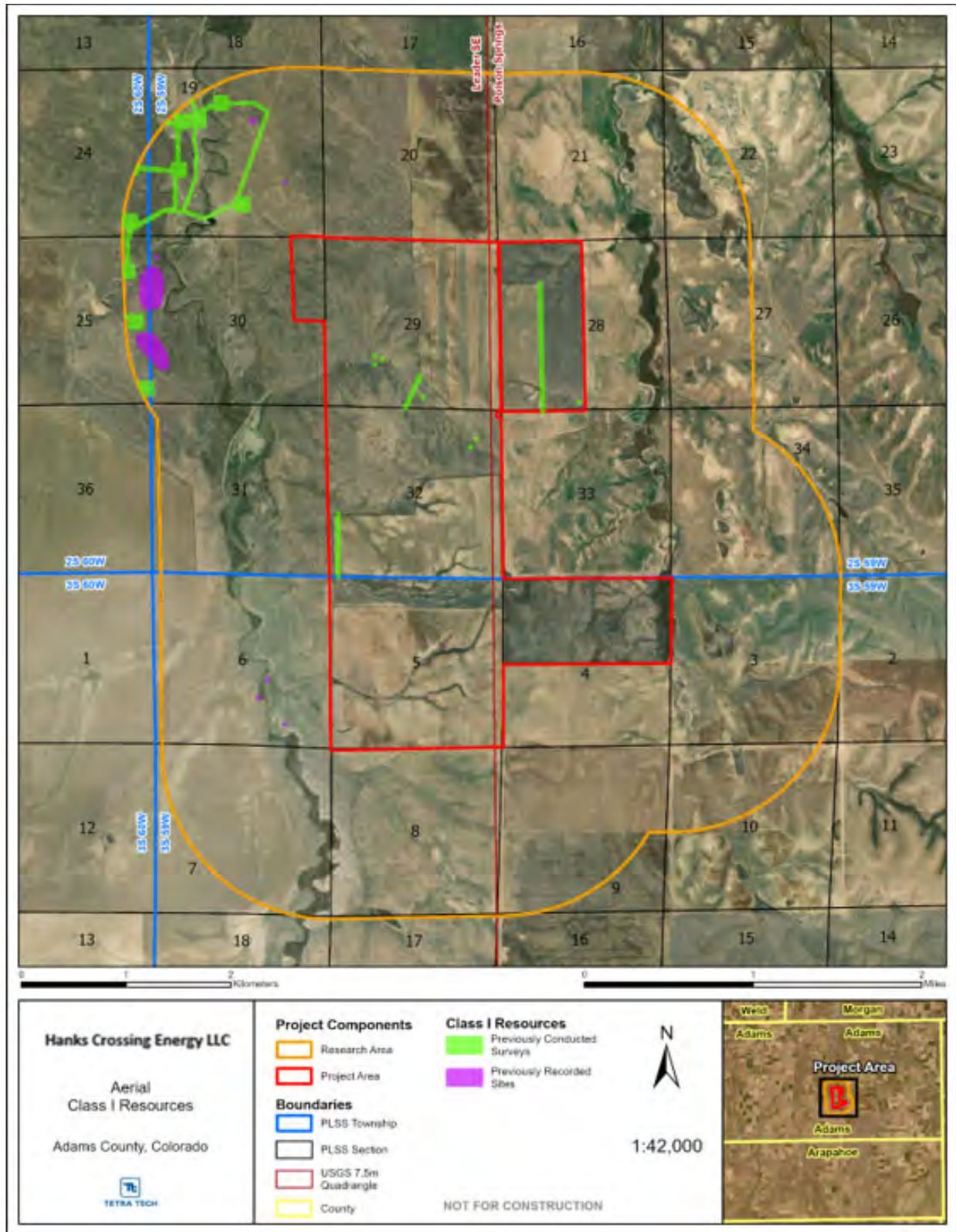


Figure 3 Aerial Imagery Map of Research Area and Project Area for Hanks Crossing Energy

5.0 CONCLUSION AND RECOMMENDATIONS

Eight cultural resources were identified within the Research Area, none of which fall within the Project Area. All eight resources have been determined as unevaluated for listing on the NRHP. Based on this the results of the file search, there are no anticipated direct or indirect Project impacts to previously recorded resources identified within the Research Area. The low density of sites identified within the Project Area may be a function of a general lack of surveys and archaeological investigations in the region rather than an actual lack of sites, as a large portion of the Project Area has not been previously surveyed. Therefore, although there are no documented eligible resources within the Project Area, undocumented cultural resources may be present within the Project Area.

Based on the current Project understanding, there is no state or federal nexus anticipated for the Project that would require a cultural resource investigation for compliance with Section 106 of the National Historic Preservation Act or associated tribal consultation. However, any portions of the Project that may fall under Federal or State jurisdiction (e.g. Section 404 of the Clean Water Act) will likely require complete archaeological survey of any permitted areas. Tetra Tech also recommends developing a Project-specific, Unanticipated Discoveries Plan prior to the start of construction to have procedures in place for unexpected finds, human remains, and other archaeological remains.

APPENDIX I PHASE I ESA (FULL REPORT)

FINAL

PHASE I ENVIRONMENTAL

SITE ASSESSMENT

HANKS CROSSING ENERGY
ADAMS COUNTY, COLORADO

April 4, 2024

Prepared for

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EXECUTIVE SUMMARY

On behalf of Hanks Crossing Energy, LLC, a subsidiary of Novis Renewables, LLC (Novis or the User), Tetra Tech, Inc. (Tetra Tech) performed a Phase I Environmental Site Assessment (ESA) for Hanks Crossing Energy (the Project), a proposed 355-megawatt photovoltaic (PV) and 178-megawatt battery energy storage system (BESS) utility-scale project, herein referred to as the Subject Property. The Subject Property encompasses approximately 2,659 acres of agricultural land in Adams County, Colorado (Figure 1). This Phase I ESA was prepared in accordance with ASTM International Standard E2247-16, *Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process for Forestland or Rural Property* (ASTM 2016), including the U.S. Environmental Protection Agency's All Appropriate Inquiries rule. The purpose of this Phase I ESA was to determine, to the maximum extent practicable, the presence or likely presence of recognized environmental conditions (RECs), historical RECs (HRECs), and/or controlled RECs (CRECs) in, on, or at the Subject Property.

Based on the site reconnaissance performed on December 27, 2023; the completed User questionnaire; the completed landowner questionnaires; the environmental regulatory search report provided by Environmental Data Resources, Inc. (EDR) on December 14, 2023; and review of historical topographic maps and aerial photographs, no RECs, HRECs, or CRECs were identified on the Subject Property.

The following findings were identified:

- During a previous Phase I ESA, completed in September 2023 (Tetra Tech 2023), one landowner, Mr. Raymond Morris, provided information on active and abandoned wells within the Subject Property. An oil well was active for 4 years during the 1980s in Section 29 of the property. That oil well was abandoned. Three plugged oil and gas wells were mapped within the Subject Property boundaries (Colorado Oil and Gas Conservation Commission 2023). Five water wells are currently used for cattle; and approximately 8 abandoned water wells are on the property. At the time of report production, an updated landowner questionnaire has not been received from Mr. Morris; however, the active and abandoned oil wells and water wells remain a finding for the Subject Property.
- A dilapidated cattle tank, rusted metal box, and downed windmill were observed in the southwestern portion of the Subject Property (Appendix E, Photo 16).

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ACRONYMS AND ABBREVIATIONS

AAI	All Appropriate Inquiries
ASTM	ASTM International
BESS	Battery Energy Storage System
bgs	below ground surface
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CERCLIS	Comprehensive Environmental Response, Compensation and Liability Information System
CDNR	Colorado Department of Natural Resources
CDPHE	Colorado Department of Public Health and Environment
COGCC	Colorado Oil and Gas Conservation Commission
CREC	Controlled Recognized Environmental Condition
CFR	Code of Federal Regulations
CORRACTS	Corrective Action Reports
DNPL	Federal Delisted National Priorities List
EDR	Environmental Data Resources, Inc.
EPA	U.S. Environmental Protection Agency
ESA	Environmental Site Assessment
HREC	Historical Recognized Environmental Condition
Novis	Novis Renewables, LLC
NPL	National Priorities List
Project	Hanks Crossing Solar Project
PV	Photovoltaic
REC	Recognized Environmental Condition
RCRA	Resource Conservation and Recovery Act
Subject Property	Approximately 2,659 acres in Adams County, Colorado
Tetra Tech	Tetra Tech, Inc.
TSD	Treatment, Storage, and Disposal
USGS	U.S. Geological Survey
UST	Underground Storage Tank

1.0 INTRODUCTION

On behalf of Hanks Crossing Energy, LLC, a subsidiary of Novis Renewables, LLC (Novis or the User), Tetra Tech, Inc. (Tetra Tech) performed a Phase I Environmental Site Assessment (ESA) for Hanks Crossing Energy (the Project), a proposed 355-megawatt photovoltaic (PV) and 178-megawatt battery energy storage system (BESS) utility-scale project, herein referred to as the Subject Property. The Subject Property encompasses approximately 2,659 acres of agricultural land in Adams County, Colorado (Figure 1). This Phase I ESA was prepared in accordance with ASTM International (ASTM) Standard E2247-16, *Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process for Forestland or Rural Property* (ASTM 2016), including the U.S. Environmental Protection (EPA) Agency's All Appropriate Inquiries (AAI) rule. The purpose of this Phase I ESA was to determine, to the maximum extent practicable, the presence or likely presence of recognized environmental conditions (RECs), historical RECs (HRECs), and/or controlled RECs (CRECs) in, on, or at the Subject Property.

The following subsections discuss the purpose of this report; the scope of services; significant assumptions; limitations and exceptions of assessments; and special terms and conditions.

1.1 Purpose

The objective of a Phase I ESA is to identify RECs, HRECs, and/or CRECs related to the Subject Property. A REC is the presence or likely presence of any hazardous substance or petroleum product in, on, or at a property: (1) due to any release to the environment, (2) under conditions indicative of a release to the environment, or (3) under conditions that pose a material threat of a future release to the environment. The term includes hazardous substances and petroleum products, even under conditions in compliance with laws. The term is not intended to include *de minimis* conditions that generally do not present a material risk of harm to public health or the environment, and that generally would not be the subject of an enforcement action if brought to the attention of appropriate governmental agencies (Section 1.1.2, ASTM Standard E2247-16; ASTM 2016).

An HREC is a past release of any hazardous substance or petroleum product that has occurred in connection with a property and has been addressed to the satisfaction of the applicable regulatory authority, or that has met unrestricted use criteria established by a regulatory authority without the property subjected to any required controls (Section 3.2.43, ASTM Standard E2247-16; ASTM 2016). The term is not intended to include *de minimis* conditions that generally do not present a threat to human health or the environment, and that generally would not be the subject of an enforcement action if brought to the attention of appropriate governmental agencies. Observed *de minimis* conditions are described within this report.

A CREC is a REC resulting from a past release of hazardous substances or petroleum products that has been addressed to the satisfaction of the applicable regulatory authority (for example, as evidenced by the issuance of a No Further Action letter or equivalent, or meeting risk-based criteria established by the regulatory authority) with hazardous substances or petroleum products allowed to remain in place subject to the implementation of required controls (for example, property use restrictions,

activity use limitations, institutional controls, or engineering controls) (Section 3.2.19, ASTM Standard E2247-16; ASTM 2016).

This Phase I ESA is intended to satisfy one of the requirements for innocent landowner, contiguous property owner, or bona fide prospective purchaser limitations on Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) liability (hereafter “landowner liability protections”)—that is, the practices that constitute “all appropriate inquiry into the previous ownership and uses of the property consistent with good commercial or customary practice,” as defined by the EPA AAI standard in 42 United States Code Section 9601 (35)(B).

1.2 Scope of Services

The scope of services was defined in Tetra Tech’s proposal dated November 16, 2023. The scope included a regulatory database review, historical and physical records review, interviews, a visual reconnaissance of the Subject Property and adjoining properties, compilation and evaluation of data, and preparation of this report.

1.3 Significant Assumptions

Tetra Tech assumes that all information obtained from others regarding the Subject Property is correct and complete. Additionally, Tetra Tech assumes that Novis and the current owner(s) and/or occupants have provided Tetra Tech with all reasonably ascertainable prior environmental information concerning the Subject Property. Tetra Tech assumes that the User will read this report in its entirety.

1.4 Limitations and Exceptions of Assessments

Findings and conclusions presented in this report are based on the procedures described in ASTM Standard E2247-16, Standard Practice for Environmental Site Assessments: *Phase I Environmental Site Assessment Process for Forestland or Rural Property* (ASTM 2016), including the EPA AAI standard. This report was prepared based on a review of data, as described therein, in accordance with generally accepted professional practices, applicable to work of similar nature and complexity of similar localities at the time the services were performed. The scope of this report is limited in nature and intended to provide an evaluation of the current environmental conditions at the Subject Property at the time of report preparation; it does not constitute definitive review of all potential environmental impairments and situations not otherwise ascertainable from the available information and observation.

Importantly, even the most comprehensive scope of services may not detect all environmental liabilities. Therefore, nothing herein shall be construed as a representation or certification that the Subject Property is either fully characterized or is free of environmental impairments and/or contamination. This Phase I ESA conforms to the level of documentation required in ASTM Standard E2247-16.

To conduct the investigation for this report, Tetra Tech relied upon information from sources believed to be credible.

Tetra Tech has endeavored to meet what it believes is the applicable standard of care for the services performed and, in doing so, is obligated to advise Novis of Phase I ESA limitations. Tetra Tech believes that providing information about limitations is essential to help clients identify, and thereby manage, risks.

This Phase I ESA did not include any inquiry regarding radon, methane, asbestos-containing material, lead-based paint, lead in drinking water, formaldehyde, endangered species, wetlands, subsurface investigation activities, or other services or potential conditions or features not specifically identified and discussed herein. This report describes any specific limitations attendant to additional services or service enhancements requested or authorized by the client.

This report represents Tetra Tech's service to Novis as of the report date. In that regard, the report constitutes Tetra Tech's final document, and the text of the report may not be altered in any manner after final issuance of the same. Opinions conveyed in this report pertaining to environmental conditions are based on information derived from the most recent site reconnaissance data and from other activities described herein. Novis is herewith advised that the conditions observed by Tetra Tech are subject to change. Certain indicators of the presence of hazardous materials may have been latent or not present at the time of the most recent site reconnaissance and may have subsequently become observable. In similar manner, the research effort conducted for a Phase I ESA is limited.

Further, the services herein shall in no way be construed, designed, or intended to be relied upon as legal interpretation or advice.

1.5 Special Terms and Conditions

No special terms and conditions pertaining to the Subject Property were brought to the attention of Tetra Tech during this Phase I ESA.

1.6 User Reliance

This report is an instrument of service of Tetra Tech, drawing from research and a review of specified and reasonably ascertainable information, and a reconnaissance of the Subject Property to identify RECs and HRECs in general accordance with ASTM Standard E2247-16. Tetra Tech's Phase I ESA accorded with generally accepted practices of the profession applied in similar studies at the same time and in the same geographical area, and Tetra Tech exerted that degree of care and skill generally exercised by the profession under similar circumstances and conditions.

The term "User" is defined in ASTM Standard E2247-16 as "the party seeking to use Practice E2247-16 to complete an environmental site assessment of the property. A User may include, without limitation, a purchaser of property, a potential occupant of property, an owner of property, a lender, or a property manager." The scope of services and the report have been completed on behalf of and for the exclusive use of Novis. Novis is the only party to which Tetra Tech has explained the risks involved, and which has participated in shaping the scope of services needed to satisfactorily manage those risks, if any, from Novis' point of view.

Accordingly, Tetra Tech's findings and opinions presented in this report may not be relied upon by any party except Novis without the consent of Tetra Tech. Tetra Tech may be available to contract with

other parties to develop findings and opinions related specifically to such other parties' unique risk management concerns related to the Subject Property.

2.0 SUBJECT PROPERTY DESCRIPTION

This section briefly describes the Subject Property and the physical setting based on information obtained from Novis; a review of records; and general observations made regarding property use at the time of site reconnaissance on December 27, 2023. Observations during the site reconnaissance regarding current land use of the Subject Property and of adjoining properties are described in Section 5, Site Reconnaissance.

2.1 Location of Subject Property

The Subject Property is located in Adams County, Colorado, and encompasses approximately 2,659 acres (Figure 1). The southern boundary is approximately 5 miles north of U.S. Highway 36 and 16 miles east-northeast of Strasburg, Colorado. Access to the Subject Property is via public county roads and private access roads.

2.2 Site and Vicinity General Characteristics

The Subject Property currently consists of agricultural cropland and pastureland used for cattle grazing and dryland farming, with a rural homestead in the southeastern portion. Surrounding land uses consist of agricultural cropland and pastureland, with a communication tower to the adjacent east/northeast and an overhead transmission line to the adjacent north of the Subject Property.

2.3 Regional Setting

2.3.1 Geology and Groundwater

The Subject Property is primarily underlain by the Pleistocene loess and Tertiary Dawson Arkose sandstone and shale (USGS 2023). The loess consists of clayey silty sand and sandy silt up to 26 feet in thickness.

The elevation of the Subject Property ranges from approximately 4,900 feet to approximately 5,050 feet above mean sea level.

According to the Colorado Department of Natural Resources' (CDNR) Division of Water Resources Well Permit Map Viewer, water wells are located within the Subject Property and surrounding area. Total depths are reported from 100 to 400 feet below ground surface (bgs), and water levels are reported from 55 to 102 feet bgs. Well uses include domestic, stock, and irrigation; and aquifers include alluvial aquifers and the Laramie Fox Hills aquifer (CDNR 2023).

2.3.2 Soils

The primary surface soils on the Subject Property are classified into the following general units, in order of prominence within the area of the Subject Property (NRCS 2023). Soils that cover less than 3% of the area are not listed:

- Ascalon-Vona sandy loams (~25.8%);
- Terry fine sandy loam (~23.9%);
- Vona loamy sand (~11.3%);

- Ascalon sandy loam (~8.0%);
- Terry-Tassel-Ulm complex (~7.6%);
- Renohill loam (~5.4%); and
- Adena-Colby association (~6.9%).

2.3.3 Climate

The Subject Property receives an average of 15.58 inches of rainfall and 55 inches of snowfall annually. Temperatures range from an average high of 88 degrees Fahrenheit during the summer season to an average low of 17 degrees Fahrenheit during the winter season (U.S. Climate Data 2023).

2.4 Uses of the Subject Property

2.4.1 Current Use

The Subject Property currently consists of agricultural cropland and pastureland with a homestead in the southeastern portion, in addition to solar powered water tanks and evidence of cattle grazing.

2.4.2 Historical Use

Based on a review of historical topographic maps for the years 1951, 1973/1978, 2013, 2016, and 2019 (Appendix A) and historical aerial photographs for the years 1937, 1948, 1953, 1970, 1975, 1985, 1993, 1998, 2006, 2011, 2015, and 2019 (Appendix B), historical Property uses and features have consisted of agriculture, drainages, windmills, and dirt roads since at least the 1937 aerial photograph. A road, and what appears to be a small pond, are visible within the Subject Property in the 1948 aerial photograph. A dirt road, windmills, and a small structure are depicted within the western portion of the Subject Property beginning in the 1951 topographic map; however, the eastern portion of the Subject Property is within an unmapped area. A possible small structure and disturbed area are visible in the eastern portion of the Subject Property in the 1970 aerial photograph. A small pond along a drainage is depicted, and three small rural structures are depicted within the southeastern portion of the Subject Property in the 1973/1978 topographic map. Several small, disturbed areas, a small pond, and apparent oil and gas equipment on the northeastern portion of the Subject Property are visible in the 1985 aerial photograph. The majority of oil and gas production areas appear to be abandoned in the 1993 aerial photograph, and the remaining oil and gas equipment area appears to be abandoned in the 2015 aerial photograph. Several circular disturbed areas that could be prairie dog habitat are located in a central portion of the Subject Property. No significant changes are noted over time in the remaining topographic maps and aerial photographs.

2.5 Uses of the Surrounding Area

2.5.1 Current Use

The surrounding land uses consist of agricultural cropland and pastureland, with a communication tower to the adjacent east/northeast and overhead transmission lines = to the adjacent north of the Subject Property.

2.5.2 Historical Use

Based on a review of topographic maps for the years 1951, 1973/1978, 2013, 2016, and 2019 (Appendix A) and aerial photographs for the years 1937, 1948, 1953, 1970, 1975, 1985, 1993, 1998, 2006, 2011, 2015, and 2019 (Appendix B), historical uses of the surrounding areas have consisted of agricultural land, farmsteads, creeks, drainages, and rural roads since at least the 1937 aerial photograph. A large impoundment first appears in the 1973/1978 topographic map to the west of the Subject Property. A transmission line is visible west of the Subject Property in the 1985 aerial photograph. The impoundment to the west is named as the Bramkamp Reservoir in the 2013 topographic map. Wetlands are shown in the vicinity of the reservoir in the 2016 topographic map. A reservoir is visible west of the Subject Property in the 1998 aerial photograph. No significant changes are noted in the remaining topographic maps and aerial photographs.

3.0 USER-PROVIDED INFORMATION

This section discusses information provided by Novis relevant to the goals of this Phase I ESA.

3.1 Title Records

No title information was provided to Tetra Tech for review during the preparation of this report.

3.2 Specialized Knowledge

No specialized knowledge was provided to Tetra Tech during preparation of this report.

3.3 Commonly Known or Reasonably Ascertainable Information

No commonly known or reasonably ascertainable information available at the time of submission of this report has not been covered in other sections.

3.4 Valuation Reduction for Environmental Issues

In a transaction involving purchase of a parcel of commercial real estate, the User shall consider the relationship of the purchase price of the property to the fair market value of the property if the property was not affected by hazardous substances or petroleum products. According to the completed User Questionnaire (Appendix C), the purchase (or lease) price being paid for the Subject Property reflects fair value in the opinion of the User.

3.5 Owner, Property Manager, and Occupant Information

Novis, as the User of this Phase I ESA, provided the Subject Property information, ownership information, and the completed User Questionnaire.

3.6 Reason for Performing Phase I

The purpose of this Phase I ESA was to determine, to the maximum extent practicable, the presence or likely presence of RECs, HRECs, and/or CRECs at the Subject Property.

4.0 RECORDS REVIEW

The records review section of the Phase I ESA included performing database searches and reviewing physical setting information for the Subject Property and surrounding areas.

4.1 Regulatory Agency Database Search

A search of readily available federal, state, regional, and local agency database listings was conducted on December 14, 2023, by Environmental Data Resources, Inc. (EDR), a subcontracted regulatory search service. The EDR report was conducted for the Subject Property, as well as for the respective search radii described in Table 1, and is presented in Appendix D. Numerous government databases were searched, as described in detail in the EDR report, including, but not limited to the following databases and associated search radii distances specified in Section 8.2.1 of ASTM Standard E2247-16:

- Federal National Priorities List (NPL) within 1 mile
- Federal Delisted NPL (DNPL) within 1.0 mile
- Federal Comprehensive Environmental Response, Compensation and Liability Act Information System (CERCLIS) or Superfund Enterprise Management System (SEMS) within 0.5 mile
- CERCLIS/SEMS No Further Remedial Action Planned within 0.5 mile
- Federal Resource Conservation and Recovery Act (RCRA) Corrective Action Reports (CORRACTS) facilities within 1 mile
- RCRA Non-CORRACTS Treatment, Storage, and Disposal (TSD) facilities within 0.5 mile
- Federal RCRA generators list within 0.25 mile
- Federal Emergency Response Notification System list on the Subject Property
- State-equivalent NPL sites within 1 mile
- State-equivalent CERCLIS sites within 1 mile
- Solid Waste Facility/Landfills (SWF/LF) sites within 0.5 mile
- Leaking storage tank listing within 0.5 mile
- Registered storage tank listing within 0.25 mile
- Institutional control or engineering control registries within 0.5 mile
- State-equivalent voluntary cleanup sites within 0.5 mile
- State-equivalent brownfield sites within 0.5 mile

4.1.1 Database Results for the Subject Property

No listings were identified by the EDR report on the Subject Property.

4.1.2 Database Results for the Surrounding Area

No listings were identified by the EDR database search report within the area surrounding the Subject Property.

Table 1. Database Search Results for the Project

Database	Purpose	Search Radius	Search Results
National Priorities List (NPL) (Superfund)	The NPL identifies federal Superfund sites with the highest priority for cleanup.	1.0 mile	No NPL listings were identified within 1.0 mile of the Subject Property.
Federal Delisted NPL (DNPL)	The DNPL identifies federal Superfund sites that have been delisted by the EPA.	1.0 mile	No DNPL listings were identified within 1.0 mile of the Subject Property.
Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) or Superfund Enterprise Management System (SEMS)	The CERCLIS/SEMS database identifies sites that EPA has investigated or is in the process of investigating for potential hazardous substance contamination. A CERCLIS site may or may not become an NPL site.	0.5 mile	No CERCLIS/SEMS listings were identified within 0.5 mile of the Subject Property.
CERCLIS/SEMS No Further Remedial Action Planned (SEMS ARCHIVE)	The SEMS ARCHIVE database tracks sites for which no further remedial action is planned under the Federal Superfund Program based on available information.	0.5 mile	No SEMS ARCHIVE listings were identified within 0.5 mile of the Subject Property.
Resource Conservation and Recovery Act (RCRA) Subject to Corrective Action Facilities (CORRACTS)	The CORRACTS database is used to track the status and filing of any corrective actions that have taken place at a facility.	1.0 mile	No RCRA CORRACTS listings were identified within 1.0 mile of the Subject Property.
RCRA Non-CORRACTS Treatment, Storage, and Disposal (TSD) Facilities	The RCRA Non-CORRACTS database lists those facilities where treatment, storage, and/or disposal of hazardous wastes takes place, and where corrective remedial action has not been required by the EPA as defined and regulated by RCRA.	0.5 mile	No RCRA Non-CORRACTS TSD listings were identified within 0.5 mile of the Subject Property.
RCRA Large Quantity, Small Quantity, and Very Small Quantity Generators (LOG, SOG, and VSQG, respectively)	These databases include selective information on sites that generate, transport, store, treat, and/or dispose of hazardous waste as defined by RCRA.	0.25 mile	No LOG, SOG, or VSQG listings were identified within 0.25 mile of the Subject Property.
Federal Emergency Response Notification System (ERNS)	The Federal ERNS list records and stores information about reported releases of oil and hazardous substances.	Within the Subject Property	No ERNS listings were identified within the boundaries of the Subject Property.
State Hazardous Waste Sites (SHWF)	The SHWF database is used to help administer various programs under the Solid Waste and Materials Management Program.	0.5 mile	No SHWF listings were identified within 0.5 mile of the Subject Property.
Solid Waste Facilities/Landfills (SWF/LF)	SWF/LF are sites that used to accept, or currently accept, waste of any kind for disposal on site.	0.5 mile	No SWF/LF listings were identified within 0.5 mile of the Subject Property.
Leaking Underground Storage Tank (LUST)	The LUST database contains an inventory of reported leaking petroleum storage tank incidents.	0.5 mile	No LUST listings were identified within 0.5 mile of the Subject Property.
Leaking Aboveground Storage Tanks (LAST)	The LAST database contains an inventory of LAST sites.	0.5 mile	No LAST listings were identified within 0.5 mile of the Subject Property.

Table 1. Database Search Results for the Project

Database	Purpose	Search Radius	Search Results
Underground Storage Tank (UST)	The UST database contains an inventory of registered USTs.	0.25 mile	No UST listings were identified within 0.25 mile of the Subject Property.
Aboveground Storage Tank (AST)	The AST database contains an inventory of registered ASTs.	0.25 mile	No AST listings were identified within 0.25 mile of the Subject Property.
Federal Engineering Controls / Institutional Controls (ENG Controls/INST Controls)	The ENG CONTROLS database contains a listing of sites with engineering controls in place. The INST CONTROLS database contains a listing of sites with institutional controls in place.	0.5 mile	No ENG CONTROLS or INST CONTROLS listings were identified within 0.5 mile of the Subject Property.
Voluntary Cleanup Sites (VCP)	State-equivalent VCP sites.	0.5 mile	No VCP listings were identified within 0.5 mile of the Subject Property.
Brownfields Sites (BROWNFIELDS)	BROWNFIELDS sites are abandoned or unused industrial or commercial properties that are complicated by environmental contamination by regulated substances.	0.5 mile	No BROWNFIELDS listings were identified within 0.5 mile of the Subject Property.

4.1.3 Orphan Summary

Orphan sites are facilities with incomplete or insufficient address information that may be in the vicinity of the Subject Property. No orphan listings were identified in the EDR report.

4.2 Review of User-Provided Title Commitment Records

A review of User-provided Title Commitment Records was not performed as a part of this Phase I ESA.

4.3 Review of Previous Phase I Environmental Site Assessment

Tetra Tech previously completed a Phase I ESA for the Deer Trail Solar Project on September 19, 2023 (Tetra Tech 2023). The September 2023 report covered approximately 1,960 acres of agricultural land within the current Subject Property boundary. No RECs, HRECs, or CRECs were identified for the Subject Property. The following findings were identified:

- One landowner, Mr. Raymond Morris, provided information on active and abandoned wells within the Subject Property. An oil well was active for 4 years in the 1980s, in Section 29 of the property, and was abandoned. Three plugged oil and gas wells were mapped within the Subject Property boundaries (Colorado Oil and Gas Conservation Commission [COGCC] 2023). Five water wells used for cattle were currently in use, and approximately eight abandoned water wells are on the property.
- A dilapidated cattle tank, rusted metal box, and downed windmill were observed in the southern portion of the Subject Property.

At the time of report production, an updated landowner questionnaire has not been received from Mr. Raymond Morris; however, based on the questionnaire responses provided during the September 2023 Phase I ESA, the active and abandoned oil wells and water wells remain a finding for the Subject Property.

5.0 SITE RECONNAISSANCE

Ms. Mindy Sinnott, Environmental Professional with Tetra Tech, conducted the site reconnaissance on December 27, 2023. During the site reconnaissance, Ms. Sinnott accessed the Subject Property using public county roads and private access roads. The site reconnaissance was limited to features visible on the day the site visit was conducted. Photographs taken during the site reconnaissance are presented in Appendix E. Ms. Sinnott's resume is available in Appendix F.

5.1 General Site Setting and Observations

The Subject Property is in Adams County, Colorado, and encompasses approximately 2,659 acres (Figure 1). Figure 2 shows the photograph locations from the site reconnaissance. Additional details observed during the site reconnaissance are discussed below and documented in photographs presented in Appendix E.

5.2 Site Reconnaissance Observations

5.2.1 Summary of Observations

Table 2 is a summary of the observations made during the site reconnaissance conducted on December 27, 2023. Observed land uses consisted of agricultural cropland and pastureland, with a rural homestead in the southeastern portion. No RECs were identified on the Subject Property at the time of the site reconnaissance.

Table 2. Summary of Site Reconnaissance Observations

Observation	Comments/Photographs
Structures (existing)	Two residences, two garages, two Quonset huts, and two barns were observed in the southeastern portion of the Subject Property (Appendix E, Photos 1, 3, 4, 8, and 9).
Aboveground Storage Tanks (ASTs)	One propane AST was observed in the southeastern portion of the Subject Property (Appendix E, Photo 2).
Underground Storage Tanks (USTs) or Evidence of USTs	None observed.
Drums or Other Containers	None observed.
Chemicals or Hazardous Materials (other than <i>de minimis</i> quantities)	None observed.
Evidence of Leaks, Spills, or Releases Around ASTs, USTs, and/or Chemical Storage Areas	None observed.
On-Site Septic System	Two septic systems were observed in the southeastern portion of the Subject Property (Appendix E, Photos 2 and 8).
Sewage Disposal System	None observed.
Potable Water Supply	None observed.
Discolored or Stained Soil or Vegetation Potentially from Hazardous Substances	None observed.
Hazardous Waste Disposal Areas	None observed.

Table 2. Summary of Site Reconnaissance Observations

Observation	Comments/Photographs
Uncontained Debris, Refuse or Unidentified Waste Materials	Wooden debris was observed in the southeastern portion of the Subject Property (Appendix E, Photo 7). Additionally, a dilapidated cattle tank, rusted metal box, and downed windmill were observed in the southwestern portion of the Subject Property (Appendix E, Photo 16).
Standing Water or other Liquids	None observed.
Catch Basins and Stormwater Drainage	Natural drainages were observed on the Subject Property.
Pits/Ponds/Lagoons	None observed.
Waste or Wastewater Discharges	None observed.
Unusual Odors	None observed.
Stressed Vegetation	None observed.
Fill Material	None observed.
Water Wells	Solar-powered water wells and a downed windmill were observed on the Subject Property (Appendix E, Photos 13 and 16).
Pad-Mounted Transformers	None observed.
Pole-Mounted Transformers	A pole-mounted transformer was observed in the southeastern portion of the Subject Property (Appendix E, Photo 1).
Other Observations	A shooting target was observed in the southeastern portion of the Subject Property (Appendix E, Photo 6). Buried fiber optic cable markers were observed on the Subject Property (Appendix E, Photo 10). Cattle pens were observed in the southern portion of the Subject Property (Appendix E, Photos 4 and 11). Cattle water tanks were observed on the Subject Property (Appendix E, Photos 14 and 16). An electrical power pole was observed on the Subject Property (Appendix E, Photo 23).

No RECs were identified on the Subject Property at the time of the site reconnaissance. The following findings were observed:

- Two residences, two garages, two Quonset huts, and two barns were observed in the southeastern portion of the Subject Property (Appendix E, Photos 1, 3, 4, 8, and 9). Two septic systems were observed in association with the residences in the southeastern portion of the Subject Property (Appendix E, Photos 2 and 8). Additionally, wooden debris was observed in the southeastern portion of the Subject Property (Appendix E, Photo 7).
- A dilapidated cattle tank, a rusted metal box, and downed windmill were observed in the southwestern portion of the Subject Property (Appendix E, Photo 16).

5.2.2 Adjacent Property and Vicinity Findings

Surrounding land uses consist of agricultural cropland and pastureland, with a communication tower to the adjacent east/northeast of the Subject Property (Appendix E, Photos 26 and 27). Additionally, overhead transmission lines were observed to the adjacent north of the Subject Property (Appendix E, Photo 25). No RECs were identified on adjacent properties at the time of the site reconnaissance.

6.0 INTERVIEWS

6.1 User Questionnaire

The ASTM Standard E2247-16 requires that the User of an ESA provide certain information for incorporation into the ESA report. Therefore, to meet the AAI rule, Novis was asked to provide responses to questions presented in the User Questionnaire (Appendix C). The User responses, completed on January 8, 2024, indicated that the User is not aware of environmental concerns for the Subject Property.

6.2 Landowner Interviews

Tetra Tech contacted the landowners of the Subject Property to complete the 18-question landowner questionnaire using contact information provided by Novis.

Ms. Lisa Beauprez has owned the Subject Property since 1974. The Subject Property has been used for cattle grazing and has overhead power lines. Ms. Beauprez was not aware of any environmental concerns in connection with the Subject Property.

Mr. Jim Holden has owned the Subject Property for 7 years and 9 months. According to Mr. Holden, the Subject Property has been used for farming, and includes Quonset huts and two houses with associated septic systems and propane tanks. In addition, two private wells, one windmill well, and a pole-mounted transformer are present on the Subject Property. Mr. Holden was not aware of any environmental concerns in connection with the Subject Property.

No RECs were identified for the Subject Property based on the completed landowner interviews (Appendix C).

6.3 Interviews with State and/or Local Government Officials

Tetra Tech reviewed the Colorado Department of Public Health and Environment's (CDPHE) Environmental Records Search online database on December 27, 2023 (CDPHE 2023). No solid waste facilities, voluntary cleanup program, institutional controls, Brownfields, or Superfund sites were identified within the ASTM-prescribed search distances of the Subject Property (CDPHE 2023).

The Colorado Oil and Gas Conservation Commission online interactive map was reviewed on December 27, 2023; eight plugged oil and gas wells were mapped within the Subject Property boundaries (COGCC 2023).

7.0 FINDINGS AND CONCLUSIONS

Tetra Tech conducted this Phase I ESA in general accordance with ASTM Standard E2247-16. Based on the site reconnaissance performed on December 27, 2023; the completed User questionnaire; the completed landowner questionnaires; the environmental regulatory search report provided by EDR on December 14, 2023; and review of historical topographic maps and aerial photographs, no RECs, HRECs, or CRECs were identified for the Subject Property.

The following findings were identified at the Subject Property:

- During a previous Phase I ESA completed in September 2023 (Tetra Tech 2023), one landowner, Mr. Raymond Morris, provided information on active and abandoned wells within the Subject Property. An oil well was active for 4 years during the 1980s in Section 29 of the property, and was later abandoned. Three plugged oil and gas wells were mapped within the Subject Property boundaries (COGCC 2023). Five water wells are currently in use for cattle; and approximately eight abandoned water wells are located on the property. At the time of report production, an updated landowner questionnaire has not been received from Mr. Morris; however, the active and abandoned oil wells and water wells remain a finding for the Subject Property.
- Two residences, two garages, two Quonset huts, and two barns were observed in the southeastern portion of the Subject Property (Appendix E, Photos 1, 3, 4, 8, and 9). Two septic systems were observed in association with the residences in the southeastern portion of the Subject Property (Appendix E, Photos 2 and 8). Additionally, wooden debris was observed in the southeastern portion of the Subject Property (Appendix E, Photo 7).
- A dilapidated cattle tank, rusted metal box, and downed windmill were observed in the southwestern portion of the Subject Property (Appendix E, Photo 16).

Tetra Tech recommends that Novis consider the “shelf life” of Phase I documents in determining risk. ASTM Standard E2247-16 states that a conforming Phase I report is valid for 180 days and may be updated during the 180 days to a 1-year timeframe. A Phase I report is valid for use in any of the CERCLA defenses *only* if updated within this timeframe. If more than 1 year passes following the final report date, the Phase I effort must be repeated to remain in compliance with ASTM and to retain AAI protection.

8.0 LIMITATIONS

This report was compiled based partially on information supplied to Tetra Tech from outside sources and other information in the public domain. The conclusions and opinions herein are based on the information Tetra Tech obtained in compiling the report. This information is on file at Tetra Tech's office in Lakewood, Colorado. Tetra Tech makes no warranty as to the accuracy of statements made by others that may be contained in the report, nor are any other warranties or guarantees, expressed or implied, included or intended by the report, except that it has been prepared in accordance with the current generally accepted practices and standards consistent with the level of care and skill exercised under similar circumstances by other professional consultants or firms performing the same or similar services. Because the facts forming the basis for the report are subject to professional interpretation, differing conclusions could be reached. Tetra Tech does not assume responsibility for discovery and elimination of hazards that could cause accidents, injuries, or damage. Compliance with submitted recommendations or suggestions does not assure elimination of hazards or fulfillment of client's obligations under local, state, or federal laws, or any modifications or changes to such laws. None of the work performed hereunder shall constitute or be represented as a legal opinion of any kind or nature but shall be a representation of findings of fact from site reconnaissance and records examined.

9.0 SIGNATURE OF ENVIRONMENTAL PROFESSIONALS

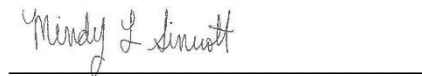
We declare that, to the best of our professional knowledge and belief, we meet the definition of environmental professional as defined in §312.10 of 40 Code of Federal Regulations (CFR) 312. We have the specific qualifications based on education, training, and experience to assess a property of the nature, history, and setting of the Subject Property. We have developed and performed all appropriate inquiries in conformance with the standards and practices set forth in 40 CFR Part 312.

Preparation of this Phase I ESA report was conducted by the following Tetra Tech personnel:



Riley Houston
Environmental Professional

This Phase I ESA report was reviewed by the following Tetra Tech personnel:

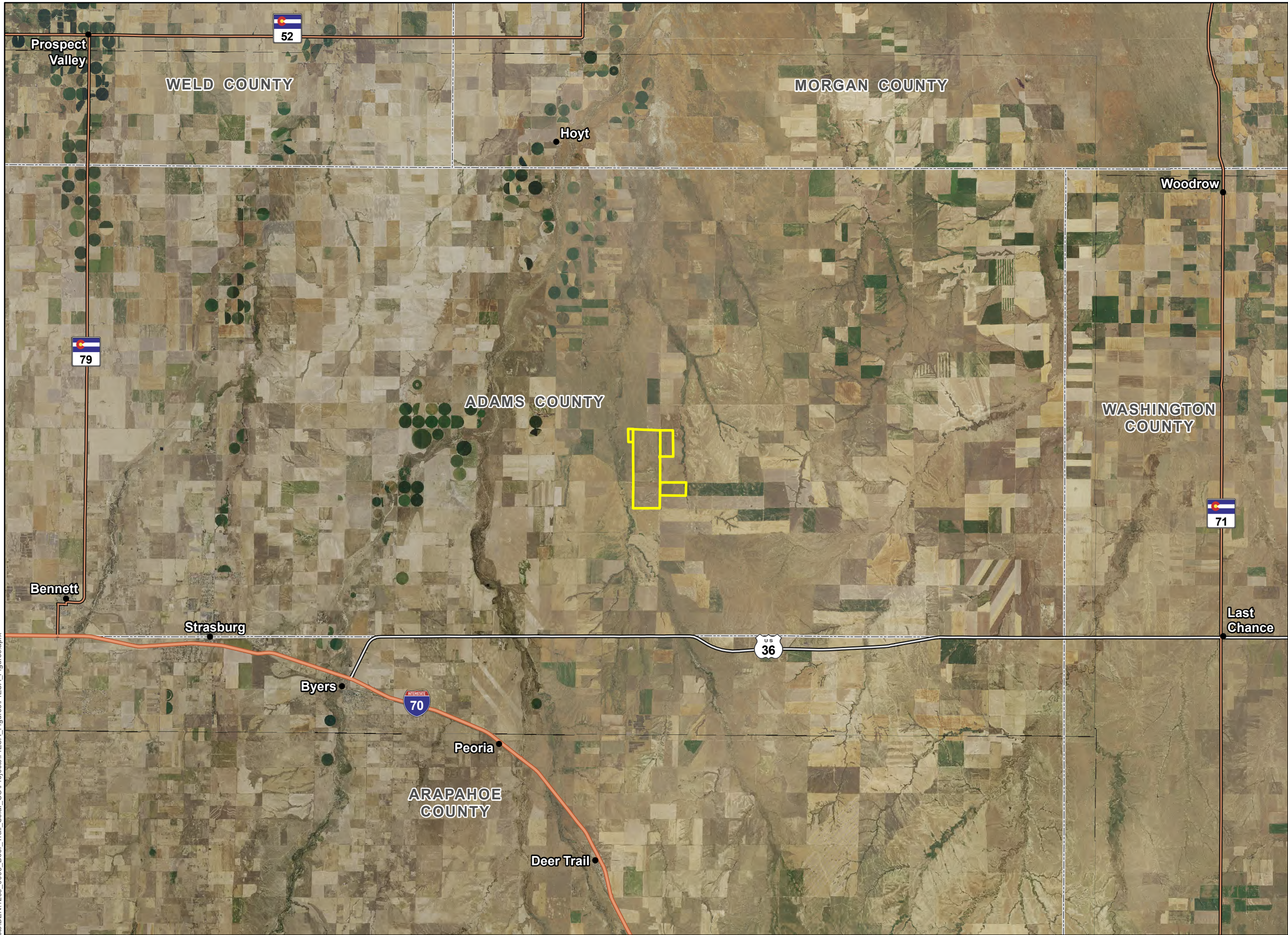


Mindy Sinnott
Senior Technical Peer Reviewer

10.0 REFERENCES

- ASTM (ASTM International). 2016. ASTM Standard E2247-16, Standard Practice for Environmental Subject Property Assessments: Phase I Environmental Subject Property Assessment Process for Forestland or Rural Property.
- CDNR (Colorado Department of Natural Resources). 2023. DWR Well Permit Viewer. Available online at: <https://maps.dnrgis.state.co.us/dwr/Index.html?viewer=mapviewer>. Accessed December 27, 2023.
- CDPHE (Colorado Department of Public Health and Environment). 2023. Colorado Environmental Sites Search Online Map. Available online at: <https://cdphe.maps.arcgis.com/apps/webappviewer/index.html?id=dbca3a2942764fd8bdb947826a5a2228>. Accessed December 27, 2023.
- COGCC (Colorado Oil and Gas Conservation Commission). 2023. Online interactive map: https://cogccmap.state.co.us/cogcc_gis_online/. Accessed December 26, 2023.
- U.S. Climate Data. 2023. Climate Data for Denver, Colorado. Available online at: <https://www.usclimatedata.com/climate/denver/colorado/united-states/usco0105>. Accessed December 27, 2023.
- NRCS (U.S. Department of Agriculture-Natural Resources Conservation Service). 2023. Web Soil Survey. Available online at: <http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx>. Accessed December 27, 2023.
- Tetra Tech. 2023. Phase I Environmental Site Assessment, Deer Trail Solar Project, Adams County, Colorado. September 19, 2023.
- USGS. (U.S. Geological Survey). 2023. National Geologic Map Database Viewer. Available online at: https://ngmdb.usgs.gov/Prodesc/proddesc_9003.htm and https://ngmdb.usgs.gov/Prodesc/proddesc_9832.htm. Accessed December 26, 2023.

FIGURES



Hanks Crossing Energy, LLC

**Figure 1
Project Location**

Adams County, CO

Project Features

- Subject Property
- Transportation**
- Interstate Highway
- US Highway
- State Highway
- Boundaries**
- County Boundary



Updated: 12/28/2023
NOT FOR CONSTRUCTION

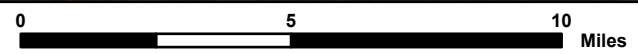
Reference Map



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1:225,000 NAD 1983 StatePlane Colorado North FIPS 0501 Feet



Source: ESRI, USDA NAIP, US CENSUS, BTS

Hanks Crossing Energy, LLC

Figure 2 Site Reconnaissance

Adams County, CO

Project Features

 Subject Property

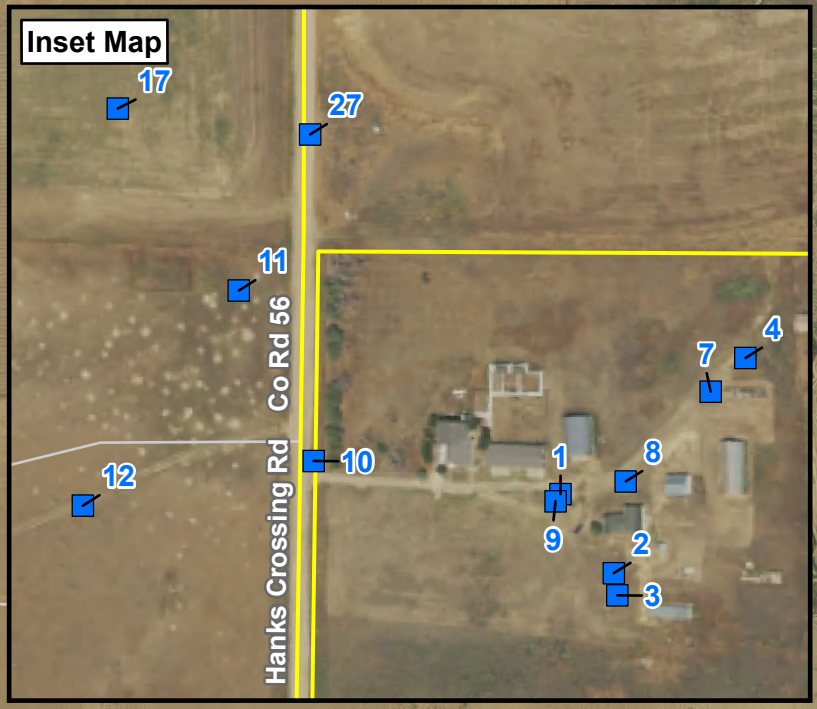
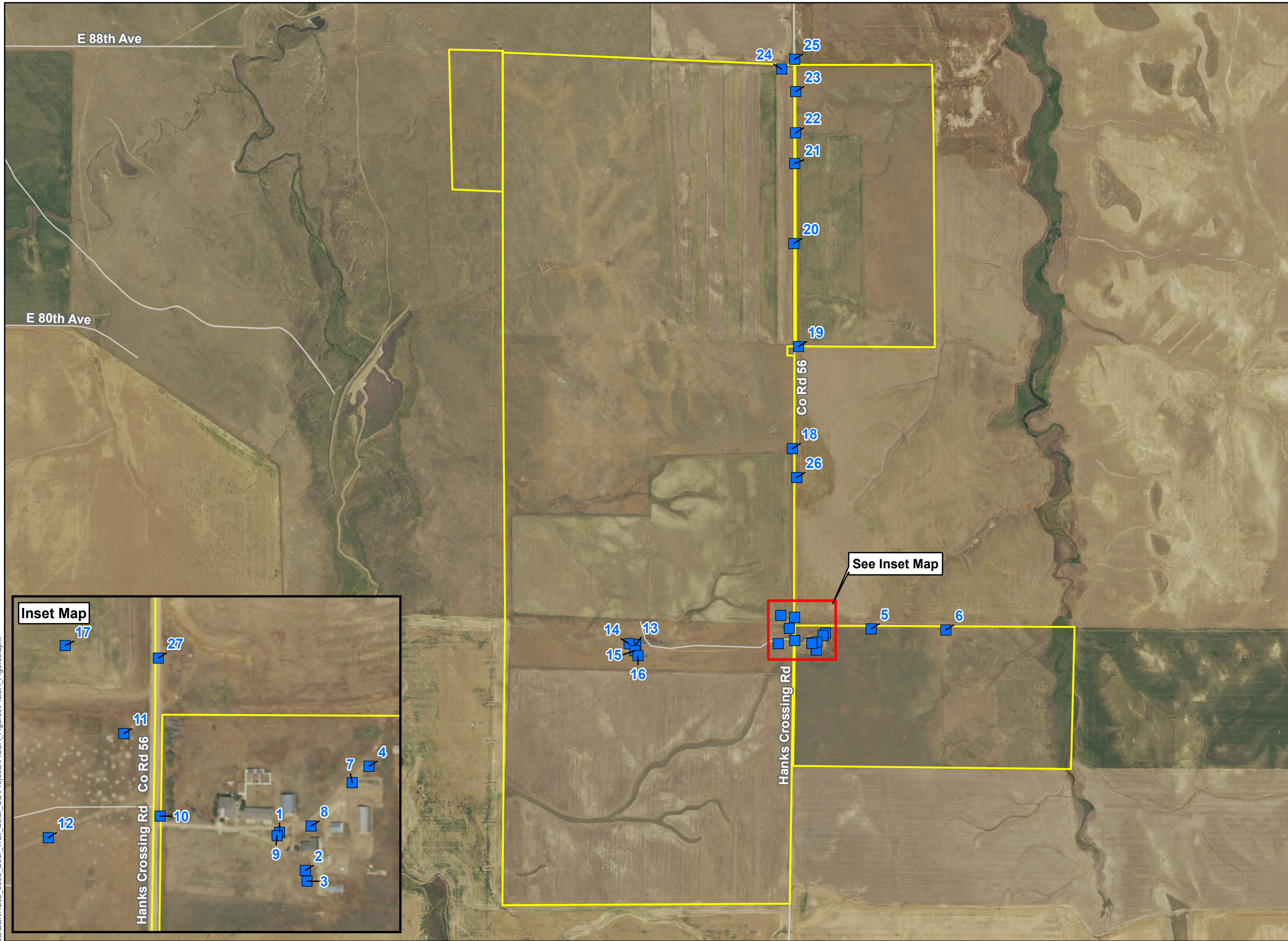
Transportation
 Local Road

Phase I Report
 Photo Point

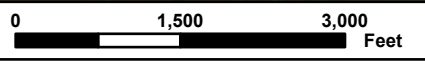


Updated: 12/28/2023
NOT FOR CONSTRUCTION

Reference Map



1:21,000 NAD 1983 StatePlane Colorado North FIPS 0501 Feet



Source: ESRI, USDA NAIP, US CENSUS, BTS

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APPENDIX A: HISTORICAL TOPOGRAPHIC MAPS

Deer Trail
Deer Trail
Byers, CO 80103

Inquiry Number: 7389174.6

July 14, 2023

EDR Historical Topo Map Report

with QuadMatch™



6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

EDR Historical Topo Map Report

07/14/23

Site Name:

Deer Trail
Deer Trail
Byers, CO 80103
EDR Inquiry # 7389174.6

Client Name:

Tetra Tech EC, Inc.
350 Indiana Street
Golden, CO 80401
Contact: Rachel Miller



EDR Topographic Map Library has been searched by EDR and maps covering the target property location as provided by Tetra Tech EC, Inc. were identified for the years listed below. EDR's Historical Topo Map Report is designed to assist professionals in evaluating potential liability on a target property resulting from past activities. EDR's Historical Topo Map Report includes a search of a collection of public and private color historical topographic maps, dating back to the late 1800s.

Search Results:**Coordinates:**

P.O.# NA
Project: NA

Latitude: 39.834792 39° 50' 5" North
Longitude: -104.008124 -104° 0' 29" West
UTM Zone: Zone 13 North
UTM X Meters: 584870.69
UTM Y Meters: 4409891.61
Elevation: 4993.77' above sea level

Maps Provided:

2019
2016
2013
1973, 1978
1951

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Topo Sheet Key

This EDR Topo Map Report is based upon the following USGS topographic map sheets.

2019 Source Sheets



Leader SE
2019
7.5-minute, 24000



Poison Springs
2019
7.5-minute, 24000

2016 Source Sheets



Leader SE
2016
7.5-minute, 24000

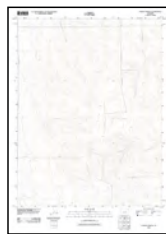


Poison Springs
2016
7.5-minute, 24000

2013 Source Sheets

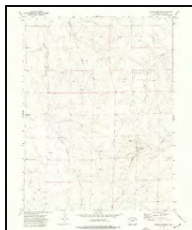


Leader SE
2013
7.5-minute, 24000



Poison Springs
2013
7.5-minute, 24000

1973, 1978 Source Sheets



Poison Springs
1973
7.5-minute, 24000
Aerial Photo Revised 1972

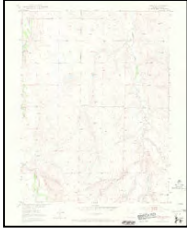


Leader SE
1978
7.5-minute, 24000
Aerial Photo Revised 1975

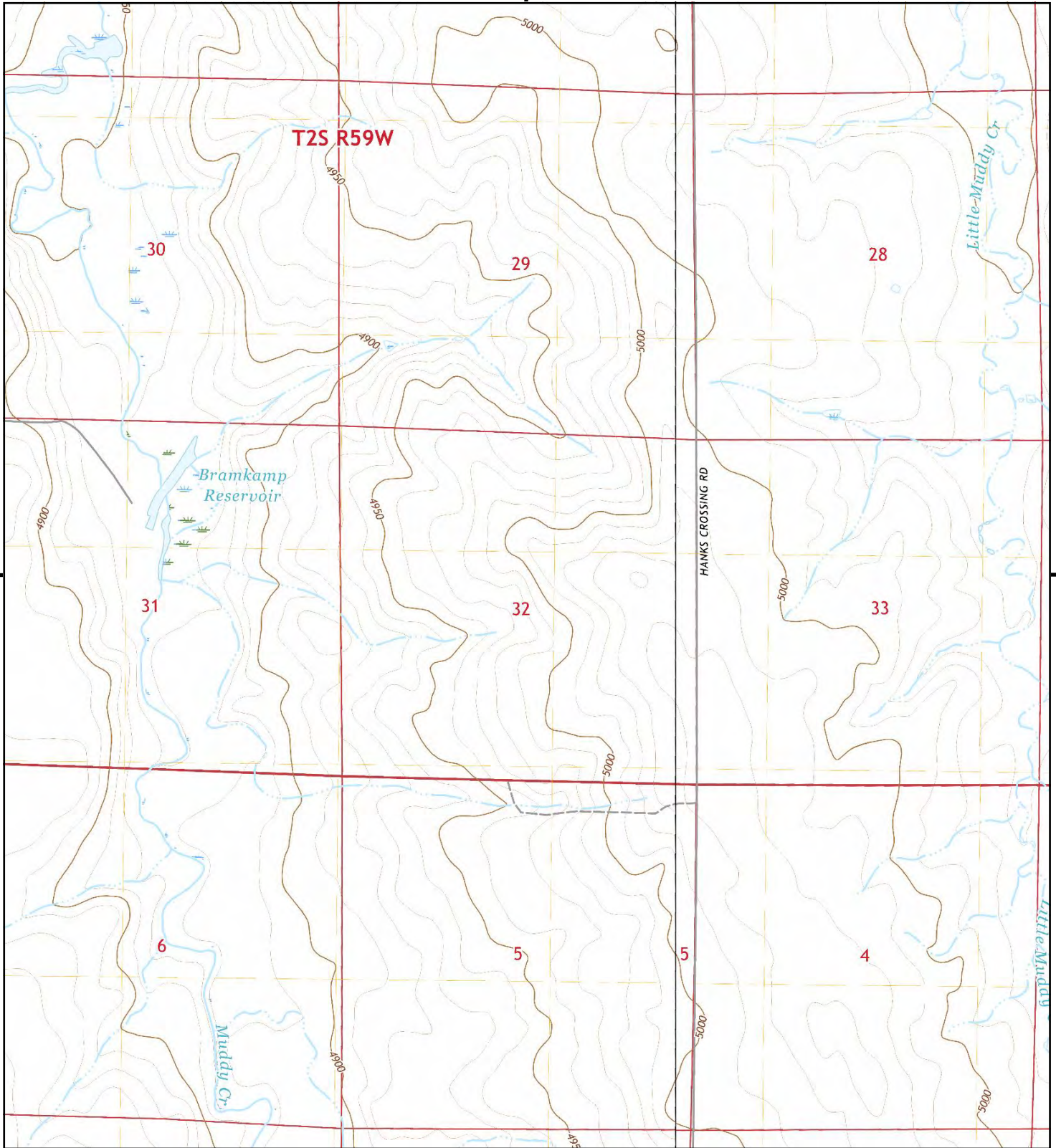
Topo Sheet Key

This EDR Topo Map Report is based upon the following USGS topographic map sheets.

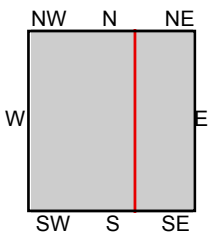
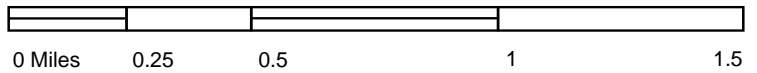
1951 Source Sheets



Leader SE
1951
7.5-minute, 24000
Aerial Photo Revised 1949



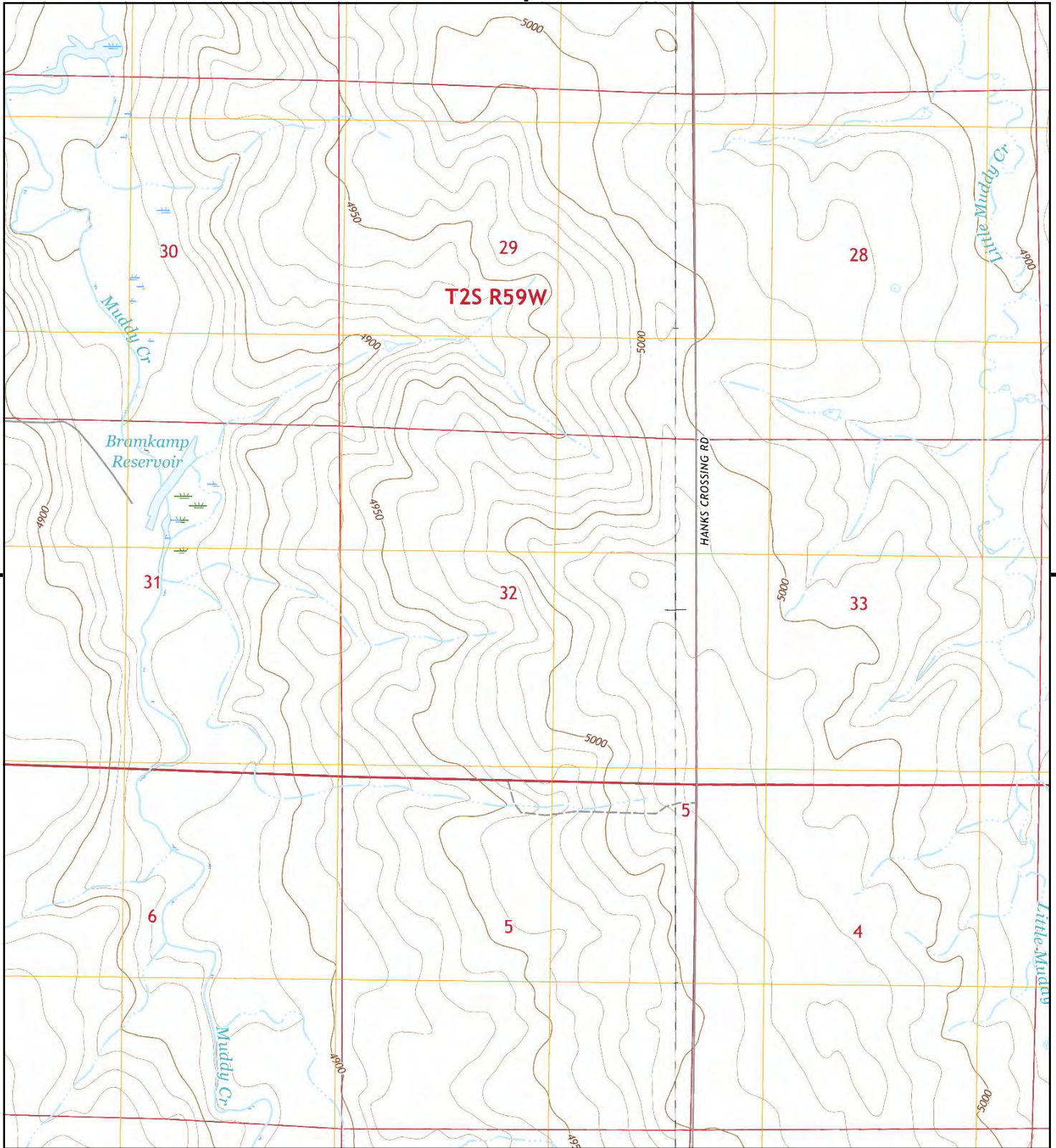
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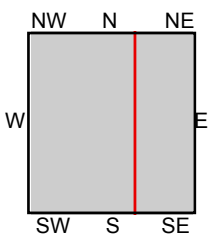
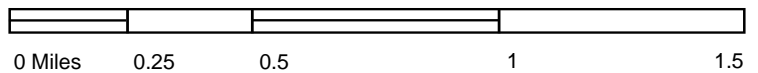
TP, Leader SE, 2019, 7.5-minute
E, Poison Springs, 2019, 7.5-minute

SITE NAME: Deer Trail
ADDRESS: Deer Trail
Byers, CO 80103
CLIENT: Tetra Tech EC, Inc.





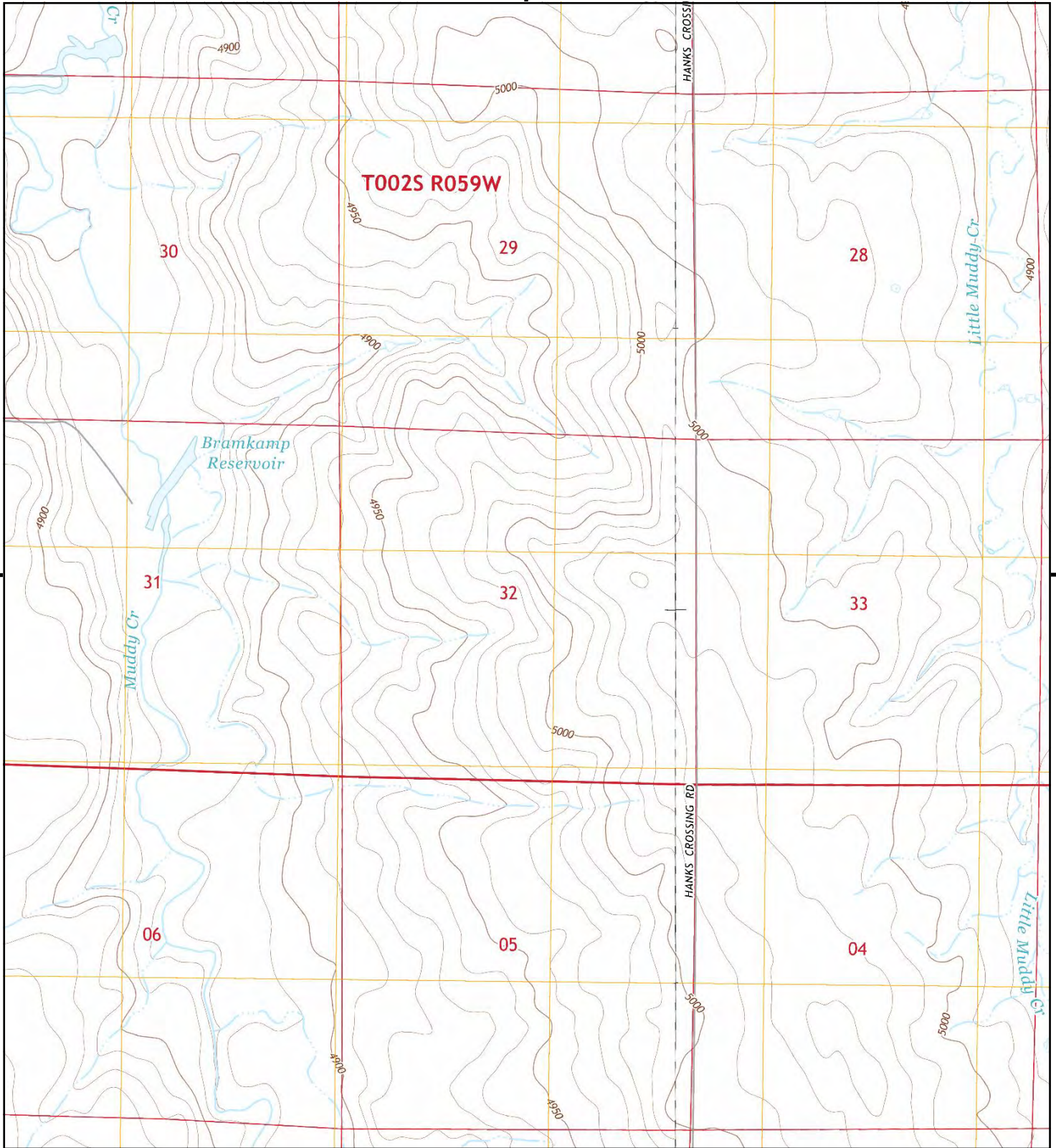
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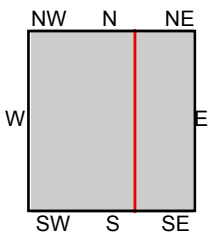
TP, Leader SE, 2016, 7.5-minute
E, Poison Springs, 2016, 7.5-minute

SITE NAME: Deer Trail
ADDRESS: Deer Trail
Byers, CO 80103
CLIENT: Tetra Tech EC, Inc.





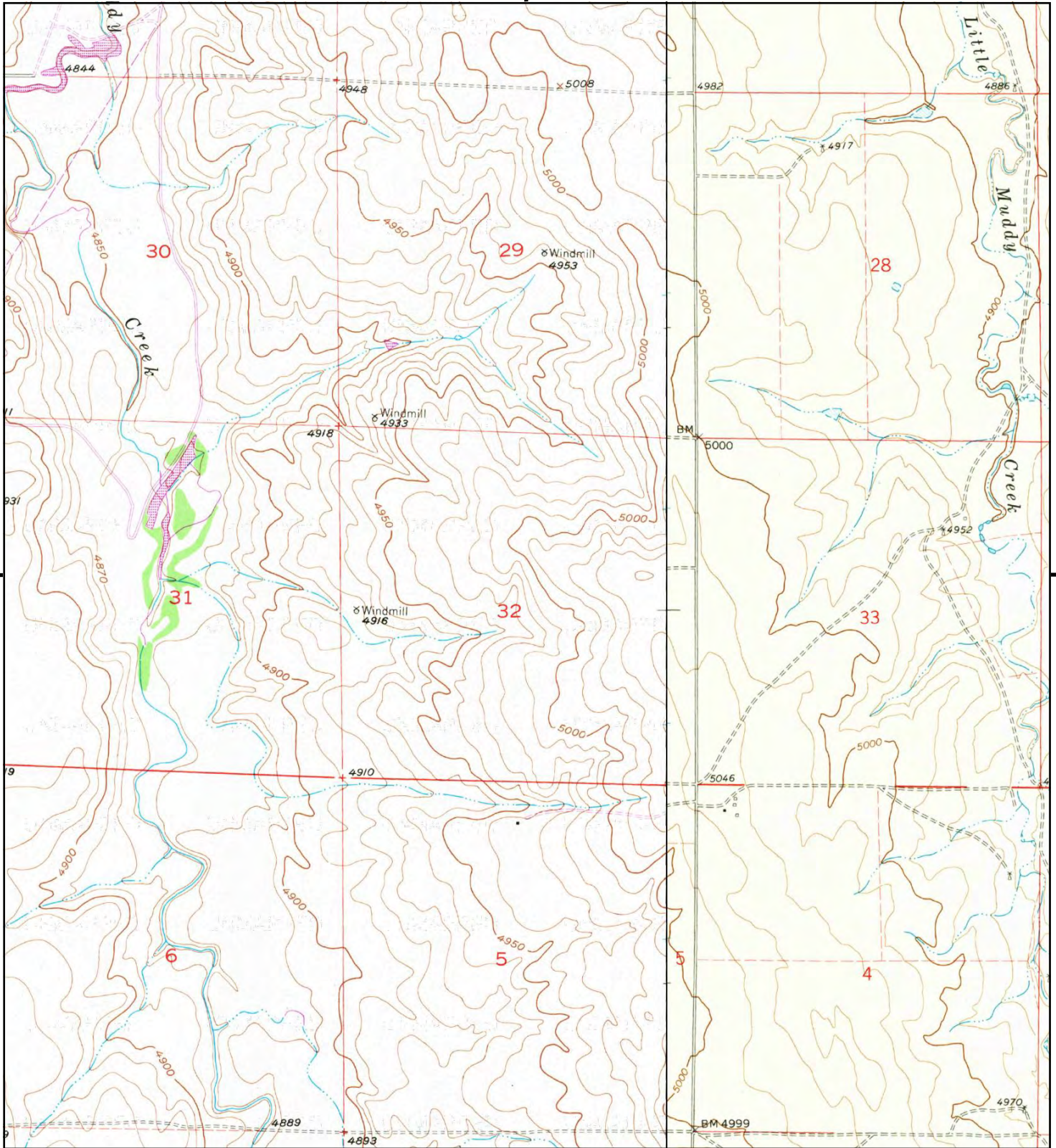
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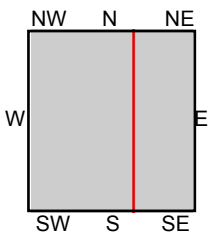
TP, Leader SE, 2013, 7.5-minute
E, Poison Springs, 2013, 7.5-minute

SITE NAME: Deer Trail
ADDRESS: Deer Trail
Byers, CO 80103
CLIENT: Tetra Tech EC, Inc.





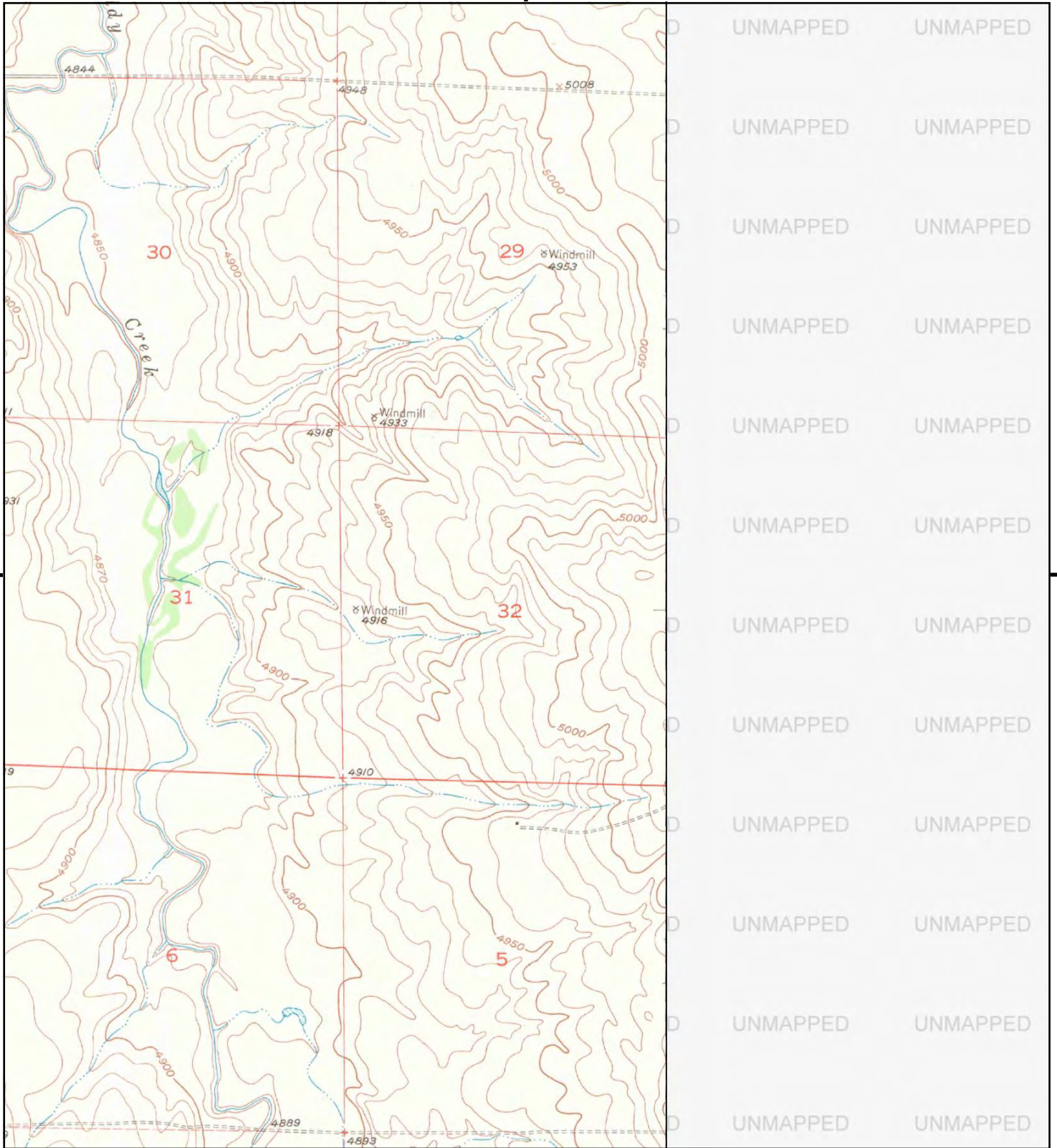
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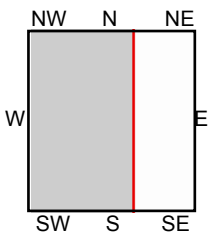
TP, Leader SE, 1978, 7.5-minute
E, Poison Springs, 1973, 7.5-minute

SITE NAME: Deer Trail
ADDRESS: Deer Trail
Byers, CO 80103
CLIENT: Tetra Tech EC, Inc.





This report includes information from the following map sheet(s).



TP, Leader SE, 1951, 7.5-minute

SITE NAME: Deer Trail
 ADDRESS: Deer Trail
 Byers, CO 80103
 CLIENT: Tetra Tech EC, Inc.



APPENDIX B: HISTORICAL AERIAL PHOTOGRAPHS



Hanks Crossing

Hanks Crossing

Byers, CO 80103

Inquiry Number: 7521270.5

December 19, 2023

The EDR Aerial Photo Decade Package



6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

Date EDR Searched Historical Sources:

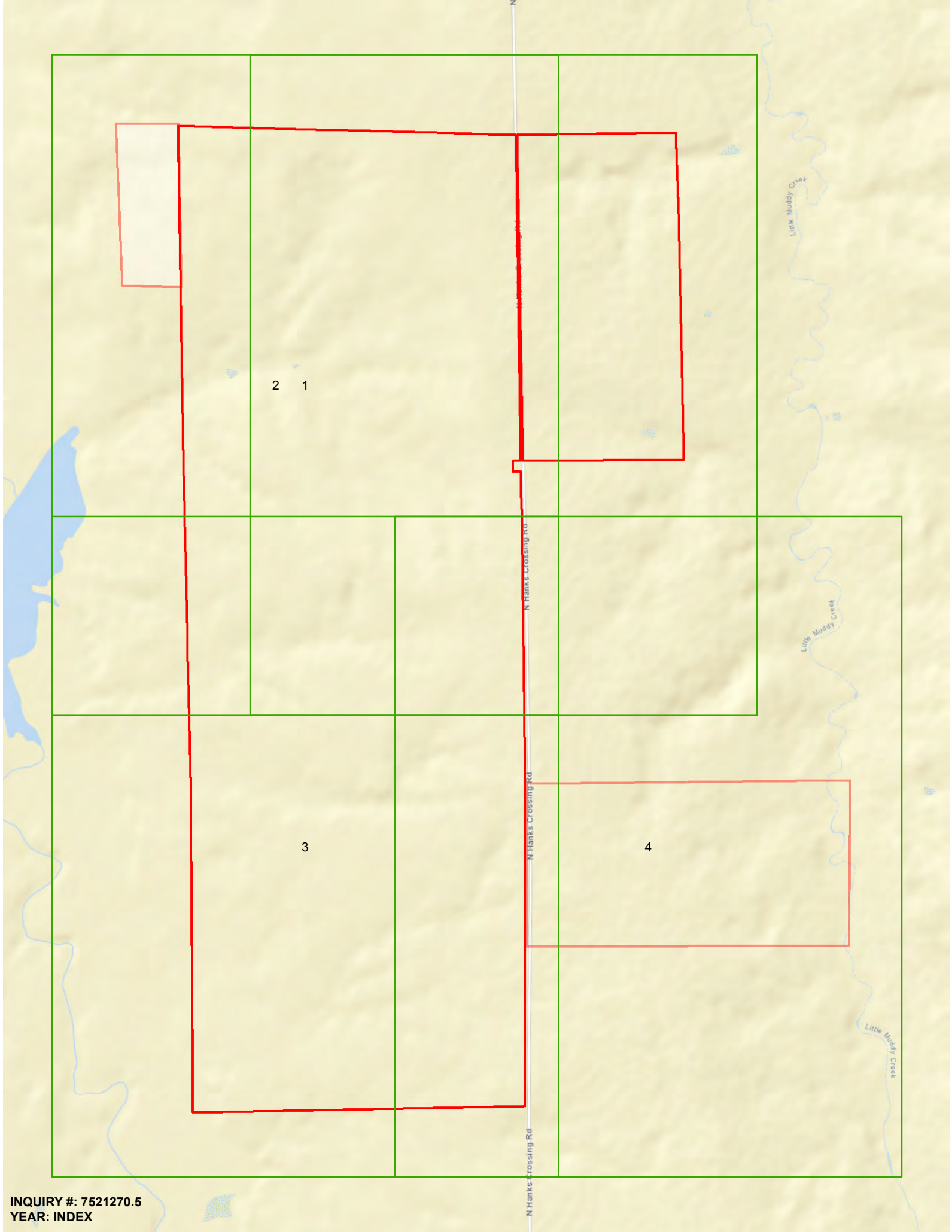
Aerial Photography December 19, 2023

Target Property:

Hanks Crossing

Byers, CO 80103

<u><i>Year</i></u>	<u><i>Scale</i></u>	<u><i>Details</i></u>	<u><i>Source</i></u>
1937	Aerial Photograph. Scale: 1"=1000'	Flight Year: 1937	USDA
1948	Aerial Photograph. Scale: 1"=1000'	Flight Year: 1948	USGS
1953	Aerial Photograph. Scale: 1"=1000'	Flight Year: 1953	USGS
1970	Aerial Photograph. Scale: 1"=1000'	Flight Year: 1970	USDA
1975	Aerial Photograph. Scale: 1"=1000'	Flight Year: 1975	USGS
1985	Aerial Photograph. Scale: 1"=1000'	Flight Year: 1985	USGS
1993	Aerial Photograph. Scale: 1"=1000'	Flight Year: 1993	USGS/DOQQ
1998	Aerial Photograph. Scale: 1"=1000'	Flight Year: 1998	USGS/DOQQ
2006	Aerial Photograph. Scale: 1"=1000'	Flight Year: 2006	USDA/NAIP
2011	Aerial Photograph. Scale: 1"=1000'	Flight Year: 2011	USGS/NAIP
2015	Aerial Photograph. Scale: 1"=1000'	Flight Year: 2015	USDA/NAIP
2019	Aerial Photograph. Scale: 1"=1000'	Flight Year: 2019	USDA/NAIP



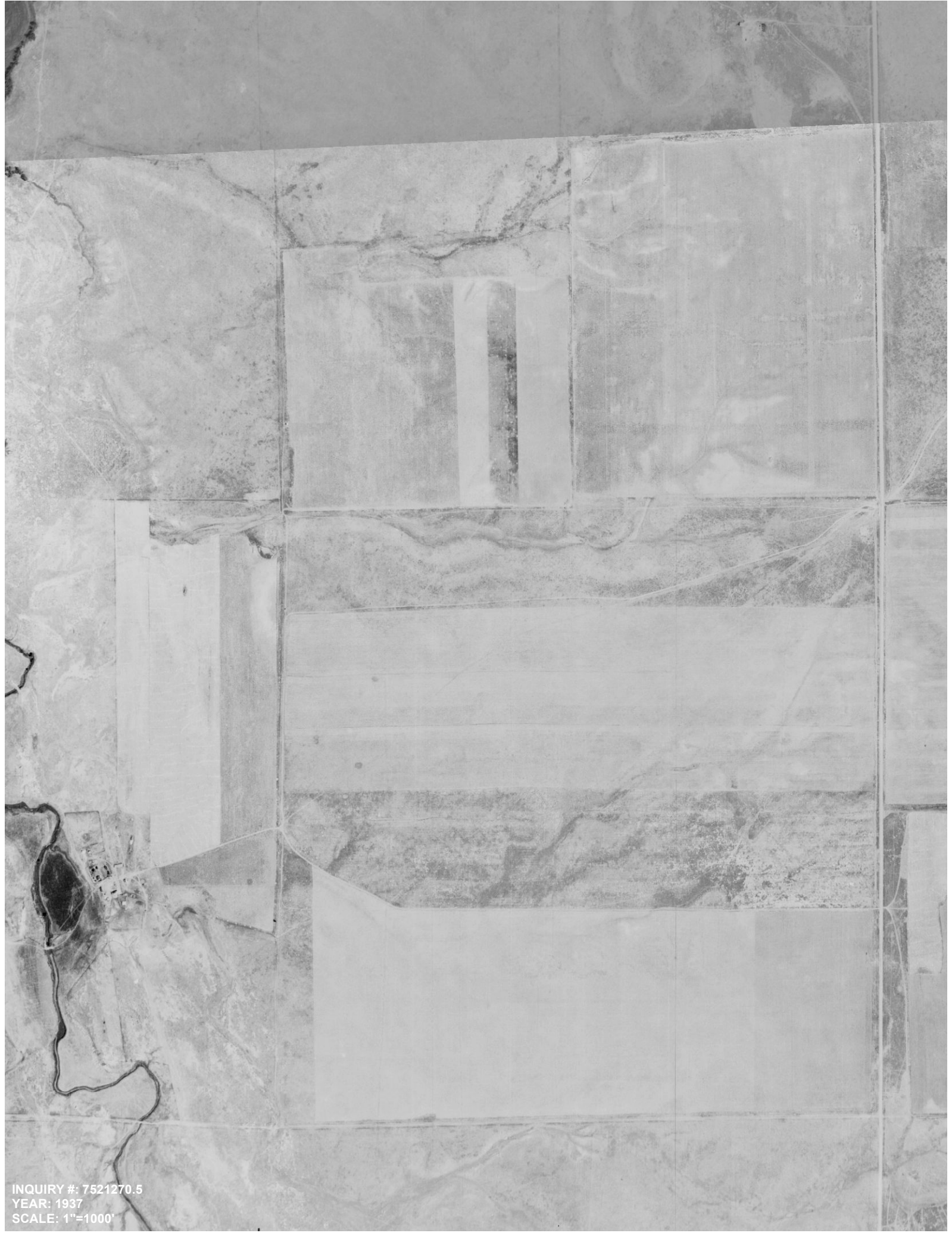
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YEAR: INDEX



INQUIRY #: 7521270.5
YEAR: 1937
SCALE: 1"=1000'



INQUIRY #: 7521270.5
YEAR: 1937
SCALE: 1"=1000'



INQUIRY #: 7521270.5
YEAR: 1937
SCALE: 1"=1000'



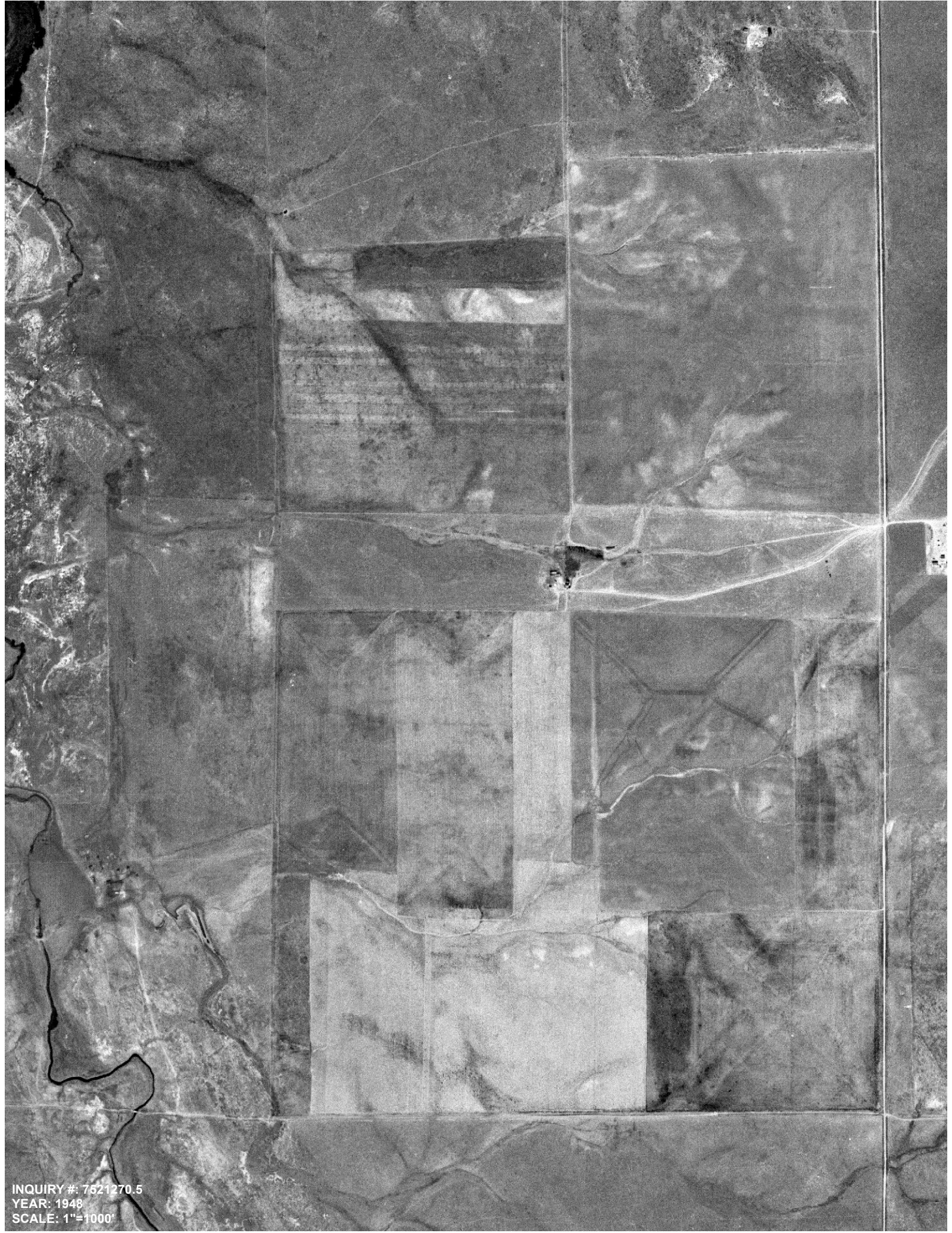
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INQUIRY #: 7521270.5
YEAR: 1948
SCALE: 1"=1000'



INQUIRY #: 7521270.5
YEAR: 1948
SCALE: 1"=1000'



INQUIRY #: 7621270.5
YEAR: 1948
SCALE: 1"=1000'



INQUIRY #: 7521270.5
YEAR: 1948
SCALE: 1"=1000'



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YEAR: 1953
SCALE: 1"=1000'



INQUIRY #: 7521270.5
YEAR: 1953
SCALE: 1"=1000'

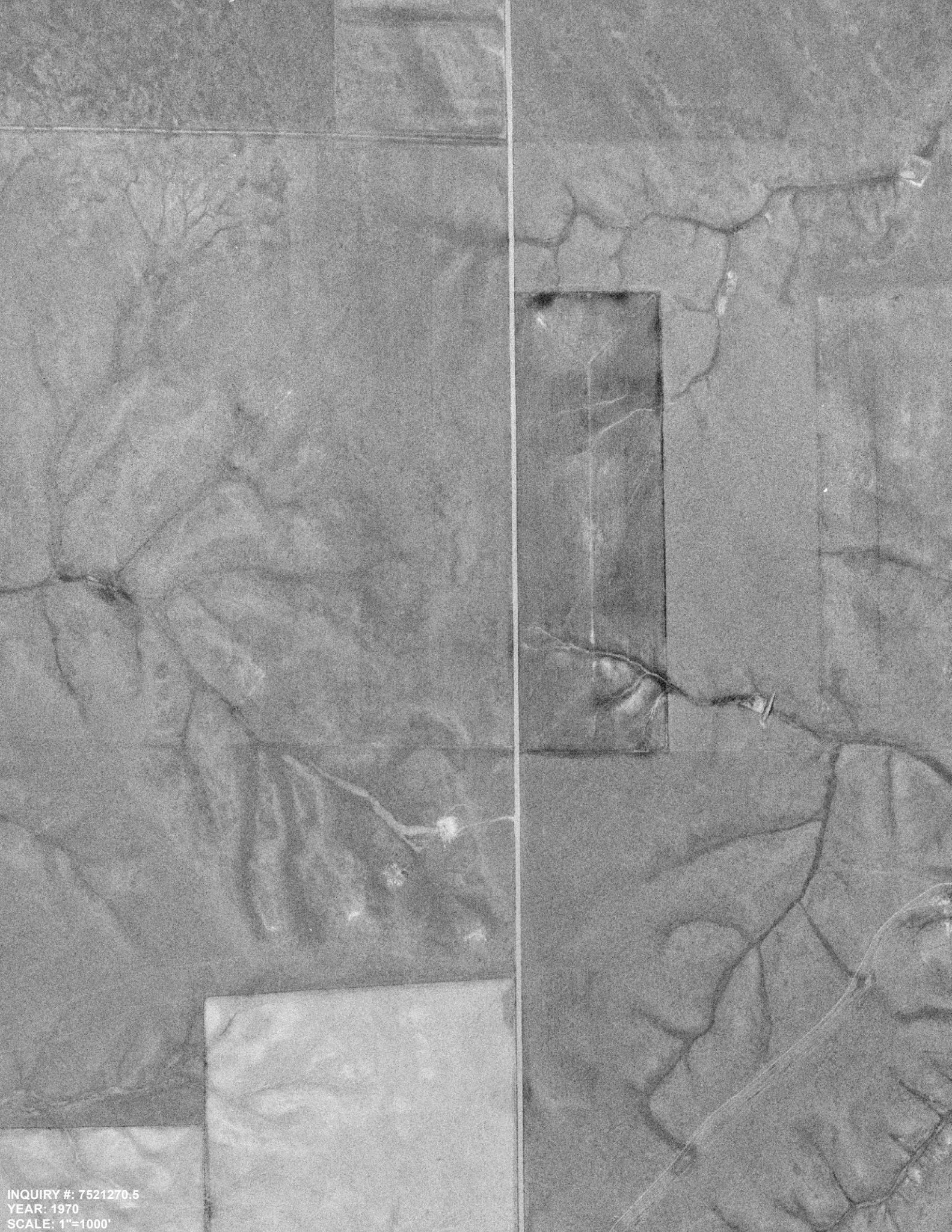


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SCALE: 1"=1000'



INQUIRY #: 7521270.5
YEAR: 1953
SCALE: 1"=1000'

INQUIRY #: 7521270.5
YEAR: 1970
SCALE: 1"=1000'



INQUIRY #: 7521270.5
YEAR: 1970
SCALE: 1"=1000'



INQUIRY #: 7521270.5
YEAR: 1970
SCALE: 1"=1000'



INQUIRY #: 7521270.5
YEAR: 1970
SCALE: 1"=1000'



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SCALE: 1"=1000'

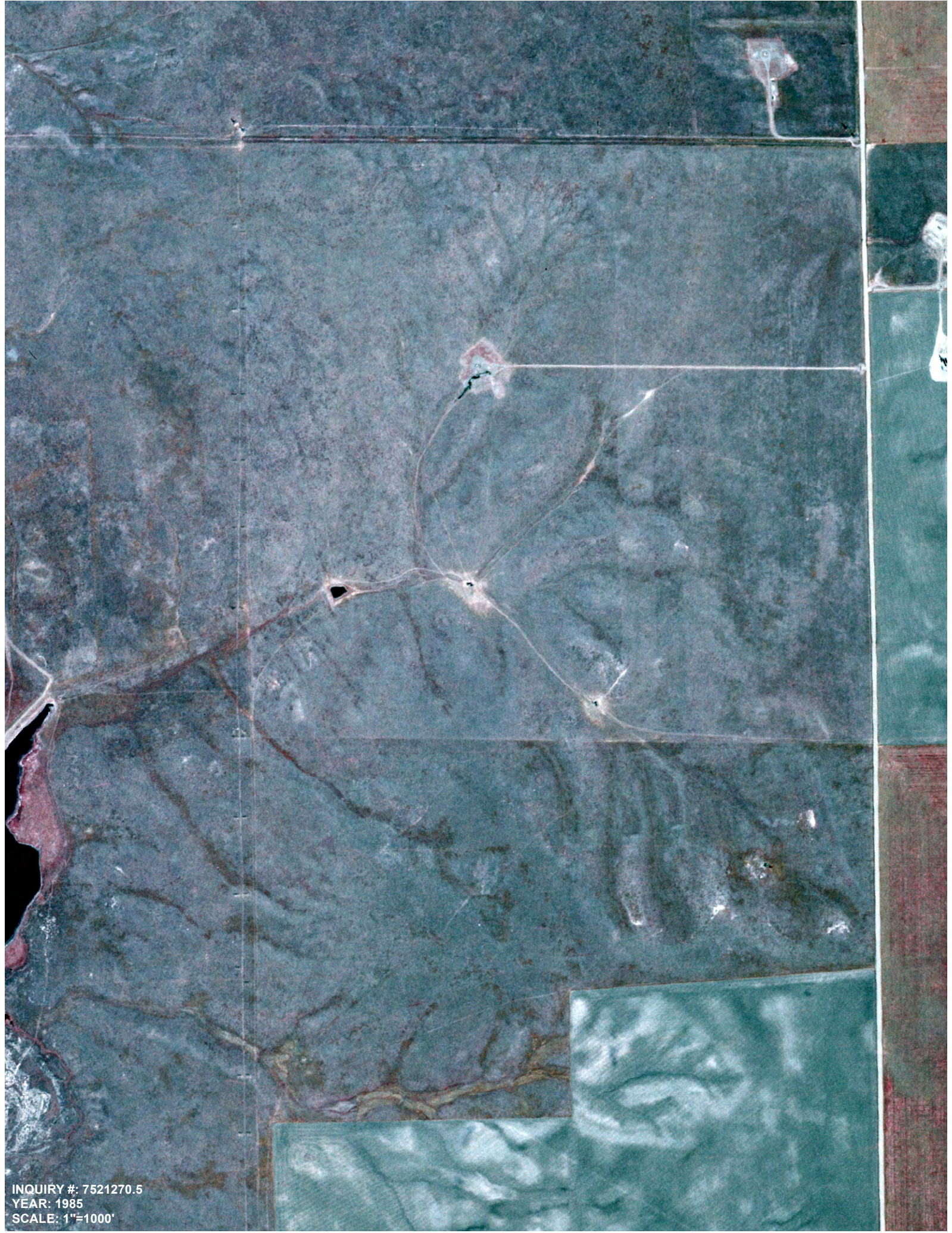
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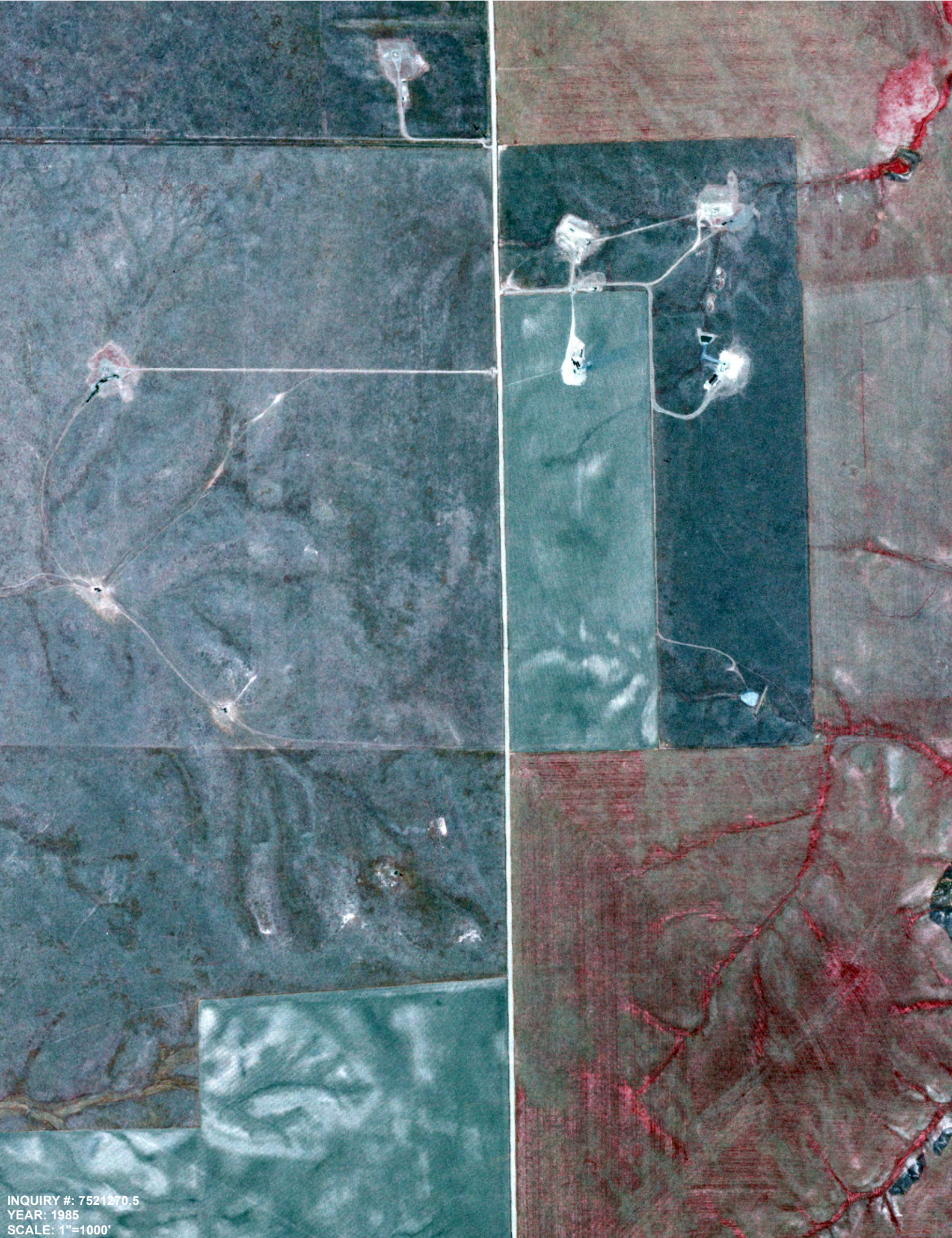
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SCALE: 1"=1000'



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SCALE: 1"=1000'



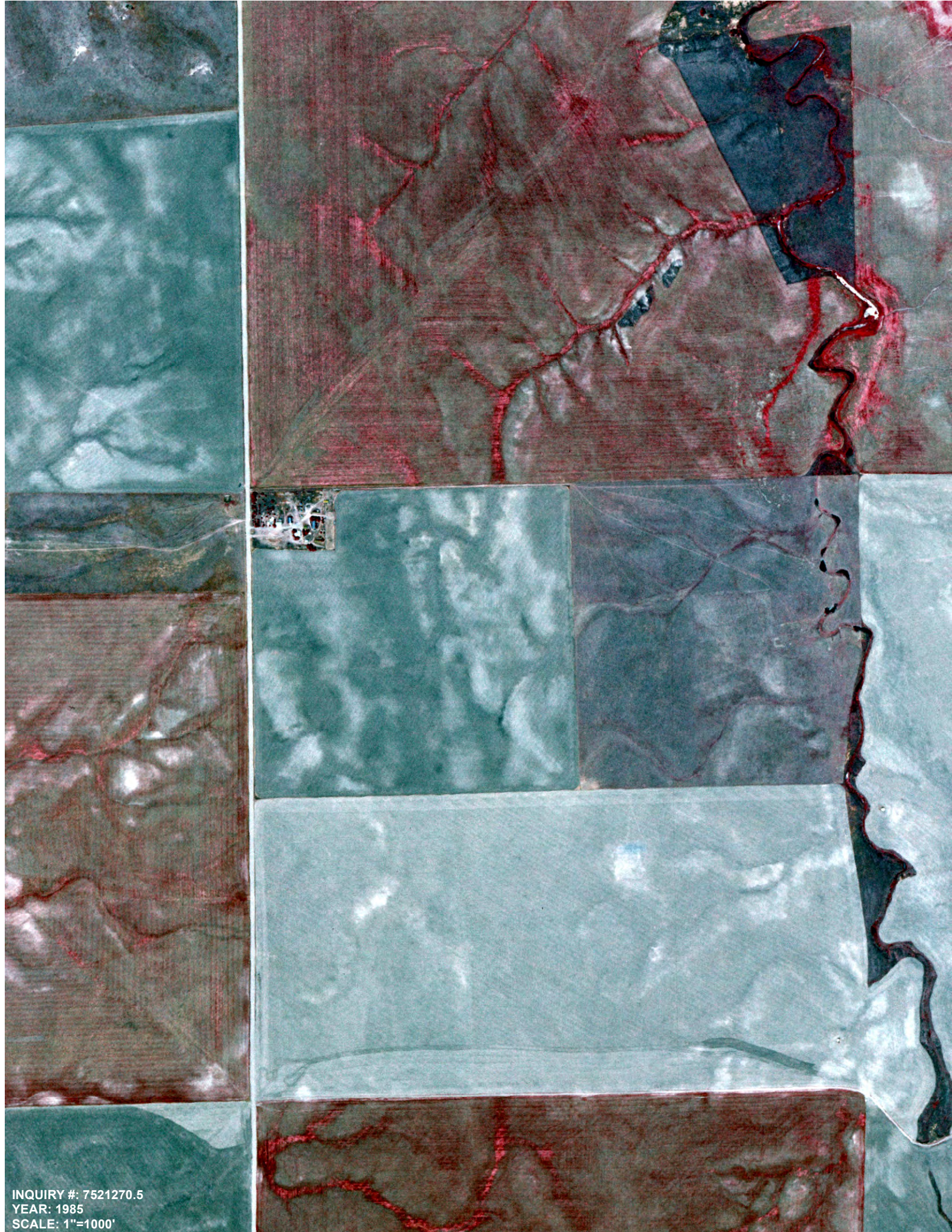
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YEAR: 1985
SCALE: 1"=1000'



INQUIRY #: 7521270.5
YEAR: 1985
SCALE: 1"=1000'



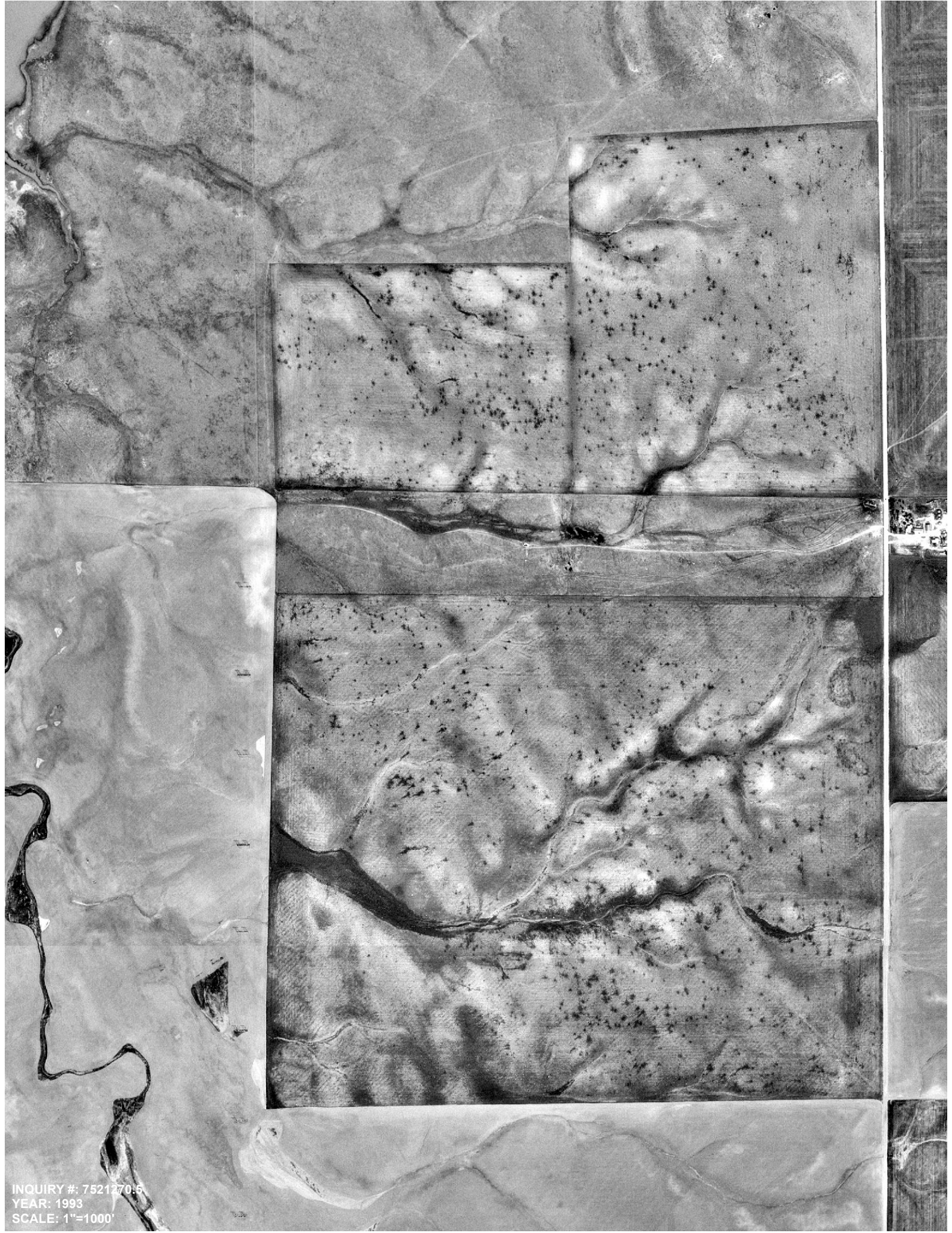
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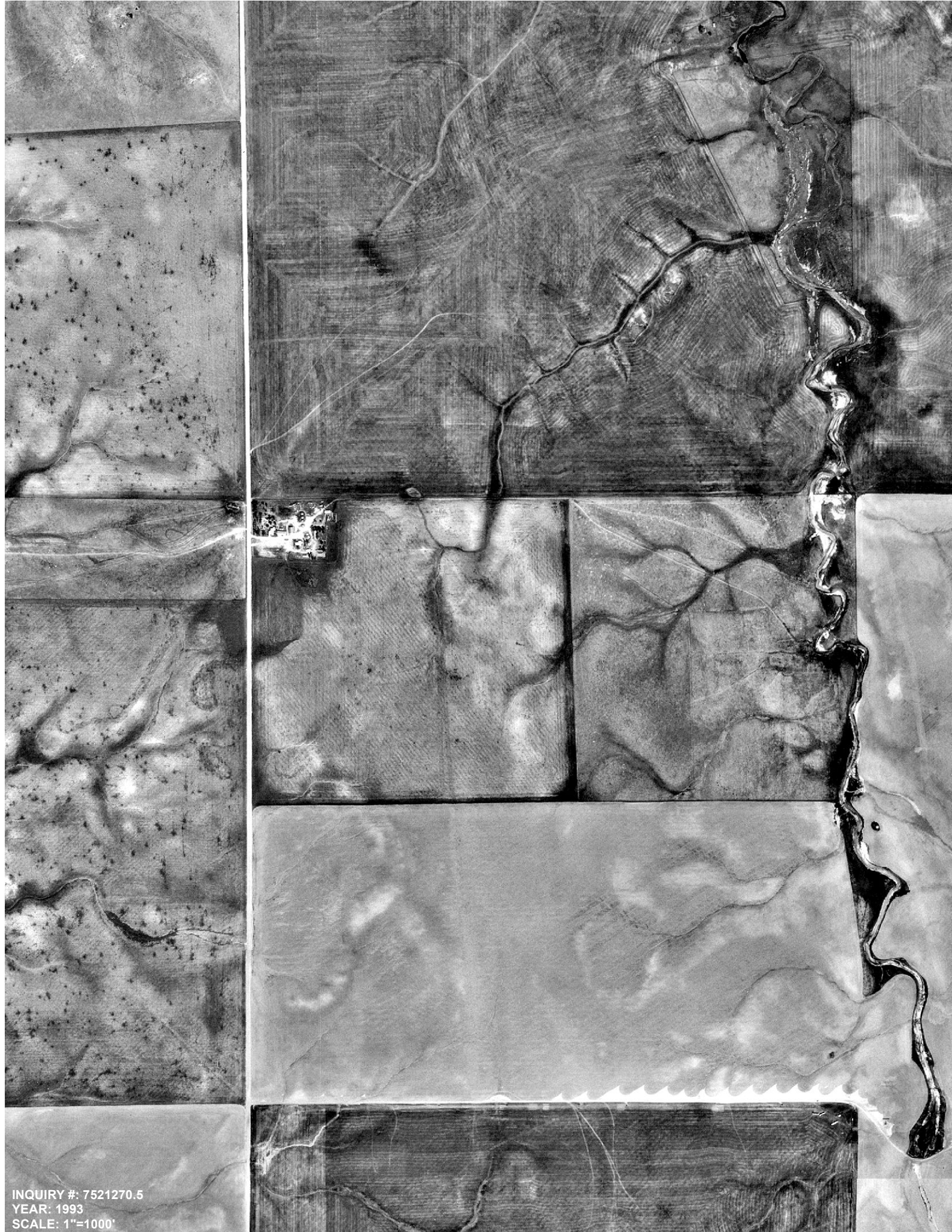
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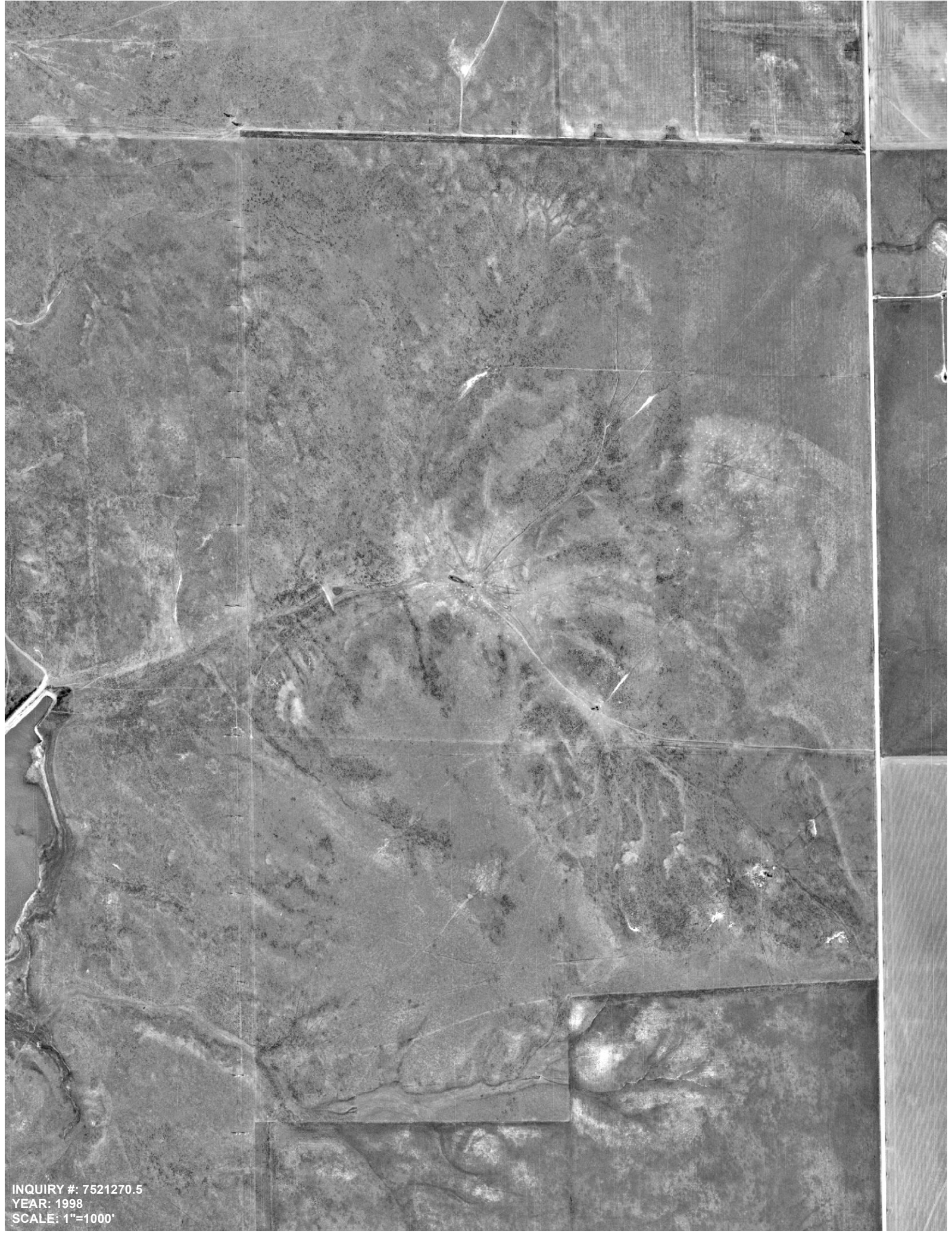
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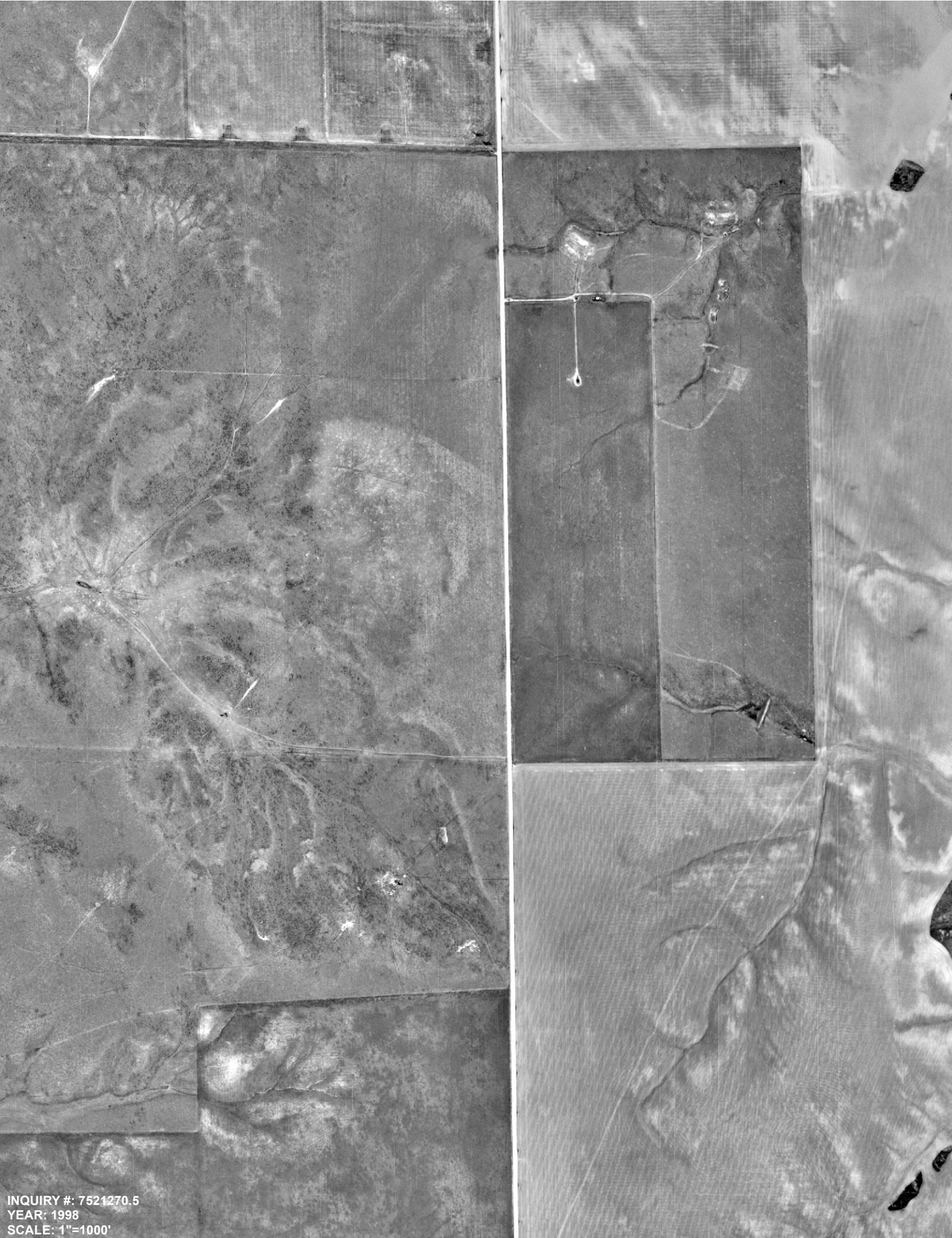
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YEAR: 1993
SCALE: 1"=1000'



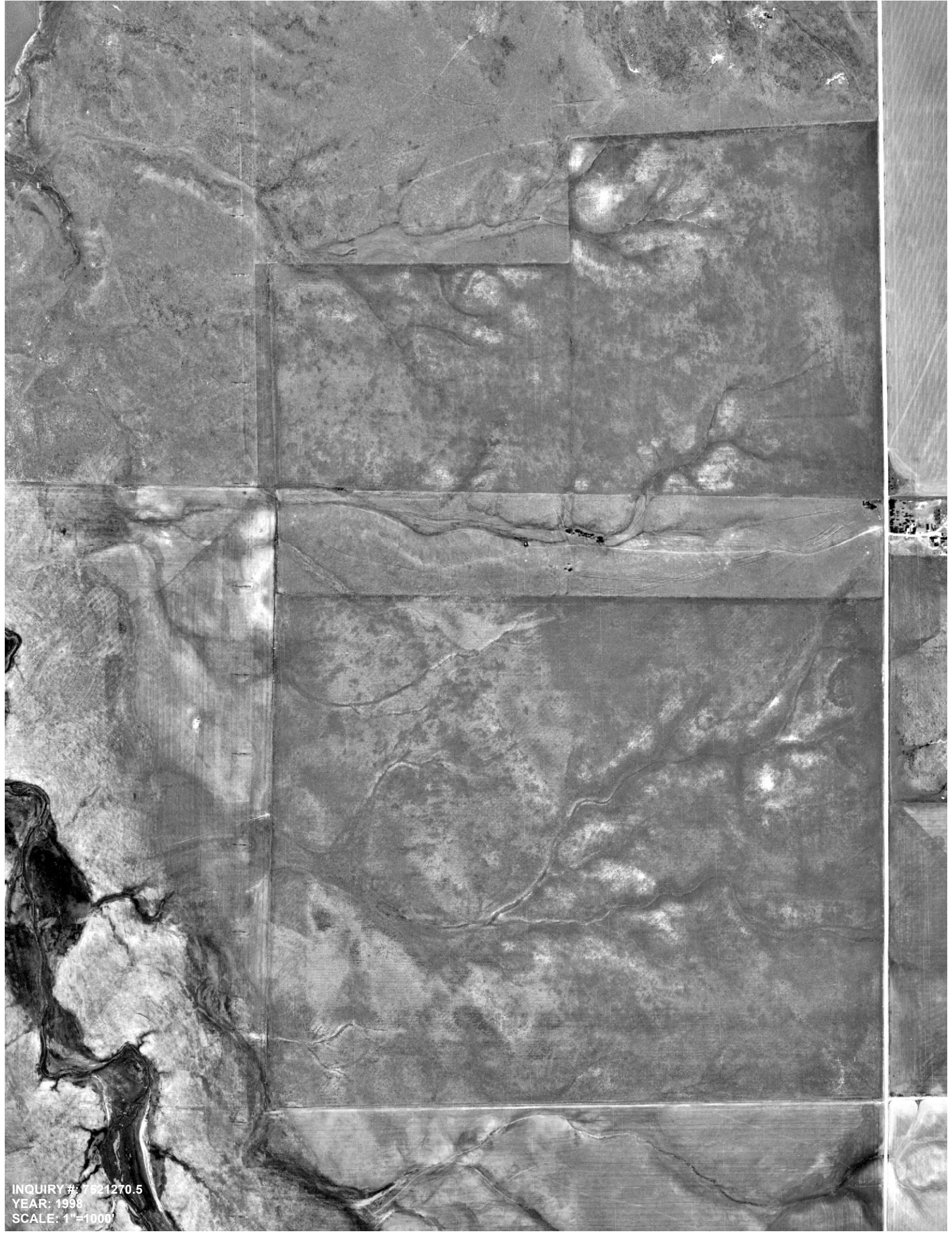
INQUIRY #: 7521270.5
YEAR: 1993
SCALE: 1"=1000'



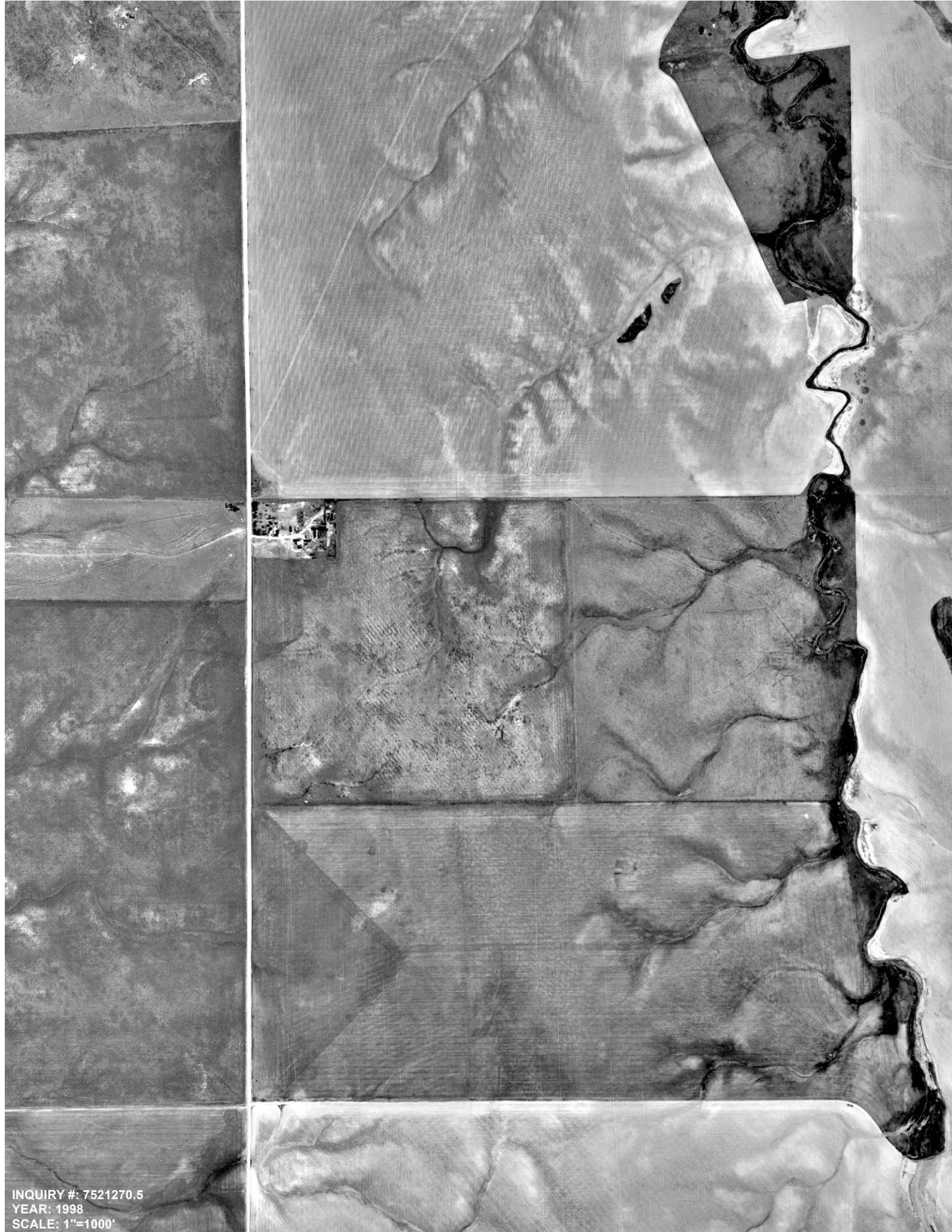
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SCALE: 1"=1000'



INQUIRY #: 7521270.5
YEAR: 1998
SCALE: 1"=1000'



INQUIRY #: 7621270.5
YEAR: 1998
SCALE: 1"=1000'



INQUIRY #: 7521270.5
YEAR: 1998
SCALE: 1"=1000'



INQUIRY #: 7521270.5
YEAR: 2006
SCALE: 1"=1000'



INQUIRY #: 7521270.5
YEAR: 2006
SCALE: 1"=1000'



INQUIRY #: 7521270.5
YEAR: 2006
SCALE: 1"=1000'



INQUIRY #: 7521270.5
YEAR: 2006
SCALE: 1"=1000'



INQUIRY #: 7521270.5
YEAR: 2011
SCALE: 1"=1000'



INQUIRY #: 7521270.5
YEAR: 2011
SCALE: 1"=1000'



INQUIRY #: 7521270.5
YEAR: 2011
SCALE: 1"=1000'



INQUIRY #: 7521270.5
YEAR: 2011
SCALE: 1"=1000'



INQUIRY #: 7521270.5
YEAR: 2015
SCALE: 1"=1000'



INQUIRY #: 7521270.5
YEAR: 2015
SCALE: 1"=1000'



INQUIRY #: 7521270.5
YEAR: 2015
SCALE: 1"=1000'



INQUIRY #: 7521270.5
YEAR: 2015
SCALE: 1"=1000'



INQUIRY #: 7521270.5
YEAR: 2019
SCALE: 1"=1000'



INQUIRY #: 7521270.5
YEAR: 2019
SCALE: 1"=1000'



INQUIRY #: 7521270.5
YEAR: 2019
SCALE: 1"=1000'



INQUIRY #: 7521270.5
YEAR: 2019
SCALE: 1"=1000'

APPENDIX C: AAI USER QUESTIONNAIRE AND LANDOWNER QUESTIONNAIRES



**Phase I Environmental Site Assessment
User's Questionnaire**

**Hanks Crossing Solar Project
Adams County, Colorado**

The purpose of this questionnaire is to assist us in compiling the information required by ASTM Standard E2247-16, *Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process for Farmland or Rural Property*—the standard for conducting Phase I Environmental Site Assessments. Please answer questions to the best of your ability. If an answer cannot be provided, write “Unknown.”

Question	Response/Comments
1. Is the User aware of any environmental cleanup liens against the Property that are filed or recorded under federal, tribal, state or local law?	No
2. Is the User aware of any AULs, such as engineering controls, land use restrictions or institutional controls that are in place on the Property and/or have been filed or recorded in a registry under federal, state or local law?	No
3. Does the User have any specialized knowledge or experience related to the Property or nearby properties?	No
4. Is the User involved in the same line of business as the current or former occupants of the Property or on adjoining properties so that they would have knowledge of the chemicals and processes used by current or former occupants?	No
5. Is the User aware of any commonly known or reasonably ascertainable information about the Property that would help the environmental professional to identify conditions indicative of releases or threatened releases?	No
6. Is the User aware of specific chemicals that are or may have been present on the Property, spills or chemical releases on the property, or any cleanups that may have taken place on the Property?	No

Question	Response/Comments
7. Is it the User's opinion that the purchase (or lease) price being paid for Property reasonably reflects the fair market value of the Property?	Yes
8. Is the User aware of any obvious indicators that point to the presence or likely presence of contamination on the Property?	No

Please use space below to provide additional explanation of any your responses above:

Answers provided herein are based on the knowledge of Paul Gascoigne, Sr. Mgr., Site Acquisition & Strategy.

**Name of User
(or Representative)** Novis Renewables, LLC

**Company,
Address, and
Phone
Number** 1 Bridge Street, #11,
Irvington, NY 10533

Signature *Thomas Leahy*

Date January 8, 2024

Email Address information@novisrenew.com



**Phase I Environmental Site Assessment
Landowner Questionnaire**

**Hanks Crossing Solar Project
Adams County, Colorado**

The purpose of this questionnaire is to assist us in compiling the information required by ASTM Standard E2247-16, *Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process for Farmland or Rural Property*—the standard for conducting Phase I Environmental Site Assessments. Please answer questions to the best of your ability as a landowner involved in the project. If an answer cannot be provided, write “Unknown.”

Question	Response/Comments
1. How long have you owned or occupied the <i>property</i> ?	Our family has owned it since 1974
2. What is the approximate age of the building(s) (if any)?	N/A
3. What was the past use of the property and any adjacent properties?	Cattle grazing
4. Have there been other tenants? If yes, what is the nature of the other tenants' operations?	No
5. Is the <i>property</i> , or <i>any adjoining property</i> , ever been used for any of the following activities: Industrial Use, gas station; motor repair; commercial printing; dry cleaners; photo-developing; junkyard or landfill; waste treatment, storage, disposal, processing, or recycling? <i>(if yes, please provide brief explanation)</i>	No

Question	Response/Comments
<p>6. Are there or had there been any accumulations of damaged or discarded automotive batteries, pesticides, paints, drums, or chemicals?</p> <p><i>(if yes, please describe and provide general locations)</i></p>	<p>No</p>
<p>7. Has fill dirt been brought onto the <i>property</i> from off-site sources?</p> <p><i>(if yes, please provide origin of fill, when it was brought on the property.)</i></p>	<p>No</p>
<p>8. Are there or have there been any pits, ponds, lagoons, cisterns, cesspools, or septic systems located on the <i>property</i> in connection with waste treatment, waste disposal, or are likely to contain hazardous substances or petroleum products?</p> <p><i>(if yes, please provide when and where pits, lagoons, or ponds were located on property)</i></p>	<p>No</p>
<p>9. Is there any stained soil or significantly stained paved areas on the <i>property</i>?</p> <p><i>(if yes, please provide location and source of staining)</i></p>	<p>No</p>
<p>10. Are there or have there been any aboveground or underground storage tanks located on the <i>property</i>?</p>	<p>No</p>
<p>11. Are there or have there been any vent pipes, fill pipes, or access ways protruding from the ground or <i>adjacent</i> to any <i>structure</i> located on the <i>property</i>?</p>	<p>No</p>
<p>12. Is the property served by either a private well or non-public water system?</p> <p><i>(if "yes", go to 13; if "no" go to 14)</i></p>	<p>No</p>

Question	Response/Comments
<p>13. Have contaminants been identified in the well, or has the well been designated as contaminated?</p>	<p style="text-align: center;">No</p>
<p>14. Are there any dry wells, irrigation wells, injection wells, abandoned wells, or monitoring wells located on the subject property?</p>	<p style="text-align: center;">No</p>
<p>15. Do you know of any environmental site assessment of the property that indicated the presence of hazardous substances or petroleum products?</p> <p><i>(If yes, please explain – Do you have documentation of this assessment?)</i></p>	<p style="text-align: center;">No</p>
<p>16. Does the <i>property</i> discharge wastewater, other than storm water, into a sanitary sewer system?</p> <p><i>(if yes, please indicate what is discharged and where it is discharged)</i></p>	<p style="text-align: center;">No</p>
<p>17. Have any of the following been dumped, buried, or burned on the <i>property</i>?</p> <p>Hazardous substances or petroleum products, unidentified waste materials, tires, automotive or industrial batteries or any other waste materials.</p>	<p style="text-align: center;">No</p>
<p>18. Is there a transformer, capacitor, or any hydraulic equipment on the <i>property</i>?</p>	<p style="text-align: center;">There is Excel Power lines</p>

Please use space below to provide additional explanation of any your responses above:

The questionnaire was completed by:

Name of Property Owner (or Representative)	<u>Lisa Beauprez</u>	Company, Address, and Phone Number	_____
Signature	<u>Lisa Beauprez</u>	Date	<u>12-28-23</u>
Email Address	<u>Lisa.l@bradbury.companies.com</u>		



TETRA TECH

Phase I Environmental Site Assessment
Landowner Questionnaire

Hanks Crossing Solar Project
Adams County, Colorado

The purpose of this questionnaire is to assist us in compiling the information required by ASTM Standard E2247-16, *Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process for Farmland or Rural Property*—the standard for conducting Phase I Environmental Site Assessments. Please answer questions to the best of your ability as a landowner involved in the project. If an answer cannot be provided, write "Unknown."

Question	Response/Comments
1. How long have you owned or occupied the property?	7 years 9 mos.
2. What is the approximate age of the building(s) (if any)?	118 yr old house 57-85 yr old wood huts 110 yr old house (large)
3. What was the past use of the property and any adjacent properties?	farming / unknown
4. Have there been other tenants? If yes, what is the nature of the other tenants' operations?	no - homestead in 1880
5. Is the property, or any adjoining property, ever been used for any of the following activities: Industrial Use, gas station, motor repair, commercial printing, dry cleaners, photo-developing, junkyard or landfill, waste treatment, storage, disposal, processing, or recycling? (if yes, please provide brief explanation)	no / unknown

Tetra Tech, Inc.

150 Indiana Street, Suite 500, Golden, CO 80401
Tel 303.217.5700 Fax 303.986.2539 www.tetrattech.com

Question	Response/Comments
<p>6. Are there or had there been any accumulations of damaged or discarded automotive batteries, pesticides, paints, drums, or chemicals?</p> <p><i>(if yes, please describe and provide general locations)</i></p>	<p>unknown</p>
<p>7. Has fill dirt been brought onto the property from off-site sources?</p> <p><i>(if yes, please provide origin of fill, when it was brought on the property.)</i></p>	<p>unknown</p>
<p>8. Are there or have there been any pits, ponds, lagoons, cisterns, cesspools, or septic systems located on the property in connection with waste treatment, waste disposal, or are likely to contain hazardous substances or petroleum products?</p> <p><i>(if yes, please provide when and where pits, lagoons, or ponds were located on property)</i></p>	<p>2 septic systems</p>
<p>9. Is there any stained soil or significantly stained paved areas on the property?</p> <p><i>(if yes, please provide location and source of staining)</i></p>	<p>unknown</p>
<p>10. Are there or have there been any aboveground or underground storage tanks located on the property?</p>	<p>3 propane + 2 septic</p>
<p>11. Are there or have there been any vent pipes, fill pipes, or access ways protruding from the ground or adjacent to any structure located on the property?</p>	<p>only for septic / unknown</p>
<p>12. Is the property served by either a private well or non-public water system?</p> <p><i>(if "yes", go to 13; if "no" go to 14)</i></p>	<p>2 private wells and windmill well (old)</p>

Question	Response/Comments
13. Have contaminants been identified in the well, or has the well been designated as contaminated?	unknown
14. Are there any dry wells, irrigation wells, injection wells, abandoned wells, or monitoring wells located on the subject property?	unknown
15. Do you know of any environmental site assessment of the property that indicated the presence of hazardous substances or petroleum products? <i>(if yes, please explain - Do you have documentation of this assessment?)</i>	no
16. Does the property discharge wastewater, other than storm water, into a sanitary sewer system? <i>(if yes, please indicate what is discharged and where it is discharged)</i>	no
17. Have any of the following been dumped, buried, or burned on the property? Hazardous substances or petroleum products, unidentified waste materials, tires, automotive or industrial batteries or any other waste materials.	no / unknown
18. Is there a transformer, capacitor, or any hydraulic equipment on the property?	one pole mount transformer

Please use space below to provide additional explanation of any your responses above:

The questionnaire was completed by:

Name of Property
Owner
(or Representative)

James Holden

Company,
Address, and
Phone Number

Signature

[Handwritten Signature]

Date

12/27/2023

Email Address



RECEIVED
JAN 10 2024

Phase I Environmental Site Assessment
Landowner Questionnaire

Hanks Crossing Solar Project
Adams County, Colorado

BY:

The purpose of this questionnaire is to assist us in compiling the information required by ASTM Standard E2247-16, *Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process for Farmland or Rural Property*—the standard for conducting Phase I Environmental Site Assessments. Please answer questions to the best of your ability as a landowner involved in the project. If an answer cannot be provided, write "Unknown."

Question	Response/Comments
1. How long have you owned or occupied the property?	OWNED SINCE 1975
2. What is the approximate age of the building(s) (if any)?	NO BUILDINGS
3. What was the past use of the property and any adjacent properties?	GRASSLAND FOR CATTLE PASTURE DRYLAND FARMING - MOSTLY WHEAT OR MILLET
4. Have there been other tenants? If yes, what is the nature of the other tenants' operations?	PASTURE RENTERS FARMER ON CROP SHARE BASIS
5. Is the property, or any adjoining property, ever been used for any of the following activities: Industrial Use, gas station; motor repair; commercial printing; dry cleaners; photo-developing; junkyard or landfill; waste treatment, storage, disposal, processing, or recycling? (if yes, please provide brief explanation)	NO

Question	Response/Comments
<p>6. Are there or had there been any accumulations of damaged or discarded automotive batteries, pesticides, paints, drums, or chemicals?</p> <p><i>(if yes, please describe and provide general locations)</i></p>	NO
<p>7. Has fill dirt been brought onto the property from off-site sources?</p> <p><i>(if yes, please provide origin of fill, when it was brought on the property.)</i></p>	NO
<p>8. Are there or have there been any pits, ponds, lagoons, cisterns, cesspools, or septic systems located on the property in connection with waste treatment, waste disposal, or are likely to contain hazardous substances or petroleum products?</p> <p><i>(if yes, please provide when and where pits, lagoons, or ponds were located on property)</i></p>	NO
<p>9. Is there any stained soil or significantly stained paved areas on the property?</p> <p><i>(if yes, please provide location and source of staining)</i></p>	NO
<p>10. Are there or have there been any aboveground or underground storage tanks located on the property?</p>	<p>YES - OILFIELD PRODUCTION TANKS IN PARCEL 1 IN THE 1980'S AND IN SECTION 28 EAST OF HANKS CROSSING ROAD - ALL ABOVE GROUND CATTLE WATERING FACILITIES - ALL ABOVE GROUND</p>
<p>11. Are there or have there been any vent pipes, fill pipes, or access ways protruding from the ground or adjacent to any structure located on the property?</p>	NO
<p>12. Is the property served by either a private well or non-public water system?</p> <p><i>(if "yes", go to 13; if "no" go to 14)</i></p>	PRIVATE WELLS FOR CATTLE WATERING

Question	Response/Comments
13. Have contaminants been identified in the well, or has the well been designated as contaminated?	NO
14. Are there any dry wells, irrigation wells, injection wells, abandoned wells, or monitoring wells located on the subject property?	OIL WELLS - PLUGGED AND ABANDONED. VARIOUS CATTLE WATERING WELLS - IN USE AND ABANDONED
15. Do you know of any environmental site assessment of the property that indicated the presence of hazardous substances or petroleum products? <i>(If yes, please explain - Do you have documentation of this assessment?)</i>	NO
16. Does the <i>property</i> discharge wastewater, other than storm water, into a sanitary sewer system? <i>(if yes, please indicate what is discharged and where it is discharged)</i>	NO
17. Have any of the following been dumped, buried, or burned on the <i>property</i> ? Hazardous substances or petroleum products, unidentified waste materials, tires, automotive or industrial batteries or any other waste materials.	NO
18. Is there a transformer, capacitor, or any hydraulic equipment on the <i>property</i> ?	NO

Please use space below to provide additional explanation of any your responses above:

The questionnaire was completed by:

Name of Property Owner (or Representative)	<u>RAYMOND J. MORRIS DONNA R. JONES MORRIS</u>	Company, Address, and Phone Number	<u></u>
Signature	<u>Raymond J. Morris</u>	Date	<u>01-04-2024</u>
Email Address	<u>RAYMOND.J.MORRIS@yahoo.com</u>		

APPENDIX D: REGULATORY DATABASE REPORT



Hanks Crossing

Hanks Crossing
Byers, CO 80103

Inquiry Number: 7521270.2s
December 14, 2023

EDR Area / Corridor Report



6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

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Government Records Searched/Data Currency Tracking	GR-1

Thank you for your business.
 Please contact EDR at 1-800-352-0050
 with any questions or comments.

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EXECUTIVE SUMMARY

A search of available environmental records was conducted by Environmental Data Resources, Inc (EDR). The report was designed to assist parties seeking to meet the search requirements of EPA's Standards and Practices for All Appropriate Inquiries (40 CFR Part 312), the ASTM Standard Practice for Environmental Site Assessments (E1527 - 21), the ASTM Standard Practice for Environmental Site Assessments for Forestland or Rural Property (E2247 - 16), the ASTM Standard Practice for Limited Environmental Due Diligence: Transaction Screen Process (E1528 - 22) or custom requirements developed for the evaluation of environmental risk associated with a parcel of real estate.

SUBJECT PROPERTY INFORMATION

ADDRESS

HANKS CROSSING
BYERS, CO 80103

TARGET PROPERTY SEARCH RESULTS

The Target Property was identified in the following databases.

Page Numbers and Map Identifications refer to the EDR Area/Corridor Report where detailed data on individual sites can be reviewed.

Sites listed in ***bold italics*** are in multiple databases.

SURROUNDING SITES: SEARCH RESULTS

Surrounding sites were not identified.

Unmappable (orphan) sites are not considered in the foregoing analysis.

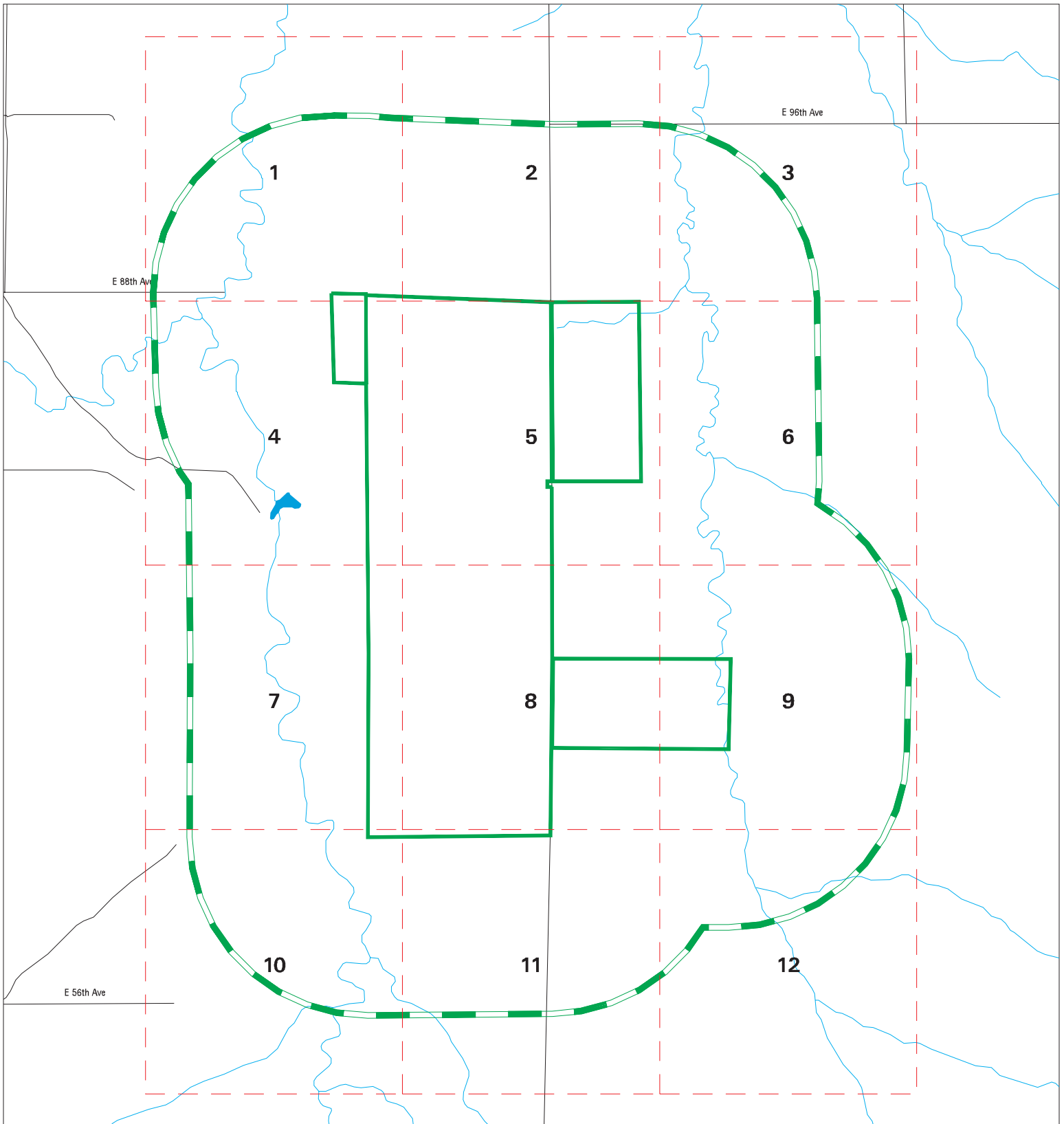
MAPPED SITES SUMMARY

Target Property:
HANKS CROSSING
BYERS, CO 80103

MAP ID / FOCUS MAP	SITE NAME	ADDRESS	DATABASE ACRONYMS	DIST (ft. & mi.) DIRECTION
-----------------------	-----------	---------	-------------------	-------------------------------

NO MAPPED SITES FOUND

Key Map - 7521270.2s



- ▲ Sites
- ▬ Target Property
- ▬ Search Buffer
- ▬ Focus Map - Sites
- National Priority List Sites
- Dept. Defense Sites
- Focus Map - No Sites
- Indian Reservations BIA



<p>SITE NAME: Hanks Crossing ADDRESS: Hanks Crossing CITY/STATE: Byers CO ZIP: 80103</p>	<p>CLIENT: Tetra Tech EC, Inc. CONTACT: Riley Houston INQUIRY #: 7521270.2s DATE: 12/14/23</p> <p style="text-align: right;">1:51 PM</p>
---	--

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
<u>STANDARD ENVIRONMENTAL RECORDS</u>								
<i>Lists of Federal NPL (Superfund) sites</i>								
NPL	1.000		0	0	0	0	NR	0
Proposed NPL	1.000		0	0	0	0	NR	0
NPL LIENS	1.000		0	0	0	0	NR	0
<i>Lists of Federal Delisted NPL sites</i>								
Delisted NPL	1.000		0	0	0	0	NR	0
<i>Lists of Federal sites subject to CERCLA removals and CERCLA orders</i>								
FEDERAL FACILITY	0.500		0	0	0	NR	NR	0
SEMS	0.500		0	0	0	NR	NR	0
<i>Lists of Federal CERCLA sites with NFRAP</i>								
SEMS-ARCHIVE	0.500		0	0	0	NR	NR	0
<i>Lists of Federal RCRA facilities undergoing Corrective Action</i>								
CORRACTS	1.000		0	0	0	0	NR	0
<i>Lists of Federal RCRA TSD facilities</i>								
RCRA-TSDF	0.500		0	0	0	NR	NR	0
<i>Lists of Federal RCRA generators</i>								
RCRA-LQG	0.250		0	0	NR	NR	NR	0
RCRA-SQG	0.250		0	0	NR	NR	NR	0
RCRA-VSQG	0.250		0	0	NR	NR	NR	0
<i>Federal institutional controls / engineering controls registries</i>								
LUCIS	0.500		0	0	0	NR	NR	0
US ENG CONTROLS	0.500		0	0	0	NR	NR	0
US INST CONTROLS	0.500		0	0	0	NR	NR	0
<i>Federal ERNS list</i>								
ERNS	TP		NR	NR	NR	NR	NR	0
<i>Lists of state- and tribal hazardous waste facilities</i>								
SHWS	N/A		N/A	N/A	N/A	N/A	N/A	N/A
<i>Lists of state and tribal landfills and solid waste disposal facilities</i>								
SWF/LF	0.500		0	0	0	NR	NR	0
SHWF	0.500		0	0	0	NR	NR	0
<i>Lists of state and tribal leaking storage tanks</i>								
LTANKS	0.500		0	0	0	NR	NR	0

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
LAST	0.500		0	0	0	NR	NR	0
LUST	0.500		0	0	0	NR	NR	0
INDIAN LUST	0.500		0	0	0	NR	NR	0
LUST TRUST	0.500		0	0	0	NR	NR	0
<i>Lists of state and tribal registered storage tanks</i>								
FEMA UST	0.250		0	0	NR	NR	NR	0
UST	0.250		0	0	NR	NR	NR	0
AST	0.250		0	0	NR	NR	NR	0
INDIAN UST	0.250		0	0	NR	NR	NR	0
<i>State and tribal institutional control / engineering control registries</i>								
AUL	0.500		0	0	0	NR	NR	0
<i>Lists of state and tribal voluntary cleanup sites</i>								
VCP	0.500		0	0	0	NR	NR	0
INDIAN VCP	0.500		0	0	0	NR	NR	0
<i>Lists of state and tribal brownfield sites</i>								
BROWNFIELDS	0.500		0	0	0	NR	NR	0
<u>ADDITIONAL ENVIRONMENTAL RECORDS</u>								
<i>Local Brownfield lists</i>								
US BROWNFIELDS	0.500		0	0	0	NR	NR	0
<i>Local Lists of Landfill / Solid Waste Disposal Sites</i>								
HIST LF	0.500		0	0	0	NR	NR	0
SWRCY	0.500		0	0	0	NR	NR	0
INDIAN ODI	0.500		0	0	0	NR	NR	0
ODI	0.500		0	0	0	NR	NR	0
DEBRIS REGION 9	0.500		0	0	0	NR	NR	0
IHS OPEN DUMPS	0.500		0	0	0	NR	NR	0
DENVER CO HISTORIC FILL	0.500		0	0	0	NR	NR	0
<i>Local Lists of Hazardous waste / Contaminated Sites</i>								
US HIST CDL	TP		NR	NR	NR	NR	NR	0
CDL	TP		NR	NR	NR	NR	NR	0
US CDL	TP		NR	NR	NR	NR	NR	0
<i>Local Land Records</i>								
LIENS 2	TP		NR	NR	NR	NR	NR	0
<i>Records of Emergency Release Reports</i>								
HMIRS	TP		NR	NR	NR	NR	NR	0
SPILLS	TP		NR	NR	NR	NR	NR	0
SPILLS 90	TP		NR	NR	NR	NR	NR	0

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
Other Ascertainable Records								
RCRA NonGen / NLR	0.250		0	0	NR	NR	NR	0
FUDS	1.000		0	0	0	0	NR	0
DOD	1.000		0	0	0	0	NR	0
SCRD DRYCLEANERS	0.500		0	0	0	NR	NR	0
US FIN ASSUR	TP		NR	NR	NR	NR	NR	0
EPA WATCH LIST	TP		NR	NR	NR	NR	NR	0
2020 COR ACTION	0.250		0	0	NR	NR	NR	0
TSCA	TP		NR	NR	NR	NR	NR	0
TRIS	TP		NR	NR	NR	NR	NR	0
SSTS	TP		NR	NR	NR	NR	NR	0
ROD	1.000		0	0	0	0	NR	0
RMP	TP		NR	NR	NR	NR	NR	0
RAATS	TP		NR	NR	NR	NR	NR	0
PRP	TP		NR	NR	NR	NR	NR	0
PADS	TP		NR	NR	NR	NR	NR	0
ICIS	TP		NR	NR	NR	NR	NR	0
FTTS	TP		NR	NR	NR	NR	NR	0
MLTS	TP		NR	NR	NR	NR	NR	0
COAL ASH DOE	TP		NR	NR	NR	NR	NR	0
COAL ASH EPA	0.500		0	0	0	NR	NR	0
PCB TRANSFORMER	TP		NR	NR	NR	NR	NR	0
RADINFO	TP		NR	NR	NR	NR	NR	0
HIST FTTS	TP		NR	NR	NR	NR	NR	0
DOT OPS	TP		NR	NR	NR	NR	NR	0
CONSENT	1.000		0	0	0	0	NR	0
INDIAN RESERV	1.000		0	0	0	0	NR	0
FUSRAP	1.000		0	0	0	0	NR	0
UMTRA	0.500		0	0	0	NR	NR	0
LEAD SMELTERS	TP		NR	NR	NR	NR	NR	0
US AIRS	TP		NR	NR	NR	NR	NR	0
US MINES	0.250		0	0	NR	NR	NR	0
ABANDONED MINES	0.250		0	0	NR	NR	NR	0
MINES MRDS	0.250		0	0	NR	NR	NR	0
FINDS	TP		NR	NR	NR	NR	NR	0
ECHO	TP		NR	NR	NR	NR	NR	0
UXO	1.000		0	0	0	0	NR	0
DOCKET HWC	TP		NR	NR	NR	NR	NR	0
FUELS PROGRAM	0.250		0	0	NR	NR	NR	0
PFAS NPL	0.250		0	0	NR	NR	NR	0
PFAS FEDERAL SITES	0.250		0	0	NR	NR	NR	0
PFAS TRIS	0.250		0	0	NR	NR	NR	0
PFAS TSCA	0.250		0	0	NR	NR	NR	0
PFAS RCRA MANIFEST	0.250		0	0	NR	NR	NR	0
PFAS ATSDR	0.250		0	0	NR	NR	NR	0
PFAS WQP	0.250		0	0	NR	NR	NR	0
PFAS NPDES	0.250		0	0	NR	NR	NR	0
PFAS ECHO	0.250		0	0	NR	NR	NR	0
PFAS ECHO FIRE TRAINING	0.250		0	0	NR	NR	NR	0
PFAS PART 139 AIRPORT	0.250		0	0	NR	NR	NR	0

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
AQUEOUS FOAM NRC	0.250		0	0	NR	NR	NR	0
BIOSOLIDS	TP		NR	NR	NR	NR	NR	0
PFAS	0.250		0	0	NR	NR	NR	0
AQUEOUS FOAM	0.250		0	0	NR	NR	NR	0
AIRS	TP		NR	NR	NR	NR	NR	0
ASBESTOS	TP		NR	NR	NR	NR	NR	0
METHANE SITE	TP		NR	NR	NR	NR	NR	0
Methane Investigation	TP		NR	NR	NR	NR	NR	0
DRYCLEANERS	0.250		0	0	NR	NR	NR	0
Financial Assurance	TP		NR	NR	NR	NR	NR	0
LEAD	TP		NR	NR	NR	NR	NR	0
MINES	0.250		0	0	NR	NR	NR	0
NPDES	TP		NR	NR	NR	NR	NR	0
UIC	TP		NR	NR	NR	NR	NR	0
UMTRA	0.500		0	0	0	NR	NR	0

EDR HIGH RISK HISTORICAL RECORDS

EDR Exclusive Records

EDR MGP	1.000		0	0	0	0	NR	0
EDR Hist Auto	0.125		0	NR	NR	NR	NR	0
EDR Hist Cleaner	0.125		0	NR	NR	NR	NR	0

EDR RECOVERED GOVERNMENT ARCHIVES

Exclusive Recovered Govt. Archives

RGA LF	TP		NR	NR	NR	NR	NR	0
RGA LUST	TP		NR	NR	NR	NR	NR	0

- Totals --		0	0	0	0	0	0	0
-------------	--	---	---	---	---	---	---	---

NOTES:

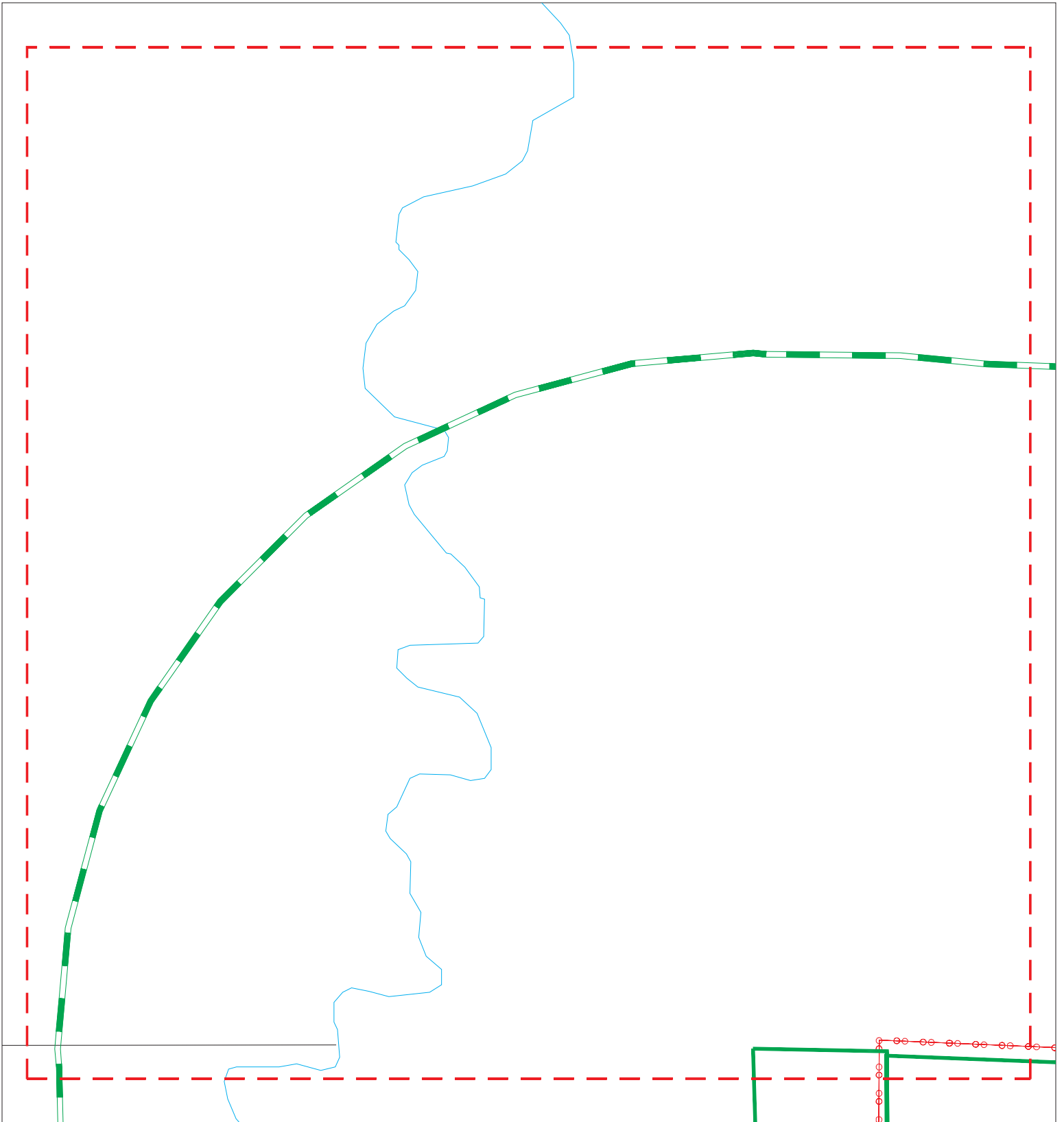
TP = Target Property

NR = Not Requested at this Search Distance

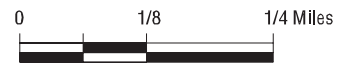
Sites may be listed in more than one database

N/A = This State does not maintain a SHWS list. See the Federal CERCLIS list.

Focus Map - 1 - 7521270.2s



- ▲ Sites
- ▲ Focus Map - Sites
- ▨ Indian Reservations BIA
- ▬ Target Property
- ⚡ Power Line
- ▬ Search Buffer
- ▨ National Priority List Sites
- ▬ Focus Map - No Sites
- ▨ Dept. Defense Sites



SITE NAME: Hanks Crossing
ADDRESS: Hanks Crossing
CITY/STATE: Byers CO
ZIP: 80103

CLIENT: Tetra Tech EC, Inc.
CONTACT: Riley Houston
INQUIRY #: 7521270.2s
DATE: 12/14/23

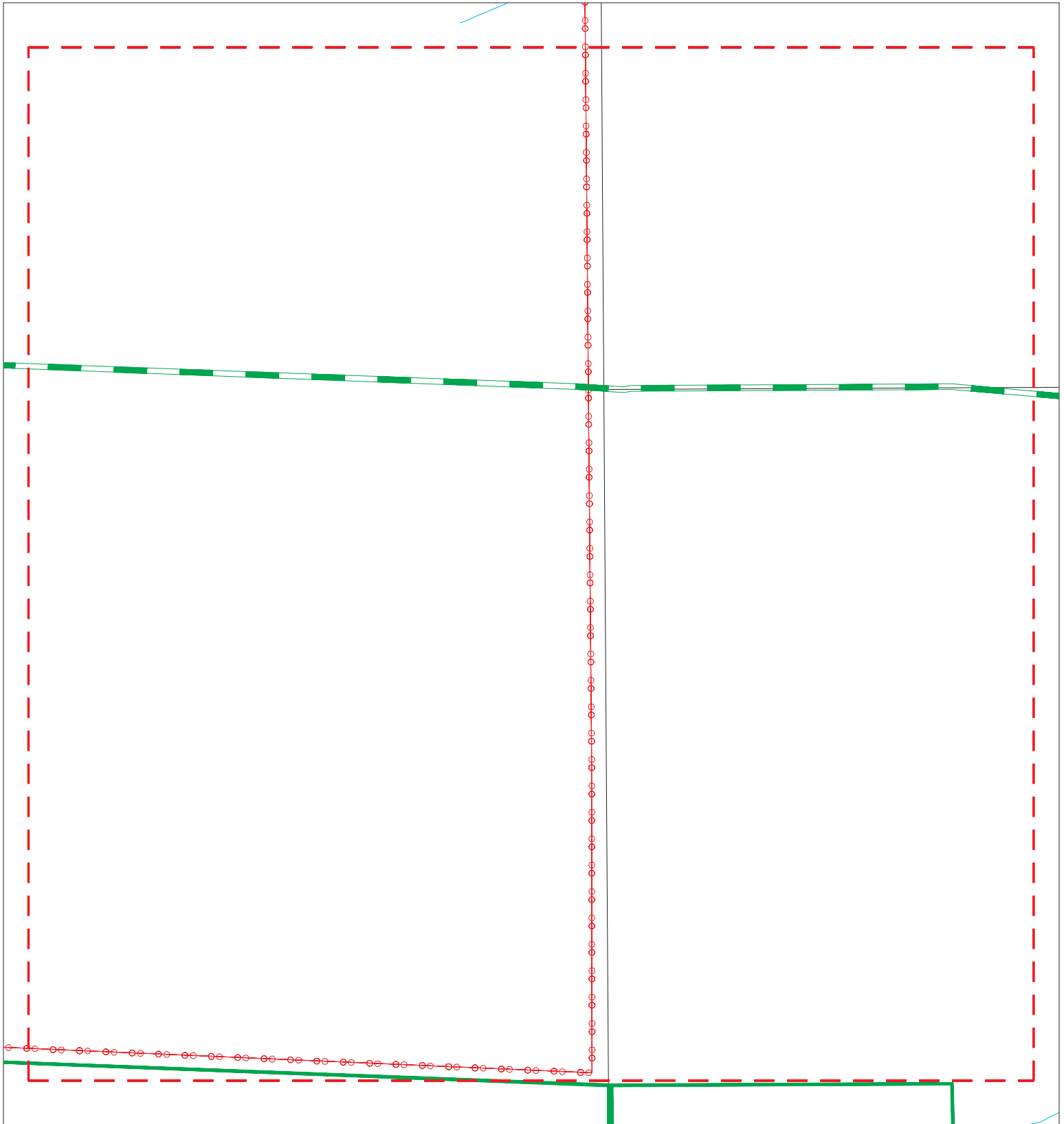
MAPPED SITES SUMMARY - FOCUS MAP 1










Target Property:
HANKS CROSSING
BYERS, CO 80103

MAP ID / FOCUS MAP	SITE NAME	ADDRESS	DATABASE ACRONYMS	DIST (ft. & mi.) DIRECTION
-----------------------	-----------	---------	-------------------	-------------------------------

NO MAPPED SITES FOUND

Focus Map - 2 - 7521270.2s



- | | | |
|---|--|---|
|  Sites |  Focus Map - Sites |  Indian Reservations BIA |
|  Target Property |  Power Line | |
|  Search Buffer |  National Priority List Sites | |
|  Focus Map - No Sites |  Dept. Defense Sites | |



SITE NAME: Hanks Crossing
ADDRESS: Hanks Crossing
CITY/STATE: Byers CO
ZIP: 80103

CLIENT: Tetra Tech EC, Inc.
CONTACT: Riley Houston
INQUIRY #: 7521270.2s
DATE: 12/14/23

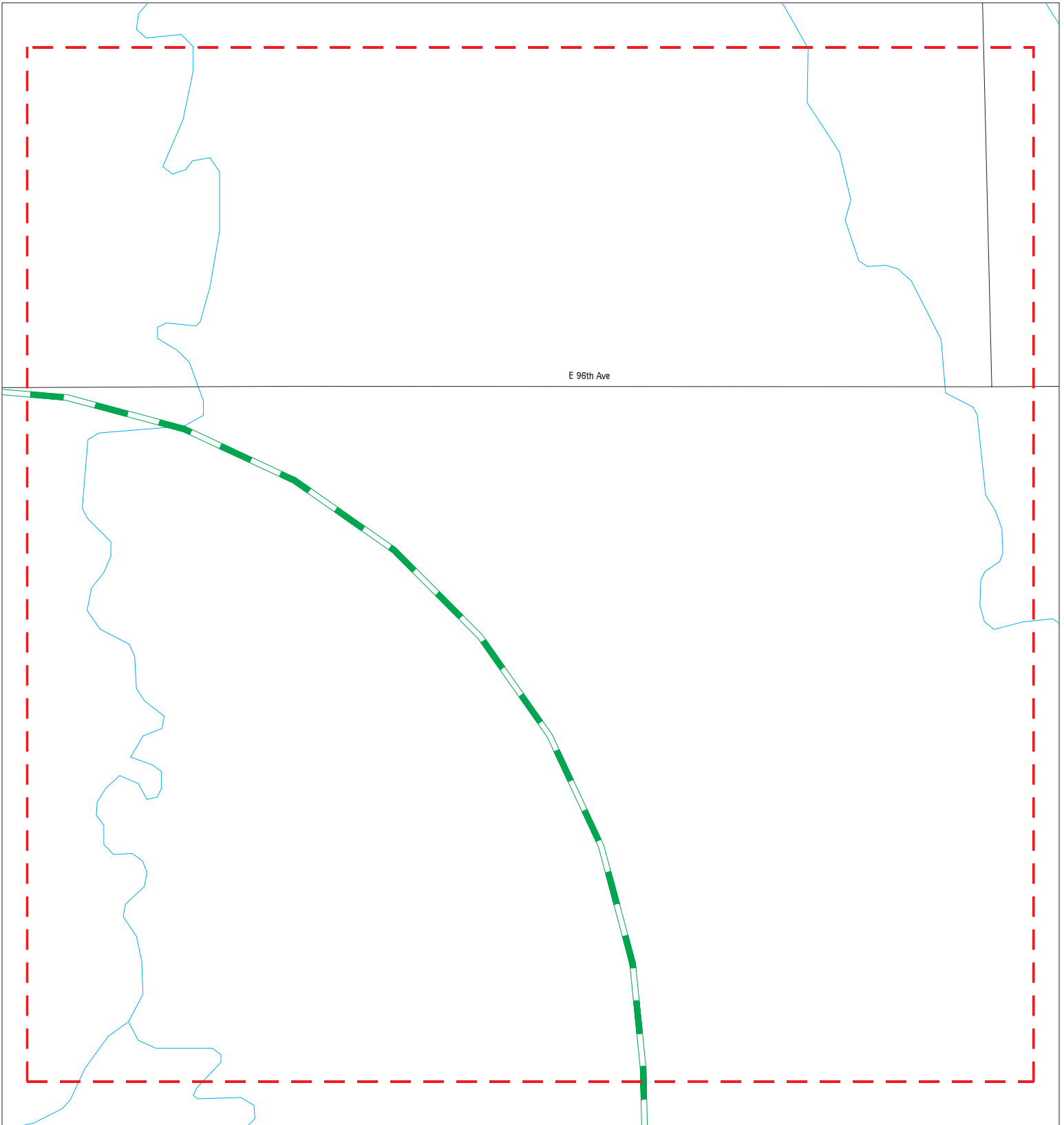
MAPPED SITES SUMMARY - FOCUS MAP 2

Target Property:
HANKS CROSSING
BYERS, CO 80103

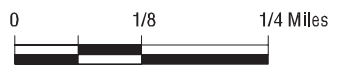
MAP ID / FOCUS MAP	SITE NAME	ADDRESS	DATABASE ACRONYMS	DIST (ft. & mi.) DIRECTION
-----------------------	-----------	---------	-------------------	-------------------------------

NO MAPPED SITES FOUND

Focus Map - 3 - 7521270.2s



- ▲ Sites
- // Focus Map - Sites
- Indian Reservations BIA
- // Target Property
- ⚡ Power Line
- National Priority List Sites
- // Search Buffer
- Dept. Defense Sites
- // Focus Map - No Sites
- Dept. Defense Sites



<p>SITE NAME: Hanks Crossing ADDRESS: Hanks Crossing CITY/STATE: Byers CO ZIP: 80103</p>	<p>CLIENT: Tetra Tech EC, Inc. CONTACT: Riley Houston INQUIRY #: 7521270.2s DATE: 12/14/23</p>
---	---

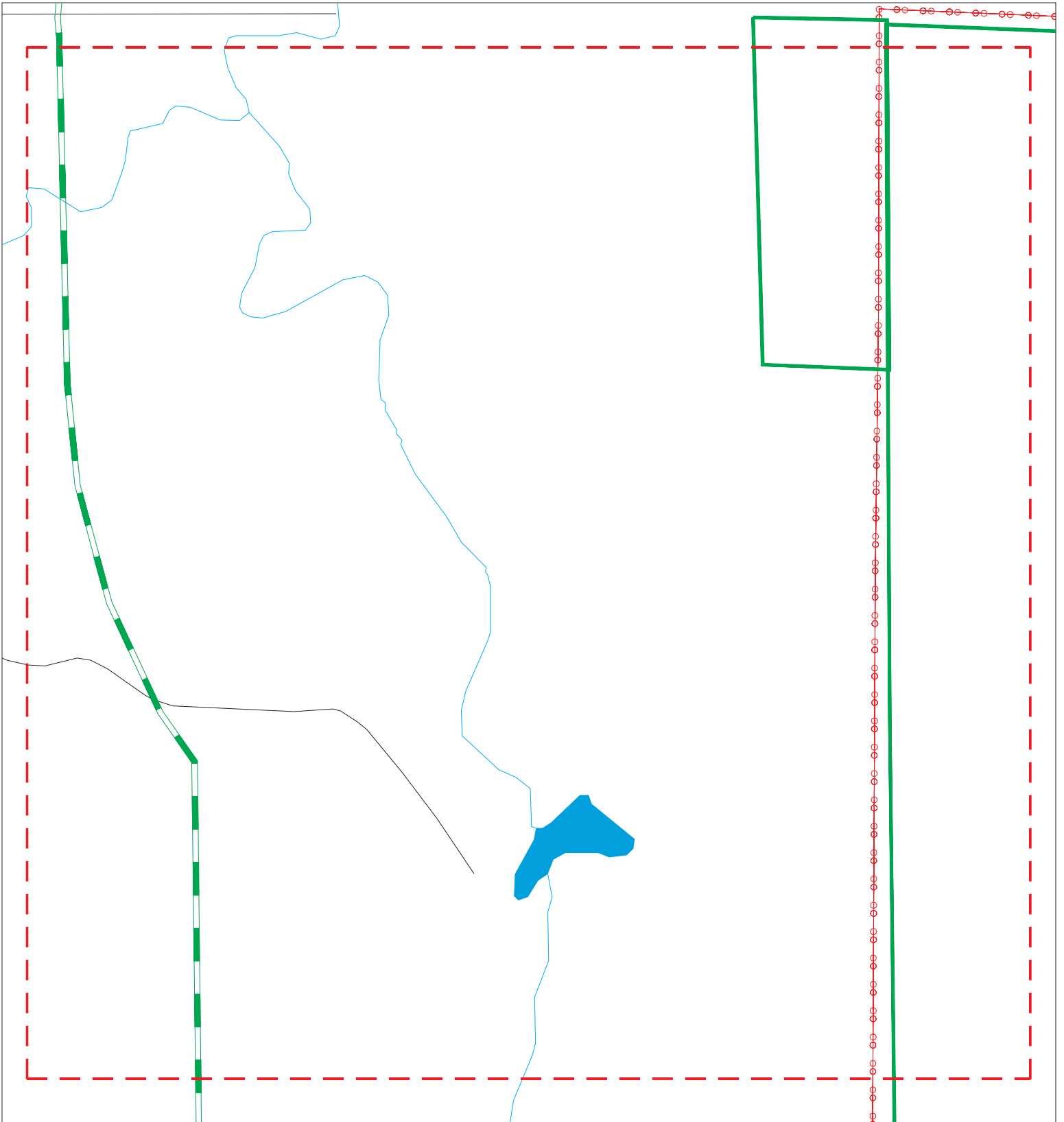
MAPPED SITES SUMMARY - FOCUS MAP 3

Target Property:
HANKS CROSSING
BYERS, CO 80103

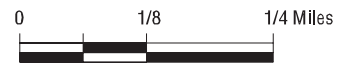
MAP ID / FOCUS MAP	SITE NAME	ADDRESS	DATABASE ACRONYMS	DIST (ft. & mi.) DIRECTION
-----------------------	-----------	---------	-------------------	-------------------------------

NO MAPPED SITES FOUND

Focus Map - 4 - 7521270.2s



- ▲ Sites
- ▲ Focus Map - Sites
- ▨ Indian Reservations BIA
- ▲ Target Property
- ▲ Power Line
- ▲ Search Buffer
- ▨ National Priority List Sites
- ▲ Focus Map - No Sites
- ▨ Dept. Defense Sites



SITE NAME: Hanks Crossing
ADDRESS: Hanks Crossing
CITY/STATE: Byers CO
ZIP: 80103

CLIENT: Tetra Tech EC, Inc.
CONTACT: Riley Houston
INQUIRY #: 7521270.2s
DATE: 12/14/23

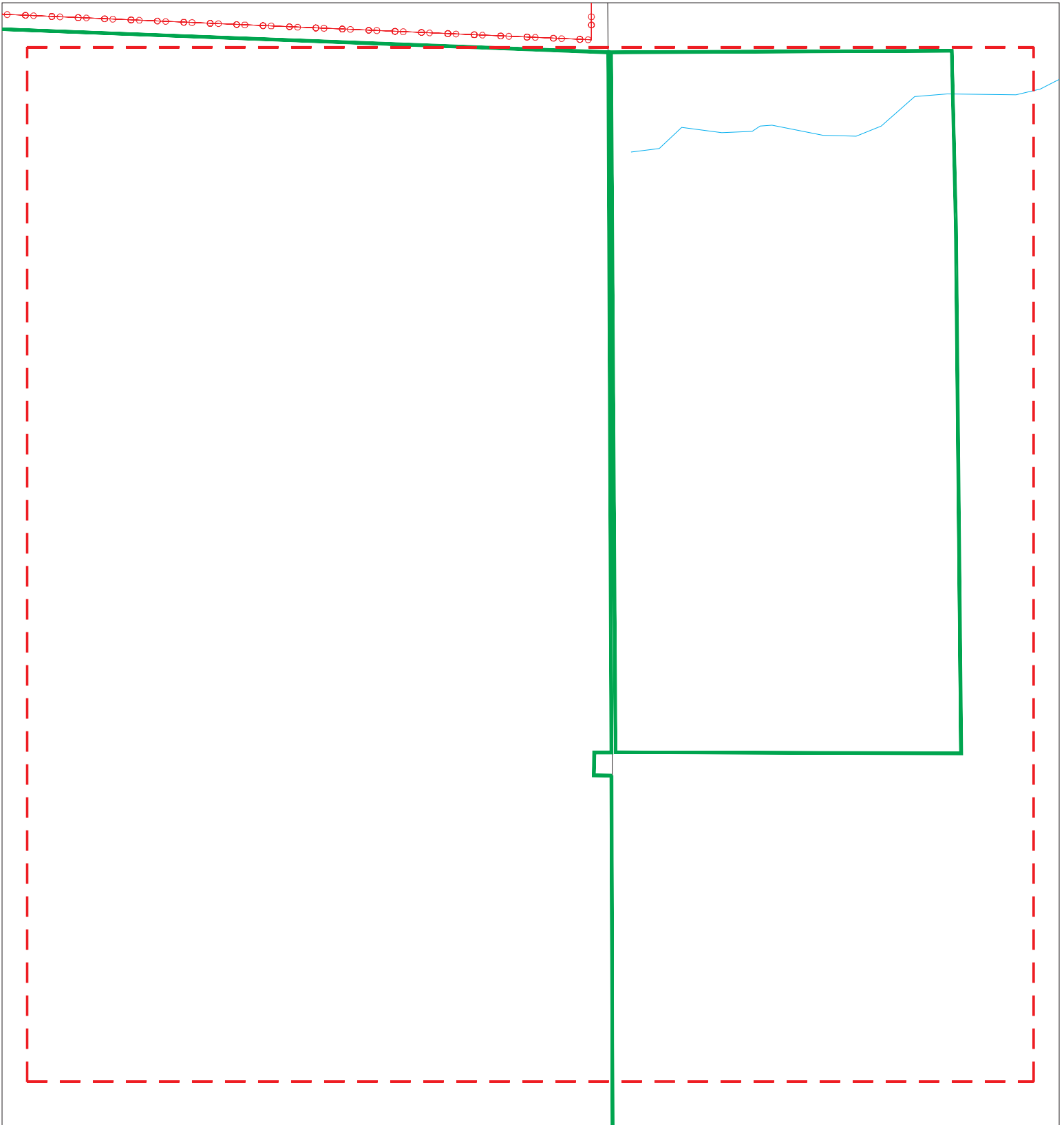
MAPPED SITES SUMMARY - FOCUS MAP 4

Target Property:
HANKS CROSSING
BYERS, CO 80103

MAP ID / FOCUS MAP	SITE NAME	ADDRESS	DATABASE ACRONYMS	DIST (ft. & mi.) DIRECTION
-----------------------	-----------	---------	-------------------	-------------------------------

NO MAPPED SITES FOUND

Focus Map - 5 - 7521270.2s



- | | | | |
|----------------------|---------------------|------------------------------|--|
| Sites | Focus Map - Sites | Indian Reservations BIA | |
| Target Property | Power Line | National Priority List Sites | |
| Search Buffer | Dept. Defense Sites | | |
| Focus Map - No Sites | | | |

<p>SITE NAME: Hanks Crossing ADDRESS: Hanks Crossing CITY/STATE: Byers CO ZIP: 80103</p>	<p>CLIENT: Tetra Tech EC, Inc. CONTACT: Riley Houston INQUIRY #: 7521270.2s DATE: 12/14/23</p>
--	--

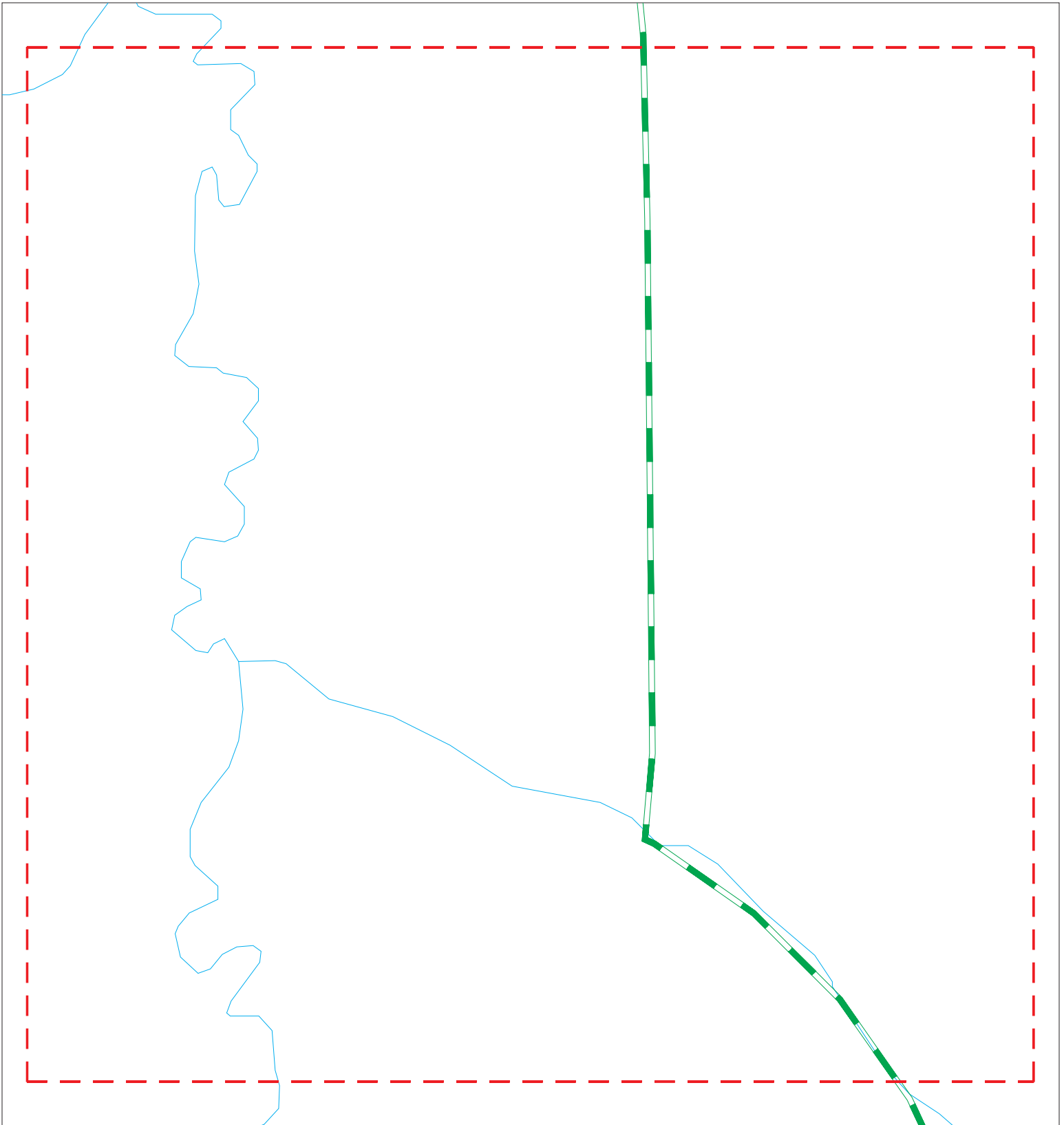
MAPPED SITES SUMMARY - FOCUS MAP 5

Target Property:
HANKS CROSSING
BYERS, CO 80103

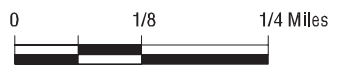
MAP ID / FOCUS MAP	SITE NAME	ADDRESS	DATABASE ACRONYMS	DIST (ft. & mi.) DIRECTION
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NO MAPPED SITES FOUND

Focus Map - 6 - 7521270.2s



- ▲ Sites
- Focus Map - Sites
- Indian Reservations BIA
- Target Property
- Power Line
- Search Buffer
- National Priority List Sites
- Focus Map - No Sites
- Dept. Defense Sites



SITE NAME: Hanks Crossing	CLIENT: Tetra Tech EC, Inc.
ADDRESS: Hanks Crossing	CONTACT: Riley Houston
CITY/STATE: Byers CO	INQUIRY #: 7521270.2s
ZIP: 80103	DATE: 12/14/23

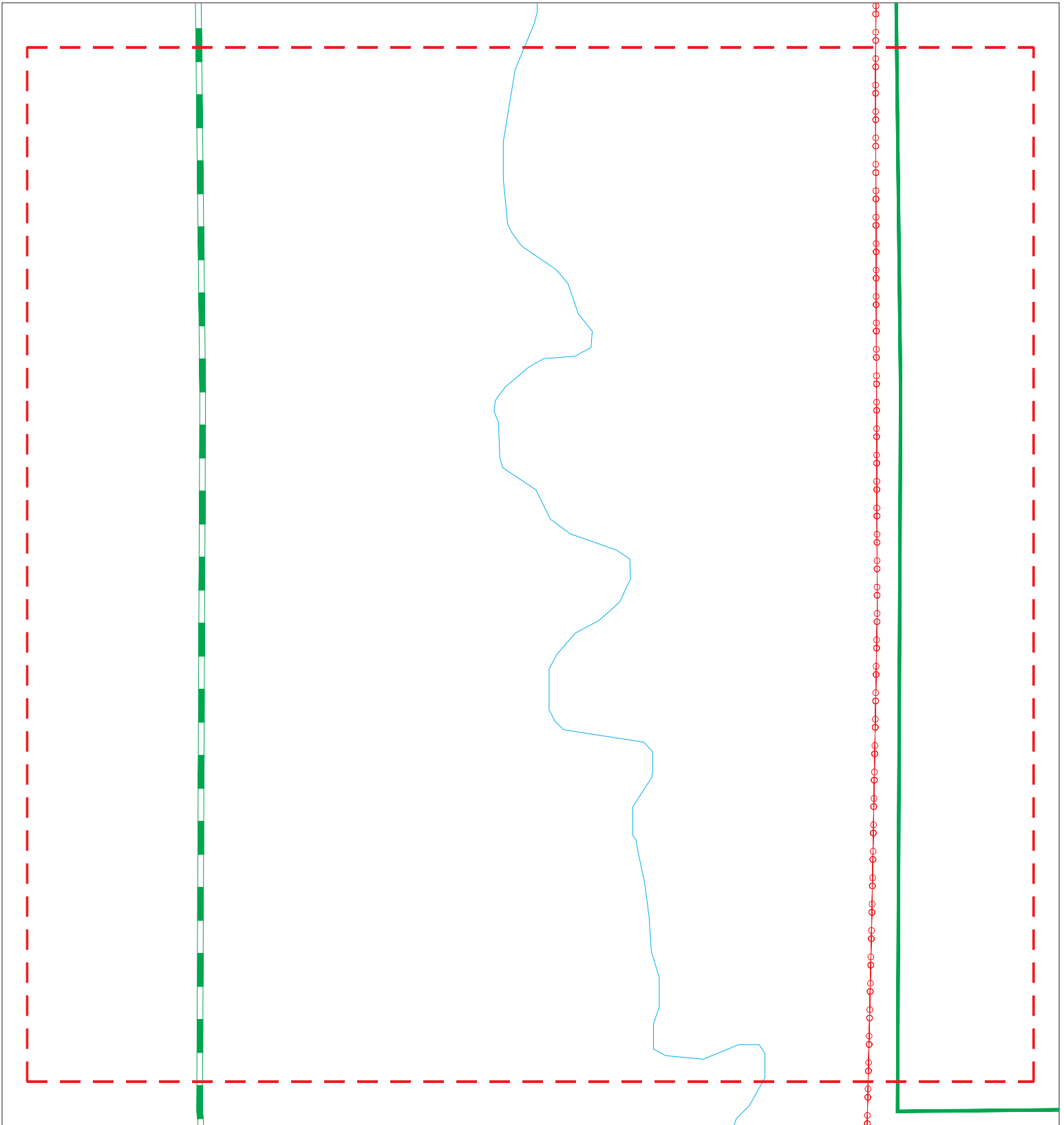
MAPPED SITES SUMMARY - FOCUS MAP 6










Target Property:
HANKS CROSSING
BYERS, CO 80103

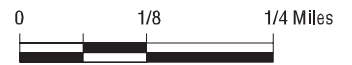
MAP ID / FOCUS MAP	SITE NAME	ADDRESS	DATABASE ACRONYMS	DIST (ft. & mi.) DIRECTION
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NO MAPPED SITES FOUND

Focus Map - 7 - 7521270.2s



-  Sites
-  Focus Map - Sites
-  Indian Reservations BIA
-  Target Property
-  Power Line
-  Search Buffer
-  National Priority List Sites
-  Focus Map - No Sites
-  Dept. Defense Sites



SITE NAME: Hanks Crossing
ADDRESS: Hanks Crossing
CITY/STATE: Byers CO
ZIP: 80103

CLIENT: Tetra Tech EC, Inc.
CONTACT: Riley Houston
INQUIRY #: 7521270.2s
DATE: 12/14/23

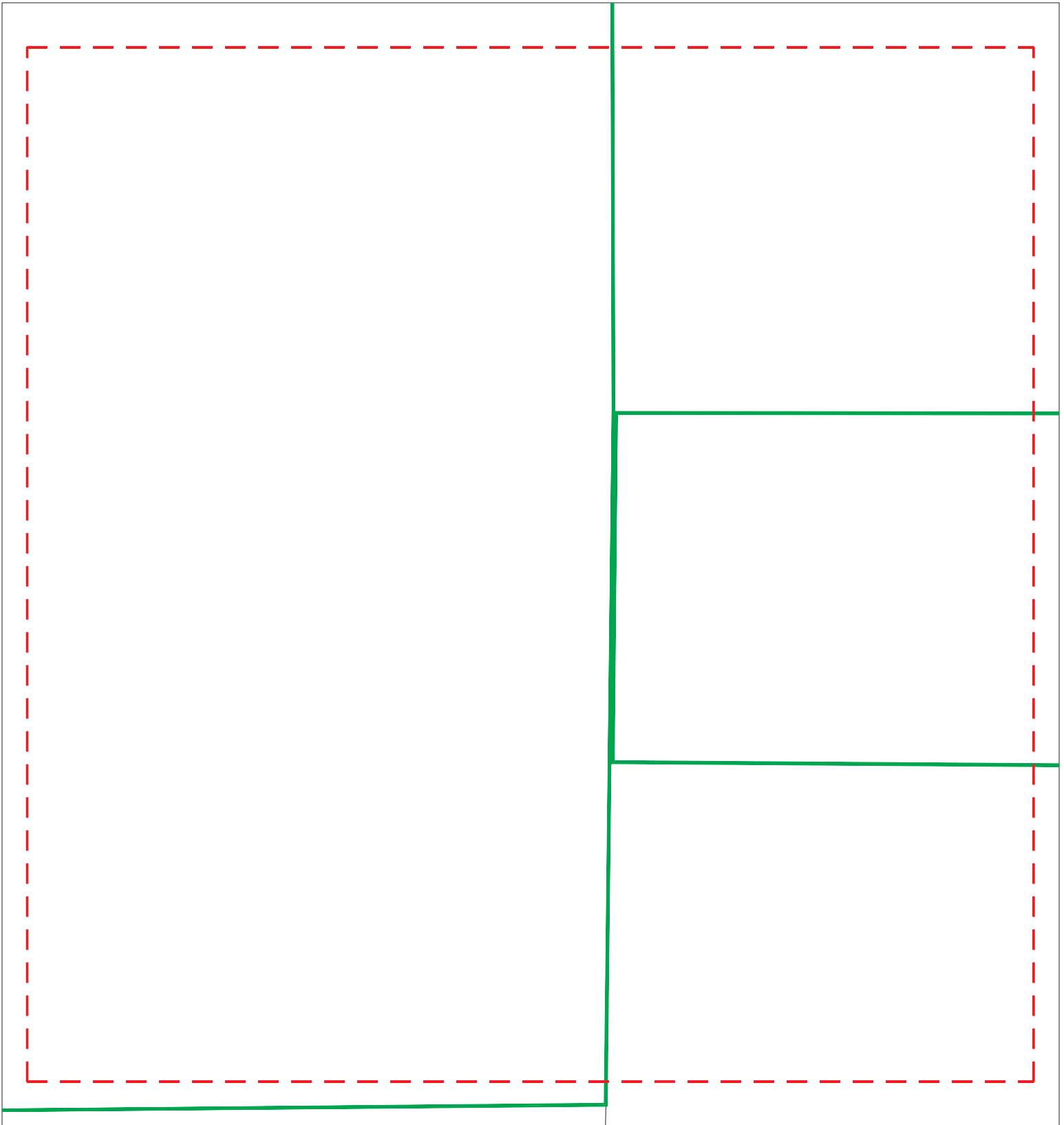
MAPPED SITES SUMMARY - FOCUS MAP 7









Target Property:
HANKS CROSSING
BYERS, CO 80103

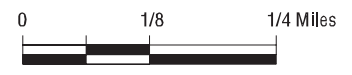
MAP ID / FOCUS MAP	SITE NAME	ADDRESS	DATABASE ACRONYMS	DIST (ft. & mi.) DIRECTION
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NO MAPPED SITES FOUND

Focus Map - 8 - 7521270.2s



-  Sites
-  Focus Map - Sites
-  Indian Reservations BIA
-  Target Property
-  Power Line
-  Search Buffer
-  National Priority List Sites
-  Focus Map - No Sites
-  Dept. Defense Sites



SITE NAME: Hanks Crossing ADDRESS: Hanks Crossing CITY/STATE: Byers CO ZIP: 80103	CLIENT: Tetra Tech EC, Inc. CONTACT: Riley Houston INQUIRY #: 7521270.2s DATE: 12/14/23
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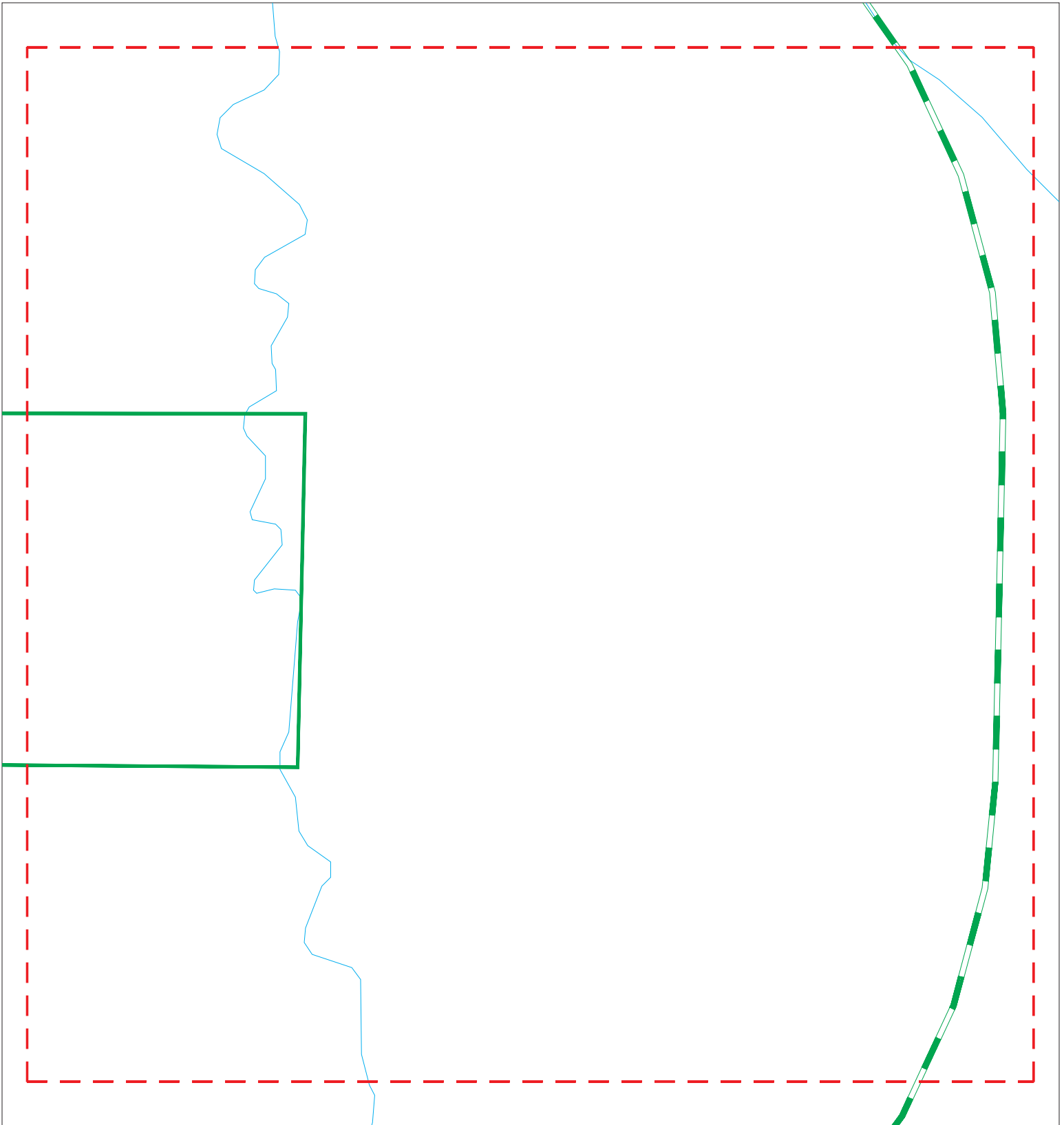
MAPPED SITES SUMMARY - FOCUS MAP 8

Target Property:
HANKS CROSSING
BYERS, CO 80103

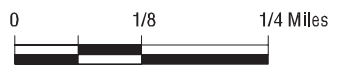
MAP ID / FOCUS MAP	SITE NAME	ADDRESS	DATABASE ACRONYMS	DIST (ft. & mi.) DIRECTION
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NO MAPPED SITES FOUND

Focus Map - 9 - 7521270.2s



- ▲ Sites
- Focus Map - Sites
- Indian Reservations BIA
- Target Property
- Power Line
- Search Buffer
- National Priority List Sites
- Focus Map - No Sites
- Dept. Defense Sites



SITE NAME: Hanks Crossing ADDRESS: Hanks Crossing CITY/STATE: Byers CO ZIP: 80103	CLIENT: Tetra Tech EC, Inc. CONTACT: Riley Houston INQUIRY #: 7521270.2s DATE: 12/14/23
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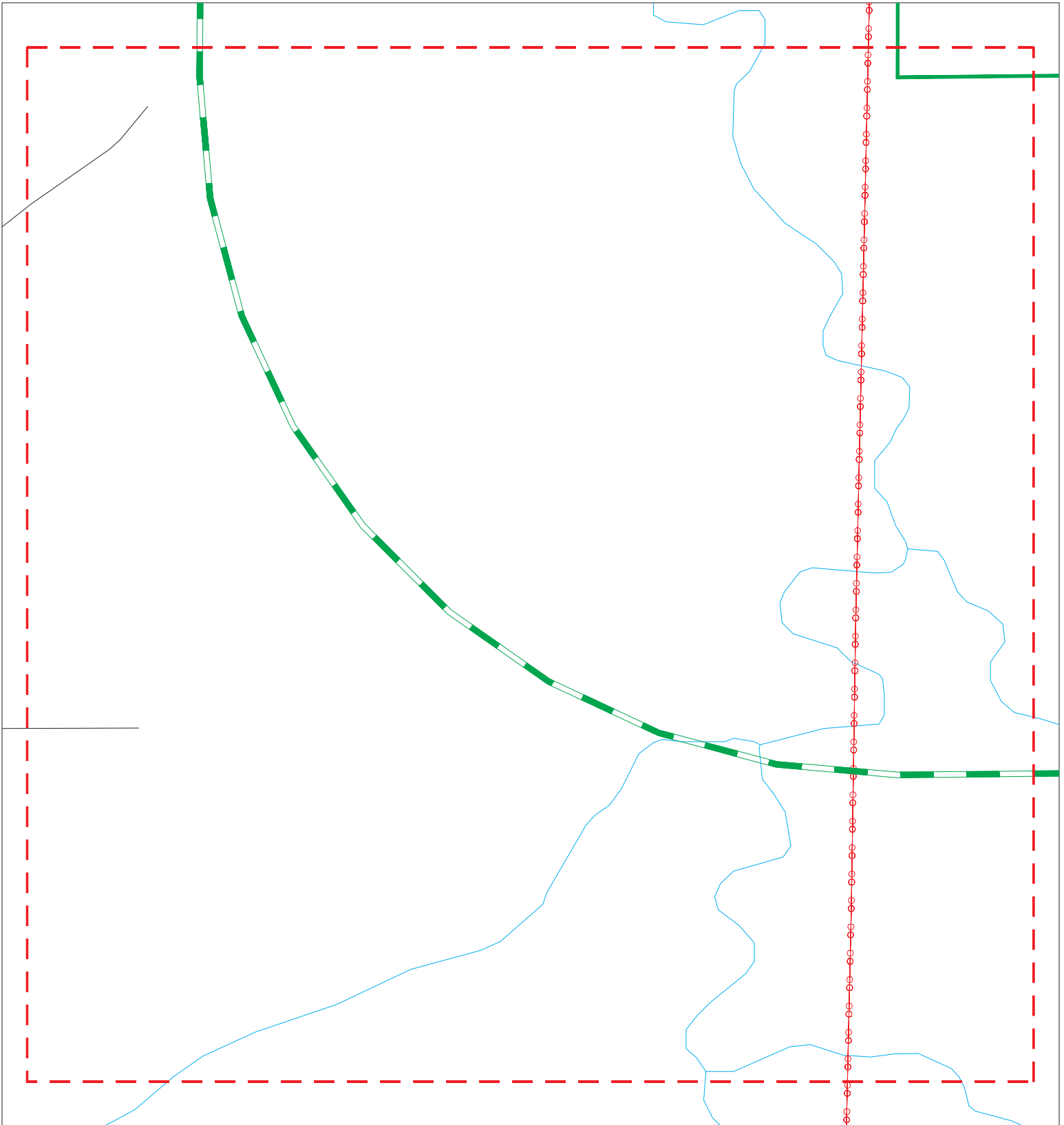
MAPPED SITES SUMMARY - FOCUS MAP 9

Target Property:
HANKS CROSSING
BYERS, CO 80103

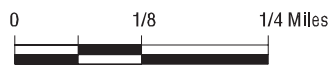
MAP ID / FOCUS MAP	SITE NAME	ADDRESS	DATABASE ACRONYMS	DIST (ft. & mi.) DIRECTION
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NO MAPPED SITES FOUND

Focus Map - 10 - 7521270.2s



- | | | |
|--|--|---|
|  Sites |  Focus Map - Sites |  Indian Reservations BIA |
|  Target Property |  Power Line | |
|  Search Buffer |  National Priority List Sites | |
|  Focus Map - No Sites |  Dept. Defense Sites | |



SITE NAME: Hanks Crossing ADDRESS: Hanks Crossing CITY/STATE: Byers CO ZIP: 80103	CLIENT: Tetra Tech EC, Inc. CONTACT: Riley Houston INQUIRY #: 7521270.2s DATE: 12/14/23
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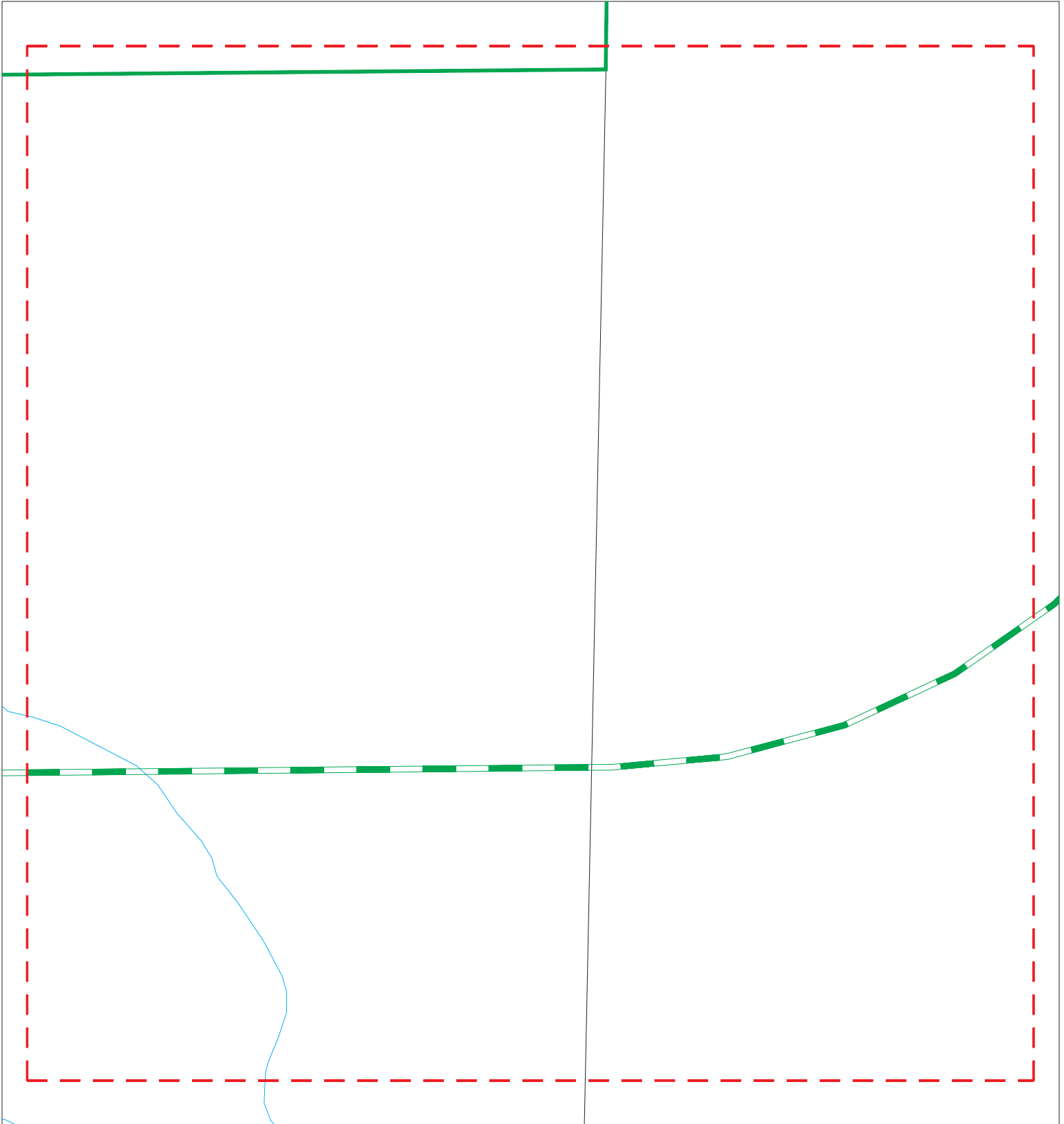
MAPPED SITES SUMMARY - FOCUS MAP 10

Target Property:
HANKS CROSSING
BYERS, CO 80103

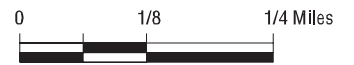
MAP ID / FOCUS MAP	SITE NAME	ADDRESS	DATABASE ACRONYMS	DIST (ft. & mi.) DIRECTION
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NO MAPPED SITES FOUND

Focus Map - 11 - 7521270.2s



- Sites
- Focus Map - Sites
- Indian Reservations BIA
- Target Property
- Power Line
- Search Buffer
- National Priority List Sites
- Focus Map - No Sites
- Dept. Defense Sites



SITE NAME: Hanks Crossing
ADDRESS: Hanks Crossing
CITY/STATE: Byers CO
ZIP: 80103

CLIENT: Tetra Tech EC, Inc.
CONTACT: Riley Houston
INQUIRY #: 7521270.2s
DATE: 12/14/23

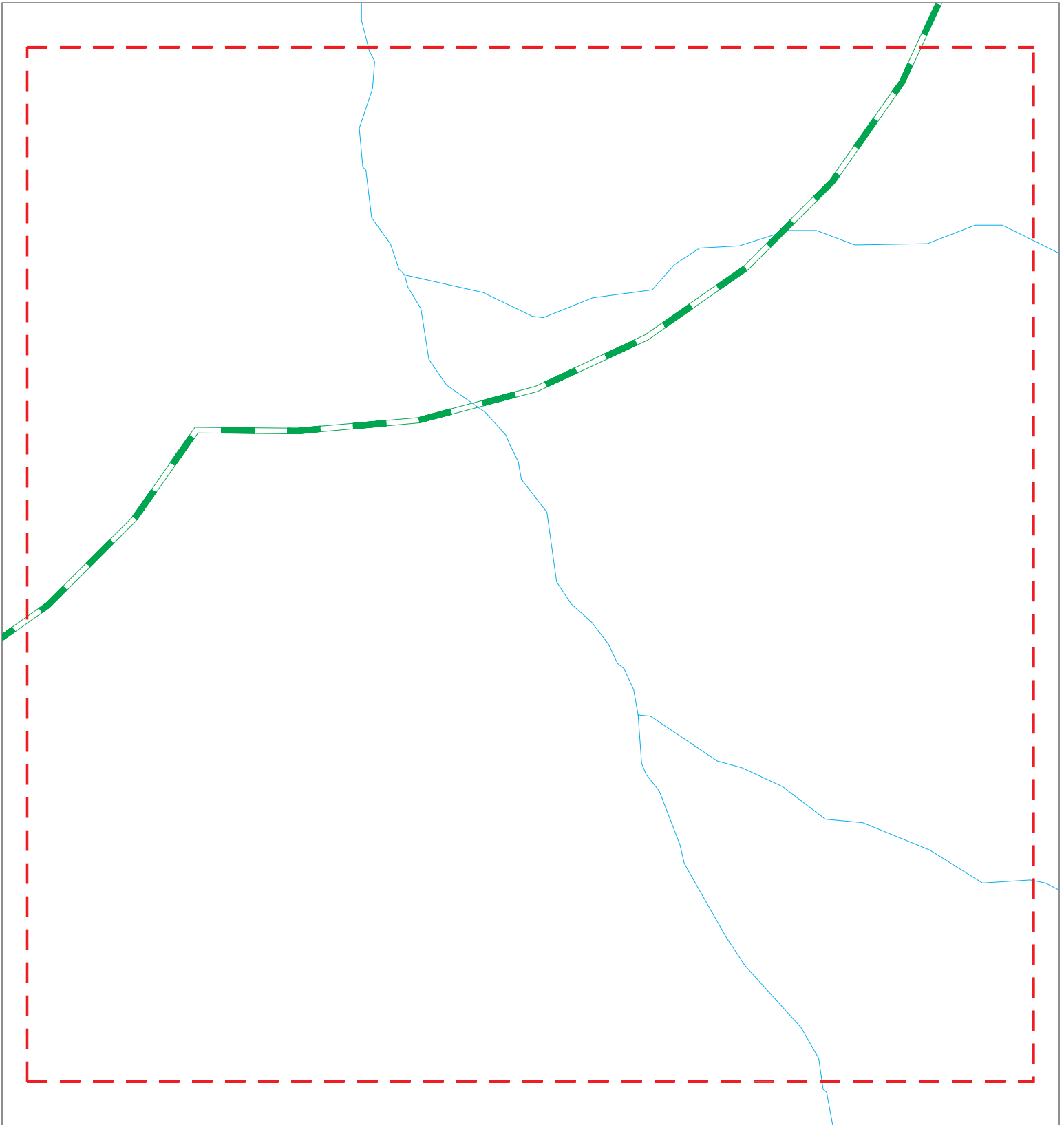
MAPPED SITES SUMMARY - FOCUS MAP 11

Target Property:
HANKS CROSSING
BYERS, CO 80103

MAP ID / FOCUS MAP	SITE NAME	ADDRESS	DATABASE ACRONYMS	DIST (ft. & mi.) DIRECTION
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NO MAPPED SITES FOUND

Focus Map - 12 - 7521270.2s



- | | | | | | |
|----------------------|------------------------------|-------------------------|---|-----|-----------|
| Sites | Focus Map - Sites | Indian Reservations BIA | 0 | 1/8 | 1/4 Miles |
| Target Property | Power Line | | | | |
| Search Buffer | National Priority List Sites | | | | |
| Focus Map - No Sites | Dept. Defense Sites | | | | |

SITE NAME: Hanks Crossing
ADDRESS: Hanks Crossing
CITY/STATE: Byers CO
ZIP: 80103

CLIENT: Tetra Tech EC, Inc.
CONTACT: Riley Houston
INQUIRY #: 7521270.2s
DATE: 12/14/23

MAPPED SITES SUMMARY - FOCUS MAP 12

Target Property:
HANKS CROSSING
BYERS, CO 80103

MAP ID / FOCUS MAP	SITE NAME	ADDRESS	DATABASE ACRONYMS	DIST (ft. & mi.) DIRECTION
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NO MAPPED SITES FOUND

Map ID
Direction
Distance
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number
EPA ID Number

NO SITES FOUND

Count: 0 records

ORPHAN SUMMARY

City	EDR ID	Site Name	Site Address	Zip	Database(s)
NO SITES FOUND					

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

To maintain currency of the following federal and state databases, EDR contacts the appropriate governmental agency on a monthly or quarterly basis, as required.

Number of Days to Update: Provides confirmation that EDR is reporting records that have been updated within 90 days from the date the government agency made the information available to the public.

STANDARD ENVIRONMENTAL RECORDS

Lists of Federal NPL (Superfund) sites

NPL: National Priority List

National Priorities List (Superfund). The NPL is a subset of CERCLIS and identifies over 1,200 sites for priority cleanup under the Superfund Program. NPL sites may encompass relatively large areas. As such, EDR provides polygon coverage for over 1,000 NPL site boundaries produced by EPA's Environmental Photographic Interpretation Center (EPIC) and regional EPA offices.

Date of Government Version: 09/19/2023	Source: EPA
Date Data Arrived at EDR: 10/03/2023	Telephone: N/A
Date Made Active in Reports: 10/19/2023	Last EDR Contact: 12/04/2023
Number of Days to Update: 16	Next Scheduled EDR Contact: 01/08/2024
	Data Release Frequency: Quarterly

NPL Site Boundaries

Sources:

EPA's Environmental Photographic Interpretation Center (EPIC)
Telephone: 202-564-7333

EPA Region 1
Telephone 617-918-1143

EPA Region 6
Telephone: 214-655-6659

EPA Region 3
Telephone 215-814-5418

EPA Region 7
Telephone: 913-551-7247

EPA Region 4
Telephone 404-562-8033

EPA Region 8
Telephone: 303-312-6774

EPA Region 5
Telephone 312-886-6686

EPA Region 9
Telephone: 415-947-4246

EPA Region 10
Telephone 206-553-8665

Proposed NPL: Proposed National Priority List Sites

A site that has been proposed for listing on the National Priorities List through the issuance of a proposed rule in the Federal Register. EPA then accepts public comments on the site, responds to the comments, and places on the NPL those sites that continue to meet the requirements for listing.

Date of Government Version: 09/19/2023	Source: EPA
Date Data Arrived at EDR: 10/03/2023	Telephone: N/A
Date Made Active in Reports: 10/19/2023	Last EDR Contact: 12/04/2023
Number of Days to Update: 16	Next Scheduled EDR Contact: 01/08/2024
	Data Release Frequency: Quarterly

NPL LIENS: Federal Superfund Liens

Federal Superfund Liens. Under the authority granted the USEPA by CERCLA of 1980, the USEPA has the authority to file liens against real property in order to recover remedial action expenditures or when the property owner received notification of potential liability. USEPA compiles a listing of filed notices of Superfund Liens.

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: 10/15/1991
Date Data Arrived at EDR: 02/02/1994
Date Made Active in Reports: 03/30/1994
Number of Days to Update: 56

Source: EPA
Telephone: 202-564-4267
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: No Update Planned

Lists of Federal Delisted NPL sites

Delisted NPL: National Priority List Deletions

The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) establishes the criteria that the EPA uses to delete sites from the NPL. In accordance with 40 CFR 300.425.(e), sites may be deleted from the NPL where no further response is appropriate.

Date of Government Version: 09/19/2023
Date Data Arrived at EDR: 10/03/2023
Date Made Active in Reports: 10/19/2023
Number of Days to Update: 16

Source: EPA
Telephone: N/A
Last EDR Contact: 12/04/2023
Next Scheduled EDR Contact: 01/08/2024
Data Release Frequency: Quarterly

Lists of Federal sites subject to CERCLA removals and CERCLA orders

FEDERAL FACILITY: Federal Facility Site Information listing

A listing of National Priority List (NPL) and Base Realignment and Closure (BRAC) sites found in the Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS) Database where EPA Federal Facilities Restoration and Reuse Office is involved in cleanup activities.

Date of Government Version: 09/25/2023
Date Data Arrived at EDR: 09/26/2023
Date Made Active in Reports: 12/12/2023
Number of Days to Update: 77

Source: Environmental Protection Agency
Telephone: 703-603-8704
Last EDR Contact: 09/26/2023
Next Scheduled EDR Contact: 01/08/2024
Data Release Frequency: Varies

SEMS: Superfund Enterprise Management System

SEMS (Superfund Enterprise Management System) tracks hazardous waste sites, potentially hazardous waste sites, and remedial activities performed in support of EPA's Superfund Program across the United States. The list was formerly known as CERCLIS, renamed to SEMS by the EPA in 2015. The list contains data on potentially hazardous waste sites that have been reported to the USEPA by states, municipalities, private companies and private persons, pursuant to Section 103 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). This dataset also contains sites which are either proposed to or on the National Priorities List (NPL) and the sites which are in the screening and assessment phase for possible inclusion on the NPL.

Date of Government Version: 09/19/2023
Date Data Arrived at EDR: 10/03/2023
Date Made Active in Reports: 10/19/2023
Number of Days to Update: 16

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 12/04/2023
Next Scheduled EDR Contact: 01/22/2024
Data Release Frequency: Quarterly

Lists of Federal CERCLA sites with NFRAP

SEMS-ARCHIVE: Superfund Enterprise Management System Archive

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

SEMS-ARCHIVE (Superfund Enterprise Management System Archive) tracks sites that have no further interest under the Federal Superfund Program based on available information. The list was formerly known as the CERCLIS-NFRAP, renamed to SEMS ARCHIVE by the EPA in 2015. EPA may perform a minimal level of assessment work at a site while it is archived if site conditions change and/or new information becomes available. Archived sites have been removed and archived from the inventory of SEMS sites. Archived status indicates that, to the best of EPA's knowledge, assessment at a site has been completed and that EPA has determined no further steps will be taken to list the site on the National Priorities List (NPL), unless information indicates this decision was not appropriate or other considerations require a recommendation for listing at a later time. The decision does not necessarily mean that there is no hazard associated with a given site; it only means that, based upon available information, the location is not judged to be potential NPL site.

Date of Government Version: 09/19/2023	Source: EPA
Date Data Arrived at EDR: 10/03/2023	Telephone: 800-424-9346
Date Made Active in Reports: 10/19/2023	Last EDR Contact: 12/04/2023
Number of Days to Update: 16	Next Scheduled EDR Contact: 01/22/2024
	Data Release Frequency: Quarterly

Lists of Federal RCRA facilities undergoing Corrective Action

CORRACTS: Corrective Action Report

CORRACTS identifies hazardous waste handlers with RCRA corrective action activity.

Date of Government Version: 12/04/2023	Source: EPA
Date Data Arrived at EDR: 12/06/2023	Telephone: 800-424-9346
Date Made Active in Reports: 12/12/2023	Last EDR Contact: 12/06/2023
Number of Days to Update: 6	Next Scheduled EDR Contact: 01/01/2024
	Data Release Frequency: Quarterly

Lists of Federal RCRA TSD facilities

RCRA-TSDF: RCRA - Treatment, Storage and Disposal

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Transporters are individuals or entities that move hazardous waste from the generator offsite to a facility that can recycle, treat, store, or dispose of the waste. TSDFs treat, store, or dispose of the waste.

Date of Government Version: 12/04/2023	Source: Environmental Protection Agency
Date Data Arrived at EDR: 12/06/2023	Telephone: 303-312-6149
Date Made Active in Reports: 12/12/2023	Last EDR Contact: 12/06/2023
Number of Days to Update: 6	Next Scheduled EDR Contact: 01/01/2024
	Data Release Frequency: Quarterly

Lists of Federal RCRA generators

RCRA-LQG: RCRA - Large Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Large quantity generators (LQGs) generate over 1,000 kilograms (kg) of hazardous waste, or over 1 kg of acutely hazardous waste per month.

Date of Government Version: 12/04/2023	Source: Environmental Protection Agency
Date Data Arrived at EDR: 12/06/2023	Telephone: 303-312-6149
Date Made Active in Reports: 12/12/2023	Last EDR Contact: 12/06/2023
Number of Days to Update: 6	Next Scheduled EDR Contact: 01/01/2024
	Data Release Frequency: Quarterly

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

RCRA-SQG: RCRA - Small Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Small quantity generators (SQGs) generate between 100 kg and 1,000 kg of hazardous waste per month.

Date of Government Version: 12/04/2023	Source: Environmental Protection Agency
Date Data Arrived at EDR: 12/06/2023	Telephone: 303-312-6149
Date Made Active in Reports: 12/12/2023	Last EDR Contact: 12/06/2023
Number of Days to Update: 6	Next Scheduled EDR Contact: 01/01/2024
	Data Release Frequency: Quarterly

RCRA-VSQG: RCRA - Very Small Quantity Generators (Formerly Conditionally Exempt Small Quantity Generators)

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Very small quantity generators (VSQGs) generate less than 100 kg of hazardous waste, or less than 1 kg of acutely hazardous waste per month.

Date of Government Version: 12/04/2023	Source: Environmental Protection Agency
Date Data Arrived at EDR: 12/06/2023	Telephone: 303-312-6149
Date Made Active in Reports: 12/12/2023	Last EDR Contact: 12/06/2023
Number of Days to Update: 6	Next Scheduled EDR Contact: 01/01/2024
	Data Release Frequency: Quarterly

Federal institutional controls / engineering controls registries

LUCIS: Land Use Control Information System

LUCIS contains records of land use control information pertaining to the former Navy Base Realignment and Closure properties.

Date of Government Version: 08/03/2023	Source: Department of the Navy
Date Data Arrived at EDR: 08/07/2023	Telephone: 843-820-7326
Date Made Active in Reports: 10/10/2023	Last EDR Contact: 11/02/2023
Number of Days to Update: 64	Next Scheduled EDR Contact: 02/19/2024
	Data Release Frequency: Varies

US ENG CONTROLS: Engineering Controls Sites List

A listing of sites with engineering controls in place. Engineering controls include various forms of caps, building foundations, liners, and treatment methods to create pathway elimination for regulated substances to enter environmental media or effect human health.

Date of Government Version: 08/21/2023	Source: Environmental Protection Agency
Date Data Arrived at EDR: 08/21/2023	Telephone: 703-603-0695
Date Made Active in Reports: 11/07/2023	Last EDR Contact: 11/17/2023
Number of Days to Update: 78	Next Scheduled EDR Contact: 03/04/2024
	Data Release Frequency: Varies

US INST CONTROLS: Institutional Controls Sites List

A listing of sites with institutional controls in place. Institutional controls include administrative measures, such as groundwater use restrictions, construction restrictions, property use restrictions, and post remediation care requirements intended to prevent exposure to contaminants remaining on site. Deed restrictions are generally required as part of the institutional controls.

Date of Government Version: 08/21/2023	Source: Environmental Protection Agency
Date Data Arrived at EDR: 08/21/2023	Telephone: 703-603-0695
Date Made Active in Reports: 11/07/2023	Last EDR Contact: 11/17/2023
Number of Days to Update: 78	Next Scheduled EDR Contact: 03/04/2024
	Data Release Frequency: Varies

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Federal ERNS list

ERNS: Emergency Response Notification System

Emergency Response Notification System. ERNS records and stores information on reported releases of oil and hazardous substances.

Date of Government Version: 09/18/2023

Source: National Response Center, United States Coast Guard

Date Data Arrived at EDR: 09/20/2023

Telephone: 202-267-2180

Date Made Active in Reports: 12/11/2023

Last EDR Contact: 12/13/2023

Number of Days to Update: 82

Next Scheduled EDR Contact: 04/01/2024

Data Release Frequency: Quarterly

Lists of state- and tribal hazardous waste facilities

SHWS: This state does not maintain a SHWS list. See the Federal CERCLIS list and Federal NPL list.

State Hazardous Waste Sites. State hazardous waste site records are the states' equivalent to CERCLIS. These sites may or may not already be listed on the federal CERCLIS list. Priority sites planned for cleanup using state funds (state equivalent of Superfund) are identified along with sites where cleanup will be paid for by potentially responsible parties. Available information varies by state.

Date of Government Version: N/A

Source: Department of Public Health & Environment

Date Data Arrived at EDR: N/A

Telephone: 303-692-3300

Date Made Active in Reports: N/A

Last EDR Contact: 11/09/2023

Number of Days to Update: N/A

Next Scheduled EDR Contact: 02/19/2024

Data Release Frequency: N/A

Lists of state and tribal landfills and solid waste disposal facilities

SWF/LF: Solid Waste Sites & Facilities

Solid Waste Facilities/Landfill Sites. SWF/LF type records typically contain an inventory of solid waste disposal facilities or landfills in a particular state. Depending on the state, these may be active or inactive facilities or open dumps that failed to meet RCRA Subtitle D Section 4004 criteria for solid waste landfills or disposal sites.

Date of Government Version: 03/26/2021

Source: Department of Public Health & Environment

Date Data Arrived at EDR: 02/08/2023

Telephone: 303-692-3300

Date Made Active in Reports: 05/02/2023

Last EDR Contact: 11/09/2023

Number of Days to Update: 83

Next Scheduled EDR Contact: 02/19/2024

Data Release Frequency: Varies

SHWF: Solid Waste Information System Listing

A listing from the Solid Waste Information System, which is used to help administer the various programs of our solid waste and materials management program. It includes a wide variety of types of facilities and sites, and includes information obtained over several decades and numerous legacy data systems.

Date of Government Version: 06/01/2023

Source: Department of Public Health & Environment

Date Data Arrived at EDR: 07/27/2023

Telephone: 303-692-6349

Date Made Active in Reports: 10/13/2023

Last EDR Contact: 10/25/2023

Number of Days to Update: 78

Next Scheduled EDR Contact: 02/12/2024

Data Release Frequency: Varies

Lists of state and tribal leaking storage tanks

LTANKS: Petroleum Release Events Listing

Active and Closed OPS Petroleum Release Events in Colorado. Includes the OPS Open Event locations, but also shows locations of closed events (releases that have been issued a No Further Action determination).

Date of Government Version: 08/01/2023

Source: Department of Labor & Employment

Date Data Arrived at EDR: 08/29/2023

Telephone: 303-318-8525

Date Made Active in Reports: 11/07/2023

Last EDR Contact: 11/22/2023

Number of Days to Update: 70

Next Scheduled EDR Contact: 03/11/2024

Data Release Frequency: Quarterly

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

LAST: Leaking Aboveground Storage Tank Listing

A listing of leaking aboveground storage tank sites. This list is no longer maintained. For current Leaking AST information, please see LTANKS.

Date of Government Version: 03/01/2018
Date Data Arrived at EDR: 03/07/2018
Date Made Active in Reports: 04/03/2018
Number of Days to Update: 27

Source: Department of Labor & Employment
Telephone: 303-318-8525
Last EDR Contact: 05/31/2018
Next Scheduled EDR Contact: 09/10/2018
Data Release Frequency: No Update Planned

LUST: Leaking Underground Storage Tank List

Leaking Underground Storage Tank Incident Reports. LUST records contain an inventory of reported leaking underground storage tank incidents. Not all states maintain these records, and the information stored varies by state.

Date of Government Version: 03/01/2018
Date Data Arrived at EDR: 03/07/2018
Date Made Active in Reports: 04/03/2018
Number of Days to Update: 27

Source: Department of Labor and Employment, Oil Inspection Section
Telephone: 303-318-8521
Last EDR Contact: 03/07/2018
Next Scheduled EDR Contact: 06/18/2018
Data Release Frequency: Quarterly

INDIAN LUST R1: Leaking Underground Storage Tanks on Indian Land

A listing of leaking underground storage tank locations on Indian Land.

Date of Government Version: 04/20/2023
Date Data Arrived at EDR: 05/09/2023
Date Made Active in Reports: 07/14/2023
Number of Days to Update: 66

Source: EPA Region 1
Telephone: 617-918-1313
Last EDR Contact: 10/11/2023
Next Scheduled EDR Contact: 01/29/2024
Data Release Frequency: Varies

INDIAN LUST R4: Leaking Underground Storage Tanks on Indian Land

LUSTs on Indian land in Florida, Mississippi and North Carolina.

Date of Government Version: 04/20/2023
Date Data Arrived at EDR: 05/09/2023
Date Made Active in Reports: 07/14/2023
Number of Days to Update: 66

Source: EPA Region 4
Telephone: 404-562-8677
Last EDR Contact: 10/11/2023
Next Scheduled EDR Contact: 01/29/2024
Data Release Frequency: Varies

INDIAN LUST R8: Leaking Underground Storage Tanks on Indian Land

LUSTs on Indian land in Colorado, Montana, North Dakota, South Dakota, Utah and Wyoming.

Date of Government Version: 04/19/2023
Date Data Arrived at EDR: 05/09/2023
Date Made Active in Reports: 07/14/2023
Number of Days to Update: 66

Source: EPA Region 8
Telephone: 303-312-6271
Last EDR Contact: 10/11/2023
Next Scheduled EDR Contact: 01/29/2024
Data Release Frequency: Varies

INDIAN LUST R7: Leaking Underground Storage Tanks on Indian Land

LUSTs on Indian land in Iowa, Kansas, and Nebraska

Date of Government Version: 04/25/2023
Date Data Arrived at EDR: 05/09/2023
Date Made Active in Reports: 07/14/2023
Number of Days to Update: 66

Source: EPA Region 7
Telephone: 913-551-7003
Last EDR Contact: 10/11/2023
Next Scheduled EDR Contact: 01/29/2024
Data Release Frequency: Varies

INDIAN LUST R9: Leaking Underground Storage Tanks on Indian Land

LUSTs on Indian land in Arizona, California, New Mexico and Nevada

Date of Government Version: 04/19/2023
Date Data Arrived at EDR: 05/09/2023
Date Made Active in Reports: 07/14/2023
Number of Days to Update: 66

Source: Environmental Protection Agency
Telephone: 415-972-3372
Last EDR Contact: 10/11/2023
Next Scheduled EDR Contact: 01/29/2024
Data Release Frequency: Varies

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

INDIAN LUST R5: Leaking Underground Storage Tanks on Indian Land

Leaking underground storage tanks located on Indian Land in Michigan, Minnesota and Wisconsin.

Date of Government Version: 04/14/2023	Source: EPA, Region 5
Date Data Arrived at EDR: 05/09/2023	Telephone: 312-886-7439
Date Made Active in Reports: 07/14/2023	Last EDR Contact: 10/11/2023
Number of Days to Update: 66	Next Scheduled EDR Contact: 01/29/2024
	Data Release Frequency: Varies

INDIAN LUST R6: Leaking Underground Storage Tanks on Indian Land

LUSTs on Indian land in New Mexico and Oklahoma.

Date of Government Version: 04/26/2023	Source: EPA Region 6
Date Data Arrived at EDR: 05/09/2023	Telephone: 214-665-6597
Date Made Active in Reports: 07/14/2023	Last EDR Contact: 10/11/2023
Number of Days to Update: 66	Next Scheduled EDR Contact: 01/29/2024
	Data Release Frequency: Varies

INDIAN LUST R10: Leaking Underground Storage Tanks on Indian Land

LUSTs on Indian land in Alaska, Idaho, Oregon and Washington.

Date of Government Version: 04/20/2023	Source: EPA Region 10
Date Data Arrived at EDR: 05/09/2023	Telephone: 206-553-2857
Date Made Active in Reports: 07/14/2023	Last EDR Contact: 10/11/2023
Number of Days to Update: 66	Next Scheduled EDR Contact: 01/29/2024
	Data Release Frequency: Varies

TRUST: Lust Trust Sites

Reimbursement application package. The 1989 Colorado General Assembly established Colorado's Petroleum Storage Tank Fund. The Fund reimburses eligible applicants for allowable costs incurred in cleaning up petroleum contamination from underground and aboveground petroleum storage tanks, as well as for third-party liability expenses. Remediation of contamination caused by railroad or aircraft fuel is not eligible for reimbursement. The Fund satisfies federal Environmental Protection Agency financial assurance requirements. Monies in the Fund come from various sources, predominantly the state environmental surcharge imposed on all petroleum products except railroad or aircraft fuel.

Date of Government Version: 08/28/2023	Source: Department of Labor and Employment, Oil Inspection Section
Date Data Arrived at EDR: 08/31/2023	Telephone: 303-318-8521
Date Made Active in Reports: 11/22/2023	Last EDR Contact: 12/12/2023
Number of Days to Update: 83	Next Scheduled EDR Contact: 04/01/2024
	Data Release Frequency: Varies

Lists of state and tribal registered storage tanks

FEMA UST: Underground Storage Tank Listing

A listing of all FEMA owned underground storage tanks.

Date of Government Version: 03/08/2023	Source: FEMA
Date Data Arrived at EDR: 03/09/2023	Telephone: 202-646-5797
Date Made Active in Reports: 05/30/2023	Last EDR Contact: 10/10/2023
Number of Days to Update: 82	Next Scheduled EDR Contact: 01/15/2024
	Data Release Frequency: Varies

UST: Underground Storage Tank Database

Registered Underground Storage Tanks. UST's are regulated under Subtitle I of the Resource Conservation and Recovery Act (RCRA) and must be registered with the state department responsible for administering the UST program. Available information varies by state program.

Date of Government Version: 09/15/2023	Source: Department of Labor and Employment, Oil Inspection Section
Date Data Arrived at EDR: 09/19/2023	Telephone: 303-318-8521
Date Made Active in Reports: 11/20/2023	Last EDR Contact: 11/21/2023
Number of Days to Update: 62	Next Scheduled EDR Contact: 03/11/2024
	Data Release Frequency: Quarterly

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

AST: Aboveground Tank List

Aboveground storage tank locations.

Date of Government Version: 09/15/2023
Date Data Arrived at EDR: 09/19/2023
Date Made Active in Reports: 11/20/2023
Number of Days to Update: 62

Source: Department of Labor and Employment, Oil Inspection Section
Telephone: 303-318-8521
Last EDR Contact: 11/21/2023
Next Scheduled EDR Contact: 03/11/2024
Data Release Frequency: Semi-Annually

INDIAN UST R9: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 9 (Arizona, California, Hawaii, Nevada, the Pacific Islands, and Tribal Nations).

Date of Government Version: 04/19/2023
Date Data Arrived at EDR: 05/09/2023
Date Made Active in Reports: 07/14/2023
Number of Days to Update: 66

Source: EPA Region 9
Telephone: 415-972-3368
Last EDR Contact: 10/11/2023
Next Scheduled EDR Contact: 01/29/2024
Data Release Frequency: Varies

INDIAN UST R4: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 4 (Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee and Tribal Nations)

Date of Government Version: 04/20/2023
Date Data Arrived at EDR: 05/09/2023
Date Made Active in Reports: 07/14/2023
Number of Days to Update: 66

Source: EPA Region 4
Telephone: 404-562-9424
Last EDR Contact: 10/11/2023
Next Scheduled EDR Contact: 01/29/2024
Data Release Frequency: Varies

INDIAN UST R6: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 6 (Louisiana, Arkansas, Oklahoma, New Mexico, Texas and 65 Tribes).

Date of Government Version: 04/26/2023
Date Data Arrived at EDR: 05/09/2023
Date Made Active in Reports: 07/14/2023
Number of Days to Update: 66

Source: EPA Region 6
Telephone: 214-665-7591
Last EDR Contact: 10/11/2023
Next Scheduled EDR Contact: 01/29/2024
Data Release Frequency: Varies

INDIAN UST R8: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 8 (Colorado, Montana, North Dakota, South Dakota, Utah, Wyoming and 27 Tribal Nations).

Date of Government Version: 04/20/2023
Date Data Arrived at EDR: 05/09/2023
Date Made Active in Reports: 07/14/2023
Number of Days to Update: 66

Source: EPA Region 8
Telephone: 303-312-6137
Last EDR Contact: 10/11/2023
Next Scheduled EDR Contact: 01/29/2024
Data Release Frequency: Varies

INDIAN UST R10: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 10 (Alaska, Idaho, Oregon, Washington, and Tribal Nations).

Date of Government Version: 04/20/2023
Date Data Arrived at EDR: 05/09/2023
Date Made Active in Reports: 07/14/2023
Number of Days to Update: 66

Source: EPA Region 10
Telephone: 206-553-2857
Last EDR Contact: 10/11/2023
Next Scheduled EDR Contact: 01/29/2024
Data Release Frequency: Varies

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

INDIAN UST R1: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 1 (Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont and ten Tribal Nations).

Date of Government Version: 04/20/2023	Source: EPA, Region 1
Date Data Arrived at EDR: 05/09/2023	Telephone: 617-918-1313
Date Made Active in Reports: 07/14/2023	Last EDR Contact: 10/11/2023
Number of Days to Update: 66	Next Scheduled EDR Contact: 01/29/2024
	Data Release Frequency: Varies

INDIAN UST R5: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 5 (Michigan, Minnesota and Wisconsin and Tribal Nations).

Date of Government Version: 04/14/2023	Source: EPA Region 5
Date Data Arrived at EDR: 05/09/2023	Telephone: 312-886-6136
Date Made Active in Reports: 07/14/2023	Last EDR Contact: 10/11/2023
Number of Days to Update: 66	Next Scheduled EDR Contact: 01/29/2024
	Data Release Frequency: Varies

INDIAN UST R7: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 7 (Iowa, Kansas, Missouri, Nebraska, and 9 Tribal Nations).

Date of Government Version: 04/25/2023	Source: EPA Region 7
Date Data Arrived at EDR: 05/09/2023	Telephone: 913-551-7003
Date Made Active in Reports: 07/14/2023	Last EDR Contact: 10/11/2023
Number of Days to Update: 66	Next Scheduled EDR Contact: 01/29/2024
	Data Release Frequency: Varies

State and tribal institutional control / engineering control registries

AUL: Environmental Real Covenants List

Senate Bill 01-145 gave authority to the Colorado Department of Public Health and Environment to approve requests to restrict the future use of a property using an enforceable agreement called an environmental covenant. When a contaminated site is not cleaned up completely, land use restrictions may be used to ensure that the selected cleanup remedy is adequately protective of human health and the environment.

Date of Government Version: 07/19/2023	Source: Department of Public Health & Environment
Date Data Arrived at EDR: 07/20/2023	Telephone: 303-692-3331
Date Made Active in Reports: 10/02/2023	Last EDR Contact: 10/20/2023
Number of Days to Update: 74	Next Scheduled EDR Contact: 02/05/2024
	Data Release Frequency: Varies

Lists of state and tribal voluntary cleanup sites

INDIAN VCP R1: Voluntary Cleanup Priority Listing

A listing of voluntary cleanup priority sites located on Indian Land located in Region 1.

Date of Government Version: 07/27/2015	Source: EPA, Region 1
Date Data Arrived at EDR: 09/29/2015	Telephone: 617-918-1102
Date Made Active in Reports: 02/18/2016	Last EDR Contact: 12/12/2023
Number of Days to Update: 142	Next Scheduled EDR Contact: 04/01/2024
	Data Release Frequency: Varies

INDIAN VCP R7: Voluntary Cleanup Priority Listing

A listing of voluntary cleanup priority sites located on Indian Land located in Region 7.

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: 03/20/2008
Date Data Arrived at EDR: 04/22/2008
Date Made Active in Reports: 05/19/2008
Number of Days to Update: 27

Source: EPA, Region 7
Telephone: 913-551-7365
Last EDR Contact: 07/08/2021
Next Scheduled EDR Contact: 07/20/2009
Data Release Frequency: Varies

VCP: Voluntary Cleanup & Redevelopment Act Application Tracking Report

The Voluntary Cleanup and Redevelopment Act is intended to permit and encourage voluntary cleanups by providing a method to determine clean-up responsibilities in planning the reuse of property. The VCRA was intended for sites which were not covered by existing regulatory programs.

Date of Government Version: 09/19/2023
Date Data Arrived at EDR: 09/20/2023
Date Made Active in Reports: 09/25/2023
Number of Days to Update: 5

Source: Department of Public Health and Environmental
Telephone: 303-692-3331
Last EDR Contact: 09/14/2023
Next Scheduled EDR Contact: 01/15/2024
Data Release Frequency: Semi-Annually

Lists of state and tribal brownfield sites

BROWNFIELDS: Brownfields Sites Listing
Brownfields Sites Listing

Date of Government Version: 07/13/2023
Date Data Arrived at EDR: 07/13/2023
Date Made Active in Reports: 10/02/2023
Number of Days to Update: 81

Source: Department of Public Health & Environment
Telephone: 303-692-3331
Last EDR Contact: 07/11/2023
Next Scheduled EDR Contact: 01/29/2024
Data Release Frequency: Varies

ADDITIONAL ENVIRONMENTAL RECORDS

Local Brownfield lists

US BROWNFIELDS: A Listing of Brownfields Sites

Brownfields are real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant. Cleaning up and reinvesting in these properties takes development pressures off of undeveloped, open land, and both improves and protects the environment. Assessment, Cleanup and Redevelopment Exchange System (ACRES) stores information reported by EPA Brownfields grant recipients on brownfields properties assessed or cleaned up with grant funding as well as information on Targeted Brownfields Assessments performed by EPA Regions. A listing of ACRES Brownfield sites is obtained from Cleanups in My Community. Cleanups in My Community provides information on Brownfields properties for which information is reported back to EPA, as well as areas served by Brownfields grant programs.

Date of Government Version: 08/15/2023
Date Data Arrived at EDR: 08/30/2023
Date Made Active in Reports: 12/01/2023
Number of Days to Update: 93

Source: Environmental Protection Agency
Telephone: 202-566-2777
Last EDR Contact: 08/30/2023
Next Scheduled EDR Contact: 12/25/2023
Data Release Frequency: Semi-Annually

Local Lists of Landfill / Solid Waste Disposal Sites

SWRCY: Registered Recyclers Listing

A listing of registered recycler locations in the state of Colorado.

Date of Government Version: 07/26/2023
Date Data Arrived at EDR: 08/24/2023
Date Made Active in Reports: 08/25/2023
Number of Days to Update: 1

Source: Department of Public Health & Environment
Telephone: 303-692-3337
Last EDR Contact: 11/28/2023
Next Scheduled EDR Contact: 03/18/2024
Data Release Frequency: Semi-Annually

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

HISTORICAL LANDFILL: Historical Landfill List Abandoned/Inactive Landfills.

Date of Government Version: 01/31/1993
Date Data Arrived at EDR: 04/24/1994
Date Made Active in Reports: 05/30/1994
Number of Days to Update: 36

Source: Department of Public Health & Environment
Telephone: 303-692-3300
Last EDR Contact: 09/05/1996
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

INDIAN ODI: Report on the Status of Open Dumps on Indian Lands Location of open dumps on Indian land.

Date of Government Version: 12/31/1998
Date Data Arrived at EDR: 12/03/2007
Date Made Active in Reports: 01/24/2008
Number of Days to Update: 52

Source: Environmental Protection Agency
Telephone: 703-308-8245
Last EDR Contact: 10/23/2023
Next Scheduled EDR Contact: 02/05/2024
Data Release Frequency: Varies

DEBRIS REGION 9: Torres Martinez Reservation Illegal Dump Site Locations

A listing of illegal dump sites location on the Torres Martinez Indian Reservation located in eastern Riverside County and northern Imperial County, California.

Date of Government Version: 01/12/2009
Date Data Arrived at EDR: 05/07/2009
Date Made Active in Reports: 09/21/2009
Number of Days to Update: 137

Source: EPA, Region 9
Telephone: 415-947-4219
Last EDR Contact: 10/10/2023
Next Scheduled EDR Contact: 01/29/2024
Data Release Frequency: No Update Planned

ODI: Open Dump Inventory

An open dump is defined as a disposal facility that does not comply with one or more of the Part 257 or Part 258 Subtitle D Criteria.

Date of Government Version: 06/30/1985
Date Data Arrived at EDR: 08/09/2004
Date Made Active in Reports: 09/17/2004
Number of Days to Update: 39

Source: Environmental Protection Agency
Telephone: 800-424-9346
Last EDR Contact: 06/09/2004
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

IHS OPEN DUMPS: Open Dumps on Indian Land

A listing of all open dumps located on Indian Land in the United States.

Date of Government Version: 04/01/2014
Date Data Arrived at EDR: 08/06/2014
Date Made Active in Reports: 01/29/2015
Number of Days to Update: 176

Source: Department of Health & Human Services, Indian Health Service
Telephone: 301-443-1452
Last EDR Contact: 10/28/2023
Next Scheduled EDR Contact: 02/05/2024
Data Release Frequency: Varies

DENVER CO HISTORIC FILL: Denver City & County Historic Fill Areas

This dataset denotes the approximate locations of historical fill areas within the City and County of Denver (CCoD) and with within approximately three-quarters of a mile of the CCoD boundaries. The data is of a general nature and obtained from historic and current documents that may not be accurate or precise.

Date of Government Version: 12/17/2019
Date Data Arrived at EDR: 01/07/2020
Date Made Active in Reports: 03/13/2020
Number of Days to Update: 66

Source: City & County of Denver
Telephone: 720-913-5237
Last EDR Contact: 10/06/2023
Next Scheduled EDR Contact: 01/15/2024
Data Release Frequency: No Update Planned

Local Lists of Hazardous waste / Contaminated Sites

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

US HIST CDL: National Clandestine Laboratory Register

A listing of clandestine drug lab locations that have been removed from the DEAs National Clandestine Laboratory Register.

Date of Government Version: 08/21/2023
Date Data Arrived at EDR: 08/21/2023
Date Made Active in Reports: 11/07/2023
Number of Days to Update: 78

Source: Drug Enforcement Administration
Telephone: 202-307-1000
Last EDR Contact: 11/17/2023
Next Scheduled EDR Contact: 03/04/2024
Data Release Frequency: No Update Planned

CDL: Meth Lab Locations

Meth lab locations that were reported to the Department of Public Health & Environment.

Date of Government Version: 11/15/2023
Date Data Arrived at EDR: 11/15/2023
Date Made Active in Reports: 11/21/2023
Number of Days to Update: 6

Source: Department of Public Health and Environment
Telephone: 303-692-3023
Last EDR Contact: 11/13/2023
Next Scheduled EDR Contact: 01/08/2024
Data Release Frequency: Quarterly

US CDL: Clandestine Drug Labs

A listing of clandestine drug lab locations. The U.S. Department of Justice ("the Department") provides this web site as a public service. It contains addresses of some locations where law enforcement agencies reported they found chemicals or other items that indicated the presence of either clandestine drug laboratories or dumpsites. In most cases, the source of the entries is not the Department, and the Department has not verified the entry and does not guarantee its accuracy. Members of the public must verify the accuracy of all entries by, for example, contacting local law enforcement and local health departments.

Date of Government Version: 08/21/2023
Date Data Arrived at EDR: 08/21/2023
Date Made Active in Reports: 11/07/2023
Number of Days to Update: 78

Source: Drug Enforcement Administration
Telephone: 202-307-1000
Last EDR Contact: 11/17/2023
Next Scheduled EDR Contact: 03/04/2024
Data Release Frequency: Quarterly

Local Land Records

LIENS 2: CERCLA Lien Information

A Federal CERCLA ("Superfund") lien can exist by operation of law at any site or property at which EPA has spent Superfund monies. These monies are spent to investigate and address releases and threatened releases of contamination. CERCLIS provides information as to the identity of these sites and properties.

Date of Government Version: 09/19/2023
Date Data Arrived at EDR: 10/03/2023
Date Made Active in Reports: 10/19/2023
Number of Days to Update: 16

Source: Environmental Protection Agency
Telephone: 202-564-6023
Last EDR Contact: 11/01/2023
Next Scheduled EDR Contact: 01/08/2024
Data Release Frequency: Semi-Annually

Records of Emergency Release Reports

HMIRS: Hazardous Materials Information Reporting System

Hazardous Materials Incident Report System. HMIRS contains hazardous material spill incidents reported to DOT.

Date of Government Version: 09/18/2023
Date Data Arrived at EDR: 09/20/2023
Date Made Active in Reports: 11/14/2023
Number of Days to Update: 55

Source: U.S. Department of Transportation
Telephone: 202-366-4555
Last EDR Contact: 12/13/2023
Next Scheduled EDR Contact: 04/01/2024
Data Release Frequency: Quarterly

CO ERNS: Spills Database

State reported spills.

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: 11/15/2023
Date Data Arrived at EDR: 11/15/2023
Date Made Active in Reports: 11/21/2023
Number of Days to Update: 6

Source: Department of Public Health and Environmental
Telephone: 303-692-2000
Last EDR Contact: 11/13/2023
Next Scheduled EDR Contact: 01/08/2024
Data Release Frequency: Quarterly

SPILLS 2: Spills

A listing of spills reported to the Oil & Gas Conservation Commission

Date of Government Version: 08/08/2023
Date Data Arrived at EDR: 09/20/2023
Date Made Active in Reports: 12/11/2023
Number of Days to Update: 82

Source: Oil & Gas Conservation Commission
Telephone: 303-894-2100
Last EDR Contact: 12/13/2023
Next Scheduled EDR Contact: 04/01/2024
Data Release Frequency: Quarterly

SPILLS 90: SPILLS90 data from FirstSearch

Spills 90 includes those spill and release records available exclusively from FirstSearch databases. Typically, they may include chemical, oil and/or hazardous substance spills recorded after 1990. Duplicate records that are already included in EDR incident and release records are not included in Spills 90.

Date of Government Version: 10/15/2012
Date Data Arrived at EDR: 01/03/2013
Date Made Active in Reports: 02/06/2013
Number of Days to Update: 34

Source: FirstSearch
Telephone: N/A
Last EDR Contact: 01/03/2013
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

Other Ascertainable Records

RCRA NonGen / NLR: RCRA - Non Generators / No Longer Regulated

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Non-Generators do not presently generate hazardous waste.

Date of Government Version: 12/04/2023
Date Data Arrived at EDR: 12/06/2023
Date Made Active in Reports: 12/12/2023
Number of Days to Update: 6

Source: Environmental Protection Agency
Telephone: 303-312-6149
Last EDR Contact: 12/06/2023
Next Scheduled EDR Contact: 01/01/2024
Data Release Frequency: Quarterly

FUDS: Formerly Used Defense Sites

The listing includes locations of Formerly Used Defense Sites properties where the US Army Corps of Engineers is actively working or will take necessary cleanup actions.

Date of Government Version: 08/07/2023
Date Data Arrived at EDR: 08/15/2023
Date Made Active in Reports: 10/10/2023
Number of Days to Update: 56

Source: U.S. Army Corps of Engineers
Telephone: 202-528-4285
Last EDR Contact: 11/10/2023
Next Scheduled EDR Contact: 02/26/2024
Data Release Frequency: Varies

DOD: Department of Defense Sites

This data set consists of federally owned or administered lands, administered by the Department of Defense, that have any area equal to or greater than 640 acres of the United States, Puerto Rico, and the U.S. Virgin Islands.

Date of Government Version: 06/07/2021
Date Data Arrived at EDR: 07/13/2021
Date Made Active in Reports: 03/09/2022
Number of Days to Update: 239

Source: USGS
Telephone: 888-275-8747
Last EDR Contact: 10/09/2023
Next Scheduled EDR Contact: 01/22/2024
Data Release Frequency: Varies

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

FEDLAND: Federal and Indian Lands

Federally and Indian administrated lands of the United States. Lands included are administrated by: Army Corps of Engineers, Bureau of Reclamation, National Wild and Scenic River, National Wildlife Refuge, Public Domain Land, Wilderness, Wilderness Study Area, Wildlife Management Area, Bureau of Indian Affairs, Bureau of Land Management, Department of Justice, Forest Service, Fish and Wildlife Service, National Park Service.

Date of Government Version: 04/02/2018	Source: U.S. Geological Survey
Date Data Arrived at EDR: 04/11/2018	Telephone: 888-275-8747
Date Made Active in Reports: 11/06/2019	Last EDR Contact: 10/04/2023
Number of Days to Update: 574	Next Scheduled EDR Contact: 01/15/2024
	Data Release Frequency: N/A

SCRD DRYCLEANERS: State Coalition for Remediation of Drycleaners Listing

The State Coalition for Remediation of Drycleaners was established in 1998, with support from the U.S. EPA Office of Superfund Remediation and Technology Innovation. It is comprised of representatives of states with established drycleaner remediation programs. Currently the member states are Alabama, Connecticut, Florida, Illinois, Kansas, Minnesota, Missouri, North Carolina, Oregon, South Carolina, Tennessee, Texas, and Wisconsin.

Date of Government Version: 07/30/2021	Source: Environmental Protection Agency
Date Data Arrived at EDR: 02/03/2023	Telephone: 615-532-8599
Date Made Active in Reports: 02/10/2023	Last EDR Contact: 11/08/2023
Number of Days to Update: 7	Next Scheduled EDR Contact: 02/19/2024
	Data Release Frequency: Varies

US FIN ASSUR: Financial Assurance Information

All owners and operators of facilities that treat, store, or dispose of hazardous waste are required to provide proof that they will have sufficient funds to pay for the clean up, closure, and post-closure care of their facilities.

Date of Government Version: 09/18/2023	Source: Environmental Protection Agency
Date Data Arrived at EDR: 09/20/2023	Telephone: 202-566-1917
Date Made Active in Reports: 12/12/2023	Last EDR Contact: 12/13/2023
Number of Days to Update: 83	Next Scheduled EDR Contact: 04/01/2024
	Data Release Frequency: Quarterly

EPA WATCH LIST: EPA WATCH LIST

EPA maintains a "Watch List" to facilitate dialogue between EPA, state and local environmental agencies on enforcement matters relating to facilities with alleged violations identified as either significant or high priority. Being on the Watch List does not mean that the facility has actually violated the law only that an investigation by EPA or a state or local environmental agency has led those organizations to allege that an unproven violation has in fact occurred. Being on the Watch List does not represent a higher level of concern regarding the alleged violations that were detected, but instead indicates cases requiring additional dialogue between EPA, state and local agencies - primarily because of the length of time the alleged violation has gone unaddressed or unresolved.

Date of Government Version: 08/30/2013	Source: Environmental Protection Agency
Date Data Arrived at EDR: 03/21/2014	Telephone: 617-520-3000
Date Made Active in Reports: 06/17/2014	Last EDR Contact: 10/31/2023
Number of Days to Update: 88	Next Scheduled EDR Contact: 02/12/2024
	Data Release Frequency: Quarterly

2020 COR ACTION: 2020 Corrective Action Program List

The EPA has set ambitious goals for the RCRA Corrective Action program by creating the 2020 Corrective Action Universe. This RCRA cleanup baseline includes facilities expected to need corrective action. The 2020 universe contains a wide variety of sites. Some properties are heavily contaminated while others were contaminated but have since been cleaned up. Still others have not been fully investigated yet, and may require little or no remediation. Inclusion in the 2020 Universe does not necessarily imply failure on the part of a facility to meet its RCRA obligations.

Date of Government Version: 09/30/2017	Source: Environmental Protection Agency
Date Data Arrived at EDR: 05/08/2018	Telephone: 703-308-4044
Date Made Active in Reports: 07/20/2018	Last EDR Contact: 11/03/2023
Number of Days to Update: 73	Next Scheduled EDR Contact: 02/12/2024
	Data Release Frequency: Varies

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

TSCA: Toxic Substances Control Act

Toxic Substances Control Act. TSCA identifies manufacturers and importers of chemical substances included on the TSCA Chemical Substance Inventory list. It includes data on the production volume of these substances by plant site.

Date of Government Version: 12/31/2020	Source: EPA
Date Data Arrived at EDR: 06/14/2022	Telephone: 202-260-5521
Date Made Active in Reports: 03/24/2023	Last EDR Contact: 09/15/2023
Number of Days to Update: 283	Next Scheduled EDR Contact: 12/25/2023
	Data Release Frequency: Every 4 Years

TRIS: Toxic Chemical Release Inventory System

Toxic Release Inventory System. TRIS identifies facilities which release toxic chemicals to the air, water and land in reportable quantities under SARA Title III Section 313.

Date of Government Version: 12/31/2021	Source: EPA
Date Data Arrived at EDR: 08/18/2023	Telephone: 202-566-0250
Date Made Active in Reports: 11/07/2023	Last EDR Contact: 11/13/2023
Number of Days to Update: 81	Next Scheduled EDR Contact: 02/26/2024
	Data Release Frequency: Annually

SSTS: Section 7 Tracking Systems

Section 7 of the Federal Insecticide, Fungicide and Rodenticide Act, as amended (92 Stat. 829) requires all registered pesticide-producing establishments to submit a report to the Environmental Protection Agency by March 1st each year. Each establishment must report the types and amounts of pesticides, active ingredients and devices being produced, and those having been produced and sold or distributed in the past year.

Date of Government Version: 07/17/2023	Source: EPA
Date Data Arrived at EDR: 07/18/2023	Telephone: 202-564-4203
Date Made Active in Reports: 10/10/2023	Last EDR Contact: 10/20/2023
Number of Days to Update: 84	Next Scheduled EDR Contact: 01/29/2024
	Data Release Frequency: Annually

ROD: Records Of Decision

Record of Decision. ROD documents mandate a permanent remedy at an NPL (Superfund) site containing technical and health information to aid in the cleanup.

Date of Government Version: 09/19/2023	Source: EPA
Date Data Arrived at EDR: 10/03/2023	Telephone: 703-416-0223
Date Made Active in Reports: 10/19/2023	Last EDR Contact: 12/04/2023
Number of Days to Update: 16	Next Scheduled EDR Contact: 03/11/2024
	Data Release Frequency: Annually

RMP: Risk Management Plans

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

When Congress passed the Clean Air Act Amendments of 1990, it required EPA to publish regulations and guidance for chemical accident prevention at facilities using extremely hazardous substances. The Risk Management Program Rule (RMP Rule) was written to implement Section 112(r) of these amendments. The rule, which built upon existing industry codes and standards, requires companies of all sizes that use certain flammable and toxic substances to develop a Risk Management Program, which includes a(n): Hazard assessment that details the potential effects of an accidental release, an accident history of the last five years, and an evaluation of worst-case and alternative accidental releases; Prevention program that includes safety precautions and maintenance, monitoring, and employee training measures; and Emergency response program that spells out emergency health care, employee training measures and procedures for informing the public and response agencies (e.g the fire department) should an accident occur.

Date of Government Version: 05/09/2023	Source: Environmental Protection Agency
Date Data Arrived at EDR: 06/29/2023	Telephone: 202-564-8600
Date Made Active in Reports: 09/25/2023	Last EDR Contact: 09/26/2023
Number of Days to Update: 88	Next Scheduled EDR Contact: 01/29/2024
	Data Release Frequency: Varies

RAATS: RCRA Administrative Action Tracking System

RCRA Administration Action Tracking System. RAATS contains records based on enforcement actions issued under RCRA pertaining to major violators and includes administrative and civil actions brought by the EPA. For administration actions after September 30, 1995, data entry in the RAATS database was discontinued. EPA will retain a copy of the database for historical records. It was necessary to terminate RAATS because a decrease in agency resources made it impossible to continue to update the information contained in the database.

Date of Government Version: 04/17/1995	Source: EPA
Date Data Arrived at EDR: 07/03/1995	Telephone: 202-564-4104
Date Made Active in Reports: 08/07/1995	Last EDR Contact: 06/02/2008
Number of Days to Update: 35	Next Scheduled EDR Contact: 09/01/2008
	Data Release Frequency: No Update Planned

PRP: Potentially Responsible Parties

A listing of verified Potentially Responsible Parties

Date of Government Version: 09/19/2023	Source: EPA
Date Data Arrived at EDR: 10/03/2023	Telephone: 202-564-6023
Date Made Active in Reports: 10/19/2023	Last EDR Contact: 12/04/2023
Number of Days to Update: 16	Next Scheduled EDR Contact: 02/12/2024
	Data Release Frequency: Quarterly

PADS: PCB Activity Database System

PCB Activity Database. PADS Identifies generators, transporters, commercial storers and/or brokers and disposers of PCB's who are required to notify the EPA of such activities.

Date of Government Version: 03/20/2023	Source: EPA
Date Data Arrived at EDR: 04/04/2023	Telephone: 202-566-0500
Date Made Active in Reports: 06/09/2023	Last EDR Contact: 10/06/2023
Number of Days to Update: 66	Next Scheduled EDR Contact: 01/15/2024
	Data Release Frequency: Annually

ICIS: Integrated Compliance Information System

The Integrated Compliance Information System (ICIS) supports the information needs of the national enforcement and compliance program as well as the unique needs of the National Pollutant Discharge Elimination System (NPDES) program.

Date of Government Version: 11/18/2016	Source: Environmental Protection Agency
Date Data Arrived at EDR: 11/23/2016	Telephone: 202-564-2501
Date Made Active in Reports: 02/10/2017	Last EDR Contact: 09/27/2023
Number of Days to Update: 79	Next Scheduled EDR Contact: 01/15/2024
	Data Release Frequency: Quarterly

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

FTTS: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)

FTTS tracks administrative cases and pesticide enforcement actions and compliance activities related to FIFRA, TSCA and EPCRA (Emergency Planning and Community Right-to-Know Act). To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 04/09/2009
Date Data Arrived at EDR: 04/16/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 25

Source: EPA/Office of Prevention, Pesticides and Toxic Substances
Telephone: 202-566-1667
Last EDR Contact: 08/18/2017
Next Scheduled EDR Contact: 12/04/2017
Data Release Frequency: No Update Planned

FTTS INSP: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)

A listing of FIFRA/TSCA Tracking System (FTTS) inspections and enforcements.

Date of Government Version: 04/09/2009
Date Data Arrived at EDR: 04/16/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 25

Source: EPA
Telephone: 202-566-1667
Last EDR Contact: 08/18/2017
Next Scheduled EDR Contact: 12/04/2017
Data Release Frequency: No Update Planned

MLTS: Material Licensing Tracking System

MLTS is maintained by the Nuclear Regulatory Commission and contains a list of approximately 8,100 sites which possess or use radioactive materials and which are subject to NRC licensing requirements. To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 07/20/2023
Date Data Arrived at EDR: 09/01/2023
Date Made Active in Reports: 09/20/2023
Number of Days to Update: 19

Source: Nuclear Regulatory Commission
Telephone: 301-415-0717
Last EDR Contact: 10/10/2023
Next Scheduled EDR Contact: 01/29/2024
Data Release Frequency: Quarterly

COAL ASH DOE: Steam-Electric Plant Operation Data

A listing of power plants that store ash in surface ponds.

Date of Government Version: 12/31/2021
Date Data Arrived at EDR: 04/14/2023
Date Made Active in Reports: 07/10/2023
Number of Days to Update: 87

Source: Department of Energy
Telephone: 202-586-8719
Last EDR Contact: 11/27/2023
Next Scheduled EDR Contact: 03/11/2024
Data Release Frequency: Varies

COAL ASH EPA: Coal Combustion Residues Surface Impoundments List

A listing of coal combustion residues surface impoundments with high hazard potential ratings.

Date of Government Version: 01/12/2017
Date Data Arrived at EDR: 03/05/2019
Date Made Active in Reports: 11/11/2019
Number of Days to Update: 251

Source: Environmental Protection Agency
Telephone: N/A
Last EDR Contact: 11/27/2023
Next Scheduled EDR Contact: 03/11/2024
Data Release Frequency: Varies

PCB TRANSFORMER: PCB Transformer Registration Database

The database of PCB transformer registrations that includes all PCB registration submittals.

Date of Government Version: 09/13/2019
Date Data Arrived at EDR: 11/06/2019
Date Made Active in Reports: 02/10/2020
Number of Days to Update: 96

Source: Environmental Protection Agency
Telephone: 202-566-0517
Last EDR Contact: 11/03/2023
Next Scheduled EDR Contact: 02/12/2024
Data Release Frequency: Varies

RADINFO: Radiation Information Database

The Radiation Information Database (RADINFO) contains information about facilities that are regulated by U.S. Environmental Protection Agency (EPA) regulations for radiation and radioactivity.

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: 07/01/2019
Date Data Arrived at EDR: 07/01/2019
Date Made Active in Reports: 09/23/2019
Number of Days to Update: 84

Source: Environmental Protection Agency
Telephone: 202-343-9775
Last EDR Contact: 09/22/2023
Next Scheduled EDR Contact: 01/08/2024
Data Release Frequency: Quarterly

HIST FTTS: FIFRA/TSCA Tracking System Administrative Case Listing

A complete administrative case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

Date of Government Version: 10/19/2006
Date Data Arrived at EDR: 03/01/2007
Date Made Active in Reports: 04/10/2007
Number of Days to Update: 40

Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 12/17/2007
Next Scheduled EDR Contact: 03/17/2008
Data Release Frequency: No Update Planned

HIST FTTS INSP: FIFRA/TSCA Tracking System Inspection & Enforcement Case Listing

A complete inspection and enforcement case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

Date of Government Version: 10/19/2006
Date Data Arrived at EDR: 03/01/2007
Date Made Active in Reports: 04/10/2007
Number of Days to Update: 40

Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 12/17/2008
Next Scheduled EDR Contact: 03/17/2008
Data Release Frequency: No Update Planned

DOT OPS: Incident and Accident Data

Department of Transportation, Office of Pipeline Safety Incident and Accident data.

Date of Government Version: 01/02/2020
Date Data Arrived at EDR: 01/28/2020
Date Made Active in Reports: 04/17/2020
Number of Days to Update: 80

Source: Department of Transportation, Office of Pipeline Safety
Telephone: 202-366-4595
Last EDR Contact: 10/04/2023
Next Scheduled EDR Contact: 02/05/2024
Data Release Frequency: Quarterly

CONSENT: Superfund (CERCLA) Consent Decrees

Major legal settlements that establish responsibility and standards for cleanup at NPL (Superfund) sites. Released periodically by United States District Courts after settlement by parties to litigation matters.

Date of Government Version: 06/30/2023
Date Data Arrived at EDR: 07/19/2023
Date Made Active in Reports: 10/10/2023
Number of Days to Update: 83

Source: Department of Justice, Consent Decree Library
Telephone: Varies
Last EDR Contact: 10/03/2023
Next Scheduled EDR Contact: 01/15/2024
Data Release Frequency: Varies

BRS: Biennial Reporting System

The Biennial Reporting System is a national system administered by the EPA that collects data on the generation and management of hazardous waste. BRS captures detailed data from two groups: Large Quantity Generators (LQG) and Treatment, Storage, and Disposal Facilities.

Date of Government Version: 12/31/2021
Date Data Arrived at EDR: 03/09/2023
Date Made Active in Reports: 03/20/2023
Number of Days to Update: 11

Source: EPA/NTIS
Telephone: 800-424-9346
Last EDR Contact: 12/06/2023
Next Scheduled EDR Contact: 01/01/2024
Data Release Frequency: Biennially

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

INDIAN RESERV: Indian Reservations

This map layer portrays Indian administered lands of the United States that have any area equal to or greater than 640 acres.

Date of Government Version: 12/31/2014	Source: USGS
Date Data Arrived at EDR: 07/14/2015	Telephone: 202-208-3710
Date Made Active in Reports: 01/10/2017	Last EDR Contact: 10/02/2023
Number of Days to Update: 546	Next Scheduled EDR Contact: 01/15/2024
	Data Release Frequency: Semi-Annually

FUSRAP: Formerly Utilized Sites Remedial Action Program

DOE established the Formerly Utilized Sites Remedial Action Program (FUSRAP) in 1974 to remediate sites where radioactive contamination remained from Manhattan Project and early U.S. Atomic Energy Commission (AEC) operations.

Date of Government Version: 03/03/2023	Source: Department of Energy
Date Data Arrived at EDR: 03/03/2023	Telephone: 202-586-3559
Date Made Active in Reports: 06/09/2023	Last EDR Contact: 10/25/2023
Number of Days to Update: 98	Next Scheduled EDR Contact: 02/12/2024
	Data Release Frequency: Varies

UMTRA: Uranium Mill Tailings Sites

Uranium ore was mined by private companies for federal government use in national defense programs. When the mills shut down, large piles of the sand-like material (mill tailings) remain after uranium has been extracted from the ore. Levels of human exposure to radioactive materials from the piles are low; however, in some cases tailings were used as construction materials before the potential health hazards of the tailings were recognized.

Date of Government Version: 08/30/2019	Source: Department of Energy
Date Data Arrived at EDR: 11/15/2019	Telephone: 505-845-0011
Date Made Active in Reports: 01/28/2020	Last EDR Contact: 11/09/2023
Number of Days to Update: 74	Next Scheduled EDR Contact: 02/26/2024
	Data Release Frequency: Varies

LEAD SMELTER 1: Lead Smelter Sites

A listing of former lead smelter site locations.

Date of Government Version: 09/19/2023	Source: Environmental Protection Agency
Date Data Arrived at EDR: 10/03/2023	Telephone: 703-603-8787
Date Made Active in Reports: 10/19/2023	Last EDR Contact: 12/04/2023
Number of Days to Update: 16	Next Scheduled EDR Contact: 01/08/2024
	Data Release Frequency: Varies

LEAD SMELTER 2: Lead Smelter Sites

A list of several hundred sites in the U.S. where secondary lead smelting was done from 1931 and 1964. These sites may pose a threat to public health through ingestion or inhalation of contaminated soil or dust

Date of Government Version: 04/05/2001	Source: American Journal of Public Health
Date Data Arrived at EDR: 10/27/2010	Telephone: 703-305-6451
Date Made Active in Reports: 12/02/2010	Last EDR Contact: 12/02/2009
Number of Days to Update: 36	Next Scheduled EDR Contact: N/A
	Data Release Frequency: No Update Planned

US AIRS (AFS): Aerometric Information Retrieval System Facility Subsystem (AFS)

The database is a sub-system of Aerometric Information Retrieval System (AIRS). AFS contains compliance data on air pollution point sources regulated by the U.S. EPA and/or state and local air regulatory agencies. This information comes from source reports by various stationary sources of air pollution, such as electric power plants, steel mills, factories, and universities, and provides information about the air pollutants they produce. Action, air program, air program pollutant, and general level plant data. It is used to track emissions and compliance data from industrial plants.

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: 10/12/2016
Date Data Arrived at EDR: 10/26/2016
Date Made Active in Reports: 02/03/2017
Number of Days to Update: 100

Source: EPA
Telephone: 202-564-2496
Last EDR Contact: 09/26/2017
Next Scheduled EDR Contact: 01/08/2018
Data Release Frequency: Annually

US AIRS MINOR: Air Facility System Data A listing of minor source facilities.

Date of Government Version: 10/12/2016
Date Data Arrived at EDR: 10/26/2016
Date Made Active in Reports: 02/03/2017
Number of Days to Update: 100

Source: EPA
Telephone: 202-564-2496
Last EDR Contact: 09/26/2017
Next Scheduled EDR Contact: 01/08/2018
Data Release Frequency: Annually

MINES VIOLATIONS: MSHA Violation Assessment Data

Mines violation and assessment information. Department of Labor, Mine Safety & Health Administration.

Date of Government Version: 07/05/2023
Date Data Arrived at EDR: 07/05/2023
Date Made Active in Reports: 09/25/2023
Number of Days to Update: 82

Source: DOL, Mine Safety & Health Admi
Telephone: 202-693-9424
Last EDR Contact: 10/04/2023
Next Scheduled EDR Contact: 02/19/2024
Data Release Frequency: Quarterly

US MINES: Mines Master Index File

Contains all mine identification numbers issued for mines active or opened since 1971. The data also includes violation information.

Date of Government Version: 08/01/2023
Date Data Arrived at EDR: 08/22/2023
Date Made Active in Reports: 11/07/2023
Number of Days to Update: 77

Source: Department of Labor, Mine Safety and Health Administration
Telephone: 303-231-5959
Last EDR Contact: 11/17/2023
Next Scheduled EDR Contact: 03/04/2024
Data Release Frequency: Semi-Annually

US MINES 2: Ferrous and Nonferrous Metal Mines Database Listing

This map layer includes ferrous (ferrous metal mines are facilities that extract ferrous metals, such as iron ore or molybdenum) and nonferrous (Nonferrous metal mines are facilities that extract nonferrous metals, such as gold, silver, copper, zinc, and lead) metal mines in the United States.

Date of Government Version: 01/07/2022
Date Data Arrived at EDR: 02/24/2023
Date Made Active in Reports: 05/17/2023
Number of Days to Update: 82

Source: USGS
Telephone: 703-648-7709
Last EDR Contact: 11/20/2023
Next Scheduled EDR Contact: 03/04/2024
Data Release Frequency: Varies

US MINES 3: Active Mines & Mineral Plants Database Listing

Active Mines and Mineral Processing Plant operations for commodities monitored by the Minerals Information Team of the USGS.

Date of Government Version: 04/14/2011
Date Data Arrived at EDR: 06/08/2011
Date Made Active in Reports: 09/13/2011
Number of Days to Update: 97

Source: USGS
Telephone: 703-648-7709
Last EDR Contact: 11/20/2023
Next Scheduled EDR Contact: 03/04/2024
Data Release Frequency: Varies

MINES MRDS: Mineral Resources Data System Mineral Resources Data System

Date of Government Version: 08/23/2022
Date Data Arrived at EDR: 11/22/2022
Date Made Active in Reports: 02/28/2023
Number of Days to Update: 98

Source: USGS
Telephone: 703-648-6533
Last EDR Contact: 11/20/2023
Next Scheduled EDR Contact: 03/04/2024
Data Release Frequency: Varies

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

ABANDONED MINES: Abandoned Mines

An inventory of land and water impacted by past mining (primarily coal mining) is maintained by OSMRE to provide information needed to implement the Surface Mining Control and Reclamation Act of 1977 (SMCRA). The inventory contains information on the location, type, and extent of AML impacts, as well as, information on the cost associated with the reclamation of those problems. The inventory is based upon field surveys by State, Tribal, and OSMRE program officials. It is dynamic to the extent that it is modified as new problems are identified and existing problems are reclaimed.

Date of Government Version: 11/28/2023	Source: Department of Interior
Date Data Arrived at EDR: 11/29/2023	Telephone: 202-208-2609
Date Made Active in Reports: 12/11/2023	Last EDR Contact: 11/28/2023
Number of Days to Update: 12	Next Scheduled EDR Contact: 03/18/2024
	Data Release Frequency: Quarterly

FINDS: Facility Index System/Facility Registry System

Facility Index System. FINDS contains both facility information and 'pointers' to other sources that contain more detail. EDR includes the following FINDS databases in this report: PCS (Permit Compliance System), AIRS (Aerometric Information Retrieval System), DOCKET (Enforcement Docket used to manage and track information on civil judicial enforcement cases for all environmental statutes), FURS (Federal Underground Injection Control), C-DOCKET (Criminal Docket System used to track criminal enforcement actions for all environmental statutes), FFIS (Federal Facilities Information System), STATE (State Environmental Laws and Statutes), and PADS (PCB Activity Data System).

Date of Government Version: 11/03/2023	Source: EPA
Date Data Arrived at EDR: 11/08/2023	Telephone: (303) 312-6312
Date Made Active in Reports: 11/20/2023	Last EDR Contact: 11/08/2023
Number of Days to Update: 12	Next Scheduled EDR Contact: 03/11/2024
	Data Release Frequency: Quarterly

DOCKET HWC: Hazardous Waste Compliance Docket Listing

A complete list of the Federal Agency Hazardous Waste Compliance Docket Facilities.

Date of Government Version: 05/06/2021	Source: Environmental Protection Agency
Date Data Arrived at EDR: 05/21/2021	Telephone: 202-564-0527
Date Made Active in Reports: 08/11/2021	Last EDR Contact: 11/15/2023
Number of Days to Update: 82	Next Scheduled EDR Contact: 03/04/2024
	Data Release Frequency: Varies

UXO: Unexploded Ordnance Sites

A listing of unexploded ordnance site locations

Date of Government Version: 09/06/2023	Source: Department of Defense
Date Data Arrived at EDR: 09/13/2023	Telephone: 703-704-1564
Date Made Active in Reports: 12/11/2023	Last EDR Contact: 09/13/2023
Number of Days to Update: 89	Next Scheduled EDR Contact: 01/22/2024
	Data Release Frequency: Varies

ECHO: Enforcement & Compliance History Information

ECHO provides integrated compliance and enforcement information for about 800,000 regulated facilities nationwide.

Date of Government Version: 06/24/2023	Source: Environmental Protection Agency
Date Data Arrived at EDR: 06/29/2023	Telephone: 202-564-2280
Date Made Active in Reports: 09/25/2023	Last EDR Contact: 10/03/2023
Number of Days to Update: 88	Next Scheduled EDR Contact: 01/15/2024
	Data Release Frequency: Quarterly

FUELS PROGRAM: EPA Fuels Program Registered Listing

This listing includes facilities that are registered under the Part 80 (Code of Federal Regulations) EPA Fuels Programs. All companies now are required to submit new and updated registrations.

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: 08/14/2023
Date Data Arrived at EDR: 08/15/2023
Date Made Active in Reports: 10/19/2023
Number of Days to Update: 65

Source: EPA
Telephone: 800-385-6164
Last EDR Contact: 11/10/2023
Next Scheduled EDR Contact: 02/26/2024
Data Release Frequency: Quarterly

PFAS NPL: Superfund Sites with PFAS Detections Information

EPA's Office of Land and Emergency Management and EPA Regional Offices maintain data describing what is known about site investigations, contamination, and remedial actions under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) where PFAS is present in the environment.

Date of Government Version: 07/05/2023
Date Data Arrived at EDR: 07/05/2023
Date Made Active in Reports: 10/02/2023
Number of Days to Update: 89

Source: Environmental Protection Agency
Telephone: 703-603-8895
Last EDR Contact: 10/03/2023
Next Scheduled EDR Contact: 01/15/2024
Data Release Frequency: Varies

PFAS FEDERAL SITES: Federal Sites PFAS Information

Several federal entities, such as the federal Superfund program, Department of Defense, National Aeronautics and Space Administration, Department of Transportation, and Department of Energy provided information for sites with known or suspected detections at federal facilities.

Date of Government Version: 07/05/2023
Date Data Arrived at EDR: 07/05/2023
Date Made Active in Reports: 10/02/2023
Number of Days to Update: 89

Source: Environmental Protection Agency
Telephone: 202-272-0167
Last EDR Contact: 10/03/2023
Next Scheduled EDR Contact: 01/15/2024
Data Release Frequency: Varies

PFAS TRIS: List of PFAS Added to the TRI

Section 7321 of the National Defense Authorization Act for Fiscal Year 2020 (NDAA) immediately added certain per- and polyfluoroalkyl substances (PFAS) to the list of chemicals covered by the Toxics Release Inventory (TRI) under Section 313 of the Emergency Planning and Community Right-to-Know Act (EPCRA) and provided a framework for additional PFAS to be added to TRI on an annual basis.

Date of Government Version: 07/05/2023
Date Data Arrived at EDR: 07/05/2023
Date Made Active in Reports: 10/02/2023
Number of Days to Update: 89

Source: Environmental Protection Agency
Telephone: 202-566-0250
Last EDR Contact: 10/03/2023
Next Scheduled EDR Contact: 01/15/2024
Data Release Frequency: Varies

PFAS TSCA: PFAS Manufacture and Imports Information

EPA issued the Chemical Data Reporting (CDR) Rule under the Toxic Substances Control Act (TSCA) and requires chemical manufacturers and facilities that manufacture or import chemical substances to report data to EPA. EPA publishes non-confidential business information (non-CBI) and includes descriptive information about each site, corporate parent, production volume, other manufacturing information, and processing and use information.

Date of Government Version: 07/05/2023
Date Data Arrived at EDR: 07/05/2023
Date Made Active in Reports: 10/02/2023
Number of Days to Update: 89

Source: Environmental Protection Agency
Telephone: 202-272-0167
Last EDR Contact: 10/03/2023
Next Scheduled EDR Contact: 01/15/2024
Data Release Frequency: Varies

PFAS RCRA MANIFEST: PFAS Transfers Identified In the RCRA Database Listing

To work around the lack of PFAS waste codes in the RCRA database, EPA developed the PFAS Transfers dataset by mining e-Manifest records containing at least one of these common PFAS keywords: PFAS, PFOA, PFOS, PERFL, AFFF, GENX, GEN-X (plus the VT waste codes). These keywords were searched for in the following text fields: Manifest handling instructions (MANIFEST_HANDLING_INSTR), Non-hazardous waste description (NON_HAZ_WASTE_DESCRIPTION), DOT printed information (DOT_PRINTED_INFORMATION), Waste line handling instructions (WASTE_LINE_HANDLING_INSTR), Waste residue comments (WASTE_RESIDUE_COMMENTS).

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: 07/05/2023
Date Data Arrived at EDR: 07/05/2023
Date Made Active in Reports: 10/02/2023
Number of Days to Update: 89

Source: Environmental Protection Agency
Telephone: 202-272-0167
Last EDR Contact: 10/03/2023
Next Scheduled EDR Contact: 01/15/2024
Data Release Frequency: Varies

PFAS ATSDR: PFAS Contamination Site Location Listing

PFAS contamination site locations from the Department of Health & Human Services, Center for Disease Control & Prevention. ATSDR is involved at a number of PFAS-related sites, either directly or through assisting state and federal partners. As of now, most sites are related to drinking water contamination connected with PFAS production facilities or fire training areas where aqueous film-forming firefighting foam (AFFF) was regularly used.

Date of Government Version: 06/24/2020
Date Data Arrived at EDR: 03/17/2021
Date Made Active in Reports: 11/08/2022
Number of Days to Update: 601

Source: Department of Health & Human Services
Telephone: 202-741-5770
Last EDR Contact: 10/23/2023
Next Scheduled EDR Contact: 02/05/2024
Data Release Frequency: Varies

PFAS WQP: Ambient Environmental Sampling for PFAS

The Water Quality Portal (WQP) is a part of a modernized repository storing ambient sampling data for all environmental media and tissue samples. A wide range of federal, state, tribal and local governments, academic and non-governmental organizations and individuals submit project details and sampling results to this public repository. The information is commonly used for research and assessments of environmental quality.

Date of Government Version: 09/23/2023
Date Data Arrived at EDR: 10/03/2023
Date Made Active in Reports: 10/10/2023
Number of Days to Update: 7

Source: Environmental Protection Agency
Telephone: 202-272-0167
Last EDR Contact: 10/03/2023
Next Scheduled EDR Contact: 01/15/2024
Data Release Frequency: Varies

PFAS NPDES: Clean Water Act Discharge Monitoring Information

Any discharger of pollutants to waters of the United States from a point source must have a National Pollutant Discharge Elimination System (NPDES) permit. The process for obtaining limits involves the regulated entity (permittee) disclosing releases in a NPDES permit application and the permitting authority (typically the state but sometimes EPA) deciding whether to require monitoring or monitoring with limits. Caveats and Limitations: Less than half of states have required PFAS monitoring for at least one of their permittees and fewer states have established PFAS effluent limits for permittees. New rulemakings have been initiated that may increase the number of facilities monitoring for PFAS in the future.

Date of Government Version: 07/05/2023
Date Data Arrived at EDR: 07/05/2023
Date Made Active in Reports: 10/02/2023
Number of Days to Update: 89

Source: Environmental Protection Agency
Telephone: 202-272-0167
Last EDR Contact: 10/03/2023
Next Scheduled EDR Contact: 01/15/2024
Data Release Frequency: Varies

PFAS ECHO: Facilities in Industries that May Be Handling PFAS Listing

Regulators and the public have expressed interest in knowing which regulated entities may be using PFAS. EPA has developed a dataset from various sources that show which industries may be handling PFAS. Approximately 120,000 facilities subject to federal environmental programs have operated or currently operate in industry sectors with processes that may involve handling and/or release of PFAS.

Date of Government Version: 07/05/2023
Date Data Arrived at EDR: 07/05/2023
Date Made Active in Reports: 09/25/2023
Number of Days to Update: 82

Source: Environmental Protection Agency
Telephone: 202-272-0167
Last EDR Contact: 10/03/2023
Next Scheduled EDR Contact: 01/15/2024
Data Release Frequency: Varies

PFAS ECHO FIRE TRAINING: Facilities in Industries that May Be Handling PFAS Listing

A list of fire training sites was added to the Industry Sectors dataset using a keyword search on the permitted facility's name to identify sites where fire-fighting foam may have been used in training exercises. Additionally, you may view an example spreadsheet of the subset of fire training facility data, as well as the keywords used in selecting or deselecting a facility for the subset. as well as the keywords used in selecting or deselecting a facility for the subset. These keywords were tested to maximize accuracy in selecting facilities that may use fire-fighting foam in training exercises, however, due to the lack of a required reporting field in the data systems for designating fire training sites, this methodology may not identify all fire training sites or may potentially misidentify them.

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: 07/05/2023
Date Data Arrived at EDR: 07/05/2023
Date Made Active in Reports: 09/25/2023
Number of Days to Update: 82

Source: Environmental Protection Agency
Telephone: 202-272-0167
Last EDR Contact: 10/03/2023
Next Scheduled EDR Contact: 01/15/2024
Data Release Frequency: Varies

PFAS PART 139 AIRPORT: All Certified Part 139 Airports PFAS Information Listing

Since July 1, 2006, all certified part 139 airports are required to have fire-fighting foam onsite that meet military specifications (MIL-F-24385) (14 CFR 139.317). To date, these military specification fire-fighting foams are fluorinated and have been historically used for training and extinguishing. The 2018 FAA Reauthorization Act has a provision stating that no later than October 2021, FAA shall not require the use of fluorinated AFFF. This provision does not prohibit the use of fluorinated AFFF at Part 139 civilian airports; it only prohibits FAA from mandating its use. The Federal Aviation Administration's document AC 150/5210-6D - Aircraft Fire Extinguishing Agents provides guidance on Aircraft Fire Extinguishing Agents, which includes Aqueous Film Forming Foam (AFFF).

Date of Government Version: 07/05/2023
Date Data Arrived at EDR: 07/05/2023
Date Made Active in Reports: 09/25/2023
Number of Days to Update: 82

Source: Environmental Protection Agency
Telephone: 202-272-0167
Last EDR Contact: 10/03/2023
Next Scheduled EDR Contact: 01/15/2024
Data Release Frequency: Varies

AQUEOUS FOAM NRC: Aqueous Foam Related Incidents Listing

The National Response Center (NRC) serves as an emergency call center that fields initial reports for pollution and railroad incidents and forwards that information to appropriate federal/state agencies for response. The spreadsheets posted to the NRC website contain initial incident data that has not been validated or investigated by a federal/state response agency. Response center calls from 1990 to the most recent complete calendar year where there was indication of Aqueous Film Forming Foam (AFFF) usage are included in this dataset. NRC calls may reference AFFF usage in the ?Material Involved? or ?Incident Description? fields.

Date of Government Version: 07/05/2023
Date Data Arrived at EDR: 07/06/2023
Date Made Active in Reports: 09/25/2023
Number of Days to Update: 81

Source: Environmental Protection Agency
Telephone: 202-267-2675
Last EDR Contact: 10/03/2023
Next Scheduled EDR Contact: 01/15/2024
Data Release Frequency: Varies

PCS ENF: Enforcement data

No description is available for this data

Date of Government Version: 12/31/2014
Date Data Arrived at EDR: 02/05/2015
Date Made Active in Reports: 03/06/2015
Number of Days to Update: 29

Source: EPA
Telephone: 202-564-2497
Last EDR Contact: 09/28/2023
Next Scheduled EDR Contact: 01/15/2024
Data Release Frequency: Varies

PCS: Permit Compliance System

PCS is a computerized management information system that contains data on National Pollutant Discharge Elimination System (NPDES) permit holding facilities. PCS tracks the permit, compliance, and enforcement status of NPDES facilities.

Date of Government Version: 07/14/2011
Date Data Arrived at EDR: 08/05/2011
Date Made Active in Reports: 09/29/2011
Number of Days to Update: 55

Source: EPA, Office of Water
Telephone: 202-564-2496
Last EDR Contact: 09/28/2023
Next Scheduled EDR Contact: 01/15/2024
Data Release Frequency: No Update Planned

BIOSOLIDS: ICIS-NPDES Biosolids Facility Data

The data reflects compliance information about facilities in the biosolids program.

Date of Government Version: 07/16/2023
Date Data Arrived at EDR: 07/18/2023
Date Made Active in Reports: 08/28/2023
Number of Days to Update: 41

Source: Environmental Protection Agency
Telephone: 202-564-4700
Last EDR Contact: 10/03/2023
Next Scheduled EDR Contact: 01/29/2024
Data Release Frequency: Varies

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

PFAS: PFAS Information Listing

A list of entities that have tested groundwater and have found PFAS chemicals, specifically PFOA and PFOS, levels above the health advisory. Potential sources of these chemicals include military bases, fire stations or training centers, landfills, industrial sites, car racetracks, and ski resorts.

Date of Government Version: 07/18/2023	Source: Department of Public Health & Environment
Date Data Arrived at EDR: 07/19/2023	Telephone: 303-692-3605
Date Made Active in Reports: 10/02/2023	Last EDR Contact: 10/10/2023
Number of Days to Update: 75	Next Scheduled EDR Contact: 01/15/2024
	Data Release Frequency: Varies

AQUEOUS FOAM: Class B Firefighting Foam Contaminating PFAS Listing

Class B foams put out fires caused by flammable liquids like gasoline, oil, and jet fuel. They may contain PFAS chemicals. Anyone using or storing Class B firefighting foam containing these chemicals must register through the Certificate of Registration Program.303-692-38

Date of Government Version: 07/07/2023	Source: Department of Public Health & Environment
Date Data Arrived at EDR: 07/07/2023	Telephone: 303-692-3605
Date Made Active in Reports: 09/20/2023	Last EDR Contact: 10/04/2023
Number of Days to Update: 75	Next Scheduled EDR Contact: 01/15/2024
	Data Release Frequency: Varies

AIRS: Permitted Facility & Emissions Listing

A listing of Air Pollution Control Division permits and emissions data.

Date of Government Version: 08/23/2023	Source: Department of Public Health & Environment
Date Data Arrived at EDR: 08/29/2023	Telephone: 303-692-3213
Date Made Active in Reports: 11/07/2023	Last EDR Contact: 12/05/2023
Number of Days to Update: 70	Next Scheduled EDR Contact: 03/11/2024
	Data Release Frequency: Varies

ASBESTOS: Asbestos Abatement & Demolition Projects

Asbestos abatement and demolition projects by the contractor.

Date of Government Version: 11/06/2019	Source: Department of Public Health & Environment
Date Data Arrived at EDR: 01/09/2020	Telephone: 303-692-3100
Date Made Active in Reports: 03/16/2020	Last EDR Contact: 11/20/2023
Number of Days to Update: 67	Next Scheduled EDR Contact: 02/12/2024
	Data Release Frequency: Semi-Annually

METHANE SITE: Methane Site Investigations - Jefferson County 1980

The objectives of the study are to define as closely as possible the boundaries of methane producing solid waste landfills.

Date of Government Version: 12/31/1980	Source: Jefferson County Health Department
Date Data Arrived at EDR: 02/13/1995	Telephone: 303-239-7175
Date Made Active in Reports: 04/04/1995	Last EDR Contact: 01/27/1995
Number of Days to Update: 50	Next Scheduled EDR Contact: N/A
	Data Release Frequency: No Update Planned

METHANE INVESTIGATION: Methane Gas & Swamp Findings

The primary objective of this study was to assess methane gas related hazards at selected landfill sites in Colorado. These sites were selected by the Colorado Department of Health following evaluation of responses received from County and Municipal agencies about completed and existing landfills within their jurisdiction.

Date of Government Version: 03/15/1979	Source: Department of Health
Date Data Arrived at EDR: 02/13/1995	Telephone: 303-640-3335
Date Made Active in Reports: 04/04/1995	Last EDR Contact: 01/27/1995
Number of Days to Update: 50	Next Scheduled EDR Contact: N/A
	Data Release Frequency: No Update Planned

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

DRYCLEANERS: Drycleaner Facilities

A listing of drycleaning facilities.

Date of Government Version: 08/23/2023
Date Data Arrived at EDR: 08/24/2023
Date Made Active in Reports: 11/07/2023
Number of Days to Update: 75

Source: Department of Public Health & Environment
Telephone: 303-692-3213
Last EDR Contact: 12/05/2023
Next Scheduled EDR Contact: 03/11/2024
Data Release Frequency: Varies

Financial Assurance 1: Financial Assurance Information Listing

A listing of financial assurance information for hazardous waste facilities. Financial assurance is intended to ensure that resources are available to pay for the cost of closure, post-closure care, and corrective measures if the owner or operator of a regulated facility is unable or unwilling to pay.

Date of Government Version: 06/30/2023
Date Data Arrived at EDR: 07/13/2023
Date Made Active in Reports: 10/02/2023
Number of Days to Update: 81

Source: Department of Public Health & Environment
Telephone: 303-692-3350
Last EDR Contact: 10/04/2023
Next Scheduled EDR Contact: 01/08/2024
Data Release Frequency: Varies

Financial Assurance 2: Financial Assurance Information Listing

A listing of financial assurance information for solid waste facilities. Financial assurance is intended to ensure that resources are available to pay for the cost of closure, post-closure care, and corrective measures if the owner or operator of a regulated facility is unable or unwilling to pay.

Date of Government Version: 06/30/2023
Date Data Arrived at EDR: 07/13/2023
Date Made Active in Reports: 10/02/2023
Number of Days to Update: 81

Source: Department of Public Health & Environment
Telephone: 303-392-3350
Last EDR Contact: 10/04/2023
Next Scheduled EDR Contact: 01/08/2024
Data Release Frequency: Quarterly

LEAD: Lead Abatement Permit Listing

Lead inspection

Date of Government Version: 11/07/2019
Date Data Arrived at EDR: 11/14/2019
Date Made Active in Reports: 01/21/2020
Number of Days to Update: 68

Source: Department of Public Health & Environment
Telephone: 303-692-2000
Last EDR Contact: 11/20/2023
Next Scheduled EDR Contact: 02/12/2024
Data Release Frequency: Varies

MINES: Permitted Mines Listing

This dataset represents permitted mines in the State of Colorado

Date of Government Version: 07/09/2023
Date Data Arrived at EDR: 07/10/2023
Date Made Active in Reports: 10/04/2023
Number of Days to Update: 86

Source: Division of Reclamation Mining and safety
Telephone: 303-866-3567
Last EDR Contact: 10/09/2023
Next Scheduled EDR Contact: 01/22/2024
Data Release Frequency: Semi-Annually

NPDES: Permitted Facility Listing

A listing of permitted facilities from the Water Quality Control Division.

Date of Government Version: 07/01/2023
Date Data Arrived at EDR: 07/25/2023
Date Made Active in Reports: 10/13/2023
Number of Days to Update: 80

Source: Department of Public Health & Environment
Telephone: 303-692-3611
Last EDR Contact: 10/24/2023
Next Scheduled EDR Contact: 02/05/2024
Data Release Frequency: Varies

UIC: Underground Injection Control

A list of underground injection wells and their locations.

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: 08/18/2023
Date Data Arrived at EDR: 08/21/2023
Date Made Active in Reports: 11/03/2023
Number of Days to Update: 74

Source: Oil & Gas Conservation Commission
Telephone: 303-894-2100
Last EDR Contact: 11/02/2023
Next Scheduled EDR Contact: 02/19/2024
Data Release Frequency: Varies

UMTRA: Uranium Mill Tailings Sites

There were nine uranium mill tailings sites in Colorado designated for cleanup under the federal Uranium Mill Tailings Radiation Control Act. These nine sites, known commonly as UMTRA sites, were remediated jointly by the State of Colorado and the U.S. Department of Energy during the late 1980's and early 1990's. Mill tailings were removed from 8 of the mill sites and relocated in engineered disposal cells. A disposal cell is designed to encapsulate the material, reduce radon emanation, and prevent the movement of water through the material. At one site, Maybell, CO, the tailings were stabilized in-place at the mill site. After remediation of the tailings was completed, the State and DOE began to investigate the residual impacts to groundwater at the mill sites. The groundwater phase of the UMTRA program is on-going.

Date of Government Version: 11/14/2022
Date Data Arrived at EDR: 02/14/2023
Date Made Active in Reports: 02/15/2023
Number of Days to Update: 1

Source: Department of Public Health & Environment
Telephone: 970-248-7164
Last EDR Contact: 11/16/2023
Next Scheduled EDR Contact: 02/26/2024
Data Release Frequency: Varies

EDR HIGH RISK HISTORICAL RECORDS

EDR Exclusive Records

EDR MGP: EDR Proprietary Manufactured Gas Plants

The EDR Proprietary Manufactured Gas Plant Database includes records of coal gas plants (manufactured gas plants) compiled by EDR's researchers. Manufactured gas sites were used in the United States from the 1800's to 1950's to produce a gas that could be distributed and used as fuel. These plants used whale oil, rosin, coal, or a mixture of coal, oil, and water that also produced a significant amount of waste. Many of the byproducts of the gas production, such as coal tar (oily waste containing volatile and non-volatile chemicals), sludges, oils and other compounds are potentially hazardous to human health and the environment. The byproduct from this process was frequently disposed of directly at the plant site and can remain or spread slowly, serving as a continuous source of soil and groundwater contamination.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

EDR Hist Auto: EDR Exclusive Historical Auto Stations

EDR has searched selected national collections of business directories and has collected listings of potential gas station/filling station/service station sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include gas station/filling station/service station establishments. The categories reviewed included, but were not limited to gas, gas station, gasoline station, filling station, auto, automobile repair, auto service station, service station, etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

EDR Hist Cleaner: EDR Exclusive Historical Cleaners

EDR has searched selected national collections of business directories and has collected listings of potential dry cleaner sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include dry cleaning establishments. The categories reviewed included, but were not limited to dry cleaners, cleaners, laundry, laundromat, cleaning/laundry, wash & dry etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

EDR RECOVERED GOVERNMENT ARCHIVES

Exclusive Recovered Govt. Archives

RGA LF: Recovered Government Archive Solid Waste Facilities List

The EDR Recovered Government Archive Landfill database provides a list of landfills derived from historical databases and includes many records that no longer appear in current government lists. Compiled from Records formerly available from the Department of Public Health & Environment in Colorado.

Date of Government Version: N/A
Date Data Arrived at EDR: 07/01/2013
Date Made Active in Reports: 01/15/2014
Number of Days to Update: 198

Source: Department of Public Health & Environment
Telephone: N/A
Last EDR Contact: 06/01/2012
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

RGA LUST: Recovered Government Archive Leaking Underground Storage Tank

The EDR Recovered Government Archive Leaking Underground Storage Tank database provides a list of LUST incidents derived from historical databases and includes many records that no longer appear in current government lists. Compiled from Records formerly available from the Department of Labor and Employment, Oil Inspection Section in Colorado.

Date of Government Version: N/A
Date Data Arrived at EDR: 07/01/2013
Date Made Active in Reports: 01/02/2014
Number of Days to Update: 185

Source: Department of Labor and Employment, Oil Inspection Section
Telephone: N/A
Last EDR Contact: 06/01/2012
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

COUNTY RECORDS

ADAMS COUNTY:

LF ADAMS: Summary Report on Methane Gas Hazards and Surveys Conducted on Domestic and Demolition Landfills in Adams County
As of May 8, 1978, all known landfills or dumping sites in the Adams County area have been surveyed.

Date of Government Version: 05/08/1978
Date Data Arrived at EDR: 02/16/1995
Date Made Active in Reports: 04/04/1995
Number of Days to Update: 47

Source: Tri-County Health Department
Telephone: 303-761-1340
Last EDR Contact: 01/27/1995
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

ARAPAHOE COUNTY:

LF ARAPAHOE: A Survey of Landfills in Arapahoe County

A survey of Arapahoe County was conducted from August through November, 1977, of all open and closed landfills and dumpsites in the county. Each of the sites found was classified as domestic or demolition.

Date of Government Version: 12/31/1978
Date Data Arrived at EDR: 02/16/1995
Date Made Active in Reports: 04/04/1995
Number of Days to Update: 47

Source: Tri-County Health Department
Telephone: 303-761-1340
Last EDR Contact: 01/27/1995
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

BOULDER COUNTY:

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

LF BOULDER: Old Landfill Sites

Landfill sites in Boulder county.

Date of Government Version: 05/01/1986
Date Data Arrived at EDR: 11/14/1995
Date Made Active in Reports: 12/07/1995
Number of Days to Update: 23

Source: Boulder County Health Department
Telephone: 303-441-1182
Last EDR Contact: 01/30/1998
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

DENVER COUNTY:

LF DENVER: Landfills in Denver County

Landfill sites in the city and county of Denver.

Date of Government Version: 06/23/2017
Date Data Arrived at EDR: 06/23/2017
Date Made Active in Reports: 09/06/2017
Number of Days to Update: 75

Source: City and County of Denver
Telephone: 720-913-4839
Last EDR Contact: 12/11/2023
Next Scheduled EDR Contact: 03/25/2024
Data Release Frequency: No Update Planned

LF DENVER CO METHANE: Investigation of Methane Gas Hazards

The purpose of this study was to assess the actual and potential generation, migration, explosive and related problem associated with specified old landfills, and to identify existing and potential problems, suggested strategies to prevent, abate, and control such problems and recommend investigative and monitoring functions as may be deemed necessary. Eight sites determined to be priorities due to population density and potential hazards to population and property were selected by the Colorado Department of Health.

Date of Government Version: 01/01/1981
Date Data Arrived at EDR: 01/29/2013
Date Made Active in Reports: 03/08/2013
Number of Days to Update: 38

Source: City and County of Denver Department of Environmental Health
Telephone: 720-865-5522
Last EDR Contact: 01/15/2013
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

DOUGLAS COUNTY:

LF DOUGLAS: Douglas County Landfill Key

Landfill sites in Douglas county.

Date of Government Version: 06/12/1991
Date Data Arrived at EDR: 02/16/1995
Date Made Active in Reports: 04/04/1995
Number of Days to Update: 47

Source: Tri-County Health Department
Telephone: 303-761-1340
Last EDR Contact: 01/27/1995
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

PUEBLO COUNTY:

LF PUEBLO: Designated Disposal & Landfill Sites

Only inert materials. Asphalt, cement, dirt & rock unless otherwise specified. These sites are no longer active.

Date of Government Version: 04/30/1990
Date Data Arrived at EDR: 11/16/1995
Date Made Active in Reports: 12/07/1995
Number of Days to Update: 21

Source: Pueblo City-County Health Department
Telephone: 719-583-4300
Last EDR Contact: 11/13/1995
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

TRI COUNTY:

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

LF TRI: Tri-County Area Solid Waste Facilities List (Adams, Arapahoe and Douglas Counties)

Closed Domestic Landfills in Adams County, Closed Domestic Landfills in Arapahoe County, Closed Demolition Landfills in Arapahoe County, Closed Domestic Landfills in Douglas County.

Date of Government Version: 10/15/1983
Date Data Arrived at EDR: 02/16/1995
Date Made Active in Reports: 04/04/1995
Number of Days to Update: 47

Source: Tri-County Health Department
Telephone: 303-761-1340
Last EDR Contact: 01/27/1995
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

WELD COUNTY:

LF WELD: Solid Waste Facilities in Weld County Solid Waste Facilities in Weld County.

Date of Government Version: 01/16/2018
Date Data Arrived at EDR: 02/09/2018
Date Made Active in Reports: 02/23/2018
Number of Days to Update: 14

Source: Weld County Department of Public Health
Telephone: 970-304-6415
Last EDR Contact: 11/03/2023
Next Scheduled EDR Contact: 02/12/2024
Data Release Frequency: No Update Planned

OTHER DATABASE(S)

Depending on the geographic area covered by this report, the data provided in these specialty databases may or may not be complete. For example, the existence of wetlands information data in a specific report does not mean that all wetlands in the area covered by the report are included. Moreover, the absence of any reported wetlands information does not necessarily mean that wetlands do not exist in the area covered by the report.

CT MANIFEST: Hazardous Waste Manifest Data

Facility and manifest data. Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a tsd facility.

Date of Government Version: 08/07/2023
Date Data Arrived at EDR: 08/08/2023
Date Made Active in Reports: 10/24/2023
Number of Days to Update: 77

Source: Department of Energy & Environmental Protection
Telephone: 860-424-3375
Last EDR Contact: 11/07/2023
Next Scheduled EDR Contact: 02/19/2024
Data Release Frequency: No Update Planned

NY MANIFEST: Facility and Manifest Data

Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a TSD facility.

Date of Government Version: 12/31/2019
Date Data Arrived at EDR: 11/30/2023
Date Made Active in Reports: 12/01/2023
Number of Days to Update: 1

Source: Department of Environmental Conservation
Telephone: 518-402-8651
Last EDR Contact: 11/30/2023
Next Scheduled EDR Contact: 02/05/2024
Data Release Frequency: Quarterly

PA MANIFEST: Manifest Information

Hazardous waste manifest information.

Date of Government Version: 06/30/2018
Date Data Arrived at EDR: 07/19/2019
Date Made Active in Reports: 09/10/2019
Number of Days to Update: 53

Source: Department of Environmental Protection
Telephone: 717-783-8990
Last EDR Contact: 10/05/2023
Next Scheduled EDR Contact: 01/22/2024
Data Release Frequency: Annually

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

WI MANIFEST: Manifest Information

Hazardous waste manifest information.

Date of Government Version: 05/31/2018

Date Data Arrived at EDR: 06/19/2019

Date Made Active in Reports: 09/03/2019

Number of Days to Update: 76

Source: Department of Natural Resources

Telephone: N/A

Last EDR Contact: 11/29/2023

Next Scheduled EDR Contact: 03/18/2024

Data Release Frequency: Annually

Oil/Gas Pipelines

Source: Endeavor Business Media

Petroleum Bundle (Crude Oil, Refined Products, Petrochemicals, Gas Liquids (LPG/NGL), and Specialty Gases (Miscellaneous)) N = Natural Gas Bundle (Natural Gas, Gas Liquids (LPG/NGL), and Specialty Gases (Miscellaneous)). This map includes information copyrighted by Endeavor Business Media. This information is provided on a best effort basis and Endeavor Business Media does not guarantee its accuracy nor warrant its fitness for any particular purpose. Such information has been reprinted with the permission of Endeavor Business Media.

Electric Power Transmission Line Data

Source: Endeavor Business Media

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Sensitive Receptors: There are individuals deemed sensitive receptors due to their fragile immune systems and special sensitivity to environmental discharges. These sensitive receptors typically include the elderly, the sick, and children. While the location of all sensitive receptors cannot be determined, EDR indicates those buildings and facilities - schools, daycares, hospitals, medical centers, and nursing homes - where individuals who are sensitive receptors are likely to be located.

AHA Hospitals:

Source: American Hospital Association, Inc.

Telephone: 312-280-5991

The database includes a listing of hospitals based on the American Hospital Association's annual survey of hospitals.

Medical Centers: Provider of Services Listing

Source: Centers for Medicare & Medicaid Services

Telephone: 410-786-3000

A listing of hospitals with Medicare provider number, produced by Centers of Medicare & Medicaid Services, a federal agency within the U.S. Department of Health and Human Services.

Nursing Homes

Source: National Institutes of Health

Telephone: 301-594-6248

Information on Medicare and Medicaid certified nursing homes in the United States.

Public Schools

Source: National Center for Education Statistics

Telephone: 202-502-7300

The National Center for Education Statistics' primary database on elementary and secondary public education in the United States. It is a comprehensive, annual, national statistical database of all public elementary and secondary schools and school districts, which contains data that are comparable across all states.

Private Schools

Source: National Center for Education Statistics

Telephone: 202-502-7300

The National Center for Education Statistics' primary database on private school locations in the United States.

Daycare Centers: Daycare Listing

Source: Department of Human Services

Telephone: 303-866-5958

Flood Zone Data: This data was obtained from the Federal Emergency Management Agency (FEMA). It depicts 100-year and 500-year flood zones as defined by FEMA. It includes the National Flood Hazard Layer (NFHL) which incorporates Flood Insurance Rate Map (FIRM) data and Q3 data from FEMA in areas not covered by NFHL.

Source: FEMA

Telephone: 877-336-2627

Date of Government Version: 2003, 2015

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002, 2005, 2010 and 2015 from the U.S. Fish and Wildlife Service.

State Wetlands Data: Riparian Vegetation Data

Source: Division of Wildlife

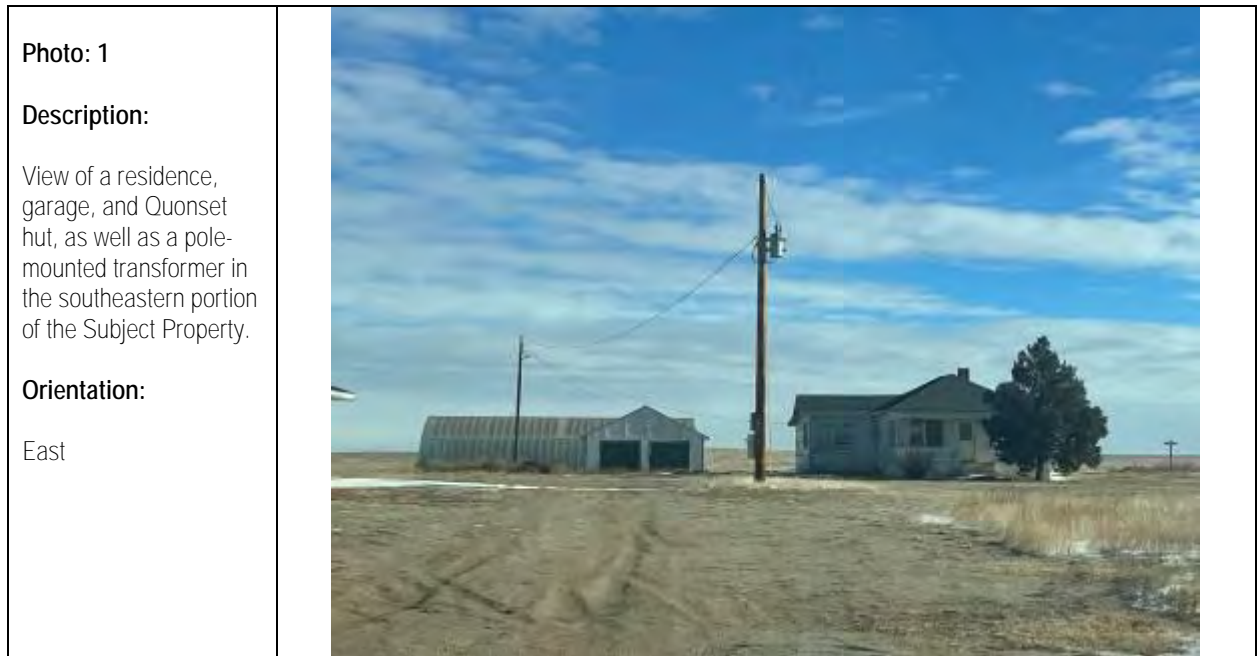
Telephone: 970-416-3360

STREET AND ADDRESS INFORMATION

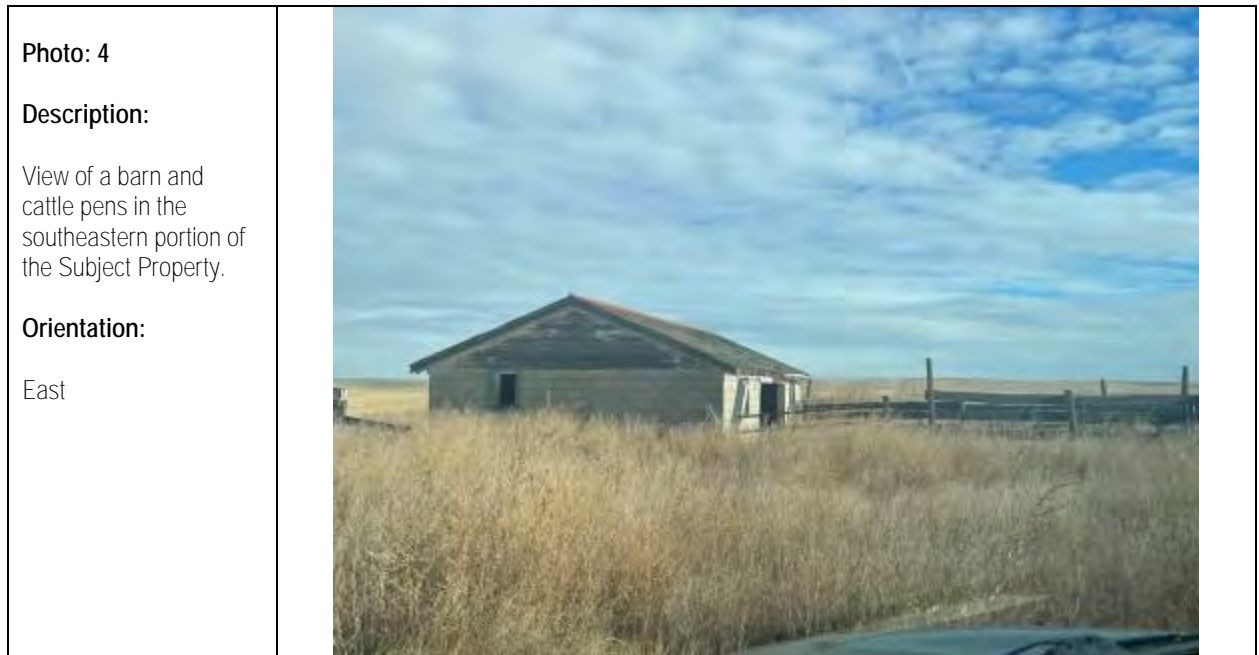
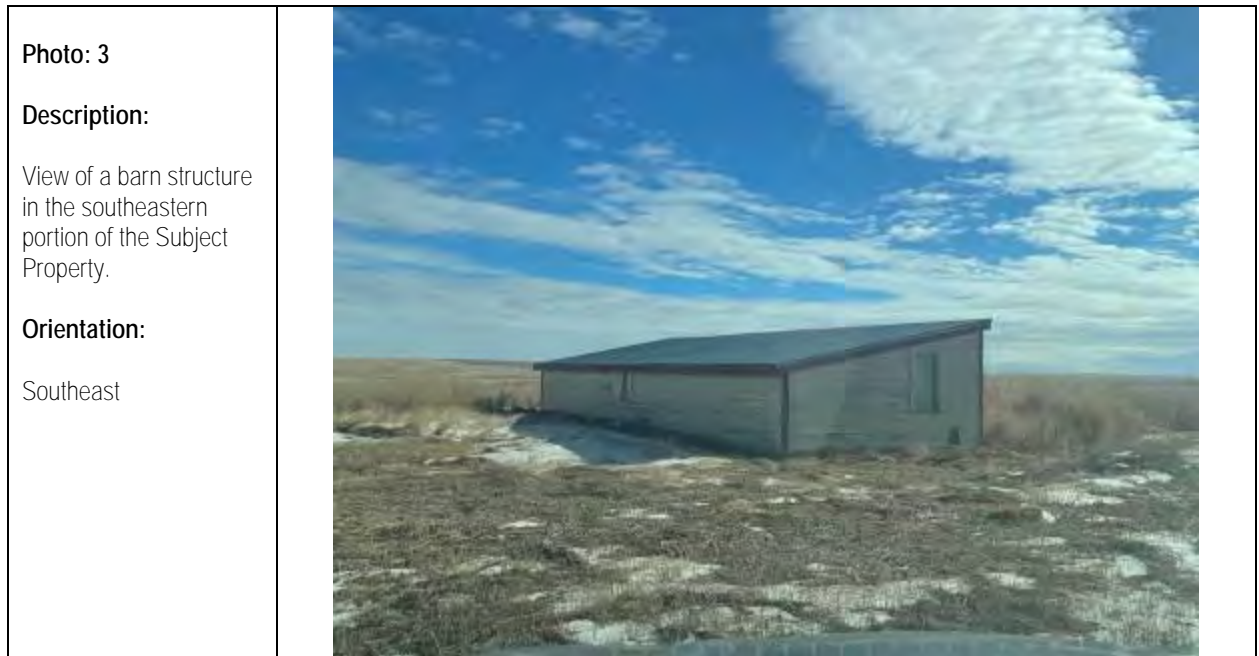
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APPENDIX E: SITE RECONNAISSANCE PHOTOGRAPH LOG

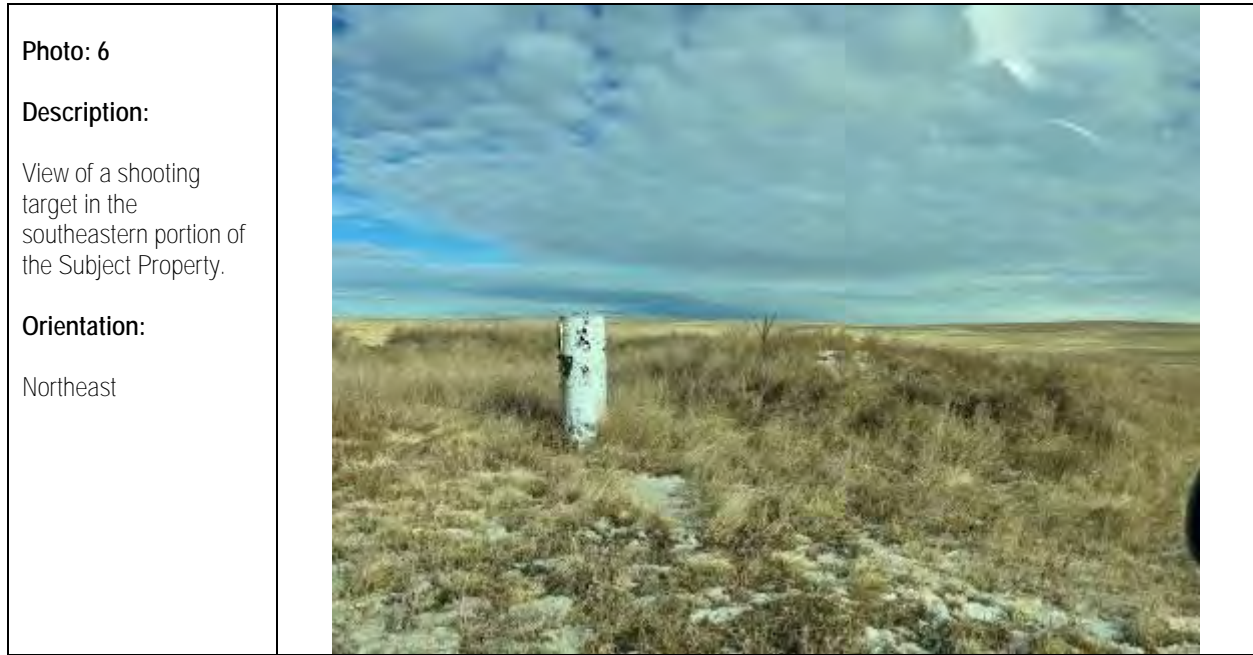
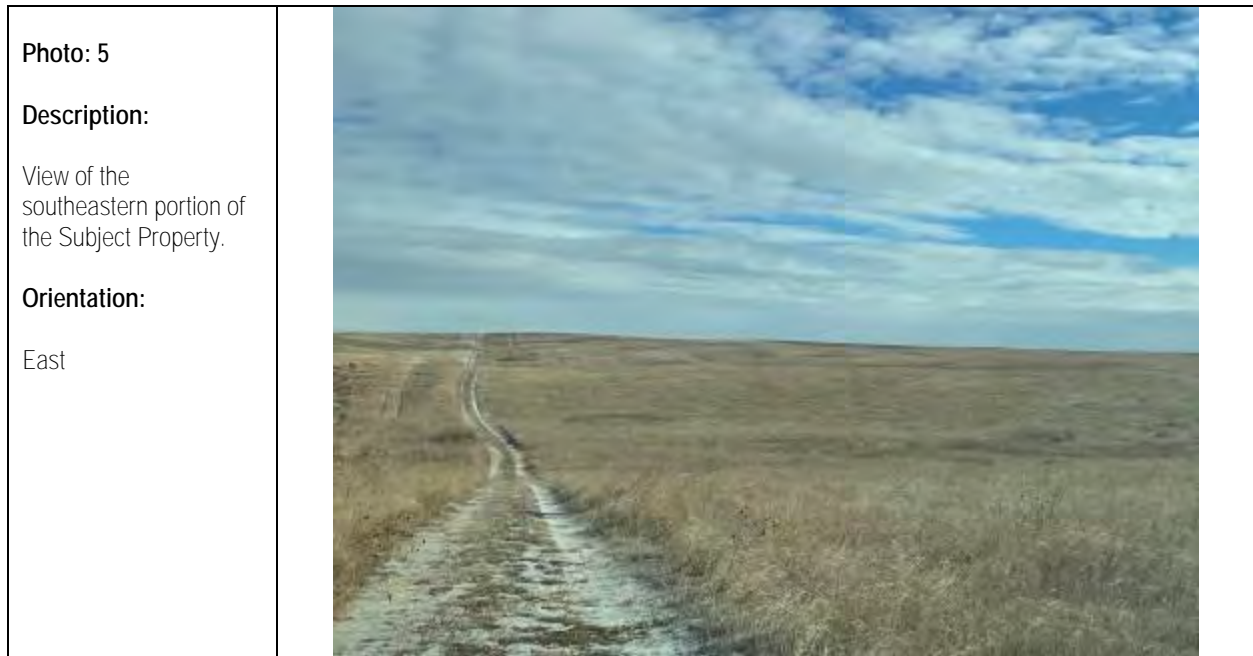
**Photographic Documentation
Novis Renewables, LLC
Hanks Crossing Solar Project
Adams County, Colorado**



**Photographic Documentation
Novis Renewables, LLC
Hanks Crossing Solar Project
Adams County, Colorado**



**Photographic Documentation
Novis Renewables, LLC
Hanks Crossing Solar Project
Adams County, Colorado**



**Photographic Documentation
Novis Renewables, LLC
Hanks Crossing Solar Project
Adams County, Colorado**



**Photographic Documentation
Novis Renewables, LLC
Hanks Crossing Solar Project
Adams County, Colorado**

Photo: 9

Description:

View of a garage and residence in the southeastern portion of the Subject Property.

Orientation:

West



Photo: 10

Description:

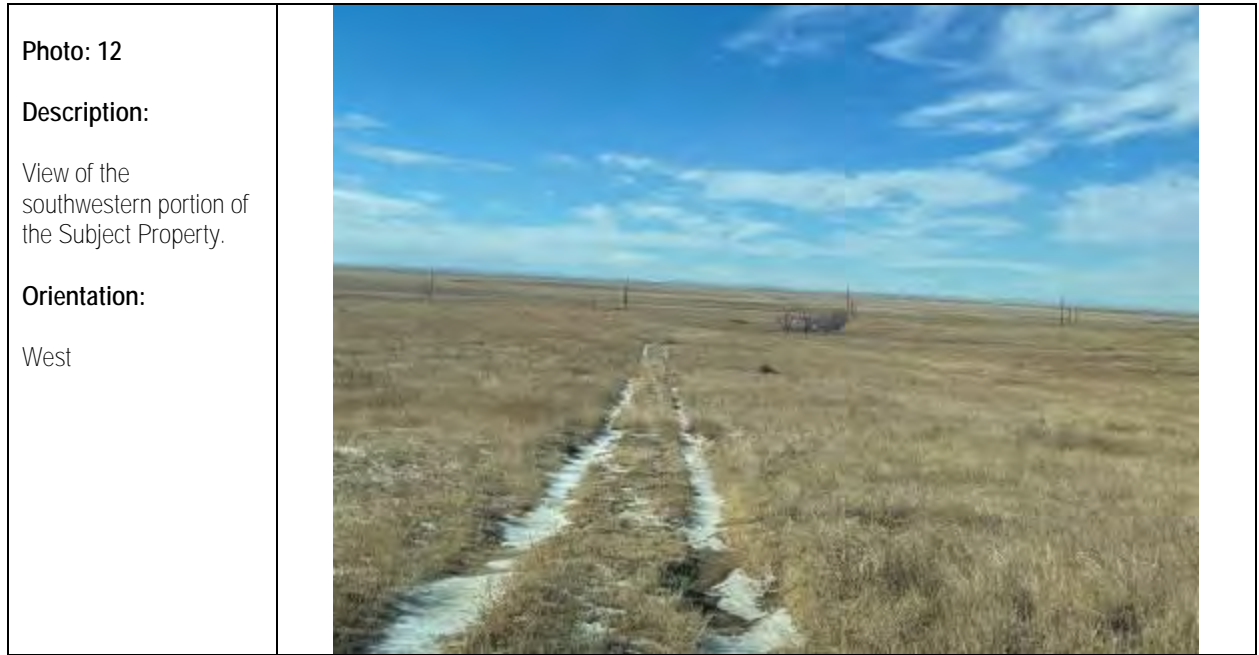
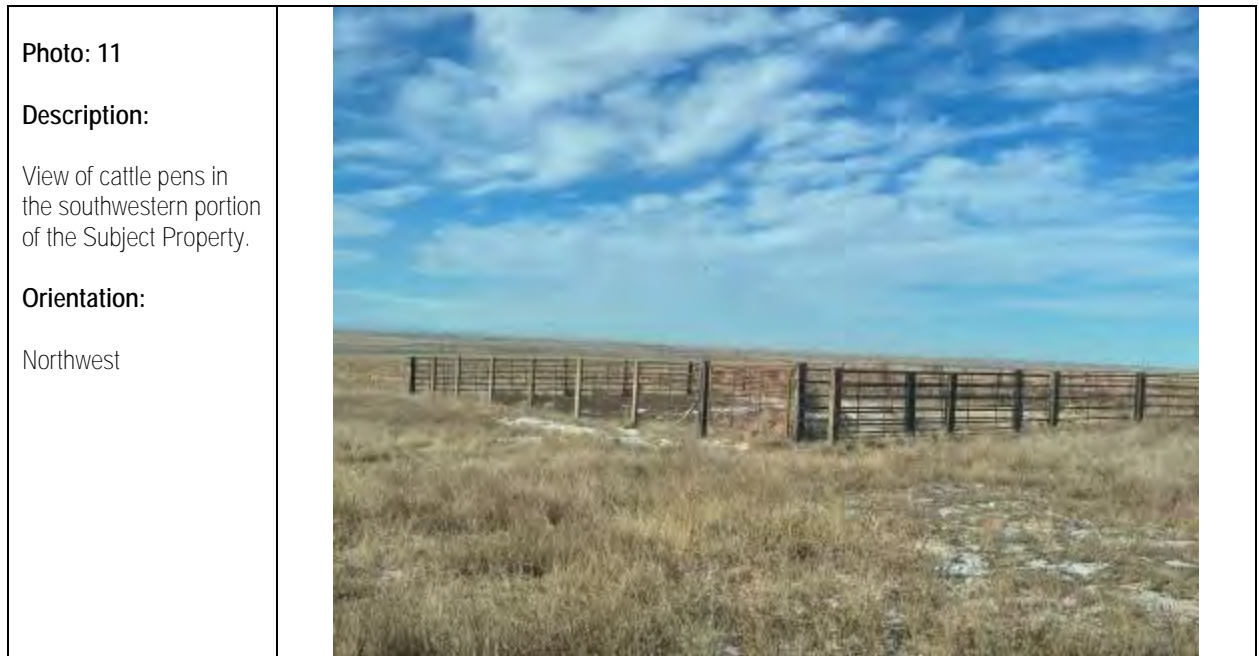
View of buried fiber optic cable markers in the southeastern portion of the Subject Property.

Orientation:

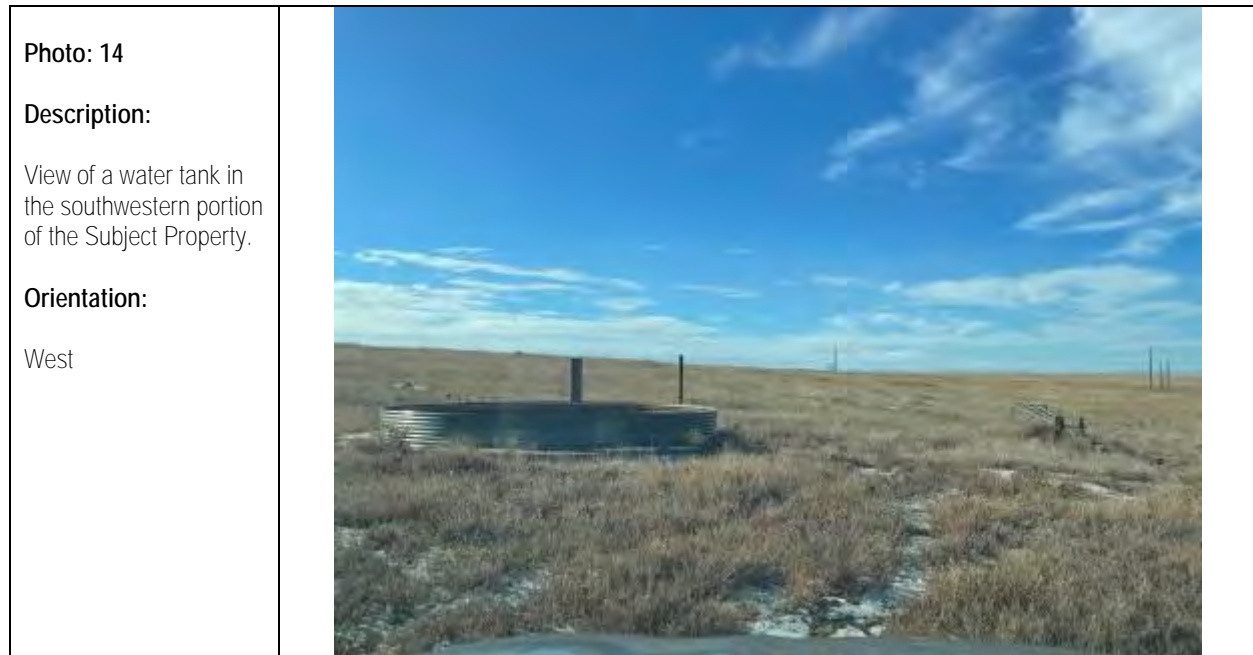
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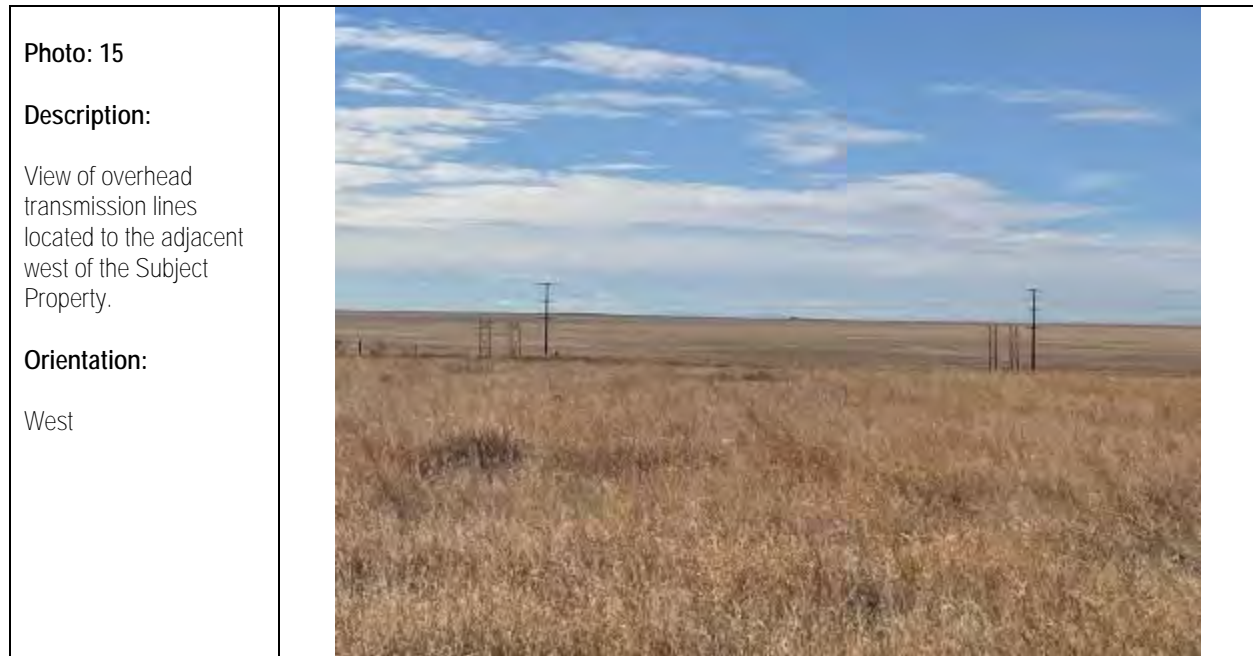
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Novis Renewables, LLC
Hanks Crossing Solar Project
Adams County, Colorado**



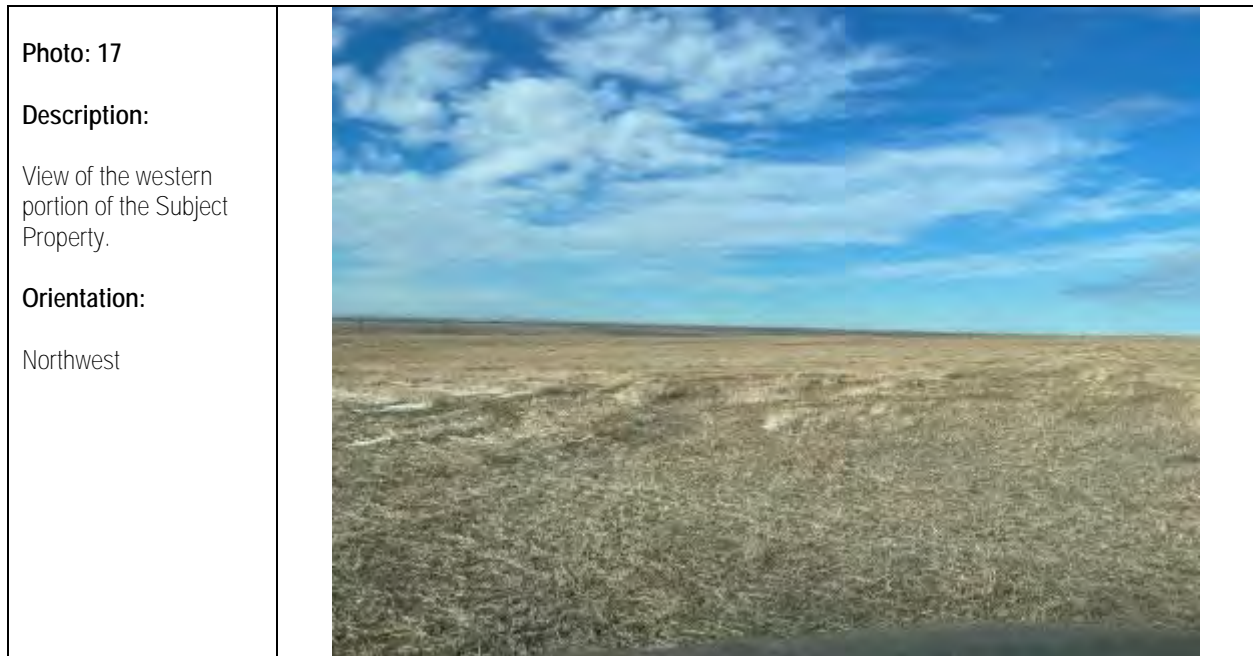
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Hanks Crossing Solar Project
Adams County, Colorado**



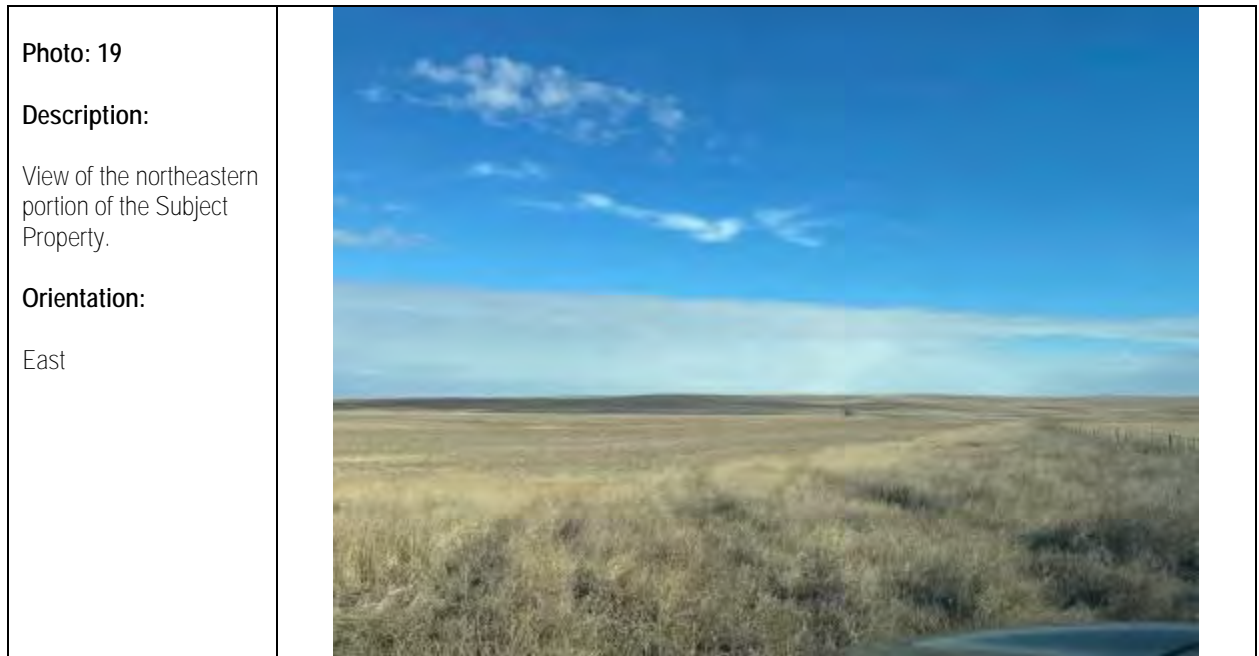
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Hanks Crossing Solar Project
Adams County, Colorado**



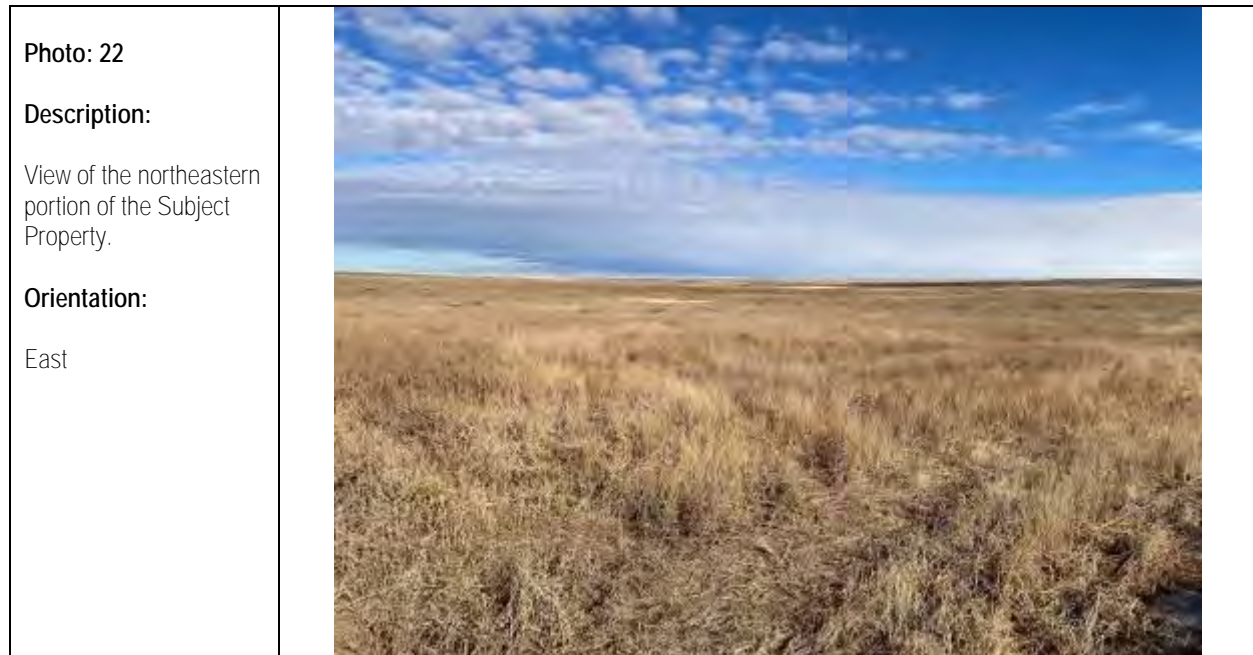
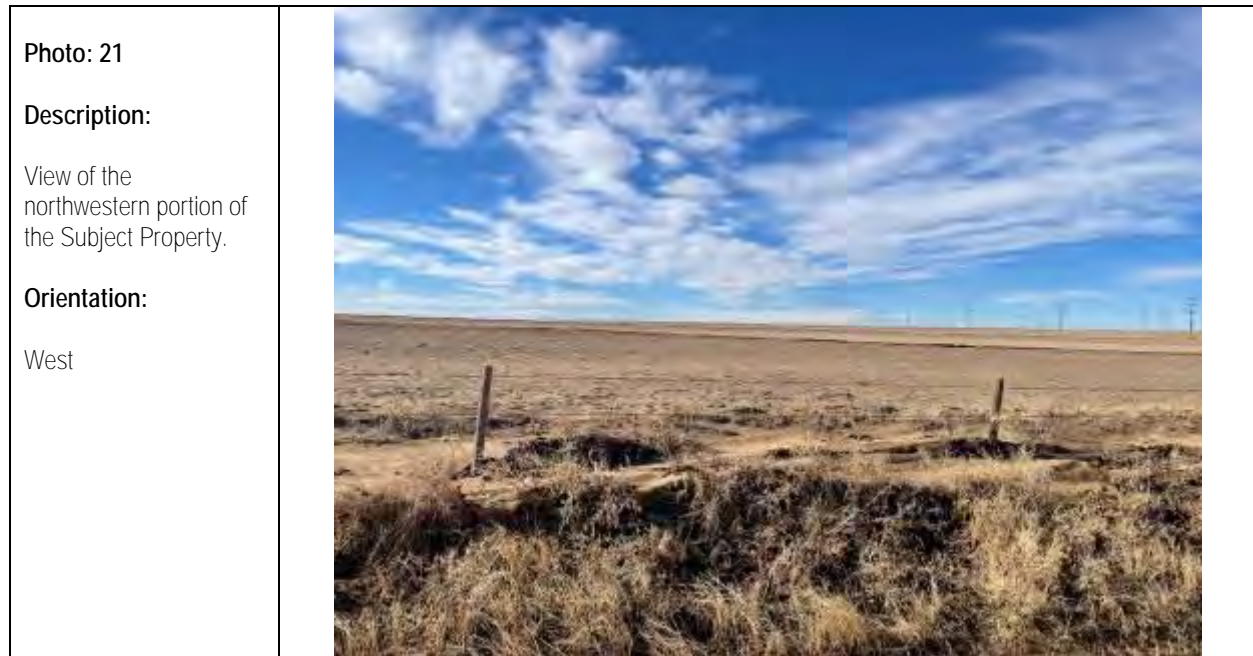
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Adams County, Colorado**



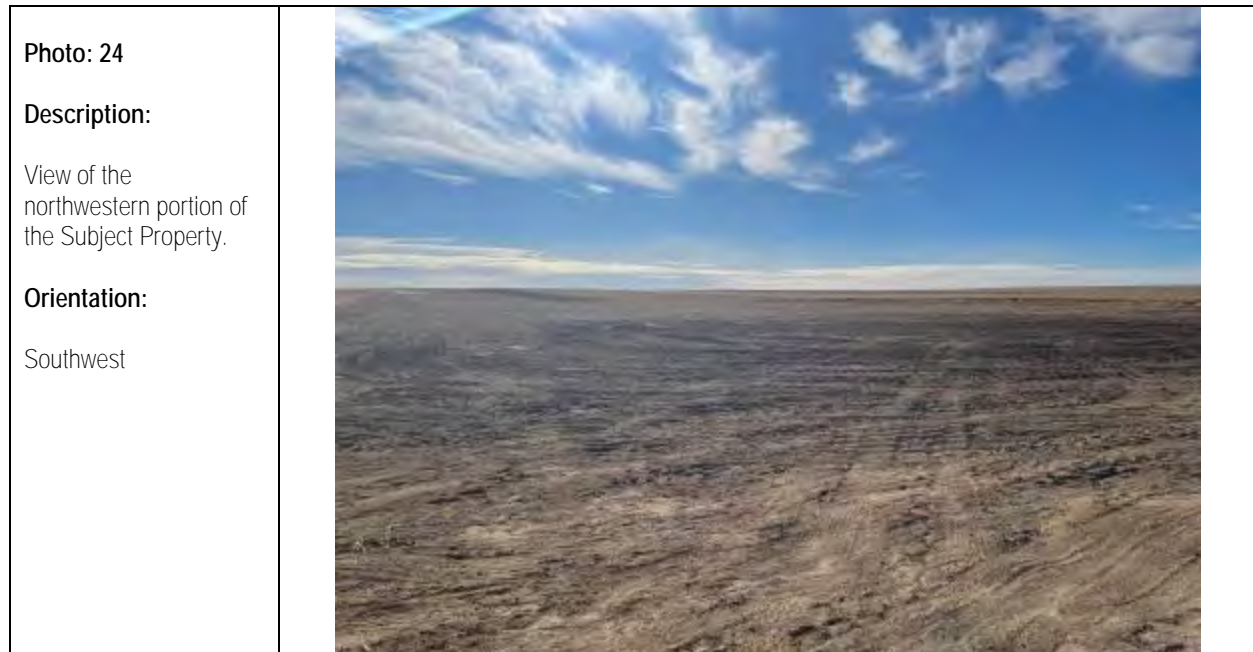
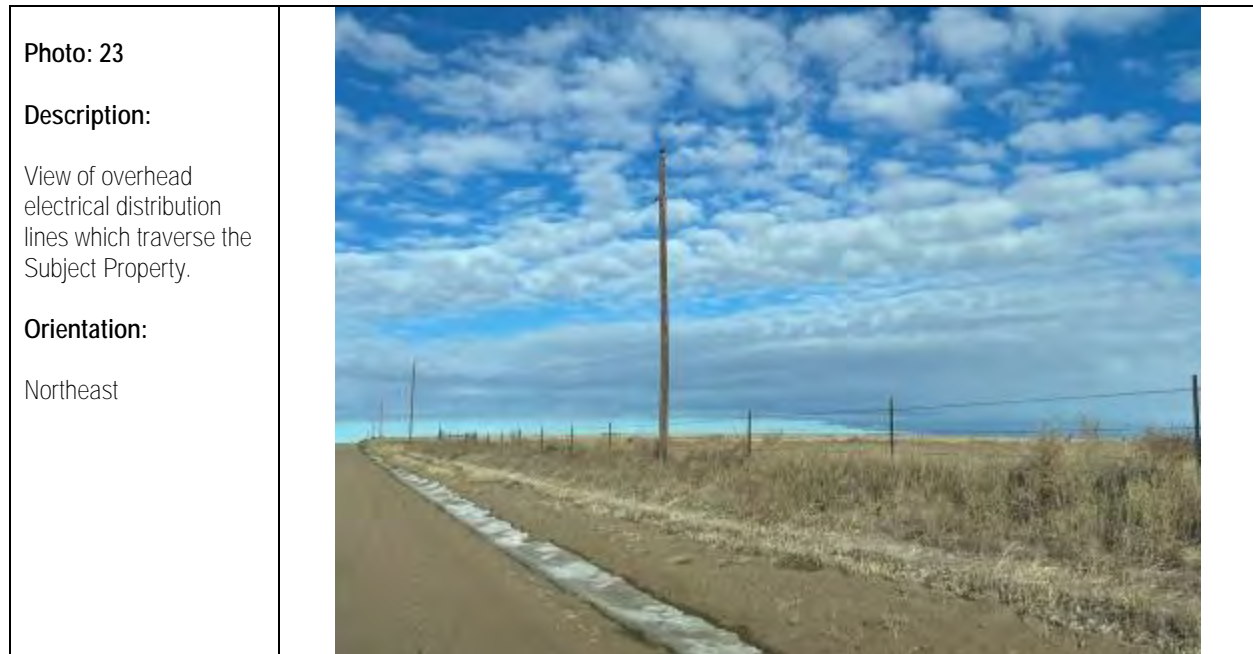
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Novis Renewables, LLC
Hanks Crossing Solar Project
Adams County, Colorado**



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**Photographic Documentation
Novis Renewables, LLC
Hanks Crossing Solar Project
Adams County, Colorado**



**Photographic Documentation
Novis Renewables, LLC
Hanks Crossing Solar Project
Adams County, Colorado**

Photo: 27

Description:

View of a meteorological tower located adjacent to the southeastern portion of the Subject Property.

Orientation:

East



APPENDIX F: CREDENTIALS OF ENVIRONMENTAL PROFESSIONALS

EXPERIENCE SUMMARY

Mr. Houston has over ten years of experience in environmental consulting conducting Phase I Environmental Site Assessments, Phase II Environmental Site Assessments, desktop reviews, soil, groundwater, and soil vapor sampling, corrective action plan preparation, remediation oversight and confirmation sampling, and report writing. Project locations include undeveloped properties, dry cleaners, gasoline stations and automobile repair facilities, power plants, large rural and forestland properties, telecommunication facilities, shopping centers, and numerous commercial properties. Experienced in planning, budgeting, and coordinating subsurface investigations and providing oversight of remediation activities in pursuit of regulatory closure.

CORPORATE PROJECT EXPERIENCE

Project Manager, December 2022
Xcel Energy, Goose Creek Substation, Canal Crossing, Cheyenne County, CO and May Valley Substation, Kiowa County, CO

Project Manager for Phase I Environmental Site Assessments for the proposed Goose Creek Substation in Cheyenne County, Colorado and May Valley Substation in Kiowa County, Colorado.

PREVIOUS EXPERIENCE

Environmental Scientist (August 2015–June 2019), Manager of Environmental Services (June 2019–December 2022), 2015–2022
Kumar & Associates, Inc., Denver, CO

Phase I Environmental Site Assessments, CO

Served as Environmental Professional responsible for Phase I Environmental Site Assessments throughout Colorado. Project locations include operational gasoline and automobile repair stations, dry cleaners, power plants, manufacturing facilities, machine shops, shopping centers, telecommunication facilities, and numerous commercial properties.

Phase II Environmental Site Assessments, CO

Experienced in planning, implementing, and reporting for subsurface investigations, including preparing health and safety plans, utility locates and potholing, obtaining right of way permits, management of drilling, soil, groundwater, and soil vapor sampling, and reporting. Project locations include operational automobile repair facilities, dry cleaners, operational gasoline stations, historical coal yards, historical landfills, and various commercial properties. Experienced in coordinating interior and specialty drilling projects.

Dewatering Permitting, CO

Experienced in sampling and reporting for construction dewatering permits, remediation activities discharging to surface water permits, and permanent subterranean dewatering permits. Experienced with permit application and influent sampling requirements. Assisted clients with post-construction permanent dewatering permit applications and currently responsible for monthly sampling and quarterly reporting for permanent systems at two facilities.

EDUCATION

BS, Environmental Science, University of Cincinnati, 2012

BA, Anthropology, University of Cincinnati, 2012

AREA OF EXPERTISE

Phase I Environmental Site Assessments

Phase II Environmental Site Assessments

Soil, Groundwater, and Soil Vapor Sampling

Remediation Oversight

REGISTRATIONS/ CERTIFICATIONS

Colorado Asbestos Building Inspector, Colorado, Certification Number 20773

TRAINING

OSHA 40-Hour HAZWOPER, 2012

OSHA 8-Hour HAZWOPER Refresher, 2022

OFFICE

Golden, CO

YEARS OF EXPERIENCE

10

YEARS WITHIN FIRM

<1

Delgany Interceptor, Denver, CO

Served as environmental consultant for Metro Wastewater Reclamation District's Delgany Interceptor project. Responsibilities included obtaining groundwater remediation construction discharge permit, weekly compliance sampling, and permit compliance assistance. Characterized 2,000 cubic yards of soil for disposal and provided excavation oversight of urban fill in accordance with the Materials Management Plan.

Underground Storage Tank Closure, Carbondale, CO

Served as environmental consultant for an orphan 500-gallon hazardous waste underground storage tank closure. Conducted characterization sampling, Corrective Action Plan, oversight for removal, contaminated soil removal oversight, and confirmation sampling. Regulatory closure granted for release by Colorado Department of Public Health and Environment Hazardous Materials and Waste Management Division.

Red Rock Canyon Landfill, Colorado Springs, CO

Responsible for quarterly landfill cover inspections, biannual groundwater monitoring, and biannual reporting of the former 26th Street Landfill in the Red Rock Canyon Open Space.

Pepsi Center Excavation Oversight, Denver, CO

Provided excavation oversight for new utility lines on the Pepsi Center campus. Responsible for identification of coal-based fill during excavation activities and adherence to site Materials Management Plan.

Phase I Environmental Site Assessments for Telecommunications Facilities, Puerto Rico

Completed eight Phase I Environmental Site Assessments for telecommunications facilities in Puerto Rico. Responsible for mobilization, scheduling, and coordination with local contacts for site visits in San Juan, Ponce, Fajardo, Quebradillas, and Bayamon in a four-day period.

Brownfields Remediation Services, Wheat Ridge, CO

Provided remediation oversight for 100 groundwater injection points and excavation of PCE-impacted soil of a former dry cleaner for the City of Wheat Ridge.

Records Search with Risk Assessment, CO

Account manager for Security Service Federal Credit Union overseeing Records Search with Risk Assessments (RSRAs) for commercial loan applications.

Regatta Plaza Redevelopment, Aurora, CO

Served as environmental consultant to the developer for the redevelopment of the former Regatta Plaza. Responsibilities included multiple Phase I ESAs, subsurface investigations of two former dry cleaners and an automobile repair facility, and closure of an orphaned 10,000-gallon underground storage tank discovered during redevelopment.

Staff Scientist II, 2015

The Vertex Companies, Denver, Colorado

Environmental Specialist, 2012–2015

Terracon Consultants, Inc., Wheat Ridge, CO and Cincinnati, OH

Student Contractor, Environmental Technology Verification, Assessment, and Outcomes Staff, 2011–2012

United States Environmental Protection Agency, Cincinnati, OH

National Risk Management Research Laboratory

Experience Summary

Ms. Sinnott has 9 years of experience working on due diligence projects, including preparing cost estimates, scopes of work, report production, soil sampling, groundwater sampling, soil vapor sampling, and analytical data interpretation. Her experience has consisted of working with oil and gas clients, wind and solar energy clients, and various commercial clients. She has experience providing oversight of contractors, oversight of excavation activities, handling waste manifests, and preparing remediation and site closure reports. Additional experience includes storm water inspections, SPCC inspections, and sampling and reporting to meet permitting requirements. Ms. Sinnott has general knowledge of sustainable business concepts and corporate sustainability/ESG, in addition to business risks and opportunities related to climate change.

Education

BS, Bioenvironmental Science, Texas A&M University, 2013

MS, Management and Organization, Managing for Sustainability, University of Colorado Denver, expected December 2022

Training

Adult First Aid and CPR; American Red Cross; 2020

OSHA 30-Hour Construction Safety Training; 2019

OSHA 40-Hour HAZWOPER Training; 2014

OSHA 8-Hour Refresher; 2021

Corporation Project Experience

Environmental Scientist/Project Manager, December 2016- Present

Commercial Renewable Energy Companies, Environmental Site Assessments, United States

Responsible for preparing detailed cost models and proposals for Phase I and Phase II Environmental Site Assessments. Conducts site reconnaissance and sampling activities, as well as preparing Phase I and Phase II Environmental Site Assessment reports for proposed and operational wind and solar projects throughout the United States. Responsible for the preparation of Incident Prevention Plans and Health and Safety Plans for field work.

Environmental Scientist/Project Manager, January 2014–Present

Environmental Due Diligence and Remediation, United States

Responsible for communicating with clients, preparing proposals and cost estimates, conducting site assessments, and writing Phase I and Phase II ESAs for oil and gas clients. Responsible for overseeing small-scale remediation projects and preparing subsequent regulatory closure reports. Field work included regular Health and Safety Plan and Job Safety Analysis preparation, review of subcontractor Health and Safety Plans, and conducting daily health and safety tailgate meetings.

Environmental Scientist, February 2017–Present

Industrial Operation and Maintenance, Littleton, Colorado

Conducts bi-weekly outfall sampling per discharge permitting requirements at operating industrial facility. Responsible for semi-annual groundwater monitoring using hand bailing techniques and HydraSleeves and conducts various stormwater and SPCC inspections. Responsible for reviewing laboratory analytical reports and preparing the monthly Discharge Monitoring Reports. Assists in special request sampling, landfill leachate pumping, and other operation and maintenance programs.

Environmental Scientist, June 2017- Present

Environmental Services for Various Pipeline Projects, Colorado

Responsible for preparing Materials Management Plans for pipeline projects and providing mine waste identification services during trenching. Assisted with conducting groundwater level monitoring and site assessment activities within the proposed pipeline corridor. Assisted with the preparation of a Groundwater Evaluation to prepare for construction dewatering plans. Responsible for preparing Health and Safety Plans and Job Safety Analyses for field work.

Environmental Scientist, January 2014–Present
Homebuilder Client, Environmental Due Diligence, United States

Responsible for preparing Phase I/Phase II ESAs and Pre-Demolition Hazardous Materials Survey Reports for over 100 sites across the United States, including Illinois, Washington, and Colorado. Prepares reports, in addition to preparing recommendations, scopes of work, and costs for Phase II ESAs and geophysical surveys. Currently serves as the primary field scientist for conducting Phase II ESAs and geophysical surveys in the state of Colorado.

Environmental Scientist, November 2021-May 2022
Sustainable Redevelopment Project; Colorado

Managed the production of an initial Review of Environmental Conditions related to a carbon-negative sustainable redevelopment project in Colorado, including biological resources; cultural resources; water, soil, sediment and air; scenic resources, visual, aesthetics, glare, and noise; proximity to protected areas and recreation; and floodplains and geologic hazards.

Environmental Scientist, October 2017
Business Park Tenant Hazardous Material Inspections, Colorado

Responsible for conducting site visits to various business parks in the Denver area for Hazardous Material Inspections. This included inspecting interior and exterior of leased facilities, documenting hazardous substance storage and use areas and identifying other potential environmental concerns related to storage tanks, monitoring wells, and clarifiers, etc.

Environmental Scientist, June 2014–October 2016
Contaminated Site Assessment, Orange, TX

Prepared an Affected Property Assessment Report (APAR) for project along the Sabine River, which was submitted to the TCEQ. This project included the organization and interpretation of approximately four years of geotechnical reports and soil, groundwater, surface water, and/or sediment analytical data related to the historical operations as a creosote plant. Prepared the APAR report and reviewed the findings of various site-specific ecological risk assessments.

Environmental Scientist, October 2015–October 2016
Contaminated Site Assessment Reporting, Baytown, TX

Prepared a Response Action Plan (RAP) for a primary settling basin at a chemical plant following completion of the APAR. After remediation activities were completed, prepared a Response Action Completion Report (RACR) for submittal to the TCEQ.

APPENDIX L LETTER OF SUPPORT FROM PSCO AND LANDOWNERS



1800 Larimer Street
Denver, CO 80202

May 15, 2024

Adams County Board of County Commissioners
4430 S. Adams County Pkwy.
5th Floor, Suite C5000A
Brighton, CO 80601

To Whom It May Concern,

On January 23rd, 2024, the Colorado Public Utility Commission issued its Phase II decision concerning Xcel Energy's ("Company") 2021 Electric Resource Plan and Clean Energy Plan ("Plan"). After further rehearing proceedings, a final decision was then adopted on March 6th, 2024. Now, after three years of work by the Company, our communities, stakeholders, and the Commission, the focus shifts to the construction, development, and commissioning of twenty projects between now and 2028.

These twenty projects were selected from a pool of over 1,000 bids for their ability to help achieve a historic reduction of carbon emissions by over 80% without sacrificing system reliability or affordability. We write this letter to you to extend our support for one of these projects that is currently in development in Adams County. Novis' Deer Trail Solar + Storage project is a purchased power agreement that would provide 355 Megawatts of clean solar energy to our system, as well as 178 Megawatts of critical 4-hour battery storage that can extend the delivery of clean energy in low renewable energy periods. For reference, this is approximately 20% of the nameplate solar and 14% of the nameplate 4-hour storage capacity in the Plan. Furthermore, we believe that geographic diversity of solar and wind resources is vital to the reliability of a system with increasing levels of renewable energy. Deer Trail helps to provide this geographic diversity in the Plan as it is the only solar project located near the Denver metro area and in the Northern Front Range. All other solar projects are in two different southern regions of Colorado. The project was also one of the most affordable solar + storage projects bid into the Company's All-Source Solicitation. Therefore, the success of Deer Trail Solar + Storage is important for keeping customer rates low.

Overall, this kind of asset is critical to the success of the Plan and to the well-being of our customers, as it directly impacts our carbon reduction targets, system reliability, and customer rates. We kindly ask that you join us in this exciting movement towards an energy future that is safe, clean, reliable, and affordable for Colorado by supporting the permitting of this project.

Sincerely,

A handwritten signature in black ink, appearing to read 'Nathan Steele', written over the word 'Sincerely'.

Nathan Steele
South Metro Area Manager, Xcel Energy
Nathan.A.Steele@XcelEnergy.com

Date: 5-15-2024

Attn: Adams County Planning & Development Division
4430 South Adams County Parkway
Brighton, CO 80601

Subject: Letter of Support for Proposed Hanks Crossing Energy Project

Dear Adams County Planning and Development Division,

I, James Holden, as the owner of property participating in the proposed Hanks Crossing Energy Project, am submitting this letter to show my strong support for the proposed Project. As a landowner and resident of Adams County, I believe this development will bring numerous benefits to our community, environment, and local economy. I have reviewed the proposed Project plans and have no objections to the Project. I feel that the Project will be compatible with and represent a beneficial use of resources within and surrounding the Project site.

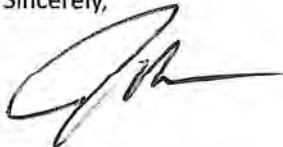
The proposed Project will make a significant contribution to the reduction of carbon emissions and provide a reliable alternative energy source. By harnessing clean and renewable energy from the sun, and its storage, the Project will help reduce greenhouse gas emissions. This aligns with our community's goals of promoting sustainability and environmental stewardship.

The proposed Project will also provide economic benefits for our area. The construction and ongoing maintenance of the facility will create job opportunities, boosting our local economy. Additionally, the Project is likely to increase the tax base, which can support essential public services.

I feel confident that Novis Renewables, LLC has the expertise and commitment to ensure the Project's success, and will work collaboratively with the community to address any concerns that may arise.

In conclusion, I support the proposed Project and encourage Adams County to approve this application, which will bring long-term benefits to our community and contribute to a more sustainable future.

Sincerely,



James Holden

Printed Name of Property Owner(s)

7110 Hanks Crossing Rd Byers CO 80103

Address

Date: May 16, 2024

Attn: Adams County Planning & Development Division
4430 South Adams County Parkway
Brighton, CO 80601

Subject: Letter of Support for Proposed Hanks Crossing Energy Project

Dear Adams County Planning and Development Division,

I/We Raymond J. Morris and Donna R. Jones Morris, as the owner(s) of property participating in the proposed Hanks Crossing Energy Project, are submitting this letter to show our strong support for the proposed Project. As a landowner and resident of Adams County, I/we believe this development will bring numerous benefits to our community, environment, and local economy. I/We have reviewed the proposed Project plans and have no objections to the Project. I/We feel that the Project will be compatible with and represent a beneficial use of resources within and surrounding the Project site.

The proposed Project will make a significant contribution to the reduction of carbon emissions and provide a reliable alternative energy source. By harnessing clean and renewable energy from the sun, and its storage, the Project will help reduce greenhouse gas emissions. This aligns with our community's goals of promoting sustainability and environmental stewardship.

The proposed Project will also provide economic benefits for our area. The construction and ongoing maintenance of the facility will create job opportunities, boosting our local economy. Additionally, the Project is likely to increase the tax base, which can support essential public services.

We feel confident that Novis Renewables, LLC has the expertise and commitment to ensure the Project's success, and will work collaboratively with the community to address any concerns that may arise.

In conclusion, we support the proposed Project and encourage Adams County to approve this application, which will bring long-term benefits to our community and contribute to a more sustainable future.

Sincerely,



Signature of Property Owner(s)

Raymond J. Morris and Donna R. Jones Morris

Printed Name of Property Owner(s)

3305 Behrens Road, Byers, CO 80103

Address

BEAUPREZ LAND & CATTLE
Mark & Lisa Beauprez
11780 Mimosa Road
Byers, CO 80103
303/822-9260

May 19, 2024

Adams County Planning & Development Division
4430 South Adams County Parkway
Brighton, CO 80601

Subject: Letter of Support for Proposed Hanks Crossing Energy Project

Dear Adams County Planning and Development Division,

We Mark and Lisa Beauprez, as the owners of property participating in the proposed Hanks Crossing Energy Project, are submitting this letter to show our strong support for the proposed Project. As a landowner and resident of Adams County, I/we believe this development will bring numerous benefits to our community, environment, and local economy. I/We have reviewed the proposed Project plans and have no objections to the Project. We feel that the Project will be compatible with and represent a beneficial use of resources within and surrounding the Project site.

The proposed Project will make a significant contribution to the reduction of carbon emissions and provide a reliable alternative energy source. By harnessing clean and renewable energy from the sun, and its storage, the Project will help reduce greenhouse gas emissions. This aligns with our community's goals of promoting sustainability and environmental stewardship.

The proposed Project will also provide economic benefits for our area. The construction and ongoing maintenance of the facility will create job opportunities boosting our local economy. Additionally, the Project is likely to increase the tax base, which can support essential public services.

We feel confident that Novis Renewables, LLC has the expertise and commitment to ensure the Project's success and will work collaboratively with the community to address any concerns that may arise.

In conclusion, we support the proposed Project and encourage Adams County to approve this application, which will bring long-term benefits to our community and contribute to a more sustainable future.

Sincerely,



Mark and Lisa Beauprez

APPENDIX K SOILS AND GEOLOGY REPORT

Soils and Geology Assessment

Hanks Crossing Energy

April 2024

Prepared for:

Hanks Crossing Energy, LLC

One Bridge Street, Suite 11
Irvington, NY 10533

Prepared by:

Tetra Tech, Inc.

390 Union Blvd., Suite 400
Lakewood, CO 80228



TETRA TECH

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1.0 INTRODUCTION

Hanks Crossing Energy, LLC, a subsidiary of Novis Renewables, LLC (Novis), is proposing to develop Hanks Crossing Energy (Project; formerly known as the Deer Trail Solar Project), a proposed 355-megawatt photovoltaic (PV) and 178-megawatt battery energy storage system (BESS) utility-scale project encompassing approximately 2,659 acres of private land (Project Area) in unincorporated Adams County, Colorado, approximately 13 miles northeast of the town of Byers (Figure 1). At the request of Novis, Tetra Tech, Inc. (Tetra Tech) has prepared a soils and geology assessment consisting of a desktop review for the Project to document existing soils and geology within the Project Area, as well as soils and geologic hazards that might affect or be affected by Project development.

2.0 METHODOLOGY

2.1 DESKTOP ANALYSIS

Tetra Tech conducted a desktop analysis to identify existing soils and geology within the Project Area and identify potential soils and geologic hazards that might be associated with Project development. Tetra Tech reviewed the following publicly available data:

- U.S. Geological Survey (USGS) Geologic Map Viewer (USGS 2023a)
- USGS Karst Map (USGS 2023b)
- USGS Mineral Resources Data System (USGS 2023c)
- U.S. Department of Agriculture (USDA) National Resources Conservation Service (NRCS) Web Soil Survey (NRCS 2023)
- NRCS Land Resource Regions Handbook (NRCS 2006)
- Colorado Geological Survey (CGS) GIS Data for Collapsible Soils, Historic Coal Mines, Aggregate Resources, Abandoned Mines, Landslides, Earthquakes and Faults (CGS 2023)
- Colorado Division of Water Resources (DWR) Water Well data (DWR 2023)

3.0 RESULTS

3.1 GEOLOGIC SETTING

The Project Area is located in the Colorado Piedmont Section of the Great Plains Province of the Interior Plains (NRCS 2006). This area is characterized by an elevated plain consisting of sediments deposited by rivers that drained the young and actively eroding Rocky Mountains. This old plain is now a dissected peneplain with a few dissected, lava-capped plateaus and buttes. In many areas the undulating to rolling shale plain is mantled by loess or windblown sand, alluvium, and outwash. The elevation of the Project Area ranges from approximately 4,900 feet to approximately 5,040 feet above mean sea level.

3.2 SOILS

Figure 2 shows the soils mapped within the Project Area (NRCS 2023). These are also listed in Table 1. Eighty-eight percent of the soils in the Project Area are mapped in the following seven soil units: Adena-Colby association, Ascalon sandy loam, Ascalon-Vona sandy loams, Renohill loam, Terry fine sandy loam, Terry-Tassel-Ulm complex, and Vona loamy sand. Ninety-nine percent of the soils in the Project Area consist of loams, sandy loams, clay loam, or loamy sand.

Approximately 220 acres of the soils in the Project Area potentially have slopes greater than 15 percent. Although soils data indicate bedrock depths from 27 to over 78 inches, most soils in the Project Area are characterized with depth to bedrock greater than 80 inches. The soils in the Project Area mostly have low susceptibility to water erosion and moderate susceptibility to wind erosion. None of the soils are rated as hydric. The Adena-Colby association, Ascalon sandy loam, Ascalon-Vona sandy loams, Nunn clay loam, Nunn loam, and Weld loam are denoted as prime farmland if irrigated.

Table 1. Soil Types within the Project Area

Land Cover Type	Percent of Project Area
Adena-Colby association, gently sloping	6.86%
Arvada loam, 0 to 3 percent slopes	0.75%
Ascalon sandy loam, 0 to 3 percent slopes	7.65%
Ascalon sandy loam, 3 to 5 percent slopes	0.27%
Ascalon-Vona sandy loams, 1 to 5 percent slopes	24.95%
Colby loam, 6 to 15 percent slopes	2.04%
Loamy alluvial land	2.71%
Nunn clay loam, 1 to 3 percent slopes	0.07%
Nunn loam, 1 to 3 percent slopes	0.48%
Renohill loam, 3 to 9 percent slopes	5.39%
Stoneham loam, 3 to 5 percent slopes	0.79%
Terry fine sandy loam, 3 to 9 percent slopes	23.75%
Terry-Tassel-Ulm complex, 3 to 20 percent slopes	7.56%
Terry-Vona-Tassel complex, 3 to 20 percent slopes	0.60%
Valent loamy sand, 3 to 9 percent slopes	1.32%
Vona loamy sand, 3 to 9 percent slopes	12.06%
Vona-Ascalon loamy sands, 3 to 9 percent slopes	1.47%
Water	0.02%
Weld loam, 1 to 3 percent slopes	1.26%
TOTAL	100%

3.3 GROUNDWATER

Figure 3 provides a map of water wells in the vicinity of the Project Area. Seventeen water wells are located within or immediately adjacent to the Project Area, generally in areas of drainages (DWR 2023). The water wells are listed for domestic and stock use and have depths between 50 and 400 feet below ground surface. Available water level information indicates depth to water of 30 to 165 feet below ground surface. The wells are located within the Denver Basin bedrock aquifer, primarily the Laramie-Fox Hills

aquifer. A review of the available well logs within the Project Area indicates approximately depth to bedrock of 7 to 65 feet below ground surface.

3.4 GEOLOGY

The Project Area bedrock consists of Cretaceous Fox Hills Sandstone (USGS 2023a). Figure 4 provides a map of the bedrock geology for the Project Area. The Fox Hills Sandstone consists of marginal marine yellow to grey sandstone with shale interbeds. The surficial deposits within the Project Area consist of Pleistocene loess and Holocene and Pleistocene eolian sand. The loess consists of clayey silty sand and sandy silt that can reach 120 feet in thickness. The eolian sand is very fine to medium-grained sand that can reach up to 100 feet in thickness.

3.5 GEOLOGIC HAZARDS

3.5.1 Shallow Bedrock

Shallow bedrock can be a constraint for construction of foundations and substratum structures but can be addressed with appropriate geotechnical design. Although soils data indicate bedrock depths from 27 to over 78 inches, most soils in the Project Area are characterized with depth to bedrock greater than 80 inches (NRCS 2023). Geologic mapping indicates surficial deposits including loess and eolian sand that can reach depths of 120 feet, and available water well logs indicate depth to bedrock from 7 to 65 feet below ground surface (DWR 2023).

3.5.2 Karst

Karst is a topography formed from the dissolution of soluble rocks such as limestone, dolomite, and gypsum. It is characterized by underground drainage systems with sinkholes and caves and unstable land surfaces. The Project Area is mapped as including common evaporite rocks in a dry climate (USGS 2023b), and no specific karst features are mapped within the Project Area. Underlying bedrock is primarily composed of sandstone and shale.

3.5.3 Mines

A search of mines listed in the USGS Mineral Resources Data System (USGS 2023c) identified seven sand and gravel resources or producing mines within five miles of the southern portion of the Project Area as shown in Figure 5. No mines were identified within the Project Area. In addition, no historic coal mines, abandoned mines, or aggregate resources are mapped within the Project Area based on CGS mapping information (CGS 2023).

3.5.4 Collapsible Soils

Collapsible soils are defined as loess or a clayey silt soils that have high strength and stiffness at normal water content conditions. However, collapsible soils compact and collapse with the impact of water. Such soils can impact structures and roadways and require geotechnical evaluation. The majority of the Project Area is located within the dune and sheet sand deposits and eolian (wind-blown) deposits categories as shown on Figure 5 (CGS 2023). These soils are susceptible to collapse with water saturation. Collapsible soils can be addressed with appropriate geotechnical design.

3.5.5 Seismic Hazards

The nearest potentially active fault is located over 40 miles west of the Project Area (CGS 2023). There is no recorded earthquake activity within the Project Area. The nearest earthquakes (magnitudes up to 4.0) occurred in the 1960s and are located over 25 miles west of the Project Area near the Denver International Airport. Seismic hazards are not indicated to be a constraint for development of the Project.

3.5.6 Landslides and Steep Slopes

Landslides are not indicated to be present in the Project Area (CGS 2023). Soils with the potential for steep slopes (greater than 15 percent) were found within 220 acres of the Project Area (NRCS 2023).

3.5.7 Erosion

The soils information indicates low to moderate susceptibility of soils within the Project Area to water and wind erosion, respectively (NRCS 2023). Appropriate best management practices (BMPs) and stormwater mitigation measures can be employed during construction and operation of the Project to avoid erosion that might be caused by the Project. A Construction Stormwater Management Permit will be required by the Colorado Department of Public Health and Environment (CDPHE) that would include erosion control measures. Adams County also has stormwater permit requirements.

4.0 CONCLUSIONS AND RECOMMENDATIONS

The Project Area is mapped with a surface layer of loess and eolian sand that overlies bedrock that primarily consists of sandstone and shale. Specific thicknesses of the surficial deposits are unknown; available water well logs indicate depth to bedrock from 7 to 65 feet below ground surface. Although soils data indicate bedrock depths from 27 to over 78 inches, most soils in the Project Area are characterized with depth to bedrock greater than 80 inches. Soils in the area have low to moderate susceptibility to water and wind erosion.

Groundwater depths are indicated to be 30 feet or more below ground surface and should not impact the ability to develop the Project. There are no karst features mapped in the Project Area, and no abandoned mines, active mines, or important mineral resources were identified in the Project Area.

The Project Area is mapped with potential collapsible soils if saturated, and these soils are susceptible to collapse with water saturation. However, neither saturated soils nor hydric soils are indicated within the Project Area. No potentially active faults or recorded earthquakes were identified within 25 miles of the Project Area, and no landslides are mapped within the Project Area. Soils with the potential for steep slopes (greater than 15 percent) were found within 220 acres of the Project Area, primarily along the northwestern and eastern boundaries.

Shallow bedrock can be a constraint for construction of foundations and substratum structures but can be addressed with appropriate geotechnical design. Geotechnical borings would allow confirmation of bedrock depths. Potential collapsible soils can be addressed with appropriate geotechnical design. Stock wells in the Project Area would need to be properly plugged prior to Project development.

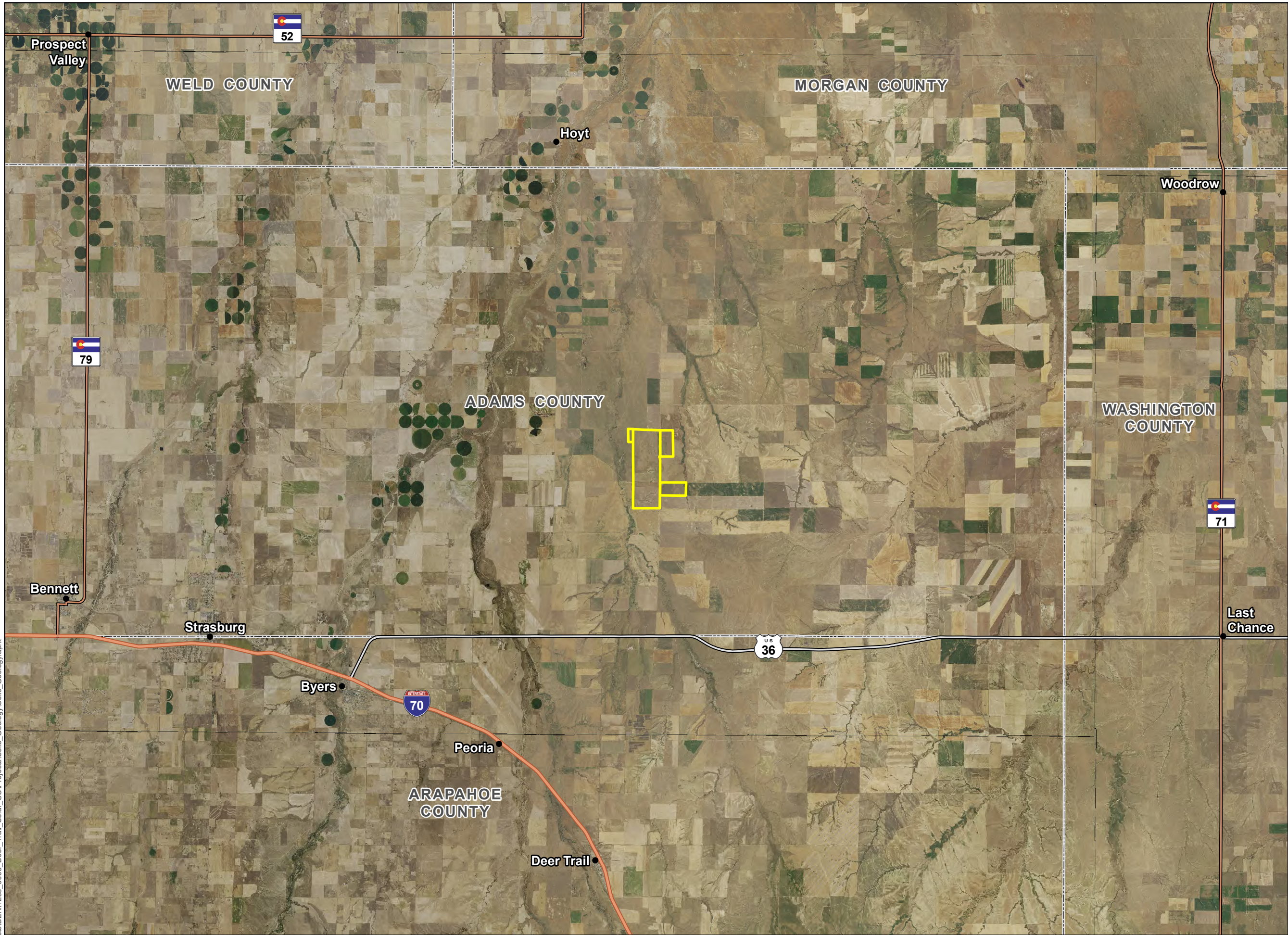
Appropriate BMPs and stormwater mitigation measures can be employed during construction and operation of the Project to avoid erosion that might be caused by the Project. A Construction Stormwater Management Permit will be required by the CDPHE that would include erosion control measures. Adams County also has stormwater permit requirements.

Overall, no soils or geologic hazards were identified within the Project Area that might significantly affect or be affected by Project development.

5.0 REFERENCES

- Colorado Division of Water Resources (DWR). 2023. DWR Well Permit Research Viewer. Available online at: <https://maps.dnrgis.state.co.us/dwr/Index.html?viewer=dwrwellpermit>. Accessed December 2023.
- Colorado Geological Survey (CGS) 2023. GIS Data – Web Maps, Collapsible Soils, Historic Coal Mines, Aggregate Resources, Abandoned Mines, Landslides, Earthquakes and Faults. Available online at: <https://coloradogeologicalsurvey.org/gis-data-map-portal/>. Accessed August 2023.
- NRCS (National Resources Conservation Service). 2006. Land Resource Regions and Major Land Resource Areas of the United States, the Caribbean, and the Pacific Basin. USDA Handbook 296. Issued 2006.
- NRCS. 2023. USDA NRCS Web Soil Survey database and map viewer. Available online at: <https://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm>. Accessed December 2023.
- USGS (U.S. Geological Survey). 2023a. National Geologic Map Database Viewer. Available online at: https://ngmdb.usgs.gov/Prodesc/proddesc_9003.htm, https://ngmdb.usgs.gov/Prodesc/proddesc_104021.htm, and https://ngmdb.usgs.gov/Prodesc/proddesc_9063.htm. Accessed December 2023.
- USGS 2023b. US Geological Survey Karst Map of the Conterminous United States. Available online at: https://pubs.usgs.gov/of/2014/1156/pdf/of2014-1156_hi-res-pdfs/of2014-1156_figure_3.pdf. Accessed August 2023.
- USGS. 2023c. USGS Mineral Resources Data System. Available online at: <https://mrdata.usgs.gov/mrds/>. Accessed August 2023.

FIGURES



Hanks Crossing Energy, LLC

**Figure 1
Project Location**

Adams County, CO

Project Features

Project Area

Transportation

Interstate Highway

US Highway

State Highway

Boundaries

County Boundary



Updated: 12/15/2023

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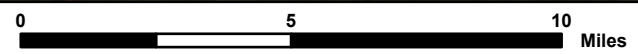
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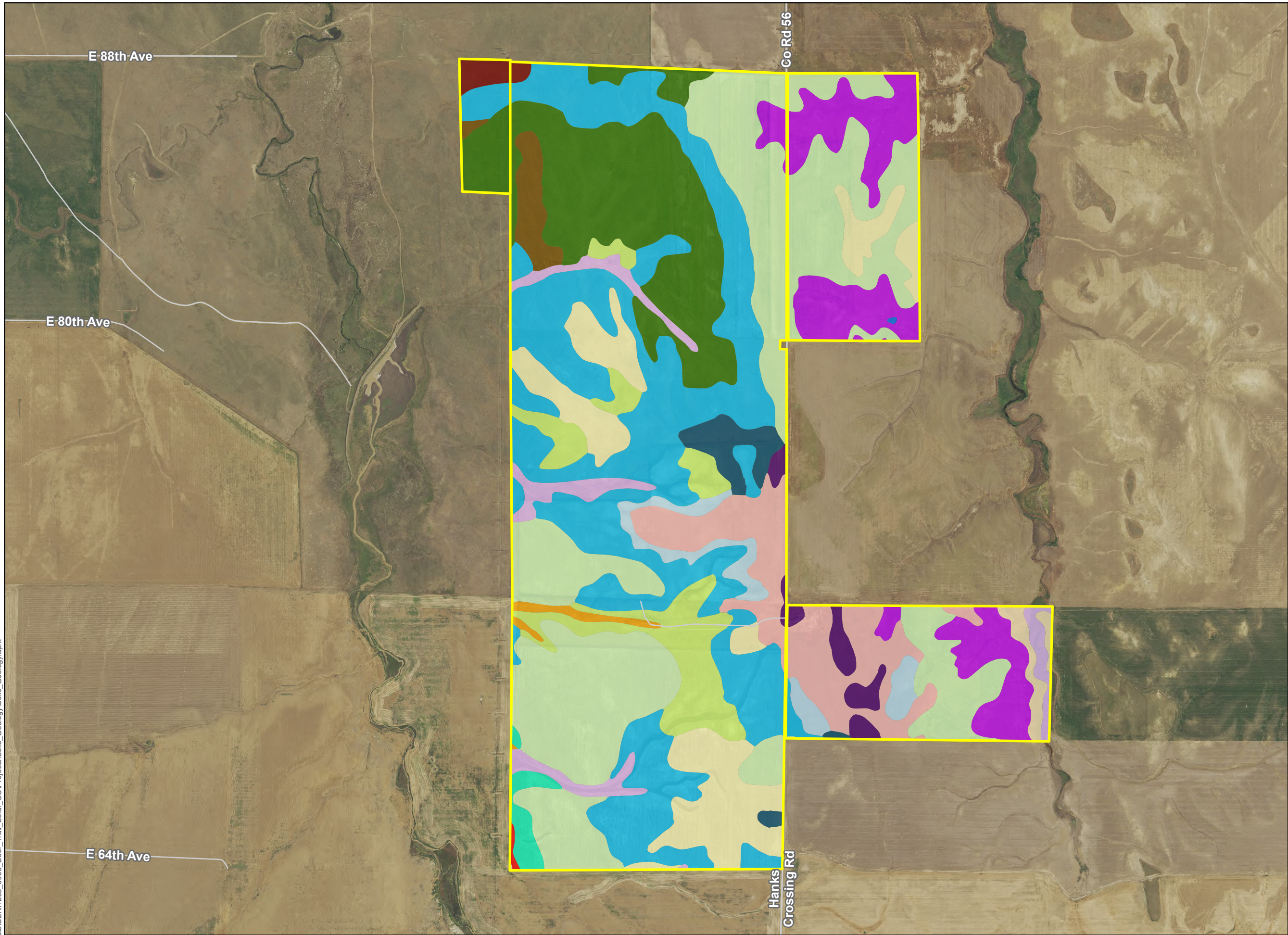
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Source: ESRI, USDA NAIP, US CENSUS, BTS



Hanks Crossing Energy, LLC

Figure 2 NRCS Soils

Adams County, CO

- Project Features**
- Project Area
- Transportation**
- Local Road
- NRCS Soil Type**
- Adena-Colby association, gently sloping
 - Arvada loam, 0-3% slopes
 - Ascalon sandy loam, 0 -5% slopes
 - Ascalon-Vona sandy loams, 1-5% slopes
 - Colby loam, 6-15% slopes
 - Loamy alluvial land
 - Nunn clay loam, 1-3% slopes
 - Nunn loam, 1-3% slopes
 - Renohill loam, 3-9% slopes
 - Stoneham loam, 3-5% slopes
 - Terry fine sandy loam, 3-9% slopes
 - Terry-Tassel-Ulm complex, 3-20% slopes
 - Terry-Vona-Tassel complex, 3-20% slopes
 - Valent loamy sand, 3-9% slopes
 - Vona loamy sand, 3-9% slopes
 - Vona-Ascalon loamy sands, 3-9% slopes
 - Water
 - Weld loam, 1-3% slopes



Updated: 12/15/2023

NOT FOR CONSTRUCTION

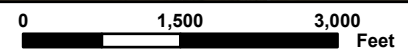
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Source: ESRI, USDA NAIP, US CENSUS, BTS, NRCS

Hanks Crossing Energy, LLC

Figure 3 Groundwater Resources

Adams County, CO


Project Features

 Project Area

Transportation

 Local Road

Groundwater Resources*

 Groundwater Well

 Alluvial Aquifer

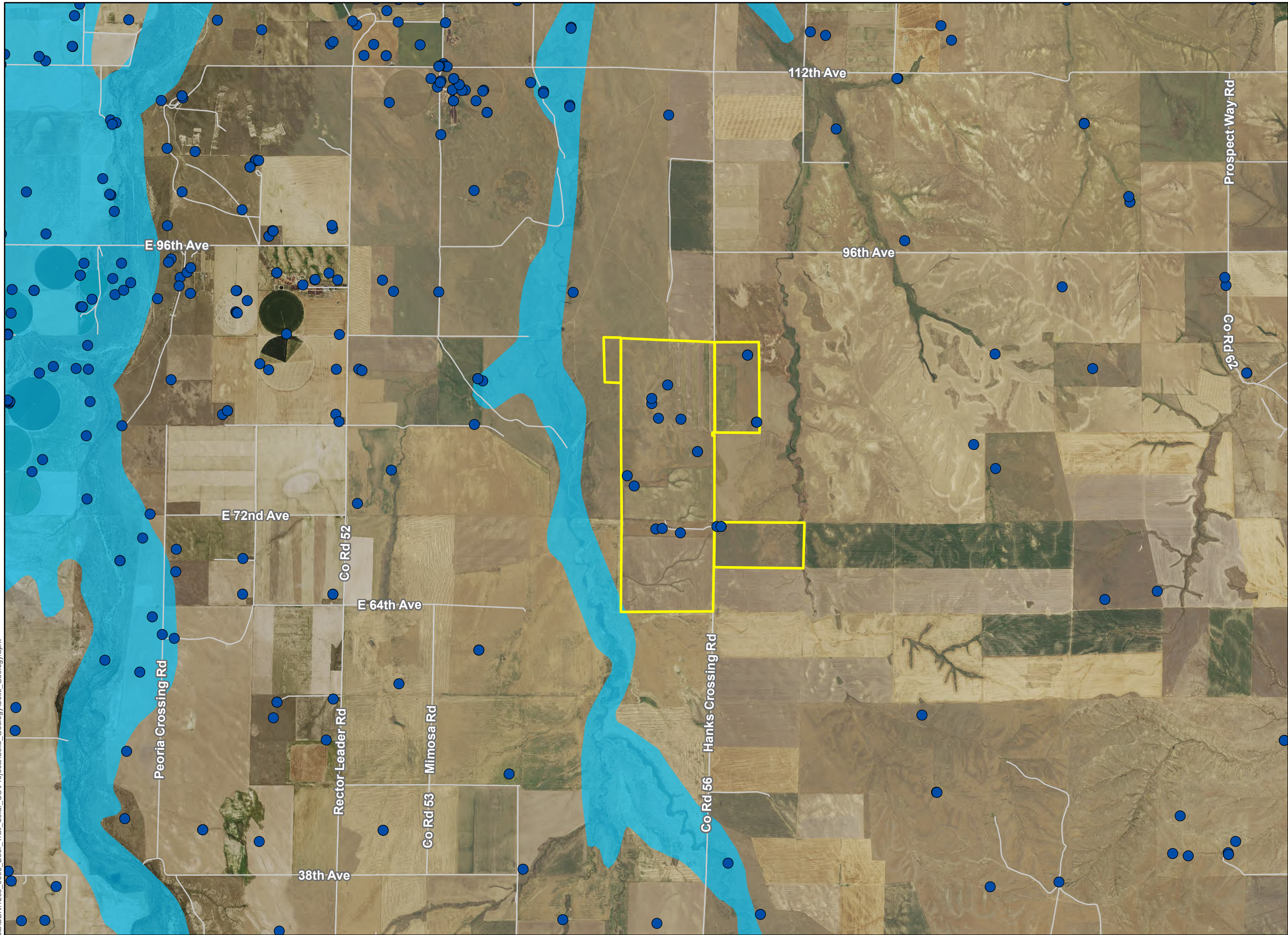
*The project and map extent fall entirely within the Kiowa Bijou Designated Basin and the Denver Basin bedrock aquifer.



Updated: 12/15/2023

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Reference Map



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0 1 2 Miles

Source: ESRI, USDA NAIP, US CENSUS, BTS, CDSS

Hanks Crossing Energy, LLC

Figure 4 Geologic Formations

Adams County, CO

Project Features

 Project Area

Transportation

 Local Road

Geologic Formations

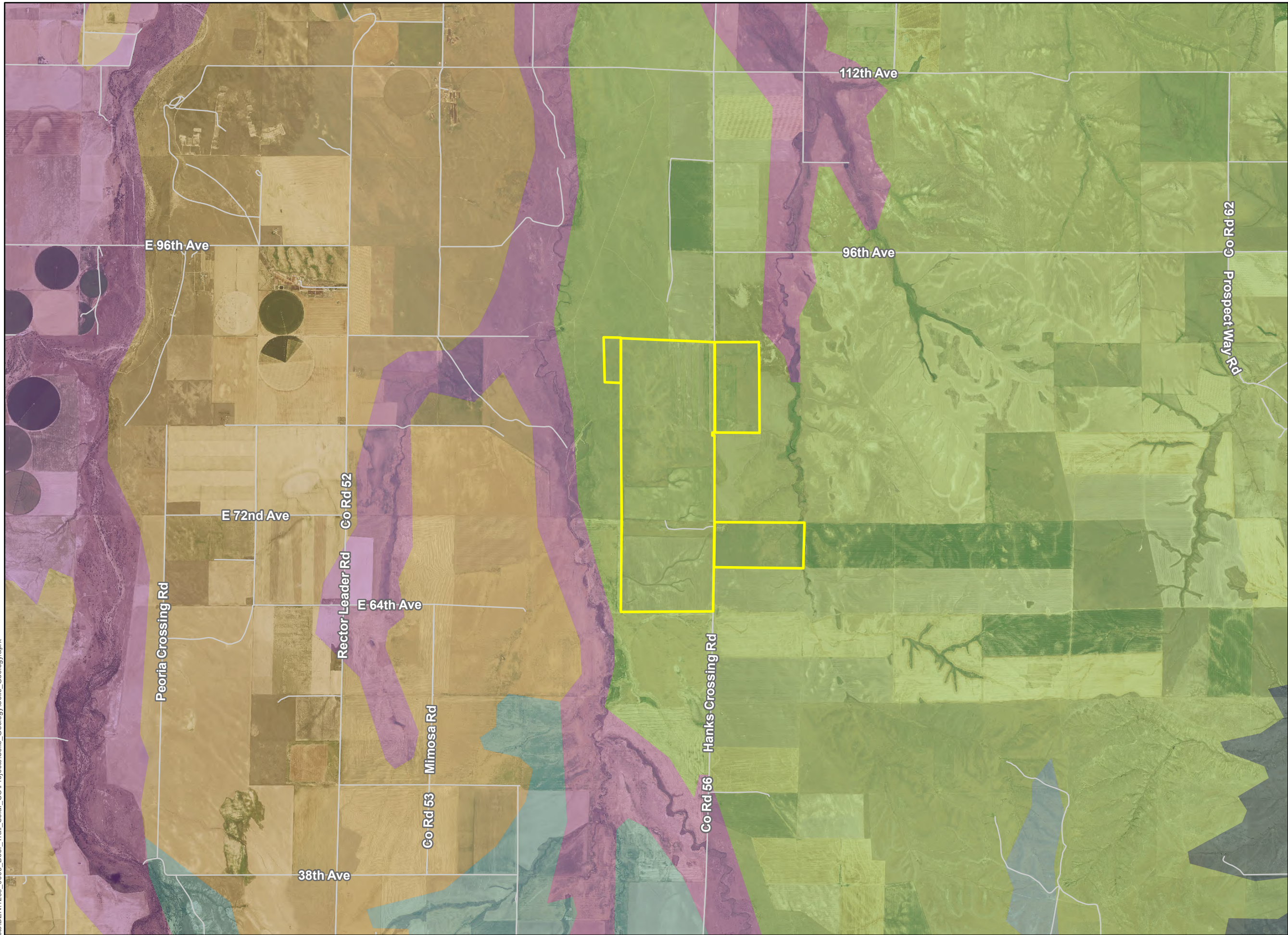
-  Eolian Deposits
-  Fox Hills Sandstone
-  Laramie Formation
-  Modern Alluvium
-  Pierre Shale - Upper Unit



Updated: 12/15/2023

NOT FOR CONSTRUCTION

Reference Map



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1:65,000 NAD 1983 StatePlane Colorado North FIPS 0501 Feet

0 1 2 Miles

Source: ESRI, USDA NAIP, US CENSUS, BTS, USGS

Hanks Crossing Energy, LLC

Figure 5 Geological Hazards

Adams County, CO

Project Features

Project Area

US Highway

Local Road

Boundaries

County Boundary

Geologic Hazards

Permitted Mine/Quarry (CODRMS)

Sand/Gravel Pit (USGS)

Eolian (wind-blown) Deposits

Dune and Sheet Sand Deposits

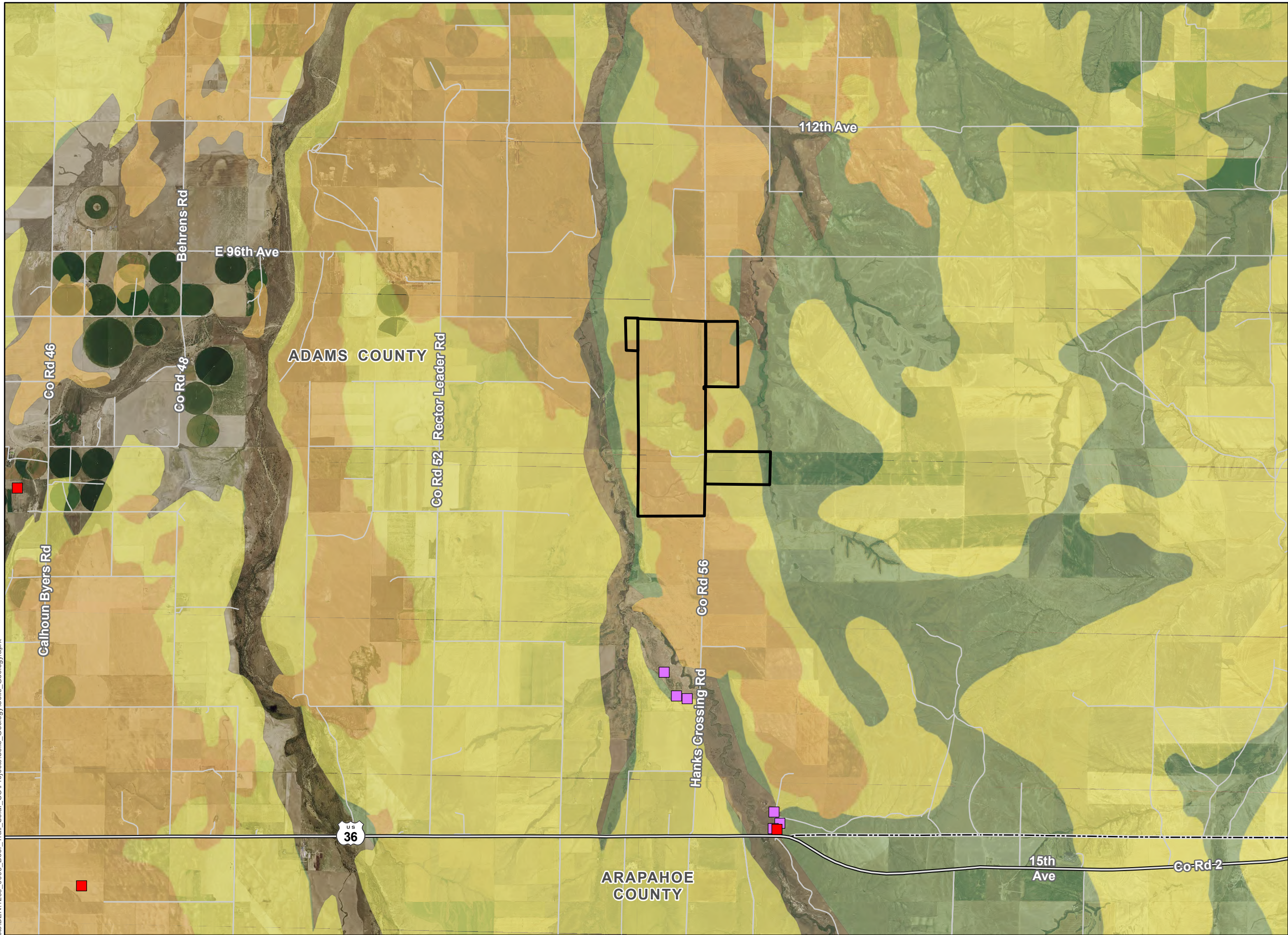
Cretaceous and Tertiary Formations



Updated: 12/15/2023

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Reference Map



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0 1.5 3 Miles

Source: ESRI, USDA NAIP, US CENSUS, BTS, USGS MRDS, CGS

APPENDIX L GREATER PRAIRIE CHICKEN SURVEY REPORT

Greater Prairie-Chicken Lek Surveys

Hanks Crossing Energy Project
Adams County, Colorado

April 2024

Prepared for

Hanks Crossing Energy, LLC

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Prepared by



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Figure 2. CPW Species Activity Mapping: Greater Prairie-Chicken Overall Range and Occurrence Data

Figure 3. Land Cover

Figure 4. 2024 Greater Prairie-Chicken Survey Points and Coverage

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Appendix A. Hanks Crossing Survey Data Forms

1.0 INTRODUCTION

Hanks Crossing Energy, LLC, a subsidiary of Novis Renewables, LLC (Novis), is proposing to develop Hanks Crossing Energy (Project), a proposed 355-megawatt photovoltaic (PV) and 178-megawatt battery energy storage system (BESS) utility-scale project encompassing approximately 2,659 acres of private land (Project Area) in unincorporated Adams County, Colorado, approximately 13 miles northeast of the town of Byers (Figure 1). At the request of Novis, Tetra Tech, Inc. (Tetra Tech) conducted greater prairie-chicken (*Tympanuchus cupido*; GPC) lek surveys for the Project to determine the potential for the species to be present within the Project Area.

Colorado Parks and Wildlife (CPW) requested that lek surveys for GPC be conducted during a Project introduction call with Novis and Tetra Tech on February 5, 2024. While the Project is located approximately 10 miles outside of the current range of the species, the Project contains potential habitat for and is within the historic range of GPC, which are found on native grasslands and Conservation Reserve Program grasslands throughout their range (Johnson et al. 2020).

This report describes the desktop assessment of the land cover within the Project Area plus a 1.2-mile buffer (Survey Area), the GPC lek survey methodology, and results of the survey conducted in April 2024.

2.0 BACKGROUND

Of the three prairie grouse species that occur in Colorado (sharp-tailed grouse [*Tympanuchus phasianellus*], lesser prairie-chicken [*Tympanuchus pallidicinctus*], and GPC), GPC are the grouse species most likely to occur in the Project Area. GPC are endemic to the eastern and southern grasslands of North America; historically, the populations were most numerous in the eastern tallgrass prairies. Currently, the core of GPC populations occurs in the Great Plains (Colorado, Oklahoma, Kansas, Nebraska, North Dakota, and South Dakota); smaller, isolated populations occur in Midwestern states (Johnson et al. 2020). Populations of GPC in Colorado occur only in the northeastern portion of the state. The entire Project Area is outside the current range for the species (Figure 2).

The preferred habitat for GPC is mixed to tallgrass prairie with minimal trees, often mixed with cropland and possessing slightly elevated sites with short and sparse vegetation for lekking and relatively dense cover for nesting and brood rearing (Johnson et al. 2020). Common plant species in their habitat include tall dropseed (*Sporobolus asper*), little bluestem (*Schizachyrium scoparium*), and big bluestem (*Adropogon gerardii*; Robel 1970). Minimum required habitat size depends on multiple factors including climate, soil type, vegetation, and current land use practices (Westemeier and Gough 1999; Svedarsky et al. 2000; Johnson et al. 2020). Minimum required habitat size varies from 2.4 square miles in Illinois (Westemeier and Gough 1999) to greater than 8.9 square miles in Nebraska (Mohler 1952; Johnson et al. 2020). Leks are frequently in areas where the vegetation has been reduced or is at a low height, such as cropland or when managed by burning or grazing (Svedarsky et al. 2003). In northeastern Colorado, GPC leks have generally been documented at least 0.5 kilometers apart unless a distinct topographical separation that allows leks to be closer is present (Schroeder and Braun 1992).

3.0 SURVEY AREA

Landcover within the Survey Area is composed of cultivated crops (70.4%) and grassland/herbaceous (28.2%; Table 1; Figure 3; USGS 2019). No other land cover types comprised greater than 1 percent each of the Survey Area. GPC occurrence data was obtained from the CPW Species Activity Mapping Data (SAM; CPW 2023b) and included GPC production areas and overall range. Production areas include nesting and brood rearing habitat within 2.2 miles around active lek locations (Figure 2). According to CPW SAM data, no production areas are present within the Project Area (Figure 2). The nearest production area occurs approximately 11.2 miles northeast of the Project and was recorded in October 2022 (CPW 2023b).

Table 1. Land Cover within the Survey Area

Land Cover	NLCD Acres	Percent NLCD
Project Area and 1.2-mile buffer		
Cultivated Crops	11,253.8	70.4%
Grassland/Herbaceous	4,503.9	28.2%
Developed, Open Space	113.7	0.7%
Emergent Herbaceous Wetlands	43.0	0.3%
Open Water	29.9	0.2%
Shrub/Scrub	26.1	0.2%
Woody Wetlands	14.5	0.1%
Pasture/Hay	5.7	<0.1%
Developed, Low Intensity	0.9	<0.1%
Deciduous Forest	0.8	<0.1%
Developed, Medium Intensity	0.2	<0.1%
Barren Land	0.1	<0.1%
Project Area and 1.2-mile buffer Total	15,992.6	100%

4.0 METHODS

At the request of CPW, a qualified Tetra Tech biologist performed a focused GPC lek survey for the Project. Tetra Tech adhered to the survey protocol provided directly from CPW (CPW 2024) via email on February 28, 2024, as well as Project-specific survey guidance provided by CPW during the Project introduction call on February 5, 2024.

The 1.2-mile buffer utilized for the Survey Area was selected based on the CPW recommendation of no surface occupancy or ground disturbance within 0.6-mile buffer of a lek (CPW 2023a). The CPW buffer was doubled to ensure adequate spatial coverage surrounding the Project Area.

On a calm morning, males may be heard at distance of up to 1.8 mi (Hamerstrom and Hamerstrom 1973; Schroeder and Braun 1992). Six listening points were established within the Survey Area along Hanks Crossing Road (Figure 4), spaced approximately 1 mile apart. During the survey, the observer stopped at a listening point every other mile, moved away from the parked vehicle, and listened for the vocalizations of male GPC for at least 3 minutes per stop. The observer also scanned the landscape for GPC while listening for vocalizations. Once the end of the route was reached, the

observer retraced the route and visited the remaining unvisited listening points along the route, located in between the previously visited listening points.

The survey was conducted on April 10, 2024. The used standardized data collection forms and collected date, time, weather, lek location, and number of male and female GPC observed. A copy of the Ground Survey Data Form is provided in Appendix A.

The survey began at 7:00 am (i.e. no earlier than 30 minutes before local sunrise) and concluded at 8 am (i.e. no later than 120 minutes after local sunrise). Survey wind speed fell between 6-8 miles per hour (mph), and no precipitation occurred during the survey period. CPW survey protocol recommends avoiding GPC surveys if wind speeds exceed 4.4 mph (CPW 2024), which would have greatly diminished Tetra Tech's ability to find a suitable time to complete surveys. The United States Fish and Wildlife Service (USFWS) recommends performing lesser prairie-chicken surveys when wind speeds are less than 12 mph (USFWS 2023). For the survey protocol, Tetra Tech utilized a wind threshold of 8 mph, as this essentially split the difference in the wind speed survey threshold provided in the protocols provided from each agency.

Any observed leks during this initial survey effort were to be recorded and, once all listening routes had been surveyed, any previously documented leks would be revisited during a second survey to determine the number of individuals (males and females) present.

5.0 RESULTS

A total of 6 listening points were established to cover the totality of the Survey Area (Figure 4). GPC were not detected within the Survey Area during the survey on April 10, 2024 (Table 2).

Table 2. Greater Prairie-Chicken Surveys Results for the Hanks Crossing Energy Project

Survey Date	# of Surveyors	# of Points Surveyed	GPC Observed	GPC Heard
04/10/2024	1	6	0	0
Grand Total		6	0	0

GPC—Greater Prairie-Chicken

6.0 DISCUSSION

While large contiguous areas of grassland (potentially suitable GPC habitat) were identified throughout the Survey Area (Figure 3), the Survey Area is outside of the current GPC range. No GPC were observed during the survey conducted on April 10, 2024.

CPW data identified no production areas within the Project Area (Figure 2; CPW 2023b), and the nearest production area occurs approximately 11.2 miles northeast of the Project. Due to the lack of occurrence of leks recorded within Project, as well as the relation of the Project to the current GPC range, it is unlikely that GPC occur within the Project Area.

7.0 LITERATURE CITED

CPW (Colorado Parks and Wildlife). 2023a. Recommendations to Avoid and Minimize Impacts to Wildlife from Land Use Development in Colorado. Updated July 19, 2023. Available online at:

https://cpw.state.co.us/Documents/Conservation-Resources/Energy-Mining/CPW_HPH-Map-Layers.pdf.

CPW. 2023b. Species Activity Mapping Data. Mapped locations of greater prairie-chicken overall range and greater prairie-chicken production areas, Updated January 23, 2023. Available online at: <https://hub.arcgis.com/content/190573c5aba643a0bc058e6f7f0510b7>.

Hamerstrom, F.N. and F. Hamerstrom. 1973. The Prairie Chicken in Wisconsin. Wisconsin Department of Natural Resources Tech. Bull. No. 64.

Johnson, J.A., M.A. Schroeder, and L.A. Robb. 2020. Greater Prairie-Chicken (*Tympanuchus cupido*), version 1.0. In: Birds of the World (A. F. Poole, Editor). Cornell Lab of Ornithology, Ithaca, NY, USA. Available online at: <https://doi.org/10.2173/bow.grpchi.01>.

Mohler, L. L. 1952. Fall and winter habits of prairie chickens in southwest Nebraska. *Journal of Wildlife Management* 16:9-23.

Robel, R.J. 1970. Possible role of behavior in regulating Greater Prairie-Chicken populations. *Journal of Wildlife Management* 34:306–312.

Schroeder, M.A. and Braun, C.E. 1992. Greater Prairie-Chicken Attendance at Leks and Stability of Leks in Colorado. *Wilson Bulletin*. Vol 104, pp. 273-284.

Svedarsky, W.D., R.L. Westemeier, R.J. Robel, S. Gough, and J.E. Toepfer. 2000. Status and management of the greater prairie-chicken *Tympanuchus cupido pinnatus* in North America. *Wildlife Biology*. 6: 277–284.

Svedarsky, W.D., J.E. Toepfer, R.L. Westemeier, and R.J. Robel. 2003. Effects of management practices on grassland birds: Greater Prairie-Chicken. Northern Prairie Wildlife Research Center, Jamestown, ND. 42 pages.

USFWS (U.S. Fish and Wildlife Service). 2023. Survey Protocol for the Lesser-Prairie Chicken. Updated March 2023. Available online at: [https://www.fws.gov/media/survey-protocol-lesser-prairie-chicken#:~:text=This%20document%20identifies%20survey%20methods,\(Tympanuchus%20pallidicinctus%2C%20LEPC](https://www.fws.gov/media/survey-protocol-lesser-prairie-chicken#:~:text=This%20document%20identifies%20survey%20methods,(Tympanuchus%20pallidicinctus%2C%20LEPC).

USGS (U.S. Geological Survey). 2019. National Land Cover Database. Multi-Resolution Land Characteristics (MRLC) Consortium. Available online at: <https://www.mrlc.gov/viewer/>.

Westemeier, R.L. and S. Gough. 1999. National Outlook and Conservation Needs for Greater Prairie-Chickens. The Greater Prairie-Chicken: A National Look. University of Minnesota, St. Paul. Pp. 169-187.

FIGURES

Hanks Crossing Energy Project
Hanks Crossing Energy LLC

Figure 1
Project Location

Adams County, CO

Project Features

- Project Area
- Survey Area (1.2-Mile Buffer)

Transportation

- Interstate Highway
- U.S. Highway
- Railroad

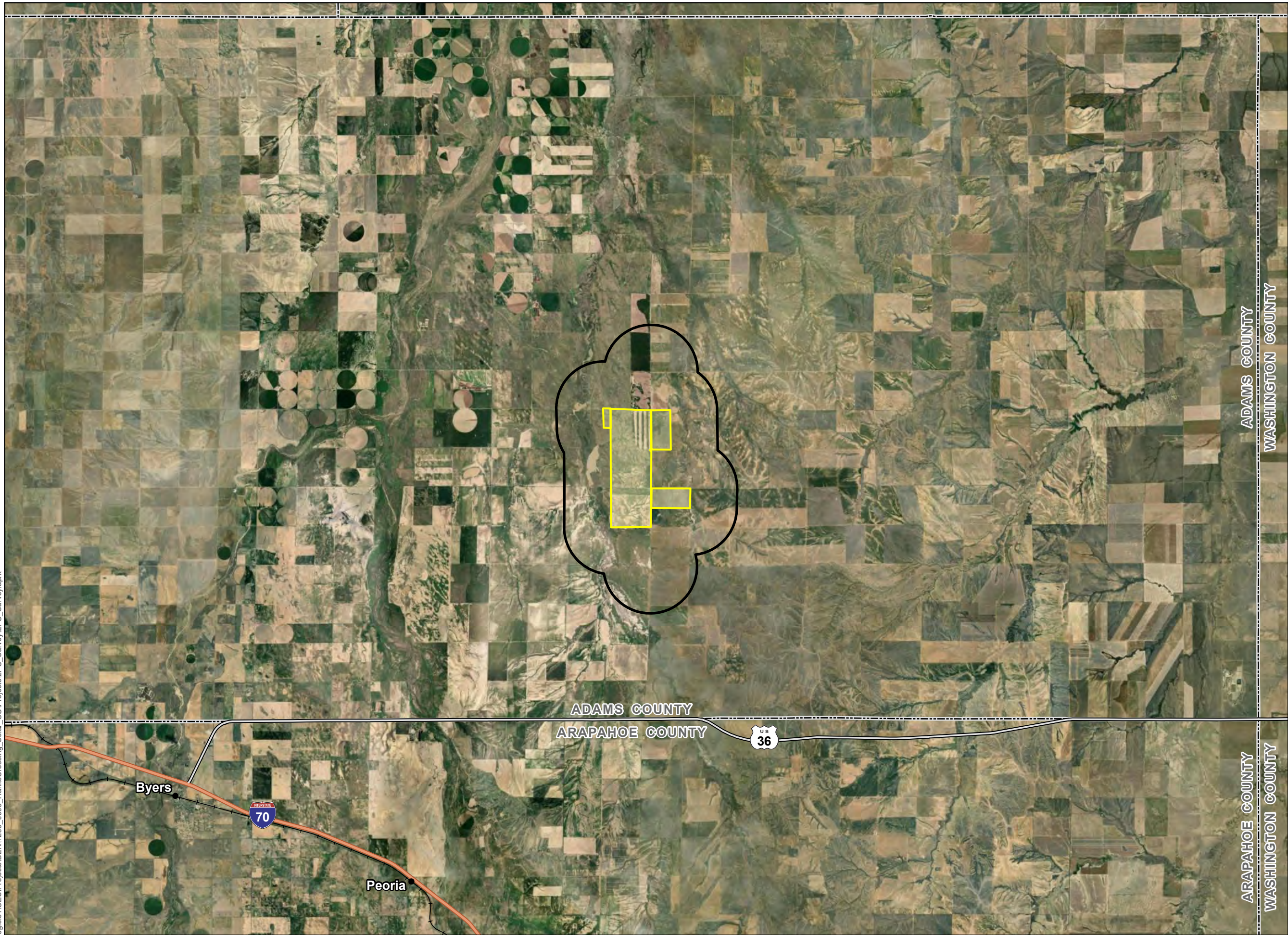
Boundaries

- U.S. County



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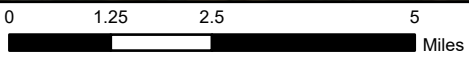
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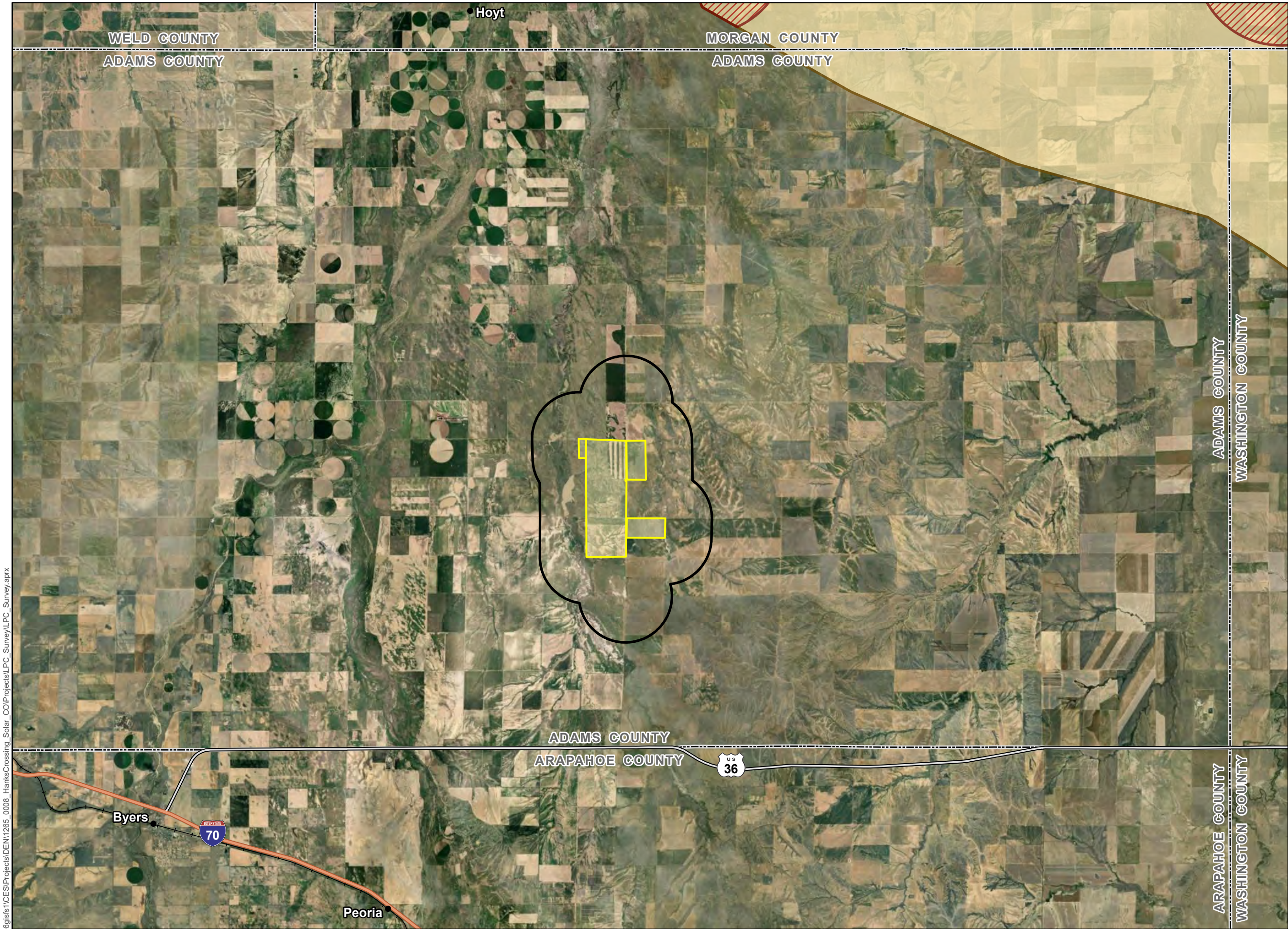
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Source: ESRI, USDA NAIP, US CENSUS, BTS



Hanks Crossing Energy Project
Hanks Crossing Energy LLC

Figure 2
Greater Prairie-Chicken
Overall Range and
Production Areas

Adams County, CO

- Project Features**
- Project Area
 - Survey Area (1.2-Mile Buffer)
- Transportation**
- Interstate Highway
 - U.S. Highway
 - Railroad
- Boundaries**
- U.S. County
- CPW SAM - Greater Prairie-Chicken**
- Production Area
 - Overall Range



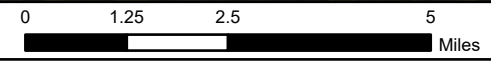
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Source: ESRI, USDA NAIP, US CENSUS, BTS, CPW SAM

**Hanks Crossing Energy Project
Hanks Crossing Energy LLC**

**Figure 3
Land Cover**

Adams County, CO








Project Features

-  Project Area
-  Survey Area (1.2-Mile Buffer)

Transportation

-  Local Road

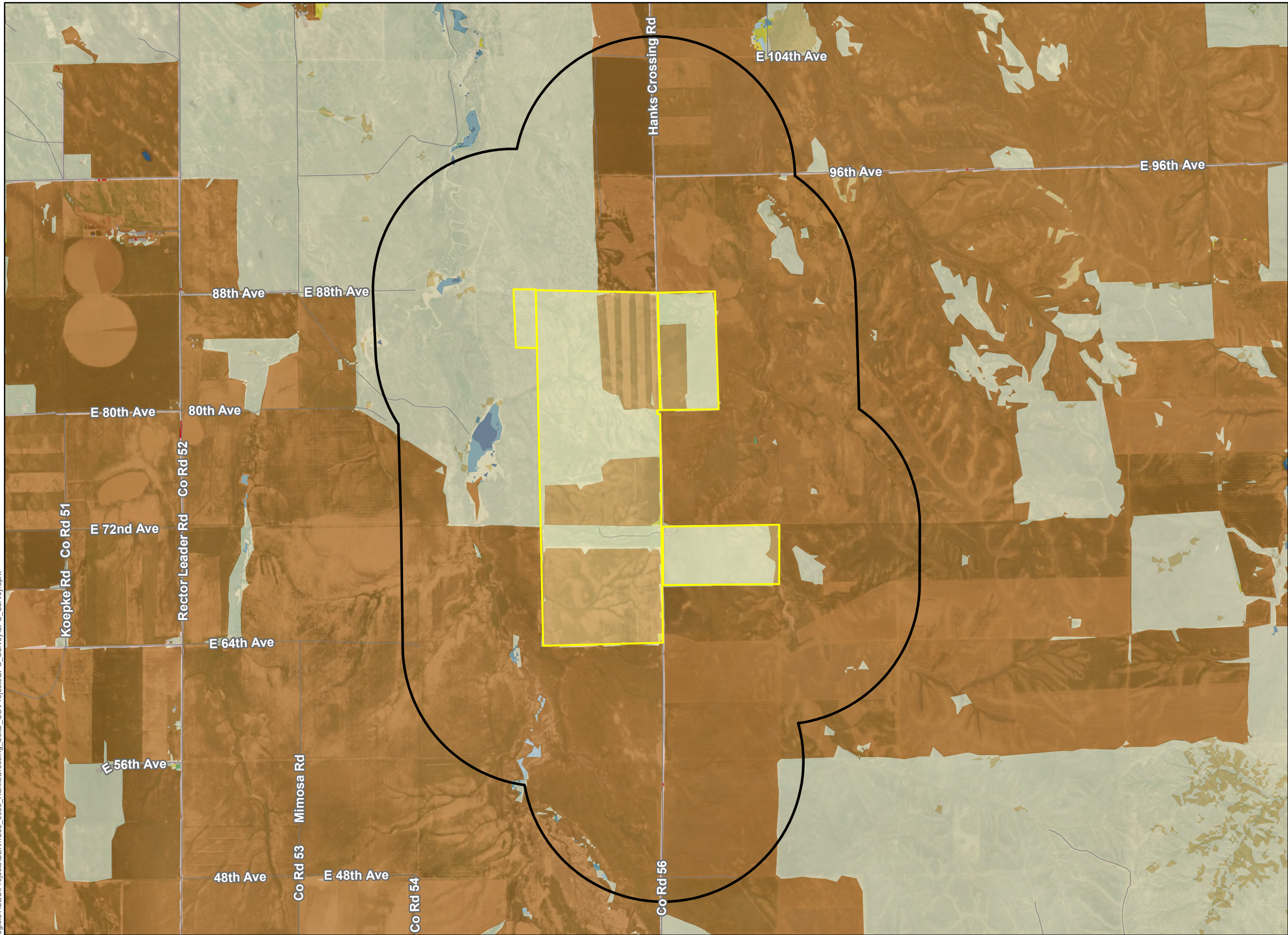
NLCD Land Classification

-  Open Water
-  Developed, Open Space
-  Developed, Low Intensity
-  Developed, Medium Intensity
-  Developed, High Intensity
-  Barren Land (Rock/Sand/Clay)
-  Deciduous Forest
-  Shrub/Scrub
-  Grassland/Herbaceous
-  Pasture/Hay
-  Cultivated Crops
-  Woody Wetlands
-  Emergent Herbaceous Wetlands



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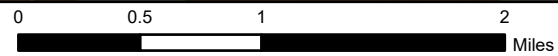
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1:50,000 NAD 1983 StatePlane Colorado North FIPS 0501 Feet



Source: ESRI, USDA NAIP, US CENSUS, BTS, NLCD

Hanks Crossing Energy Project
Hanks Crossing Energy LLC

Figure 4
2024 Greater Prairie-Chicken
Survey Points and Coverage

Adams County, CO

Project Features

- Project Area
- Survey Area (1.2-Mile Buffer)

Transportation

- Local Road

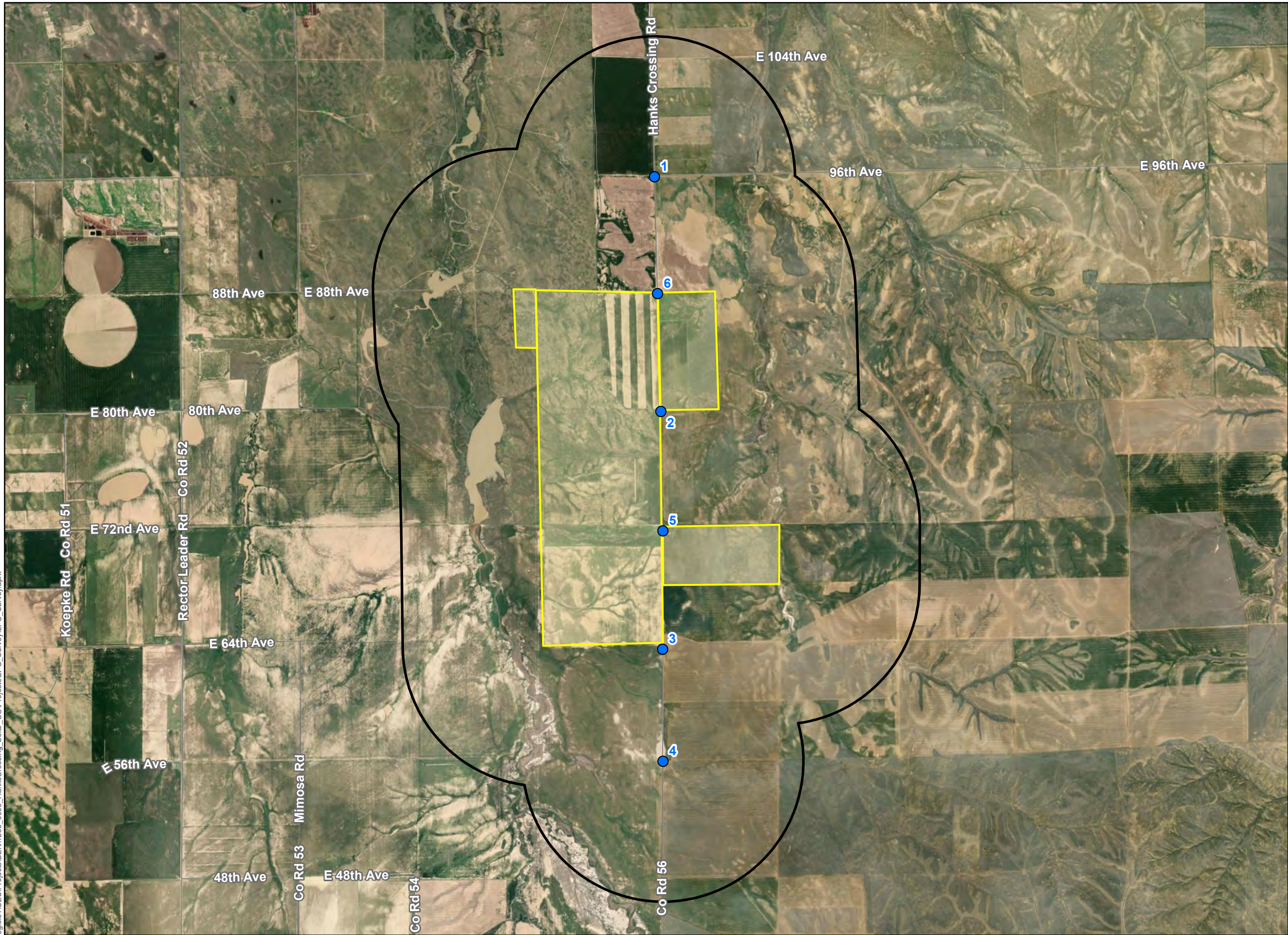
Greater Prairie-Chicken Survey

- Listening Point



NOT FOR CONSTRUCTION

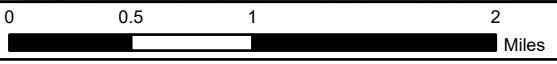
Reference Map



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1:50,000 NAD 1983 StatePlane Colorado North FIPS 0501 Feet



Source: ESRI, USDA NAIP, US CENSUS, BTS, TETRA TECH

APPENDIX A

WAFWA LPC-RWP Ground Survey Data Form

Collection Date 4/10/2024
Collected By Payden Breneman
Performed For Hank's Crossing Solar Project

Start Time 0700
Start Temp 35 F
Start Wind 6 mph

End Time 0800
End Temp 50 F
End Wind 8 mph

Weather sunny, clear, breezy
Noise Low

* Record temperature in _____ and wind speed in mph or Wind Speed Class (0-7)

	Listening Point						Triangulation					Comments
	Latitude	Longitude	Observation	Count	Range (m)	Bearing (°)	Latitude	Longitude	Range (m)	Bearing (°)	Lek	
1	39.869391	-103.999122	None									
2	39.840268	-103.999122	None									
3	39.811330	-103.998951	None									
4	39.796758	-103.999380	None									
5	39.825438	-103.998822	None									
6	39.854897	-103.998951	None									
7												
8												
9												
10												
11												
12												
13												
14												
15												
16												
17												
18												
19												
20												

Data Entry Instructions:

- Complete one data sheet for each day of surveying.
- For each listening point, enter the latitude and longitude (decimal degrees, NAD 1983).
- If no LPC are detected, enter "none" in the observation field and move on to the next listening point.
- If LPC are heard, enter "heard nearby" in the observation column, then the range and bearing to the birds from the listening point. Provide a triangulation to the birds, a range and bearing from a second observation point is needed. The two bearings should be 70 - 110° apart.
- If LPC are seen, enter "observed" in the observation column and enter the number of birds in the count column (5 or more birds is a lek).
- If multiple detections are made from a point, use a new row for each.

