



## Request for Comments

Case Name: Conner Pad at E.136th  
Case Number: OGF2024-00002

July 3, 2024

The Adams County Community & Economic Development Department is requesting comments on the following application: **Oil and Gas Facility (OGF) Permit to allow 16 wells on 8.05 acres in the Agricultural-3 zone district including the Airport Noise and Airport Height Overlay Districts.** This request is located on E. 136th Ave. between Harvest Rd. and Gun Club Rd. The Assessor's Parcel Number is 0156719400001. The applicant is Providence Energy d.b.a POCO Operating / Upstream Petroleum Management, Andrea Gross, 6494 S. Quebec St., Englewood, CO 80111.

Please forward any written comments on this application to the Community and Economic Development Department at 4430 South Adams County Parkway, Suite W2000A Brighton, CO 80601-8216 or call (720) 523-6891 by 08/02/2024 in order that your comments may be taken into consideration in the review of this case. If you would like your comments included verbatim please send your response by way of e-mail to [GDean@adcogov.org](mailto:GDean@adcogov.org).

Once comments have been received and the staff report written, the staff report and notice of public hearing dates may be forwarded to you upon request. The full text of the proposed request and additional colored maps can be obtained by contacting this office or by accessing the Adams County web site at [www.adcogov.org/current-land-use-cases](http://www.adcogov.org/current-land-use-cases).

Thank you for your review of this case.

Gregory Dean  
Oil & Gas Administrator

BOARD OF COUNTY COMMISSIONERS

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DISTRICT 1

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DISTRICT 4

Lynn Baca  
DISTRICT 5



## DEVELOPMENT APPLICATION FORM

### Application Type:

<input type="checkbox"/> Conceptual Review	<input type="checkbox"/> Preliminary PUD	<input type="checkbox"/> Temporary Use
<input type="checkbox"/> Subdivision, Preliminary	<input type="checkbox"/> Final PUD	<input type="checkbox"/> Variance
<input type="checkbox"/> Subdivision, Final	<input type="checkbox"/> Rezone	<input type="checkbox"/> Conditional Use
<input type="checkbox"/> Plat Correction/ Vacation	<input type="checkbox"/> Special Use	<input type="checkbox"/> Other: _____

**PROJECT NAME:**

### APPLICANT

Name(s):  Phone #:

Address:

City, State, Zip:

2nd Phone #:  Email:

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### OWNER

Name(s):  Phone #:

Address:

City, State, Zip:

2nd Phone #:  Email:

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

Name:  Phone #:

Address:

City, State, Zip:

2nd Phone #:  Email:

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**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

**The applicant hereby affirms that the Operator and its associated subcontractors and affiliates have complied with applicable worker safety training and certification requirements as outlined in Adams County Development Standards and Regulations Sec. 4-11-02-03-03. Records and documentation of compliance are available and will be provided to the County upon request.**

Name:  Date:

Owner's Printed Name

Name: 

Owner's Signature

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# Community Outreach Plan



POCO Operating

**Conner 19-18 Pad**

Sec. 19 T1S R65W (SESW)

Adams County, Colorado

Surface: Fee

# Providence Energy Operating LLC Adams County, Colorado

## Community Outreach Plan

### **Project Summary:**

Providence Energy Operating LLC's ("POCO's") proposed Conner 19-18 Pad "Location" is in Township 1 South, Range 65 West, Section 19 in Adams County, Colorado. The proposed Location is fee surface with a total pad disturbance of 8.052 acres, which includes the active working pad surface of 5.374 acres. During the interim reclamation and production phase 2.395 acres will be reclaimed, leaving a disturbed production area of 5.657.

### **Description of Area**

The Conner 19-18 location is in an agricultural community east of Interstate 76 and 136<sup>th</sup> Avenue in Adams County, Colorado. Surrounding land uses of the proposed location are agriculture and industrial.

There are no future plans for residential development within 2 miles. Surrounding future land uses are industrial, agricultural and mixed used commercial.

There are no residential building units (RBU) within 2,000 feet of the Working Pad Surface (WPS). The location is not within a Disproportionately Impact Community (DIC). The closest DIC is 2 miles south of the location.

### **PLANNED COMMUNITY CONSULTATION AND COMMUNICATION**

There are multiple opportunities for surrounding landowners to comment on the county and state process.

Because the area is not linguistically isolated, and all owners and tenants within 2,000 feet speak English as their primary language, POCO will send all notices and communications in English. The Operator will be available to owners and tenants during daytime and evening hours and will provide interpretation services, if requested.

Per the Adams County permitting process, POCO Operating held a neighborhood meeting on October 26, 2022, as part of the Adams County permitting process. All parcel owners within 1 mile of the property line on which the proposed location will be permitted on, were invited to the informational neighborhood meeting. The meeting was held as an open house, with posters set up according to phases of operations. POCO Representatives, in charge or regulatory, land and operations were present to speak to each phase of operations and answer any questions. Three (3) people from 2 separate households attended the meeting as well as Greg Dean, Adams County Local Government Designee.

POCO will consider owners and tenant's suggested mitigation measures and concerns related to public health, safety, and welfare.

Communication During Local Permitting:

Providence will continue to engage with owners and tenants within 2,000 feet of the Working Pad Surface and will be sending them information on the proposed location. The informational packet will include the following information:

- Description and map of the physical siting of the existing location and expansion, including the legal description.
- Description, proposed timeline, and proposed duration of operations that are planned. These operations include, but are not limited to, construction, drilling, completions, production and reclamation of the location.
- Number and orientation of the proposed additional wells including equipment.
- Description of Best Management Practices to mitigate impacts to noise, light, odor, dust, and traffic.
- Contact Information for POCO.

Communication after Local Permit Approval:

- POCO will conduct quarterly neighborhood meetings from the permit approval through the first occupation of the pad.
- POCO will hold additional quarterly neighborhood meetings for each subsequent return to the oil and gas location for any drilling or completions operations if there have not been any neighborhood meetings held for a period of six consecutive months or more.
- Notice will be sent by POCO to all property owners, current residents, or school facility or childcare administrators within one (1) mile or determined by the Director. Notice will be given at least fourteen (14) days prior to the meeting.
- At the quarterly meetings, POCO will provide an update on the status of any pending permits with the county, state or federal agencies, an overview of all planned or ongoing operations and allow time for questions and answers.
- POCO will provide a recording or summary of the meeting to the county which will include at a minimum: list of attendees and their contact information if provided, format of the meeting, an overview or comments or questions received and POCO responses within seven (7) days of the meeting.
- If required by the county, POCO will provide written and digital materials in languages other than English, provide interpretation services and hold additional meetings to accommodate resident or property owner input.

# **SITE SAFETY AND EMERGENCY SPILL RESPONSE PLAN**

**Providence Operating LLC DBA POCO Operating**



Conner 19-18 Pad  
Brighton Fire Rescue District, Brighton, Colorado  
Anticipated Frac Date: July 1<sup>st</sup>, 2026

The Following Site Safety Plan Approved By:  
Local Emergency Response Agency: Brighton Fire Rescue District  
Date of Review:  
Title:

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## 1.0 SITE SPECIFIC INFORMATION

### 1.1 Site Safety Requirements and General Information

The minimum personal protective equipment (PPE) to enter any Providence Operating LLC DBA POCO Operating (POCO) production location includes hard hat, safety glasses, safety toe boots and fire-resistant clothing (FRC). All contractors and visitors are responsible for providing their employees with the appropriate training on and use of PPE while on POCO locations. In addition, all contract personnel entering a POCO location to perform work must understand and abide by POCO contractor expectations relating to environmental, health and safety requirements.

The primary hazards that any person must be aware of while on a POCO location include, but are not limited to, the potential for release of hydrocarbon gases and/or liquids from production equipment/tanks, heavy truck and equipment traffic, loud noise, high pressure and the potential for a flash fire. These hazards can vary depending on the work being performed.

### 1.2 Emergency Muster / Assembly Point(s)

In the event of an emergency at the Conner 19-18 pad, all personnel will muster at the location entrance south of the production facility and well pad on the access road toward East 136th Avenue.

### 1.3 911 Address and GPS Coordinates

911 Address and GPS Coordinates		
API #	05-001-10273 05-001-10274 05-001-10275 05-001-10276 05-001-10277 05-001-10278 05-001-10279 05-001-10280	05-001-10281 05-001-10282 05-001-10283 05-001-10284 05-001-10285 05-001-10286 05-001-10287 05-001-10288
Legal Description	SESW Sec. 19 T1S R65W	
Address	No address available	
Driving Directions	From I-76E, take Exit 22 for Bromley Ln./E. 152 <sup>nd</sup> Ave. Travel east on Bromley Ln. for approximately 2.5 miles. Head south on Harvest Rd. to E 136 <sup>th</sup> Ave (approximately 2 miles). Travel west on E. 136 <sup>th</sup> Ave. for approximately 0.5 miles. Conner 19-18 is on the north side of E. 136 <sup>th</sup> Ave.	
Transportation Routes	It is assumed 75% of traffic will come from the direction above.	
Town, CO Zip	Brighton, CO 80603	
Lat/Long	39.944320, -104.708180	

### 1.4 Location Equipment

Conner 19-18 Equipment Estimates	
Oil Wells	16
Oil Tanks	2
Water Tanks	2
Oil Surge Drum	1
Separators	3
Heater-Treaters	1
Enclosed Combustion Unit (ECD)	3
LACT Unit	1
Gas Compressor	1
Vapor Recovery Unit (VRU)	3
Instrument Air Compressor	1
Gas Scrubber	1
Smart Purge Vapor Recover Vessel	1
Gas Sales Meter	1

### 1.5 Schools and Other High Occupancy Buildings

There are no schools or other high occupancy buildings within 5,280 ft of location.

### 1.6 Nearby Residences

There are multiple residences within 5,280 ft of the edge of the disturbed area of the location.

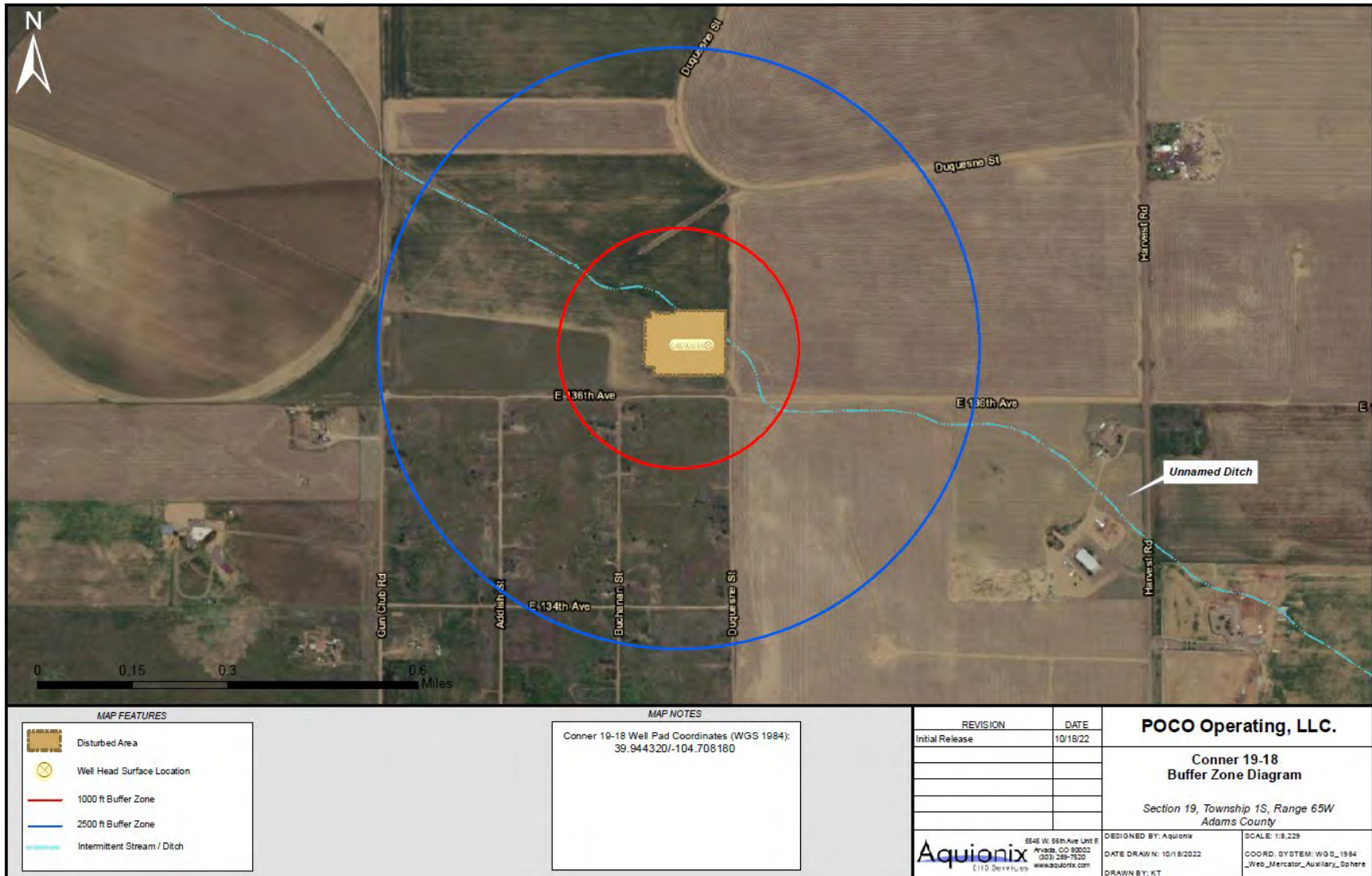
### 1.7 Location of SDS Sheets, Sign In Sheets and JSA

SDS sheets, sign in sheet and JSA form can be found within the POCO main offices.

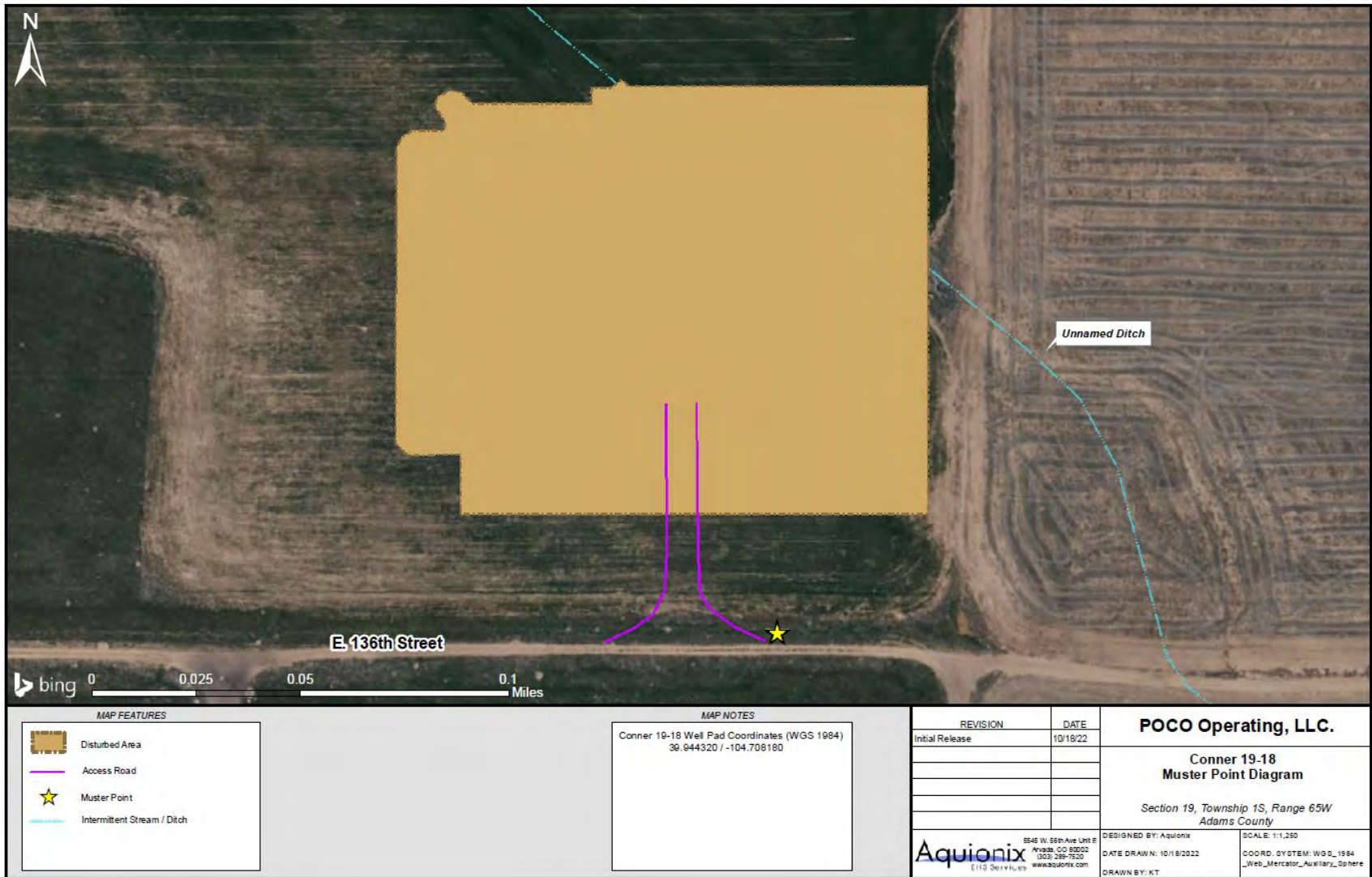


## 2.0 PROJECT AREA MAPS

### 2.1 1,000' and 2,500' Buffer Map



2.2 Access Map and Muster Point



### 3.0 LIST OF EMERGENCY CONTACTS

#### 3.1 POCO Contact Information

Name	Office Phone	Emergency/Cell
Providence Operating DBA POCO Operating	720-678-9349	303-349-0302 (Devin Brown)
Devin Brown VP of Operations	720-678-9349	303-349-0302
Meghan Grimes Sr. Manager of ESG	720-256-8774	720-256-8774
Jim Berger Lease Operator	N/A	970-481-6372
Josh Berger Lease Operator	N/A	970-373-8048

#### 3.2 First Responder Contact Information

First Responders		
Name	Emergency	Office Number
Brighton Fire Rescue District	911	303-659-4101
Adams County Sheriff	911	303-654-1850
Ambulance – Platte Valley Ambulance Service	911	720-685-8420
Colorado State Patrol	911	303-237-4501

#### 3.3 Regulatory Contact Information

Regulatory Contacts	
Name	Office Phone
COGCC	303-894-2100
CDPHE	303-692-3100
Colorado Division of Parks & Wildlife	303-291-7227
National Response Center	800-424-8802

**3.4 Nearest Hospital Information**

Medical Facilities		
Name	Office Phone	Notes
Platte Valley Medical Center	303-498-1600	Approximately 15 min. away
St. Anthony North Hospital	720-627-0000	Approximately 25 min. away
UCHealth Burn and Frostbite Center - Anschutz Medical Campus*	720-848-0747	Approximately 35 min. away
Burns and Reconstructive Center – Swedish Medical Center*	303-788-6466	Approximately 45 min. away
Western States Burn Center – North Colorado Medical Center*	970-810-4121	Approximately 45 min. away

**\*NOTE: Has a burn unit**

**3.5 Spill Response organization contact information**

Name	Office Phone
Freedom Drilling Services	970-673-8465

**3.6 Fire, explosion associated with loss of well control**

Name	Office Phone
Brighton Fire Rescue District	911 or 303-659-4101
Wild Well Control	281-353-5481
UCHealth Burn and Frostbite Center - Anschutz Medical Campus*	720-848-0747
Adams County Office of Emergency Management (Ronald Sigman)	720-523-6601

**\*NOTE: Has a burn unit**

**3.7 Government Agencies**

Name	Office Phone
Adams County Sheriff's Office	911 or 303-654-1850
COGCC	303-894-2100
CDPHE	877-518-5608
Adams County (Greg Dean, Oil & Gas Liaison)	720-523-6891

## 4.0 SPILL RESPONSE AND REPORTING

### 4.1 Spill Response

There are multiple types of hydrocarbons which can be released/spilled during oil and gas production and exploration. Most commonly released are unrefined products such as crude oil and produced water. Refined petroleum products such as diesel, gasoline and motor oil spills are less common, but still equally important to mitigate. If a spill is found reportable, it will be mitigated in accordance with Colorado Oil and Gas Conservation Commission (COGCC) and Colorado Department of Public Health and Environment (CDPHE) guidelines. Spill response guidance is further discussed in the Emergency Spill Response Plan contained within Appendix A of this plan.

### 4.2 Spill Reporting

What determines a reportable spill and to whom does the report go?

- (a) A spill/release will be reported to COGCC if released material is property of POCO and meets the COGCC thresholds (see below). Ex: Crude released from a separator or produced water from a water vault
- (b) A spill/release will be reported to CDPHE if released material is in the custody of a third party for spill that meet CDPHE reporting thresholds, are of any size that impact or threaten to impact waters of the state, a residence or occupied structure, livestock or public byway. Ex: Oil hauler over filling a truck that spills product onto the ground next to a flowing irrigation ditch

There are three release volume thresholds which determine if a hydrocarbon spill is reportable. These are:

- (a) If crude oil or produced water is released **INSIDE** secondary containment and volume is greater than **5 barrels**
- (b) If crude oil or produced water is **OUTSIDE** secondary containment and volume is greater than **1 barrel**
- (c) If more than **25 gallons** of petroleum product such as diesel, gasoline or motor oil is spilled **OUTSIDE** of secondary containment

Once a spill is determined reportable, there is a 24 hour deadline to make initial notification to the COGCC or CDPHE depending on product ownership. Spills/releases in the custody of POCO will be reported by a POCO representative. Spills/releases in the custody of a third party will be reported by the responsible company's Environmental, Health, and Safety (EHS) Department to the appropriate agency and to POCO.

These regulatory guidelines will be strictly followed by POCO and any contractors operating under POCO guidance during all activities at the Conner 19-18 pad.

## **5.0 EVACUATION INFORMATION**

### **5.1 Evacuation Plan Procedures**

The procedure to be used in alerting nearby person in the event of any occurrence that could pose a threat to life or property will be arranged and completed with public officials in detail.

In the event of an actual emergency, the following steps will be immediately taken:

- (a) The POCO representative will immediately notify proper authorities, including the sheriff's office, highway patrol and any other public officials as described above and will enlist their assistance in warning transients in the calculated radius of exposure.
- (b) POCO will coordinate with local authorities to warn residents down-wind of the location and within the radius of exposure from the wellsite. Additional evacuation zones may be necessary as the situation warrants.
- (c) The POCO representative will coordinate with the appropriate emergency personnel to divert traffic in the vicinity away from the potentially dangerous area. No trespassing and warning signs will be posted at the entrance to the well site.
- (d) In the event of an emergency, all personnel will be evacuated to the muster point defined in Section 2.
- (e) Contractors who may need assistance or do not speak English will be identified upon signing into the site. Procedures for assisting these individuals will be developed upon check in.
- (f) A roll call will be performed upon evacuation as a means to account of all employees, contractors and visitors.

## **6.0 COORDINATION WITH FIRST RESPONDER AGENCIES**

POCO representatives and first responders identified in this Site Safety and Emergency Action Plan met to review this plan and discuss coordination of efforts in the event of an emergency situation requiring first responder assistance.

## **7.0 PLAN UPDATES**

Per COGCC Rule 602.j.(2). After approval of a Form 9, Transfer of Operatorship pursuant to Rule 218.e, the Buying Operator will coordinate with the local emergency response agency to update the emergency response plan as appropriate if a transaction of the pad occurs.

**APPENDIX A – EMERGENCY SPILL RESPONSE PLAN**

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# **EMERGENCY SPILL RESPONSE PLAN**

## **Providence Operating LLC DBA POCO Operating**

**Conner 19-18 Pad**



**October 2022**

Prepared By:



5545 W. 56th Avenue, Unit E  
Arvada, CO 80002  
[www.aquionix.com](http://www.aquionix.com)



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**1.0 Introduction**

**1.1 Purpose and Scope**

The purpose of this Emergency Spill Response Plan is to define procedures and tactics for responding to discharges of oil into navigable waters or adjoining shorelines of the United States in a timely, efficient, coordinated and effective manner from discharges occurring at POCO Holdco, LLC (POCO) Conner 19-18 facility. The procedures within this plan aim to provide effective management of situations that may arise from oil and gas operations. The objective of procedures described in this Plan is to protect the public, POCO personnel, and other responders during an oil discharge, and is intended to minimize damage to the environment, natural resources, and facility installations from a discharge of oil.

This Emergency Spill Response Plan has been prepared in accordance with, and follows the content and organization of, 40 CFR Part 109 and COGCC Rule 411.a.(4).B and describes the distribution of responsibilities and basic procedures for responding to emergencies, including oil discharge and performing cleanup operations.

**1.2 Resources at Risk**

The Conner 19-18 facility is located in Brighton, Colorado and is immediately surrounded by agricultural and residential properties. The distance and gradient of the well locations from navigable water makes the risk of transport of oil into the bigger creeks and rivers unlikely.

The Conner 19-18 pad is located within Adams County, Colorado on East 136<sup>th</sup> Avenue, approximately 2,700-foot west of the intersection of Harvest Road and East 136<sup>th</sup> Street. The pad is not located in proximity to any bodies of water. The nearest downgradient bodies of water are listed below:

Facility	Potentially Affected Water Body	Distance and Presumed Gradient from Facility	Use	Priority
Conner 19-18	Unnamed Ditch	Transects the northeast portion of the site. A diversion ditch will be constructed during pad development	N/A Conveyance	First
	Denver Hudson Canal	~4,600 feet northwest	Agricultural Recreational	Second
	Barr Lake	~2 miles west	Recreational Agricultural	Second

Due to the relatively small volume of any expected discharge of oil and presumed gradient, response operations are likely to be successful at containing, dispersing and/or recovering the discharge prior to any adverse impacts the nearby bodies of water. A site map showing planned flow directions and proximity to water bodies is included in Appendix A.

**1.3 Risk Assessment**

The Conner 19-18 facility is comprised of tank batteries that provide adequate secondary containment for all aboveground storage containers and process equipment located within the boundary of each battery. Flow lines situated between the wellhead and the production equipment and the aboveground storage containers are located underground. Minimal sections of aboveground piping may exist where the process lines surface to expose valving, pumps or instrumentation used during blow down procedures. Sections of these aboveground piping may be located outside the battery secondary containment.

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A discharge of oil accompanied by a precipitation event of a size to cause significant storm water flow could potentially cause a discharge to navigable waters. The nearest water body is shown on the table above in Section 1.2 and on the Buffer Zone Diagram in Appendix B.

#### **1.4 Response Strategy**

Employees and contractors shall be equipped and trained to respond to certain minor discharges confined to the facility.

A minor discharge is defined as one that poses no significant harm to human health or the environment. These spills involve generally less than 1 barrel and can usually be cleaned up by the facility operations personnel. Other characteristics of a minor discharge include the following:

- (a) Spilled material is easily stopped or controlled at the time of the spill;
- (b) Spilled material is localized; and
- (c) Spilled material is not likely to reach surface water or groundwater.

Procedures for responding to minor discharges are covered in Section 2.3 of this Contingency Plan.

A major discharge is defined as one involving a spill that cannot be safely controlled or cleaned up. Characteristics include the following:

- (a) Spill is large enough to spread beyond the immediate spill area;
- (b) Spilled material enters surface water or groundwater (regardless of spill size);
- (c) Spill requires special training and equipment to cleanup;
- (d) Spilled material is dangerous to human health and the environment; and
- (e) There is a danger of fire or explosion.

This Emergency Spill Response Plan addresses discharge incidents, including those that affect or threaten navigable waters, during which the oil cannot be safely controlled by facility personnel and confined within the facility boundaries. Employees and contractors shall be equipped, trained, and authorized to respond to discharges exceeding the criteria listed above. Response to incidents exceeding the criteria above may also require the assistance of outside contractors or other responders to prevent imminent impact to navigable waters, or to employ alternative and additional countermeasures if navigable waters are impacted.

## 2.0 Spill Discovery and Response

The section describes the response and protocols to follow in the event of an oil spill. An uncontrolled discharge of oil to groundwater, surface water or soil is prohibited by state and federal regulations.

### 2.1 Distribution of Responsibilities

POCO has the primary responsibility for providing the initial response to oil discharge incidents originating from its facilities. To accomplish this, POCO has designated a Devin Brown (VP of Operations) as the Person Responsible for Spill Prevention (PRSP) in the event of an oil discharge. The PRSP shall be responsible for coordinating any and all emergency response procedures in the event of a discharge of oil. The PRSP has the authority to commit the necessary services and equipment to respond to the discharge and to request assistance from local fire and/or police departments, as well as the contacts listed in the POCO Consolidated SPCC Plan. The name and contact information for the PRSP can be found within the table below:

Designation	Name	Office Phone	Emergency/Cell
Person Responsible for Spill Response	Devin Brown, VP of Operations	720-678-9349	303-349-0302

In addition to coordination of emergency response procedures, the PRSP shall:

- (a) Direct notifications and initial response actions in accordance with training and capabilities. In the event of a fire or emergency situation that threatens the health and safety of those present at the site, the PRSP will direct evacuations and contact the fire and police departments;
- (b) Provide information regarding the characteristics of the materials, the equipment involved, and provide access to company resources as requested for emergencies involving outside response agencies;
- (c) Take necessary measures to control the flow of people, emergency equipment, and supplies, and obtain the support of the local emergency agencies needed to maintain control of the site to minimize injuries and confusion;
- (d) Serve as the coordinator for communications by acquiring all essential information and ensuring clear communication of information to emergency response personnel; and
- (e) Have access to reference material at the field office either as printed material or on computer files that can further assist the response activities.

The PRSP shall transmit assessments and recommendations to company management during response activities. The PRSP shall contact POCO personnel as needed but has complete authority to commit company resources to the response. In the event that the PRSP is not available, the responsibility and authority for initiating a response to a discharge rests with the personnel on site at the time the discharge is discovered. The personnel shall have POCO contact information available to reference material at the field office either as printed material or on computer files that can be used to further assist in response activities. Emergency contacts for POCO at Conner 19-18 facility are contained within Section 3.0 of the Site Safety Emergency Response Plan.

**2.2 Response Activities**

In the event of a discharge, the first priority is to stop the product flow and to shut off all ignition sources, followed by the containment, control, and mitigation of the discharge. This Emergency Spill Response Plan breaks actions to be performed in response to an oil discharge into different phases, described in greater detail in the checklists below.

**2.3 Discharge Discovery and Source Control**

A discharge at a facility will likely be discovered by an employee or contractor during routine visits to the facility. The facility is inspected weekly for stormwater considerations and the metal containment areas are informally inspected daily in addition to the annual inspection in accordance with the requirements specified in the POCO Consolidated SPCC Plan.

In the event of a minor discharge, the following guidelines shall apply:

- (a) Immediate notification to the PRSP; and
- (b) Report the discharge, if necessary, as described in Section 2.8 of this Emergency Spill Response Plan.

In the event of a major discharge, the following guidelines shall apply:

- (a) Immediately evacuate the spill site and move a safe distance away from the spill;
- (b) The PRSP shall notify the local fire/police departments;
- (c) If injuries are incurred, a senior on-site person or the PRSP shall call for medical assistance;
- (d) The PRSP shall immediately notify POCO personnel, who shall notify the appropriate agencies (i.e. NRC and Colorado authorities (see Section 2.8)). The PRSP shall also notify personnel listed on the Discharge Contact List in Section 4.0 of this plan, as needed; and
- (e) A senior on-site person or the PRSP shall notify POCO personnel and provide details regarding the spill.

Discharge discovery and source control procedures are as follows:

Completed	Actions
	Immediately report the discharge to the PRSP, providing the following information: (a) Exact location; Material involved; Quantity involved; (b) Topographic and environmental conditions; and (c) Circumstances that may hinder response; and Injuries, if any.
	Turn off all sources of ignition.
	Turn off pumps that charge or provide flow to the flowline or leaking equipment.
	Locate the flowline/equipment break.
	If safe to do so, isolate the affected section of piping/equipment by closing off the closest valves upstream and downstream from the break.

**2.4 Assessment and Notifications**

Assessment and notification procedures are as follows:

Completed	Actions
	Investigate the discharge to assess the actual or potential threat to human health or the environment: <ul style="list-style-type: none"> <li>(a) Location of the discharge relative to receiving water bodies;</li> <li>(b) Quantity of spilled material;</li> <li>(c) Ambient conditions (temperature, rain);</li> <li>(d) Other contributing factors such as fire or explosion hazards; and</li> <li>(e) Sensitive receptors downstream.</li> </ul>
	Request outside assistance from local emergency responders, as needed.
	Evaluate the need to evacuate facility and employees, as needed.
	Notify the fire/police departments to assess whether community evacuation is needed.
	Notify the response contractor (if there assistance is needed).
	If the oil reaches (or threatens to reach) a local flowing stream, immediately notify: <ul style="list-style-type: none"> <li>• The local fire/police departments to limit access to the water body by local residents until the oil has been contained and recovered;</li> <li>• The National Response Center (1-800-424-8802); and</li> <li>• CDPHE (877-518-5608).</li> </ul> Additionally, notify downstream water users of the spill and of actions that will be taken to protect these downstream receptors.
	Communicate with neighboring property owners if threatened regarding the discharge and actions taken to mitigate the damage.

**2.5 Control and Recovery**

The PRSP shall direct the initial control response and its cleanup contractors. The response actions taken will depend on whether the discharged oil has reached water (e.g. groundwater or surface water) and if the discharge has not yet reached water, all possible effort shall be made to prevent oil contact with ground or surface water bodies. Control and recovery procedures are as follows if oil has not reached groundwater or surface water bodies:

Completed	Actions
	Contact cleanup contractor(s).
	Deploy sand bags and absorbent socks down gradient from the oil, or erect temporary barriers such as trenches or mounds to prevent the oil from flowing towards local water bodies.
	Implement land based response actions (countermeasure) such as digging temporary containment pits, ponds, or curbs to prevent the flow of oil into the water.
	Deploy absorbent sock and sorbent material along the shoreline to prevent oil from entering waters.

If oil has reached groundwater or surface water bodies, the following procedures shall be implemented:

Completed	Actions
	Contact cleanup contractor(s).
	Deploy floating booms immediately downstream from the release point or if unavailable attempt to otherwise retard the downstream flow of oil by earthen dikes or vacuum truck.
	Control oil flow on the ground by placing absorbent socks and other sorbent material or physical barriers (e.g., "kitty litter," sandbags, earthen berm, trenches) across the oil flow path.
	Deploy additional floating booms across the whole width of the creek or lake at the next access point downstream from the release point.
	Deploy protective booming measures for downstream receptors that may be impacted by the spill.

**2.6 Disposal of Recovered Product and Contaminated Response Material**

The PRSP shall be responsible for the disposal of contaminated materials classified as hazardous waste in accordance with applicable solid and hazardous waste regulations as follows:

Completed	Actions
	Place any recovered product that can be recycled into a tank to be separated and recycled.
	Dispose of recovered product not suitable for on-site recycling with the rest of the waste collected during the response efforts.
	Collect all debris in properly labeled waste containers (impervious bags, drums, or buckets).
	Dispose of contaminated material in accordance with all applicable solid and hazardous waste regulations using a licensed waste hauler and disposal facility, after appropriately characterizing the material for collection and disposal.
	Dispose of all contaminated response material within 2 weeks of the discharge.

**2.7 Termination**

The PRSP shall be responsible for verifying cleanup has been completed and the contaminated area has been treated or mitigated according to the applicable regulations and state and federal cleanup action levels. If necessary, the PRSP shall collaborate with the local, state and federal authorities regarding the assessment of damages.

Completed	Actions
	Ensure that all repairs to the defective equipment or flowline section have been completed.
	Review circumstances that led to the discharge and take all necessary precautions to prevent a recurrence.
	Evaluate the effectiveness of the response activities and make adjustments as necessary to response procedures and personnel training.
	Carry out personnel and contractor debriefings as necessary to emphasize prevention measures or to communicate changes in operations or response procedures.
	Submit any required follow-up reports to the authorities.

**2.8 Discharge Notification**

Phone numbers for reporting a discharge to the National Response Center and other federal, state, and local authorities are provided in Section 4.0 of this plan *Any discharge to water must be reported immediately to the NRC.*



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The discharge is subject to 40 CFR Part 112 and the PRSP is responsible for ensuring that all pertinent information is provided to the EPA Regional Administrator if the discharge qualifies under the following:

- Violates applicable water quality standards;
- Causes a film, sheen or discoloration upon the surface of navigable waters (e.g., a wash, creek or stream) or adjoining shorelines; or
- Causes a sludge or emulsion to be deposited beneath the surface of navigable waters or upon adjoining shorelines.

If the discharge qualifies under the following:

- (a) Facility has discharged more than 1,000 U.S. gallons of oil in a single discharge;
- (b) Discharged more than 42 U.S. gallons of oil in each of two discharges occurring within any twelve-month period, the facility becomes subject to this section:

POCO must submit the following information to the Regional Administrator within 60 days from the time of the discharge(s):

- (a) Name of the facility;
- (b) Facility Manager/Operator name;
- (c) Location of the facility;
- (d) Maximum storage or handling capacity of the facility and normal daily throughput;
- (e) Corrective action and countermeasures Facility Manager/Operator have taken, including a description of equipment repairs and replacements;
- (f) An adequate description of the facility, including maps, flow diagrams, and topographical maps, as necessary;
- (g) The cause of discharge, including a failure analysis of the system or subsystem in which the failure occurred;
- (h) Additional preventive measures you have taken or contemplated to minimize the possibility of recurrence; and
- (i) Such other information as the Regional Administrator may reasonably require pertinent to the discharge.

### 3.0 Response Resources and Preparedness Activities

POCO shall familiarize employees and contractors with area landowners, surrounding water bodies, layout for the facility, and response procedures. Equipment use for discharge control shall be available for use. Communication systems shall be established and documented for notification requirements in case of discharge.

#### 3.1 Equipment, Supplies, Services, and Manpower

POCO employees, pumpers and contractors shall be supplied with shovels and absorbent material sufficient to respond to minor discharges occurring at the facility. These personnel are trained and available to respond to a minor oil discharge and shall be familiar with the layout of the facility, the location of spill response equipment and response strategies, and with the POCO Consolidated SPCC and Site Safety and Emergency Spill Response Plans for this facility.

In the event that a significant spill occurs which cannot be mitigated by the pumpers, Freedom Drilling Services shall be contacted (see Section 4.0 of this plan or Section 3.0 of the Site Safety and Emergency Response Plan). Freedom Drilling Services has approximately 20 employees to dispatch in the event of an emergency and a large inventory of spill response equipment available, including but not limited to:

Quantity	Equipment Type	Make & Model
5	Hydrovacs	Vector
6	Industrial Washer units	Hotsys w/ 550-gal capacity
2	Road Graders	John Deere 672G
4	Backhoe	CAT 450
4	Skid Steers	John Deere 3333G
4+	End Dumps	Tractor powered, various

#### 3.2 Access to Receiving Water Body

The PRSP, pumpers, and contractors shall be familiar with the area receiving water bodies, lease and two track roads in the area of operations. If necessary, prior to the deployment of response equipment, the PRSP shall contact local landowners to inform them of response activities being carried out.

#### 3.3 Communications and Control

In the event of a major discharge, a field communication system shall be set up to facilitate response activities. The field communication system shall incorporate mobile phones, and in the event emergency personnel are involved, hand-held radio devices may be necessary.

Generally, the PRSP is responsible for communicating the status of the response operations and for sharing relevant information with involved parties, including local, state, federal, and tribal authorities. In the event that local response agencies, or a federal On-Site Coordinator (OSC) assumes Incident Command, the PRSP shall function as the POCO representative.

#### 3.4 Training Exercises and Updating Procedures

POCO shall establish and maintain an ongoing training program for company personnel responding to oil discharges to communicate the proper response actions, roles, and responsibilities. In addition, POCO shall make available to these personnel the necessary equipment for responding to either a minor or major discharge. The training program is outlined in Section 8.0 of the POCO Consolidated SPCC Plan, and the PRSP

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shall be responsible for implementation and evaluation of the employee preparedness training. Following a response to an oil discharge, the PRSP shall perform the following duties to evaluate the actions taken and identify procedural areas where improvements are needed:

- (a) Conduct a briefing with field personnel, contractors, and local emergency responders to discuss lessons learned; and
- (b) Integrate in subsequent SPCC briefings and employee training seminars the outcome of the spill response.

As necessary, the PRSP shall amend this Emergency Spill Response Plan and/or the POCO Consolidated SPCC Plan to reflect changes made to each facility's equipment and operational and spill response procedures. A Professional Engineer shall certify any technical amendment to the Consolidated SPCC Plan.

**4.0 DISCHARGE CONTACT LIST**

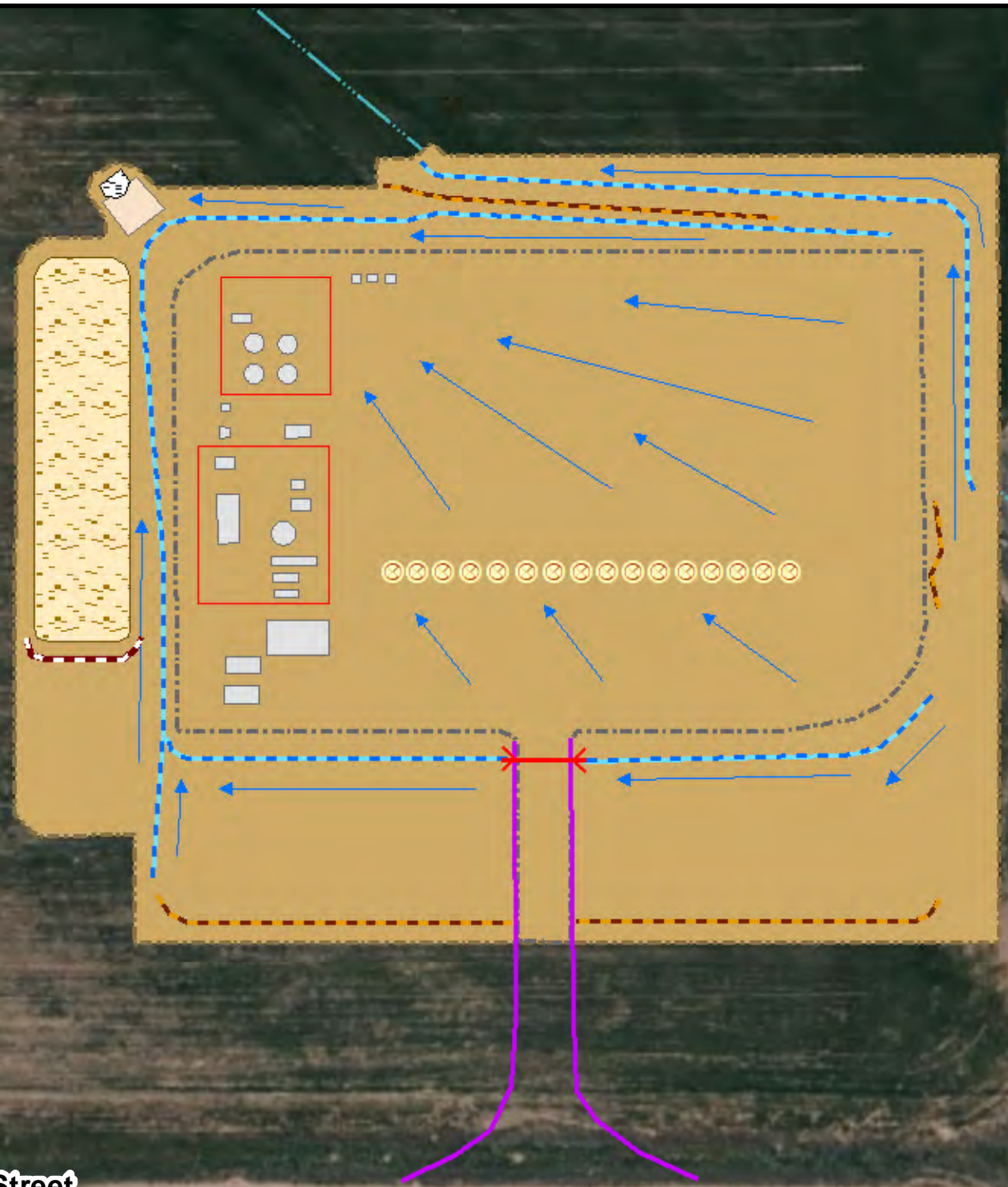
Upon discovery of a spill and after the immediate discharge response procedures outlined in Section 5.0 have been completed, the discharge should be reported to the appropriate personnel and agencies by the Person Responsible for Spill Prevention. If unable to reach the Person Responsible for Spill Prevention, report the spill to listed contact at POCO or alternate.

Contact Entity	Contact	Phone #	Circumstances	When-to-Notify
<b>Person Responsible for Spill Prevention</b>				
Providence Operating DBA POCO Operating	Devin Brown (PRSP)	720-678-9349 (o) 303-349-0302 (m)	Any discharge event, injury, fire	Immediately
<b>Emergency Response Contact List</b>				
Emergency Response	NA	911	Fire or injured personnel	Immediately
<b>Federal Discharge Contact List</b>				
National Response Center	NA	1-800-424-8802	Discharge reaching or threatening navigable waters	Immediately
EPA Region VIII	NA	1-800-227-8917	Discharge of 1,000 gallon or 2nd event of 42 gallon in navigable waters	Written Notification within 60 days (EPA Region VIII Regional Administrator)
<b>Colorado Discharge Contact List</b>				
COGCC	N/A	303-894-2100	Spill of exploration or production wastes > 20 bbls on state or private land	Within 24-Hours
CPDHE	24-Hour Spill Reporting Line	1-877-518-5608	Spills of any size that impact or threaten to impact waters of the state	Immediately following discovery
Adams County LEPC	N/A	720-523-6602	Any spills that require notification as discussed above	As soon as possible
<b>Oil Spill Removal Organization</b>				
Freedom Drilling Services	Freedom Drilling Services	970-673-8465 (o)	When assistance is needed with controlling and/or cleaning up a spill.	When it is determined that such assistance is needed.

**APPENDIX A – Figures**

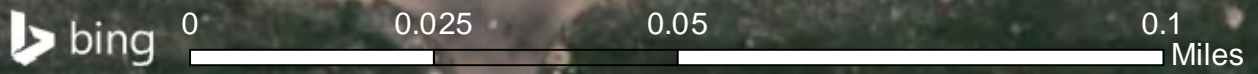
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Unnamed Ditch

E. 136th Street



MAP FEATURES

- |  |                               |  |                                   |  |                             |
|--|-------------------------------|--|-----------------------------------|--|-----------------------------|
|  | Production Pad Surface        |  | Secondary Containment             |  | Sediment Control Log        |
|  | Disturbed Area                |  | Rip Rap/Effluent of Sediment Trap |  | Culvert                     |
|  | Proposed Production Equipment |  | Access Road                       |  | Intermittent Stream / Ditch |
|  | Sediment Trap                 |  | Earthen Berm                      |  | Surface Flow Direction      |
|  | Topsoil Stockpile             |  | Drainage Ditch                    |  | Well Head Surface Location  |

MAP NOTES

Conner 19-18 Well Pad Coordinates (WGS 1984)  
39.944320 / -104.708180

REVISION	DATE	POCO Operating, LLC.	
Initial Release	10/18/22	<p align="center"><b>Conner 19-18</b>  <b>Site Specific Diagram</b>  <b>Emergency Spill Response Plan</b>  <i>Section 19, Township 1S, Range 65W</i>  <i>Adams County</i></p>	
		DESIGNED BY: Aquionix DATE DRAWN: 10/18/2022 DRAWN BY: KT	SCALE: 1:1,250 COORD. SYSTEM: WGS_1984 _Web_Mercator_Auxiliary_Sphere

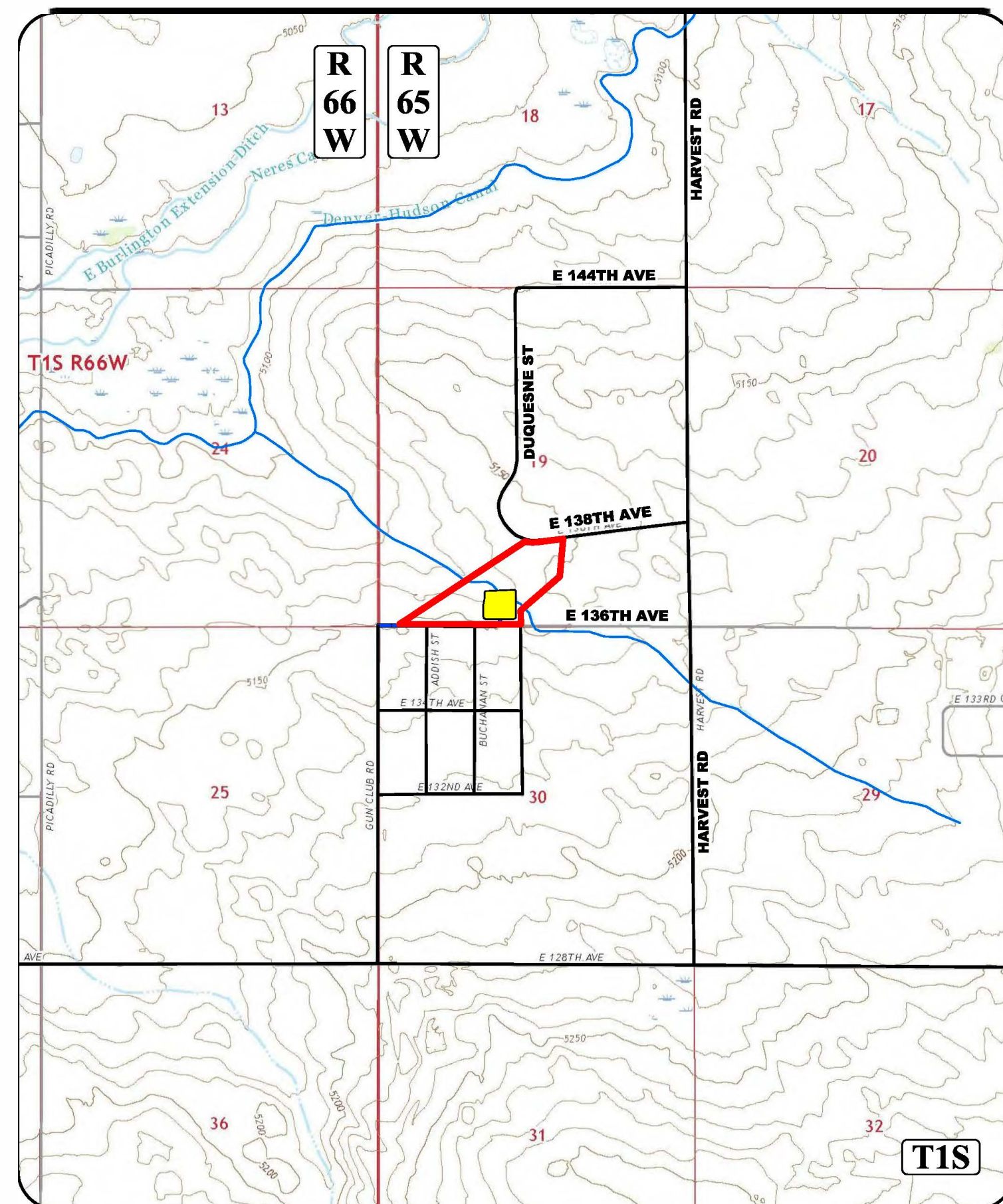
Y:\POCO Operating-3710\mxd\Conner 19-18



# ADAMS COUNTY OIL AND GAS FACILITY PERMIT POCO OPERATING CONNER 19-18 PAD

LOCATED IN THE SW 1/4 OF SECTION 19,  
TOWNSHIP 1 SOUTH, RANGE 65 WEST OF THE 6th P.M.  
COUNTY OF ADAMS, STATE OF COLORADO

## VICINITY MAP



TAKEN FROM 7.5 MIN TOPOGRAPHIC MAP PRODUCED BY THE UNITED STATES GEOLOGICAL SURVEY  
SCALE: 1"=2,000'

### VICINITY MAP LEGEND

- SITE BOUNDARY
- EXISTING ROAD
- ACCESS ROAD
- EXISTING DRAINAGE
- PROPERTY LINE
- PROPOSED SITE

### Standard General Notes for Construction Plans

- The contractor shall be responsible for contacting the Utility Notification Center of Colorado (Call before you dig), 811. Call two business days prior (not including the day of the call) to digging, grading or excavating for the marking of underground member utilities.
- Prior to commencement of any construction, the contractor shall contact all utilities to coordinate schedules.
- The contractor shall be responsible for all traffic control during construction:
  - All signs, striping and traffic control device shall conform to, and placement shall be performed in accordance with, the *Manual on Uniform Traffic Control Devices (MUTCD)*, latest edition and *CDOT M&S Standards*, latest edition.
  - The contractor shall be responsible for maintenance and cleaning of traffic control devices.
  - The contractor shall maintain existing pavement markings during construction operations, in conformance with construction documents.
  - Removal of existing pavement markings shall be accomplished by a method that does not materially damage the surface or texture of the pavement or existing surfacing. The pavement markings shall be removed to the extent that they are not visible under day or night conditions.
- The contractor shall restore any disturbed areas to equal or better condition than existed before construction. Drainage ditches or watercourses that are disturbed by construction shall be restored to the grades and cross-sections that existed before construction, unless otherwise shown on the construction documents.
- The contractor shall carefully preserve benchmarks, property corners, reference points, stakes and other survey reference monuments or markers. In case of willful or careless destruction, the contractor shall be responsible for restorations. Resetting of markers shall be performed under the direction of a Colorado licensed Professional Land Surveyor.
- The contractor shall immediately remove any construction debris and mud tracked onto existing roadways. The contractor shall repair any excavation or pavement failures caused by the construction.
- All damaged existing curb, gutter, and sidewalk shall be repaired prior to acceptance of completed improvements.
- The type, size, location and number of all known underground utilities are approximate when shown on these construction drawings. It shall be the responsibility of the contractor to verify the existence and location of all underground utilities along the route of the work prior to commencing any new construction. The contractor shall be responsible of any unknown underground utilities.
- The Owner/Developer shall be responsible for providing all required lot staking and construction staking. The Contractor shall coordinate through the Owner's designated representative to assure that the surveyor is given adequate notice and instruction in order to complete the survey requirements for the various phases of work. The Contractor shall be responsible for the cost of re-surveying required due to the Contractor's, or subcontractor's, activities. The Contractor shall be responsible for the costs associated with rescheduling the surveyor to accommodate the Contractor's requests for unscheduled staking.
- The Contractor shall provide and implement a "Traffic Control Plan" related to all construction activities for this project.
- The Contractor shall perform all work according to all Town, County, State and Federal safety and health regulations. In particular, the trenching and open excavation operations shall comply with all current O.S.H.A. regulatory requirements.
- All construction activities must comply with the State of Colorado permitting process for "Stormwater Discharges Associated with Construction Activity." For information contact the Colorado Department of Health, Water Quality Control Division, WQCD-PE-B2, 4300 Cherry Creek Drive South, Denver, Colorado, 80246. Attention: Permits and Enforcement Section. Phone (303) 692-3500.
- When discharging groundwater, all dewatering methods shall be in conformance with all laws and regulations of the State - including a Colorado Discharge Permit System for Construction Dewatering Wastewater Discharge. The contractor shall take all necessary and proper precautions to protect adjacent properties from any and all damage that may occur from stormwater runoff and/or deposition of debris resulting from any and all work.
- The contractor shall have a registered land surveyor tie out and reset any property corners or section corners planned to be disturbed by construction of this project, and shall have a registered land surveyor reestablish any property corners or section corners inadvertently disturbed during construction of this project.

## CONTACT INFORMATION

### OPERATOR

POCO OPERATING  
9635 Maroon Circle, Suite 450  
Englewood, Colorado 80112  
(972) 392-6110

### CIVIL ENGINEER / SURVEYOR

Uintah Engineering & Land Surveying, LLC  
Headquarters  
85 South 200 East  
Vernal, Utah 84078  
(435) 789-1017

Colorado Branch  
3313 35th Ave. #B  
Evans, CO 80620  
(970) 506-1544



## PROPERTY INFORMATION

OWNER: DS LLC  
PROPERTY ADDRESS: CO  
ADAMS COUNTY PARCEL NO.: 0156719300004  
LAND USE: AG  
ZONING: A-3

### COUNTY ASSESSORS LEGAL:

SECT. TWP. RANG: 19-1-65 DESC: PARC 7 PT OF THE S2 OF SEC 19  
DESC AS BEG AT THE S4 COR OF SD SEC 19 TH N 00D 08M 08S E  
40 FT TO THE TRUE POB TH CONT N 00D 08M 08S E 215 FT TH N  
49D 47M 15S E 812/30 FT TH N 06M 06S 00M E 591/05 FT TH S  
83D 25M 53S W 410 FT TO THE BEG OF A CURV TO THE RT TH  
NWLY ALG SD CURV HAV A RAD OF 560 FT A DELTA ANF OF 20D  
01M 34S A CHD THAT BRS N 88D 33M 20S W 194/74 FT AND AN  
ARC LNTH OF 195/73 FT TH S 57D 30M 41S W 2348/51 FT TH S  
88D 04M 50S E 1899/40 FT TO THE TRUE POB 39/023A

## SHEET INDEX

INDEX NO.	SHEET NO.	DESCRIPTION
<b>COVER AND GENERAL NOTES</b>		
1	C001	COVER SHEET
<b>SITE PLANS</b>		
2	C101	SITE PLAN
3	C102	DRILL PHASE FINAL GRADING PLAN
4	C103	PRODUCTION PHASE FINAL GRADING PLAN
5	C104	LANDSCAPING PLAN
6-7	C501-C502	CONSTRUCTION DETAILS

CALL UTILITY NOTIFICATION CENTER OF COLORADO

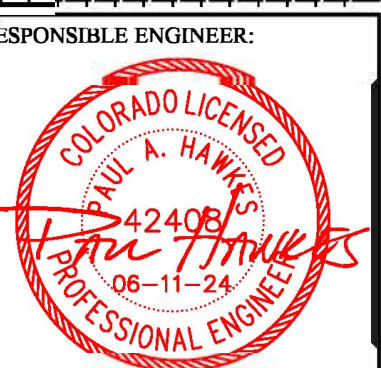


Know what's below.  
Call before you dig.  
CALL 2 BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES.



**POCO OPERATING**  
**CONNER 19-18 PAD**  
**GESC PLAN**  
**SEC. 19, T1S, R65W, 6th P.M.**  
**ADAMS COUNTY, COLORADO**

REV	DATE	BY	DESCRIPTION
1	08-11-24	CC	ISSUED FOR PERMITTING
1	08-11-24	CC	ISSUED FOR PERMITTING



SCALE: AS NOTED
DRAWN BY: CC
DATE DRAWN: 04-23-2024
UTS FILE NO.: P-2-031
PROJ. NO.: PR00621-0001
FILE: P-2-031



E:\PLANS\2024\08\19-18 PAD - CONNER\CONNER 19-18 PAD - 2024\CONNER 19-18 PAD - 2024\CONNER 19-18 PAD - 2024.dwg  
 CALDWELL  
 8/12/2024 2:13 PM  
 ARCH: FULL; PLOT: 0; CALOR: 2; CALOR: 0



N



**LEGEND**

- = OIL & GAS LOCATION
- = WORKING PAD SURFACE
- = PROPOSED ACCESS ROAD
- = = ROAD
- X- -X- -X- = FENCE
- OHP- -OHP- -OHP- = POWER LINE
- G- -G- -G- = GAS LINE
- o = REFERENCE POINT
- = WATER WELL



2000' Offset from Working Pad Surface

#	FEATURE	BEARING	DISTANCE	#	FEATURE	BEARING	DISTANCE
1	R5UBH WATER OF STATE/USA	N/A	N/A	20	WATER WELL	SW	1262'±
2	EXISTING FENCE	SW	1469'±	21	WATER WELL	SW	1135'±
3	GUN CLUB ROAD	SW	1650'±	22	WATER WELL	SW	1269'±
4	POWER LINE	WEST	1479'±	23	WATER WELL	SW	1467'±
5	POWER LINE	SOUTH	462'±	24	WATER WELL	SW	1722'±
6	GAS LINE	SOUTH	46'±	25	WATER WELL	SW	1979'±
7	WATER WELL	SOUTH	366'±	26	WATER WELL	SW	1665'±
8	WATER WELL	SOUTH	386'±	27	WATER WELL	SW	1723'±
9	WATER WELL	SOUTH	1665'±				
10	WATER WELL	SOUTH	977'±				
11	WATER WELL	SOUTH	1040'±				
12	WATER WELL	SOUTH	855'±				
13	WATER WELL	SW	1367'±				
14	WATER WELL	SW	1201'±				
15	WATER WELL	SW	413'±				
16	WATER WELL	SW	487'±				
17	WATER WELL	SW	780'±				
18	WATER WELL	SW	896'±				
19	WATER WELL	SW	1072'±				

**NOTES:**  
 • Bearings & distances shown are from the nearest edge of working pad surface.

**POCO OPERATING**

**CONNER 19-18 PAD**  
 SE 1/4 SW 1/4, SECTION 19, T1S, R65W, 6th P.M.  
 ADAMS COUNTY, COLORADO

<b>SURVEYED BY</b>	GREG WEIMER, O.R.	06-15-22	<b>SCALE</b>
<b>DRAWN BY</b>	E.C.	08-03-22	1" = 500'

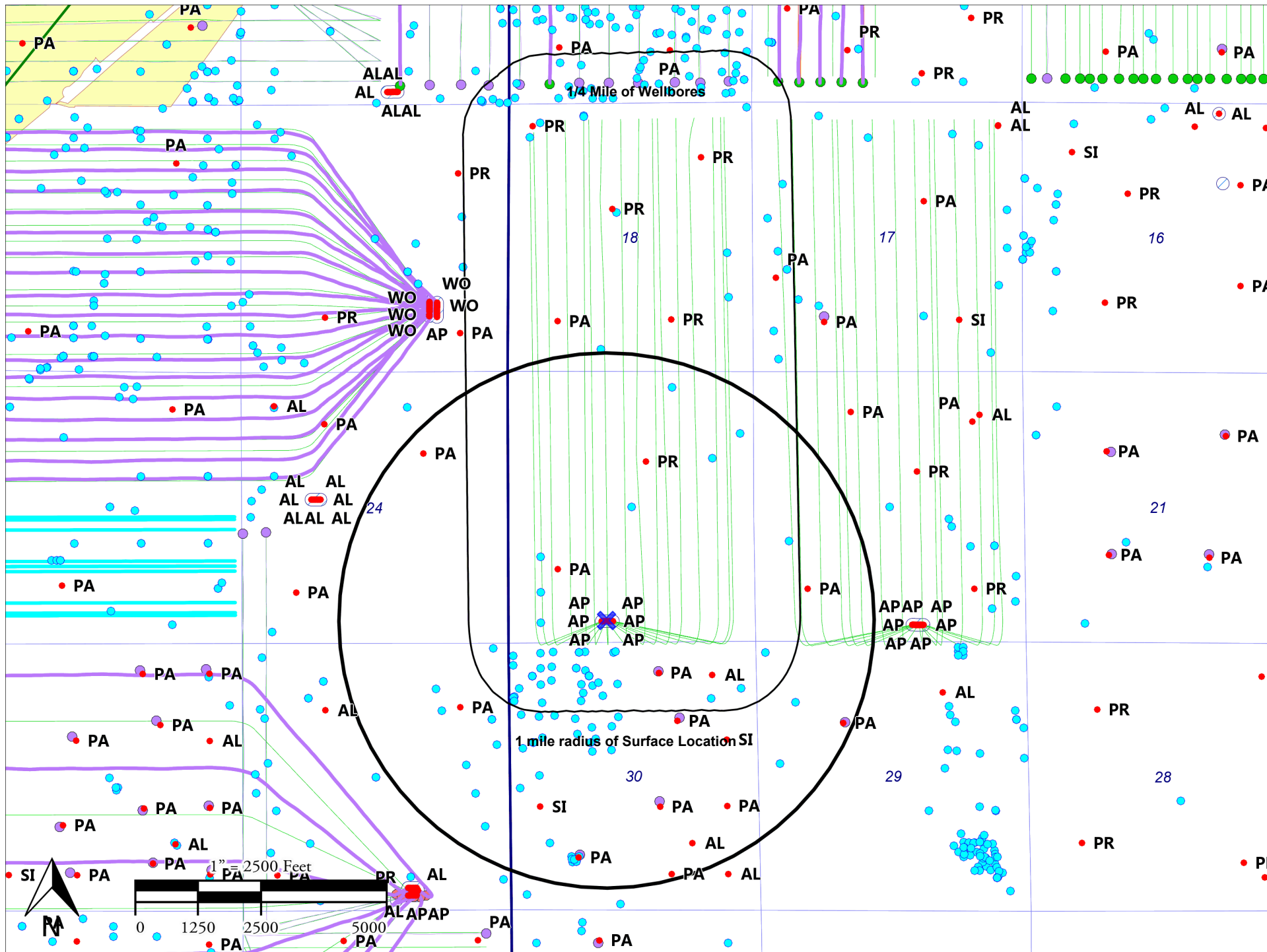
**LOCATION DRAWING**



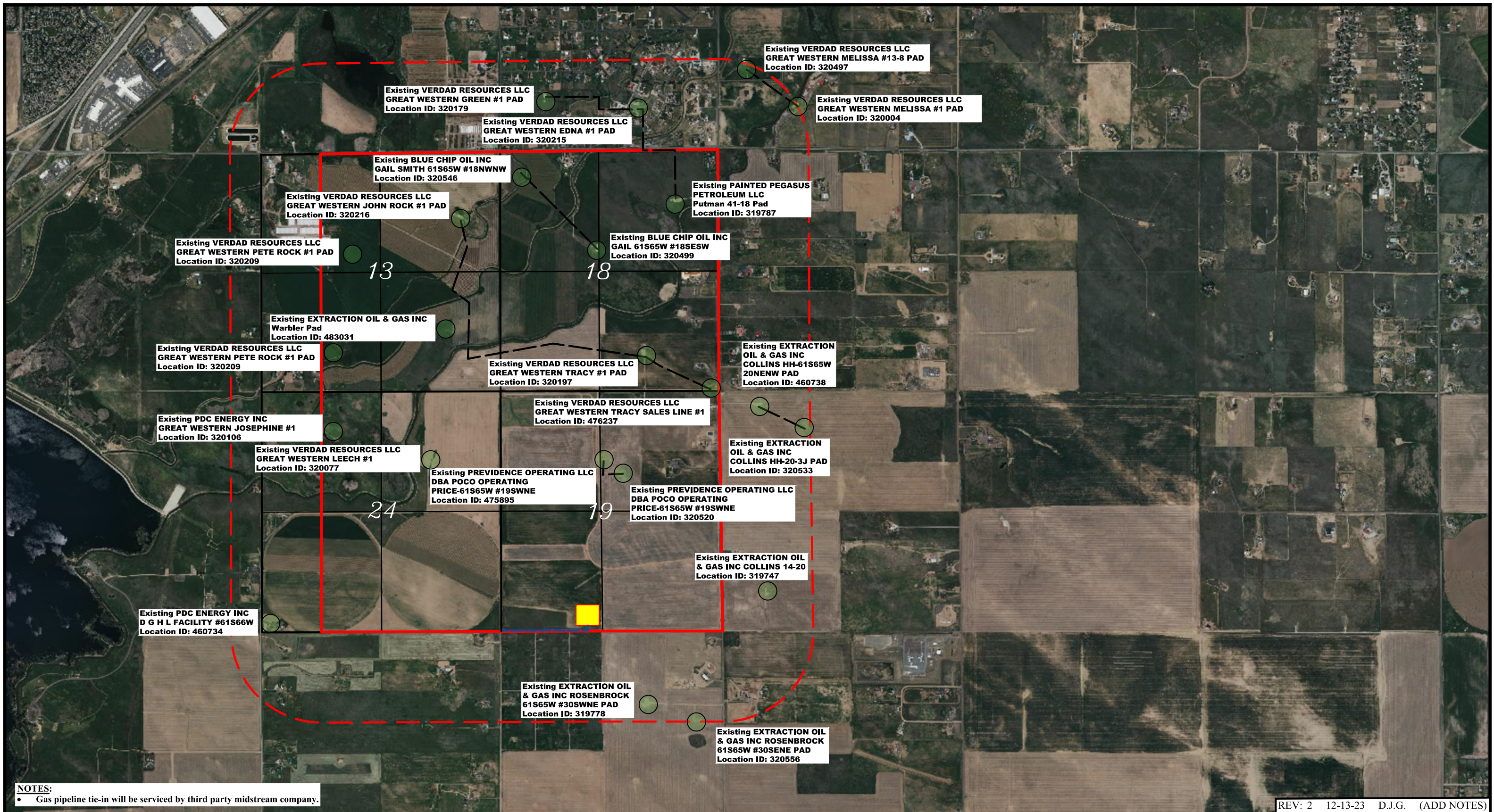
**UELS, LLC**  
 Corporate Office \* 85 South 200 East  
 Vernal, UT 84078 \* (435) 789-1017



# IMPACT AREA MAP







**NOTES:**  
• Gas pipeline tie-in will be serviced by third party midstream company.

REV: 2 12-13-23 D.J.G. (ADD NOTES)

- LEGEND:**
- OGD P BOUNDARY
  - - - 2000' OFFSET FROM OGD P BOUNDARY
  - - - EXISTING FLOWLINE
  - - - PROPOSED ACCESS ROAD
  - WORKING PAD SURFACE
  - OIL/GAS LOCATION

**UINTAH**  
ENGINEERING & LAND SURVEYING

**UELS, LLC**  
Corporate Office \* 85 South 200 East  
Vernal, UT 84078 \* (435) 789-1017



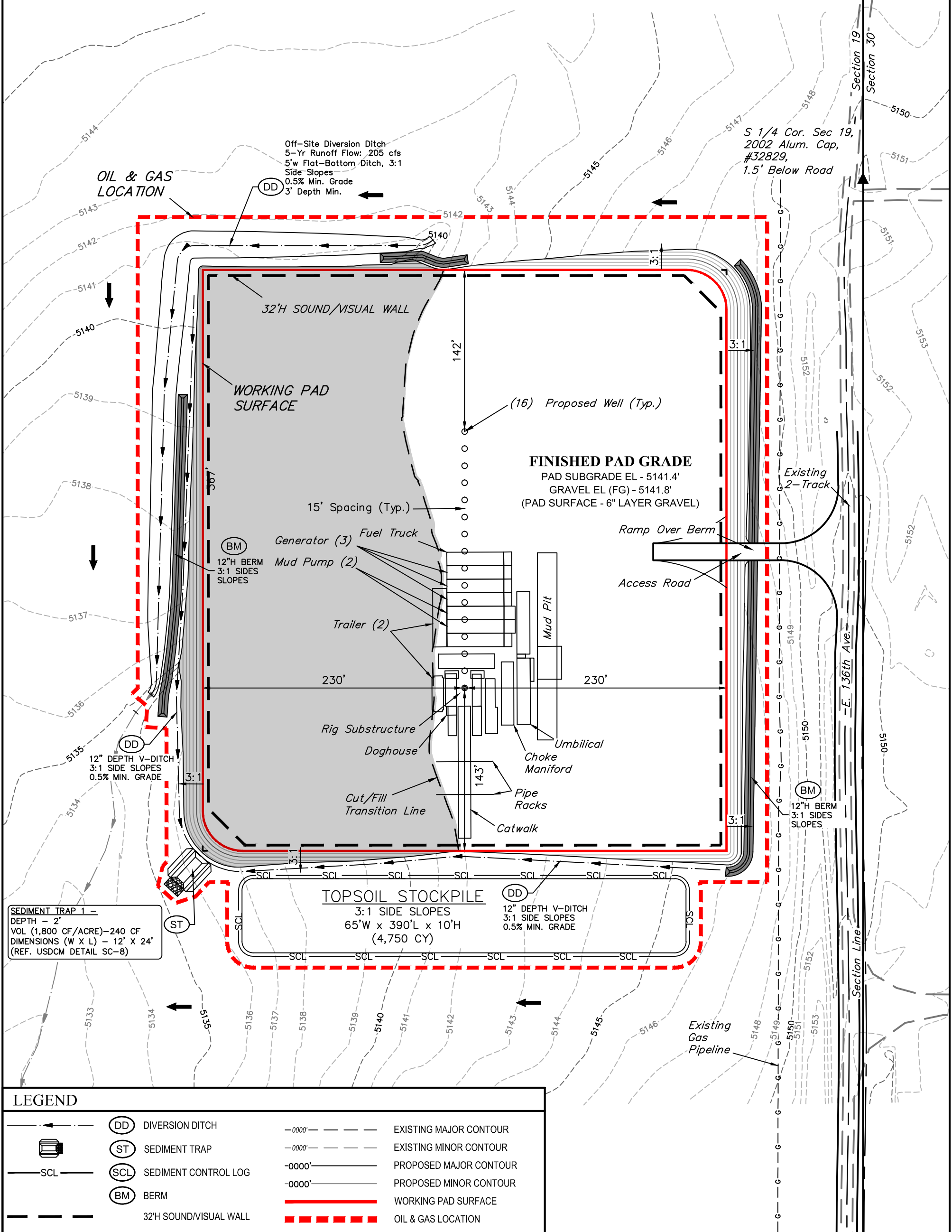
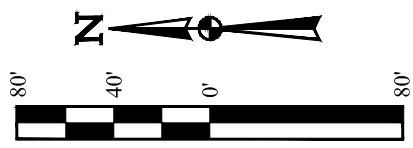
**POCO OPERATING**

**CONNER 19-18 PAD**  
SE 1/4 SW 1/4, SECTION 19, T1S, R65W, 6th P.M.  
ADAMS COUNTY, COLORADO

SURVEYED BY	GREG WEIMER, O.R.	06-15-22	SCALE
DRAWN BY	E.C.	08-03-22	1" = 2000'

**RELATED LOCATION & FLOWLINE MAP**





**SEDIMENT TRAP 1 -**  
 DEPTH - 2'  
 VOL (1,800 CF/ACRE)-240 CF  
 DIMENSIONS (W X L) - 12' X 24'  
 (REF. USDCM DETAIL SC-8)

LEGEND	
	(DD) DIVERSION DITCH
	(ST) SEDIMENT TRAP
	(SCL) SEDIMENT CONTROL LOG
	(BM) BERM
	32'H SOUND/VISUAL WALL
	-0000'- - - - - EXISTING MAJOR CONTOUR
	-0000'- - - - - EXISTING MINOR CONTOUR
	-0000'- - - - - PROPOSED MAJOR CONTOUR
	-0000'- - - - - PROPOSED MINOR CONTOUR
	WORKING PAD SURFACE
	OIL & GAS LOCATION

**NOTES:**  
 • Overall working pad surface = 510' x 460'  
 • Contours shown at 1' intervals.

**POCO OPERATING**

**CONNER 19-18 PAD**  
 SE 1/4 SW 1/4, SECTION 19, T1S, R65W, 6th P.M.  
 ADAMS COUNTY, COLORADO

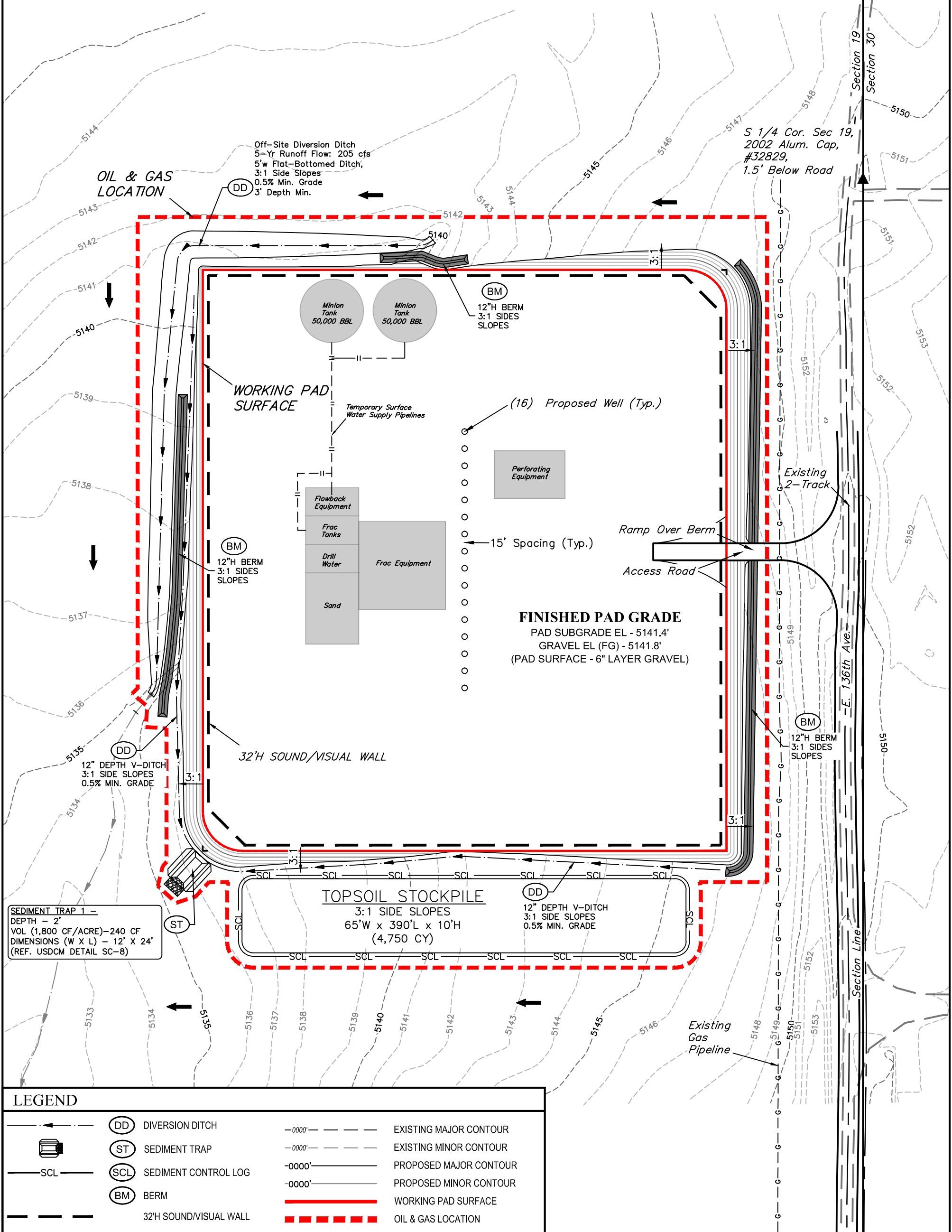
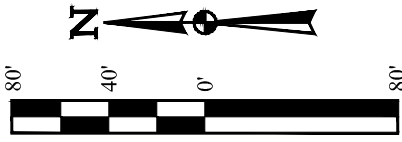
<b>SURVEYED BY</b>	GREG WEIMER, O.R.	06-15-22	<b>SCALE</b>
<b>DRAWN BY</b>	E.C.	08-03-22	1" = 80'

**PRELIMINARY DRILL RIG LAYOUT**



**UELS, LLC**  
 Corporate Office \* 85 South 200 East  
 Vernal, UT 84078 \* (435) 789-1017

REV: 1 12-13-23 D.J.G. (UPDATE EQUIPMENT)



**NOTES:**

- Contours shown at 1' intervals.
- Overall working pad surface = 510' x 460'
- Cut/Fill slopes 3:1 (Typ.).
- Gas pipeline tie-in will be serviced by third party midstream company.

**POCO OPERATING**

**CONNER 19-18 PAD**  
SE 1/4 SW 1/4, SECTION 19, T1S, R65W, 6th P.M.  
ADAMS COUNTY, COLORADO



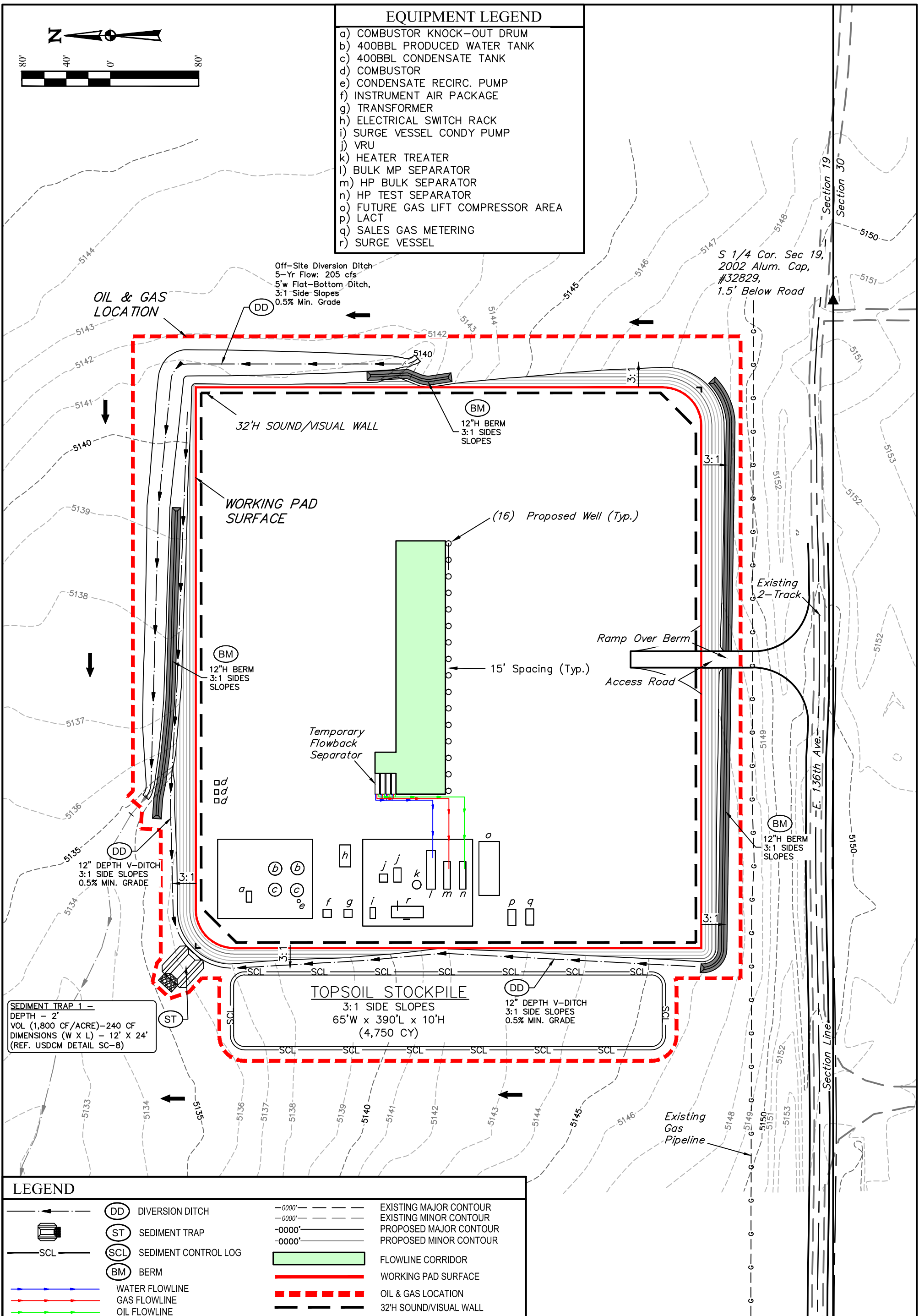
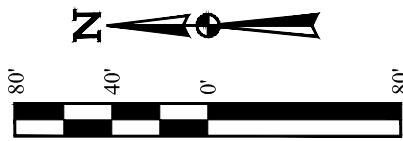
**UELS, LLC**  
Corporate Office \* 85 South 200 East  
Vernal, UT 84078 \* (435) 789-1017

REV: 1 12-13-23 D.J.G. (UPDATE EQUIPMENT)

<b>SURVEYED BY</b>	GREG WEIMER, O.R.	06-15-22	<b>SCALE</b>
<b>DRAWN BY</b>	E.C.	08-03-22	1" = 80'
<b>PRELIMINARY WELL COMPLETION &amp; STIMULATION LAYOUT</b>			

**EQUIPMENT LEGEND**

- a) COMBUSTOR KNOCK-OUT DRUM
- b) 400BBL PRODUCED WATER TANK
- c) 400BBL CONDENSATE TANK
- d) COMBUSTOR
- e) CONDENSATE RECIRC. PUMP
- f) INSTRUMENT AIR PACKAGE
- g) TRANSFORMER
- h) ELECTRICAL SWITCH RACK
- i) SURGE VESSEL CONDY PUMP
- j) VRU
- k) HEATER TREATER
- l) BULK MP SEPARATOR
- m) HP BULK SEPARATOR
- n) HP TEST SEPARATOR
- o) FUTURE GAS LIFT COMPRESSOR AREA
- p) LACT
- q) SALES GAS METERING
- r) SURGE VESSEL



**SEDIMENT TRAP 1 -**  
 DEPTH - 2'  
 VOL (1,800 CF/ACRE)-240 CF  
 DIMENSIONS (W X L) - 12' X 24'  
 (REF. USDCM DETAIL SC-8)

LEGEND	
	DD DIVERSION DITCH
	ST SEDIMENT TRAP
	SCL SEDIMENT CONTROL LOG
	BM BERM
	WATER FLOWLINE
	GAS FLOWLINE
	OIL FLOWLINE
	EXISTING MAJOR CONTOUR
	EXISTING MINOR CONTOUR
	PROPOSED MAJOR CONTOUR
	PROPOSED MINOR CONTOUR
	FLOWLINE CORRIDOR
	WORKING PAD SURFACE
	OIL & GAS LOCATION
	32'H SOUND/VISUAL WALL

- NOTES:**
- Contours shown at 1' intervals.
  - Overall working pad surface = 510' x 460'
  - Cut/Fill slopes 3:1 (Typ.).

**POCO OPERATING**

**CONNER 19-18 PAD**  
 SE 1/4 SW 1/4, SECTION 19, T1S, R65W, 6th P.M.  
 ADAMS COUNTY, COLORADO



**UELS, LLC**  
 Corporate Office \* 85 South 200 East  
 Vernal, UT 84078 \* (435) 789-1017

REV: 1 12-13-23 D.J.G. (UPDATE EQUIPMENT)

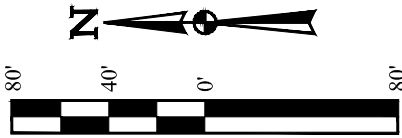
SURVEYED BY	GREG WEIMER, O.R.	06-15-22	SCALE
DRAWN BY	E.C.	08-03-22	1" = 80'

**PRELIMINARY FLOWBACK EQUIPMENT LAYOUT**



**EQUIPMENT LEGEND**

- a) COMBUSTOR KNOCK-OUT DRUM
- b) 400BBL PRODUCED WATER TANK
- c) 400BBL CONDENSATE TANK
- d) COMBUSTOR
- e) CONDENSATE RECIRC. PUMP
- f) INSTRUMENT AIR PACKAGE
- g) TRANSFORMER
- h) ELECTRICAL SWITCH RACK
- i) SURGE VESSEL CONDY PUMP
- j) VRU
- k) HEATER TREATER
- l) BULK MP SEPARATOR
- m) HP BULK SEPARATOR
- n) HP TEST SEPARATOR
- o) FUTURE GAS LIFT COMPRESSOR AREA
- p) LACT
- q) SALES GAS METERING
- r) SURGE VESSEL



**OIL & GAS LOCATION**

Off-Site Diversion Ditch  
5-Yr Flow: 205 cfs  
5'w Flat-Bottomed Ditch,  
3:1 Side Slopes  
0.5% Min. Grade

S 1/4 Cor. Sec 19,  
2002 Alum. Cap,  
#32829,  
1.5' Below Road

**PRODUCTION PAD SURFACE**

PAD DITCH-5:  
L - 256 FT  
DEPTH - 12" MIN.  
3:1 SIDE SLOPES,  
SLOPE: MIN. 0.25%  
UNLINED

(16) Proposed Well (Typ.)

15' Spacing (Typ.)

**PRODUCTION FACILITY PAD**

**FINISHED PAD GRADE**

PAD SUBGRADE EL - 5141.4'  
GRAVEL EL (FG) - 5141.8'  
(PAD SURFACE - 6" LAYER GRAVEL)

BM  
12"H BERM  
3:1 SIDES  
SLOPES

Install 18"  
Culvert  
L - 35 FT

Existing  
2-Track

**WORKING PAD SURFACE**

PAD DITCH-5:  
L - 269 FT  
DEPTH - 12" MIN.  
3:1 SIDE SLOPES,  
SLOPE: MIN. 0.25%  
UNLINED

BM  
12"H BERM  
3:1 SIDES  
SLOPES

**TOPSOIL STOCKPILE**

3:1 SIDE SLOPES  
65'W x 275'L x 10'H  
(3,270 CY)

SEDIMENT TRAP 1 -  
DEPTH - 2'  
VOL (1,800 CF/ACRE)-240 CF  
DIMENSIONS (W X L) - 12' X 24'  
(REF. USDCM DETAIL SC-8)

**LEGEND:**  
Reclaimed Area

APPROXIMATE UN-RECLAIMED ACREAGE = ±5.657 ACRES  
APPROXIMATE RECLAIMED ACREAGE = ±2.395 ACRES  
TOTAL OIL & GAS LOCATION = ±8.052 ACRES

SIZE OF DISTURBED AREA AFTER INTERIM  
RECLAMATION IN ACRES (COGCC 2A REPORTABLE):  
5.657 ACRES

**LEGEND**

- DD DIVERSION DITCH
- ST SEDIMENT TRAP
- SCL SEDIMENT CONTROL LOG
- SM SEEDING AND MULCHING
- BM BERM
- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- PROPOSED MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- WORKING PAD SURFACE
- OIL & GAS LOCATION
- PRODUCTION PAD SURFACE
- LIMITS OF PERMANENT DISTURBANCE

**NOTES:**

- Contours shown at 1' intervals.
- Overall working pad surface = 510' x 460'
- Cut/Fill slopes 3:1 (Typ.).
- Gas pipeline tie-in will be serviced by third party midstream company.

**POCO OPERATING**

**CONNER 19-18 PAD**  
SE 1/4 SW 1/4, SECTION 19, T1S, R65W, 6th P.M.  
ADAMS COUNTY, COLORADO

SURVEYED BY	GREG WEIMER, O.R.	06-15-22	SCALE
DRAWN BY	E.C.	08-03-22	1" = 80'

**FACILITY LAYOUT**



**UELS, LLC**  
Corporate Office \* 85 South 200 East  
Vernal, UT 84078 \* (435) 789-1017

REV: 1 12-13-23 D.J.G. (UPDATE EQUIPMENT)

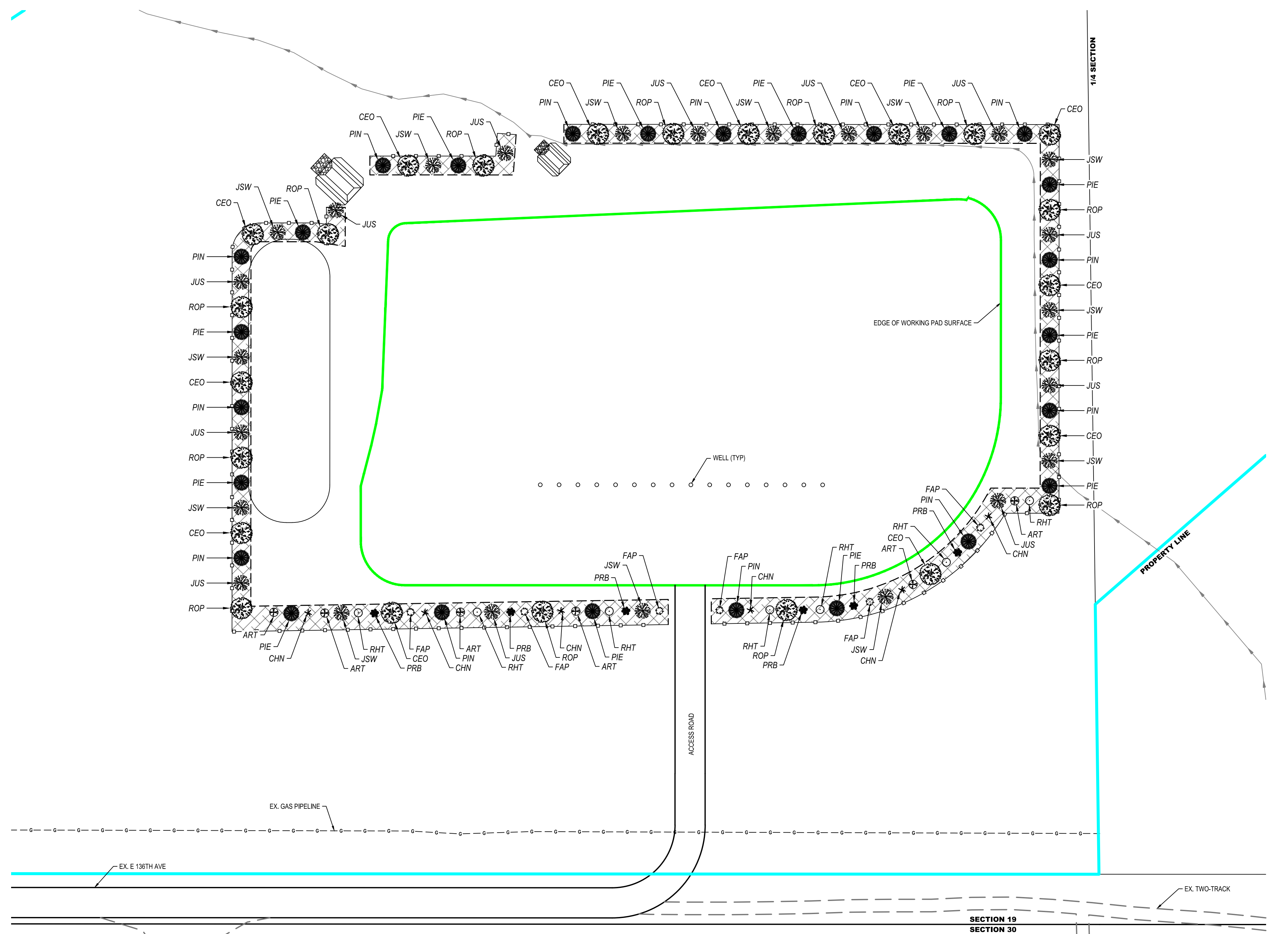


**LANDSCAPE DESIGNER**  
 Uintah Engineering & Land Surveying, LLC  
 Headquarters  
 85 South 200 East  
 Vernal, Utah 84078  
 (435) 789-1017  
 Colorado Branch  
 3313 35th Ave. #1B  
 Evans, CO 80620  
 (970) 506-1544



**LEGEND:**

	TREES
	SHRUBS
	MULCH - 3" DEPTH CASCADE CEDAR
	6" PRIVACY FENCE
	STEEL EDGER



**LANDSCAPE BUFFER REQUIREMENT TABLE**

LINEAR FEET OF BUFFER	TREES REQUIRED	TREES PROVIDED
625 LF OF STREET FRONTAGE	1 TREE PER 40 LF OF BUFFER: 16 TREES	16 TREES
	SHRUBS REQUIRED	SHRUBS PROVIDED
	2 SHRUBS PER 40 LF OF BUFFER: 31 SHRUBS	32 SHRUBS
1,224 LF AT ADJACENT PROPERTY LINES	3 TREES PER 60 LF OF BUFFER: 61 TREES	65 TREES
	SHRUBS REQUIRED	SHRUBS PROVIDED
	2 SHRUBS PER 60 LF OF BUFFER: 122 SHRUBS	125 SHRUBS

- NOTES**
- STREET FRONTAGE LANDSCAPE BUFFER PLANTING REQUIREMENTS SHALL BE CALCULATED AT 1 TREE AND 2 SHRUBS PER EVERY 40 LINEAR FEET OF BUFFER. BUFFER IS REQUIRED TO BE 20' WIDE. DEVELOPMENT STANDARDS AND REGULATIONS SECTION 4-19-07-1.
  - ADJACENT PROPERTY LINES LANDSCAPE BUFFER PLANTING REQUIREMENTS SHALL BE CLASSIFIED AS BUFFER YARD D (NEW INDUSTRIAL USE ADJUTING EXISTING AGRICULTURAL USE), AND SHALL BE CALCULATED AT 3 TREES PER EVERY 60 LINEAR FEET OF BUFFER. BUFFER IS REQUIRED TO BE 15' WIDE. DEVELOPMENT STANDARDS AND REGULATIONS SECTION 4-19-06-1.
  - THIS LANDSCAPING PLAN WAS DEVELOPED TO BE XERISCAPED WITH NATIVE TREES, AND SHRUBS. IT IS ANTICIPATED THAT ONCE THE NATIVE LANDSCAPING IS ESTABLISHED, IRRIGATION WILL NOT BE NEEDED.

**XERISCAPE PLANT LIST**

**TREES**

SYMBOL	KEY	QTY.	COMMON NAME	BOTANICAL NAME	SIZE	COND.
	CEO	12	WESTERN HACKBERRY	CELTIS OCCIDENTALIS	2.5" CALIPER	B&B
	ROP	13	BLACK LOCUST	ROBINIA PSEUDOCACIA	2.5" CALIPER	B&B
	JSW	13	'WICHITA BLUE' JUNIPER	JUNIPERUS SCOPULORUM 'WICHITA BLUE'	6 FT HT	B&B
	JUS	12	'ROCKY MOUNTAIN' JUNIPER	JUNIPERUS SCOPULORUM	6 FT HT	B&B
	PIE	13	PINYON PINE	PINUS EDULIS	6 FT HT	B&B
	PIN	13	AUSTRIAN PINE	PINUS NIGRA	6 FT HT	B&B

QUANTITIES BASED ON PERCENTAGE OF TOTAL TREE REQUIREMENT TOTAL: 81 TREES

**SHRUBS**

SYMBOL	KEY	QTY.	COMMON NAME	BOTANICAL NAME	SIZE	COND.
	ART	6	TALL WESTERN SAGE	ARTEMISIA TRIDENTATA	5 GAL.	B&B
	CHN	6	RABBIT BRUSH	CHRYSOTHAMNUS NAUSEOSUS	5 GAL.	B&B
	FAP	6	APACHE PLUME	FALLUGIA PARADOXA	5 GAL.	B&B
	PRB	6	WESTERN SAND CHERRY	PRUNUS BESSEYI	5 GAL.	B&B
	RHT	7	THREE-LEAF SUMAC	RHUS TRILOBATA	5 GAL.	B&B

QUANTITIES BASED ON PERCENTAGE OF TOTAL SHRUB REQUIREMENT TOTAL: 32 SHRUBS



PRIVACY FENCE DETAIL (TREX SADDLE COLORED 6" FENCE, OR SIMILAR)  
 \*1300' PROP. FENCE DIST.

**SURVEY BENCHMARK**  
 COA ID: 45624NE001  
 DESCRIPTION: 3 1/2 INCH DIAMETER ALUMINUM CAP STAMPED (ARAPAHOE COUNTY MAPPING, BENCHMARK, BM 010101, 2000, PLS 11424), ON 3 FOOT SMOOTH ALUMINUM RODS, WITH TWO CARBONITE POSTS, ±33 FEET WEST OF THE CENTERLINE OF WATKINS ROAD, BELOW A NORTH-SOUTH OVERHEAD POWER LINES, ±10 FEET WEST OF THE TOE OF SLOPE, AND ±3.2 MILES SOUTH OF F-70 AND WATKINS ROAD.  
 LATITUDE: 39° 41' 40.08" N  
 LONGITUDE: 104° 36' 12.54" W (NAD 83)  
 ELEV: 5689.89 (NAVD 88)  
 \*DO NOT USE FOR PAD LOCATION.

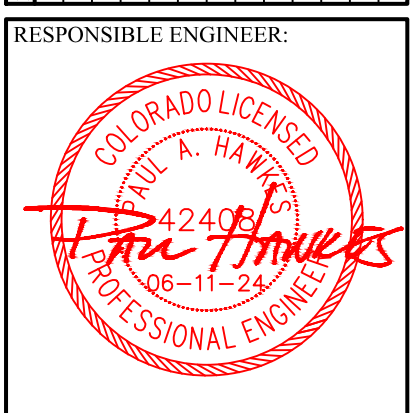
**DISCLAIMER:**  
 THIS PLOT DOES NOT REPRESENT A MONUMENTED LAND SURVEY AND SHOULD NOT BE RELIED UPON TO DETERMINE BOUNDARY LINES, PROPERTY OWNERSHIP OR OTHER PROPERTY INTERESTS. PARCEL LINES, IF DEPICTED, HAVE NOT BEEN VERIFIED AND MAY BE BASED UPON PUBLICLY AVAILABLE DATA THAT ALSO HAS NOT BEEN INDEPENDENTLY VERIFIED.  
 NOTE: EXISTING TOPOGRAPHY INFORMATION WAS COLLECTED BY UINTAH ENGINEERING & LAND SURVEYING ON 11-22-2021.

CALL 811  
 TWO WORKING DAYS  
**BEFORE YOU DIG**  
 1-800-922-1987



**POCO OPERATING**  
**CONNER 19-18 PAD**  
**GESC PLAN**  
**SEC. 19, T1S, R65W, 6th P.M.**  
**ADAMS COUNTY, COLORADO**

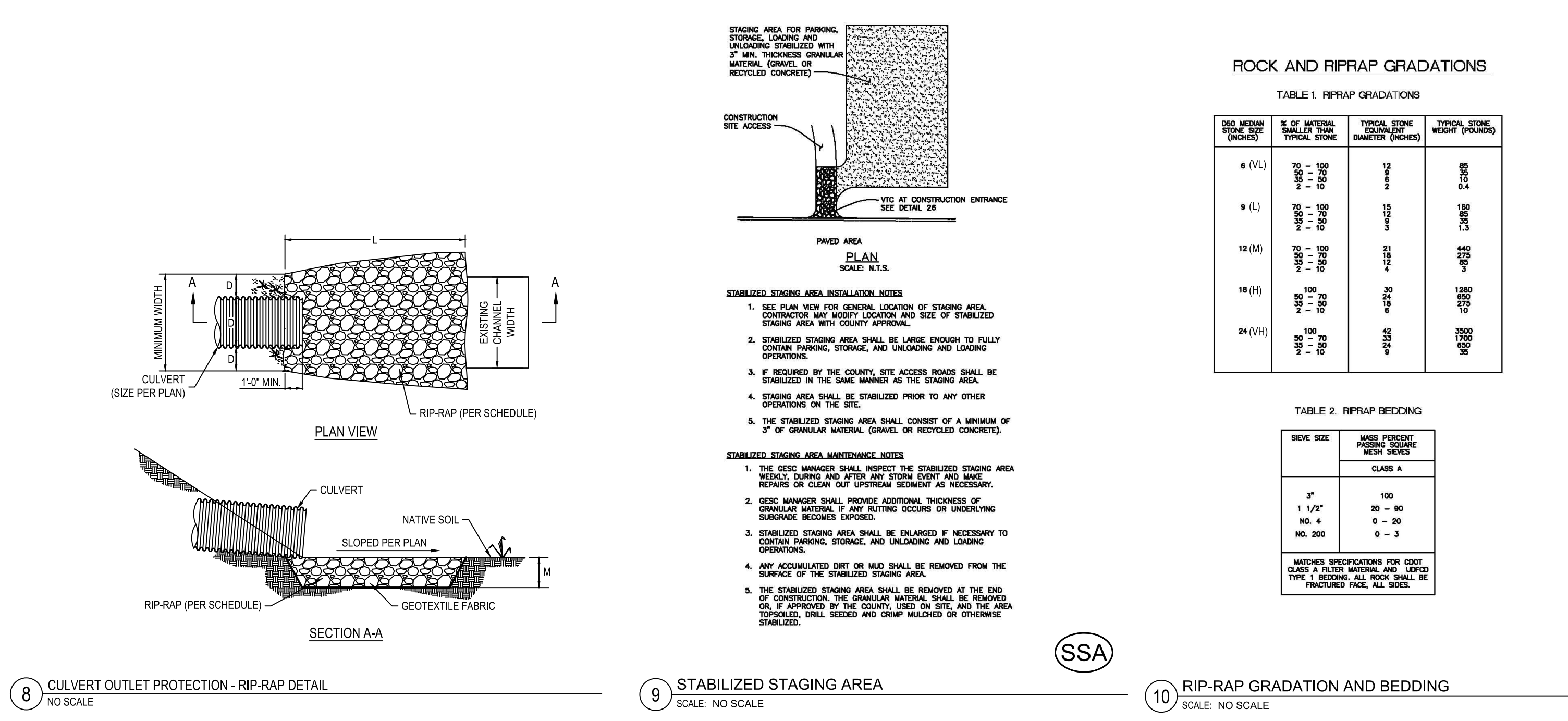
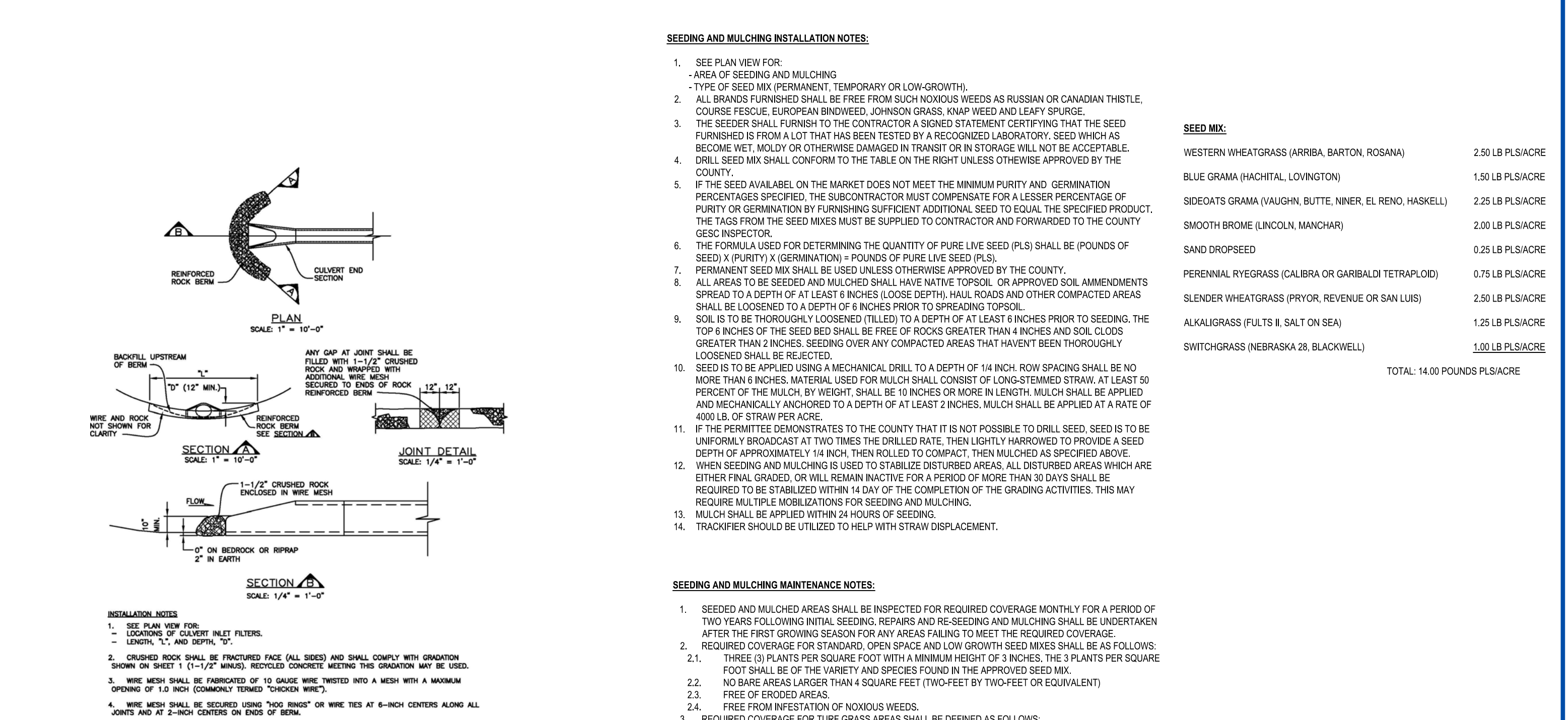
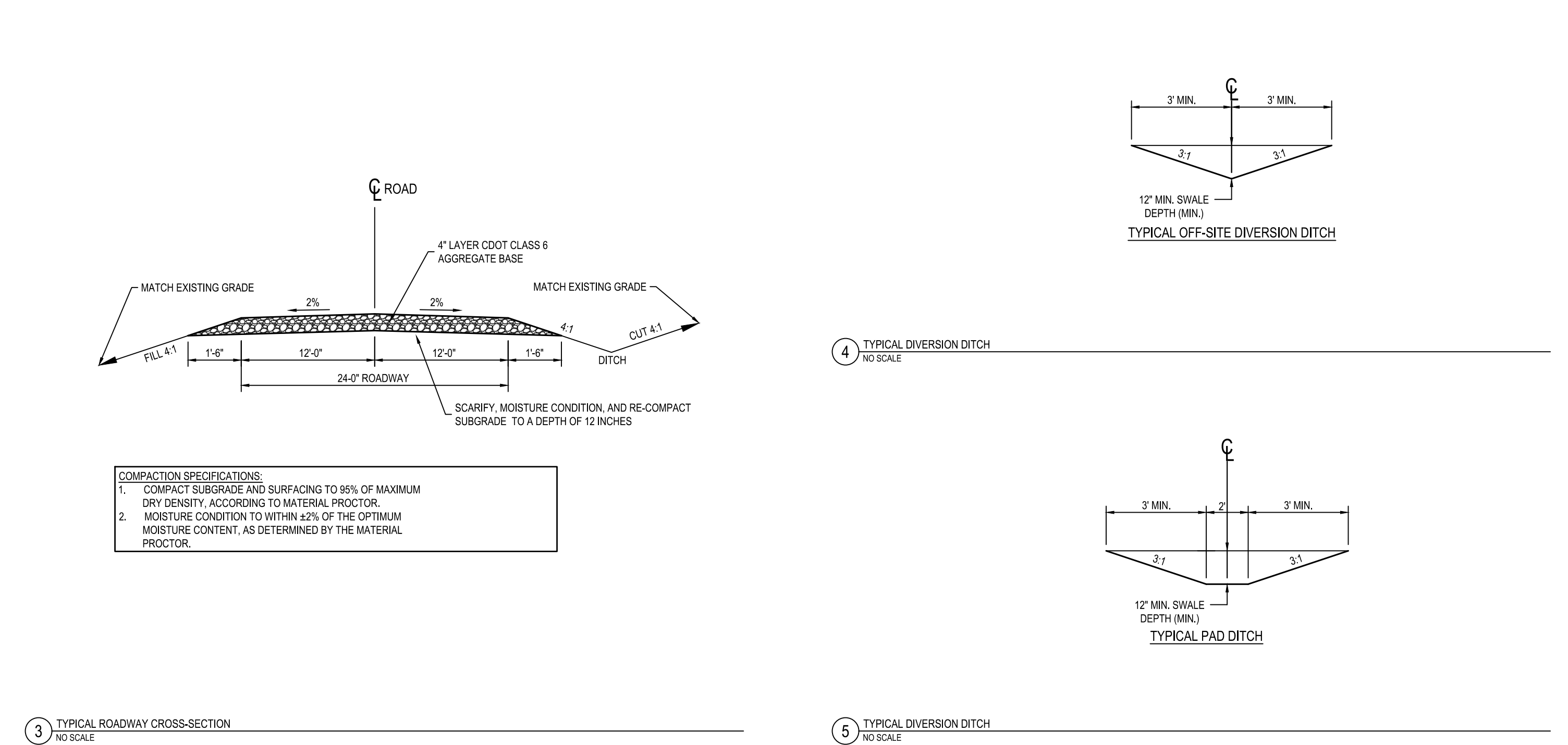
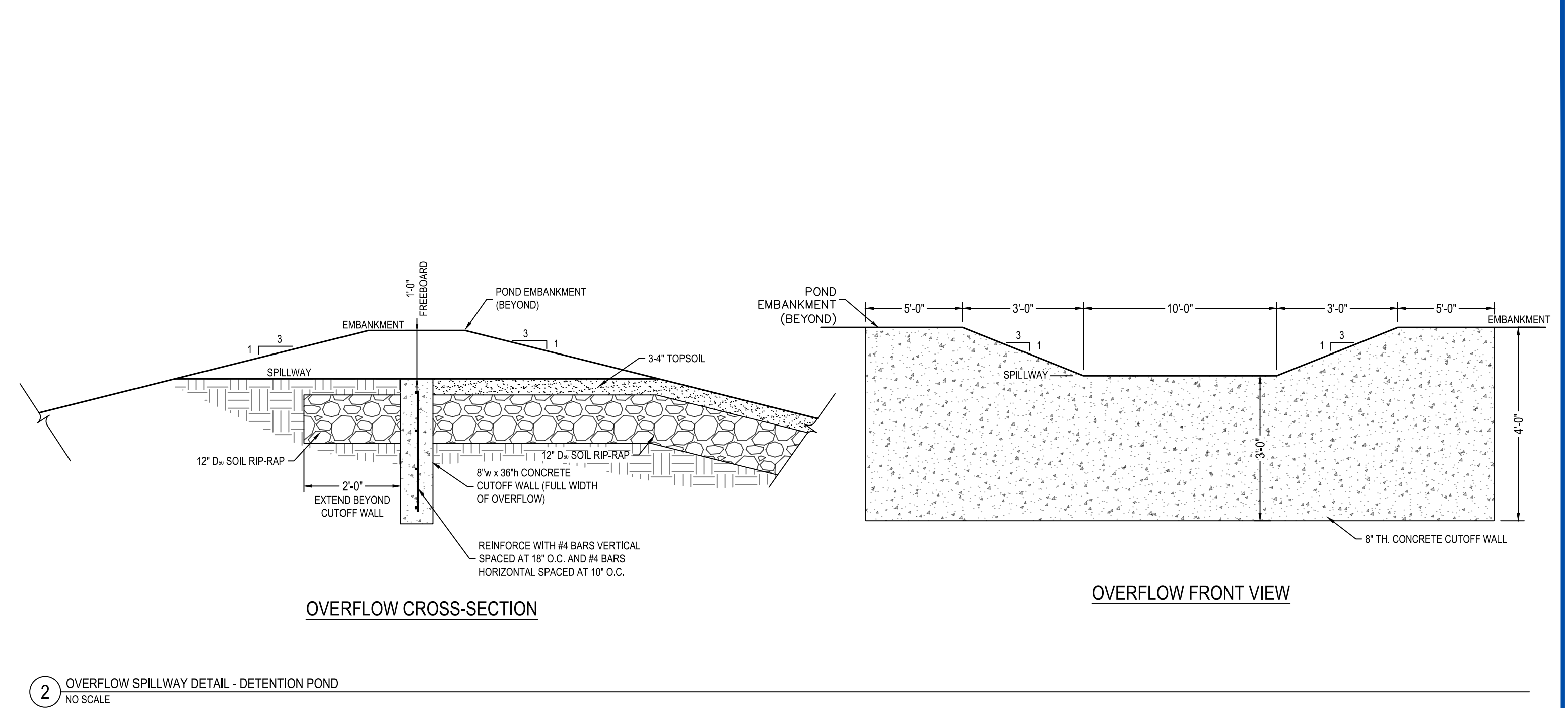
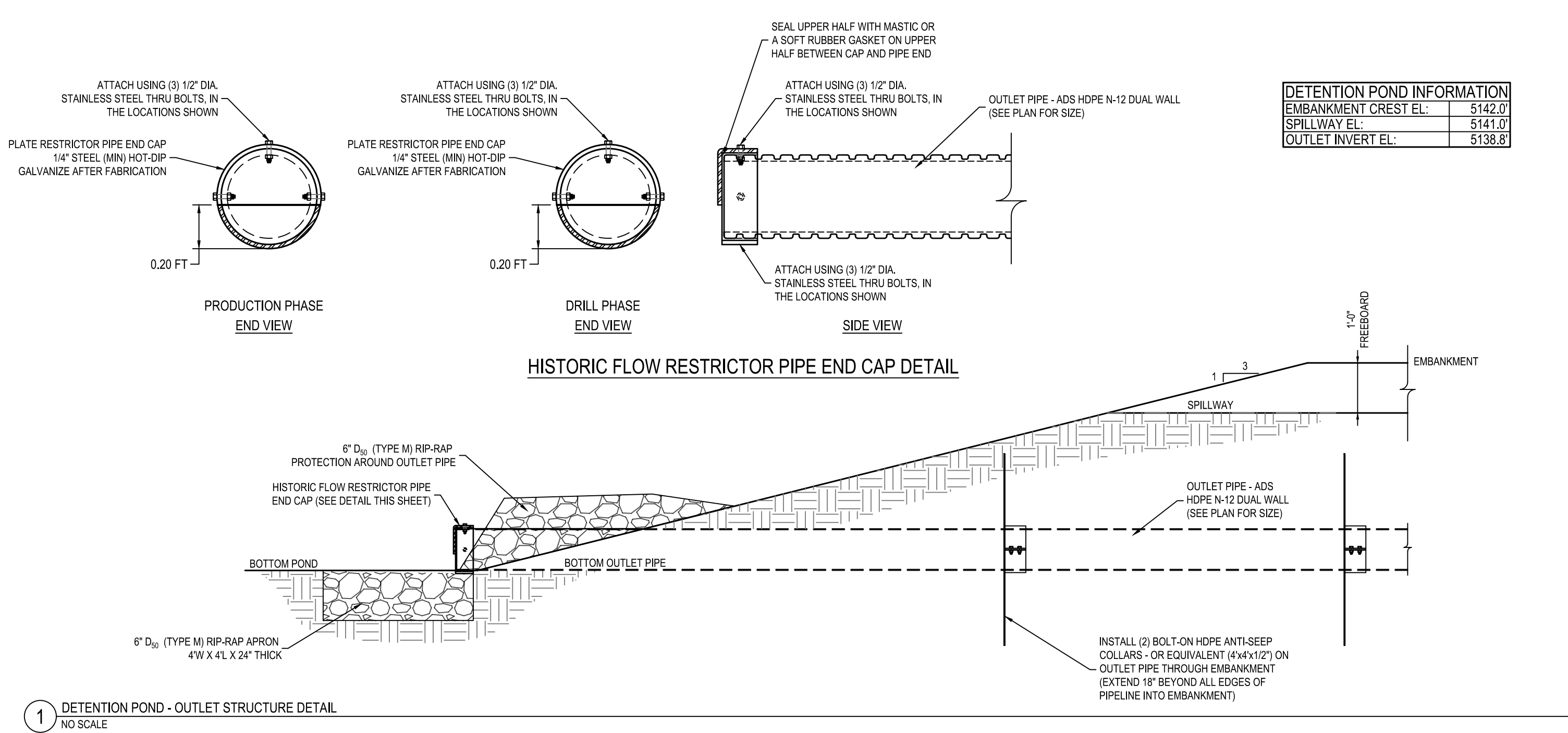
REV.	DATE	BY	REVISION
1			



RESPONSIBLE ENGINEER:  
**T. A. Hawley**  
 PROFESSIONAL ENGINEER  
 LANDSCAPING PLAN  
 SCALE: AS NOTED  
 DRAWN BY: CC  
 DATE DRAWN: 04-23-2024  
 UELS FILE NO.: P - 2 0 3 1  
 PROJ. NO.: PRO06-21-0001  
 FILE: P - 2 0 3 1  
 SHEET  
**C104**

E:\FILE 01\04002\0204\F-AN\WOOD\OWNER 19-28 PAD P-2021\UML\OWNER - GESC.dwg  
 CALDER 6/7/2024 2:14 PM ARSH FULL BLEED 0 (9.00 x 24.00 INCHES)





REV	DATE	BY	CHKD	DESCRIPTION
1	06/11/24	J.C.	J.C.	ISSUED FOR BIDDING
2		J.C.	J.C.	REVISED PRODUCTION DRAWING

RESPONSIBLE ENGINEER:  
  
**T. A. Hawley**  
 PROFESSIONAL ENGINEER

CONSTRUCTION DETAILS

SCALE: AS NOTED  
 DRAWN BY: CC  
 DATE DRAWN: 04-23-2024  
 UELS FILE NO.: P-2-0-3-1  
 PROJ. NO.: P006-21-001  
 FILE: P-2-0-3-1

SHEET  
**C501**

E:\FILE 01\WORK\2024\CONNER 19-18 PAD P-2024\UPL\CONNER - GESC.PKG 6/12/2024 2:14 PM ARSH FULL BLEED 0.0000 X 24.00 INCHES





## Operations Schedule

<b>Phase</b>	<b>Quarter</b>	<b>Duration</b>
<b>Construction</b>	Q2 2025	2 Weeks
<b>Drilling</b>	Q2 2025	18 Weeks
<b>Completions and Flowback</b>	Q3 2025	13 Weeks
<b>Production</b>	Q3 2025	20 Years
<b>Interim Reclamation</b>	Q4 2025	2 Weeks

# Best Management Practices

#	Category	Sub-Category	BMP Description	Commits? (Y, N, or X)	Modified Committal?	Commitment Text
A1	Air	Timing	Operator will appropriately time activities associated with high emissions to reduce the potential for exposure (e.g. if development is occurring near a high occupancy building unit, such as a school, then hydraulic fracturing, flowback or hydrocarbon liquids loadout will only occur when school is not in session)	X		
A2	Air	Equipment	Operator will properly maintain vehicles and equipment	Y	N	Operator will properly maintain vehicles and equipment
A3	Air	Equipment	Operator will use non-emitting pneumatic controllers	Y	N	Operator will use non-emitting pneumatic controllers
A4	Air	Electrification	Operator will use electric drilling rigs if available, and will demonstrate best-effort if unable to utilize them	N		
A5	Air	Engines	Operator will use Tier IV or equivalent engines, such as NG Tier II w/ battery assist, (or better) for drilling	Y	N	Operator will use Tier IV or equivalent engines, such as NG Tier II w/ battery assist, (or better) for drilling
A6	Air	Electrification	Operator will use electric pumps for hydraulic fracturing if available, and will demonstrate best-effort if unable to utilize them	N		
A7	Air	Engines	Operator will use Tier IV or equivalent engines, such as NG Tier II w/ battery assist, (or better) for hydraulic fracturing	Y	N	Operator will use Tier IV or equivalent engines, such as NG Tier II w/ battery assist, (or better) for hydraulic fracturing
A8	Air	Electrification	Operator will use electric equipment and devices (e.g. vapor recovery units or VRUs, fans, etc.) to minimize combustion sources on site (if yes, operator will provide a list outlining which equipment and devices will be electrified)	Y	N	Operator will use electric equipment and devices (e.g. vapor recovery units or VRUs, fans, etc.) to minimize combustion sources on site (if yes, operator will provide a list outlining which equipment and devices will be electrified)
A9	Air	Engines	Operator will use Tier IV or equivalent engines, such as NG Tier II w/ battery assist, (or better) for nonroad construction equipment	N		
A10	Air	Engines	Operator will use Tier IV or equivalent engines, such as NG Tier II w/ battery assist, (or better) for fleets accessing site (service vehicles, sand delivery, haul, produced water, etc.)	N		
A11	Air	Tanks	Operator will not store hydrocarbon liquids in permanent storage tanks on site (other than a maintenance tank possibly used for well unloading or other maintenance activities)	Y	Y	Operator will have two permanent hydrocarbon liquids storage tanks on site, and commits to usage of these tanks exclusively during upset conditions or other maintenance activities
A12		Tanks	Operator will not store produced water in permanent storage tanks on site (other than a maintenance tank possibly used for well unloading or other maintenance activities)	N		
A13	Air	Tanks	Operator will implement a "hybrid production flowback method" or "modern production flowback method" (eliminates tanks by routing the oil, natural gas and water directly to permanent production equipment)	N		
A14	Air	Pipelines	Operator will use pipelines to transport water used for hydraulic fracturing to location	Y	N	Operator will use pipelines to transport water used for hydraulic fracturing to location
A15		Pipelines	Operator will use pipelines to transport water used for hydraulic fracturing from location	N		
A16	Air	Pipelines	Operator will have adequate and committed pipeline take away capacity for all produced gas and oil	Y	N	Operator will have adequate and committed pipeline take away capacity for all produced gas and oil
A17	Air	Pipelines	Operator will shut in the facility to reduce the need for flaring if the pipeline is unavailable	Y	N	Operator will shut in the facility to reduce the need for flaring if the pipeline is unavailable
A18	Air	Pipelines	Operator will incorporate options for recycling produced gas onsite during pipeline downtime, such as: using the gas for gas lift systems, routing it to the facility fuel system, or installing a natural gas liquid (NGL) skid to process the gas onsite	N		

A19	Air	Equipment	Operator will use zero-emission desiccant dehydrators or 98% control of hydrocarbon emissions from glycol dehydrators	X		
A20	Air	Equipment	Operator will use compressors equipped with dry seals (if not using centrifugal compressors, select "N/A")	N		
A21	Air	Equipment	Operator will collect emissions from rod packing on reciprocating compressors and rout them through a closed vent system to a process or emissions control device	Y	N	Operator will collect emissions from rod packing on reciprocating compressors and rout them through a closed vent system to a process or emissions control device
A22	Air	Equipment	Operator will use lease automatic custody transfer (LACT) system to remove/reduce the need for truck loadout	Y	N	Operator will use lease automatic custody transfer (LACT) system to remove/reduce the need for truck loadout
A23	Air	Drilling Fluids	Operator will use OGP Group III drilling fluid	Y	N	Operator will use OGP Group III drilling fluid
A24	Air	Drilling Fluids	Operator will use a chiller to cool drilling fluid as it is piped through the recirculation system before routing to the suction tanks (Only applicable if using OGP Group I drilling fluid)	X		
A25	Air	Drilling Fluids	Operator will cover trucks transporting drill cuttings	Y	N	Operator will cover trucks transporting drill cuttings
A26	Air	Drilling Fluids	Operator will use a squeegee or other device to remove drilling fluids from pipes as they exit the wellbore	Y	N	Operator will use a squeegee or other device to remove drilling fluids from pipes as they exit the wellbore
A27	Air	Drilling Fluids	Operator will ensure that all drilling fluid is removed from pipes before storage	Y	N	Operator will ensure that all drilling fluid is removed from pipes before storage
A28	Air	Ozone	Ozone mitigation on forecasted high ozone days: operator will eliminate use of VOC paints and solvents	Y	N	Ozone mitigation on forecasted high ozone days: operator will eliminate use of VOC paints and solvents
A29	Air	Ozone	Ozone mitigation on forecasted high ozone days: operator will minimize vehicle and engine idling	Y	N	Ozone mitigation on forecasted high ozone days: operator will minimize vehicle and engine idling
A30	Air	Ozone	Ozone mitigation on forecasted high ozone days: operator will reduce truck traffic and worker traffic	Y	N	Ozone mitigation on forecasted high ozone days: operator will reduce truck traffic and worker traffic
A31	Air	Ozone	Ozone mitigation on forecasted high ozone days: operator will postpone the refueling of vehicles	Y	N	Ozone mitigation on forecasted high ozone days: operator will postpone the refueling of vehicles
A32	Air	Ozone	Ozone mitigation on forecasted high ozone days: operator will suspend or delay the use of fossil fuel powered ancillary equipment	Y	N	Ozone mitigation on forecasted high ozone days: operator will suspend or delay the use of fossil fuel powered ancillary equipment
A33	Air	Ozone	Ozone mitigation on forecasted high ozone days: operator will postpone construction activities	Y	N	Ozone mitigation on forecasted high ozone days: operator will postpone construction activities
A34	Air	Ozone	Ozone mitigation on forecasted high ozone days: operator will reschedule non-essential operational activities such as pigging, well unloading and tank cleaning	Y	N	Ozone mitigation on forecasted high ozone days: operator will reschedule non-essential operational activities such as pigging, well unloading and tank cleaning
A35	Air	Ozone	Ozone mitigation on forecasted high ozone days: Operator will postpone flowback if emissions cannot be adequately captured with a vapor recovery unit (VRU)	Y	N	Ozone mitigation on forecasted high ozone days: Operator will postpone flowback if emissions cannot be adequately captured with a vapor recovery unit (VRU)
W1	Water	Containment	Operator will use Modular Large Volume Storage Tanks	Y	N	Operator will use Modular Large Volume Storage Tanks
W2	Water	Containment	Secondary containment: Operator will install perimeter controls to control potential sediment-laden runoff in the event of spill or release from Modular Large Volume Storage Tank	Y	N	Secondary containment: Operator will install perimeter controls to control potential sediment-laden runoff in the event of spill or release from Modular Large Volume Storage Tank
W3	Water	General	Operator will recycle or beneficially reuse flowback and produced water for use downhole	N		
P1	PFAS	Fluids	Operator will not use fracturing fluids which contain PFAS compounds	Y	N	Operator will not use fracturing fluids which contain PFAS compounds
P2	PFAS	General	Operator will contribute to nearby fire district(s) to support transition away from PFAS-containing foam through funding, buy-back program participation/promotion, etc.	Y	N	Operator will contribute to nearby fire district(s) to support transition away from PFAS-containing foam through funding, buy-back program participation/promotion, etc.
P3	PFAS	General	Operator will coordinate with nearby fire district(s) to evaluate whether PFAS-free foam can provide the required performance for the specific hazard	Y	N	Operator will coordinate with nearby fire district(s) to evaluate whether PFAS-free foam can provide the required performance for the specific hazard

P4	PFAS	General	If PFAS-containing foam is used at a location: operator will properly characterize the site to determine the level, nature and extent of contamination	Y	N	If PFAS-containing foam is used at a location: operator will properly characterize the site to determine the level, nature and extent of contamination
P5	PFAS	General	If PFAS-containing foam is used at a location: operator will perform appropriate soil and water sampling to determine whether additional characterization is necessary and inform the need for and extent of interim or permanent remedial actions	Y	N	If PFAS-containing foam is used at a location: operator will perform appropriate soil and water sampling to determine whether additional characterization is necessary and inform the need for and extent of interim or permanent remedial actions
P6	PFAS	General	If PFAS-containing foam is used at a location: operator will properly capture and dispose of PFAS-contaminated soil and fire and flush water	Y	N	If PFAS-containing foam is used at a location: operator will properly capture and dispose of PFAS-contaminated soil and fire and flush water

## Permanent Signage



POCO Operating Conner  
19-18 Wellpad  
SE/4 SW/4  
Section 19 T1S R65W  
Adams County, Colorado  
Location ID: 461092

24/7 Emergency Contact  
**720-935-8256**

All signage will adhere to ECMC 605. Proper signage will be posted in a conspicuous place from the time of initial drilling until final abandonment. It will be posted at the intersection of the lease road and the public road providing access to the well site.

During drilling and completion operations, directional sign will be provided by the contractor. They will be posted at significant locations for emergency response crews. At a minimum, they will be posted at the first point of the access road and 136<sup>th</sup> Ave. The sign will be made out of sheet metal and will be at least 3' x 6'.

# POCO Operating Conner 19-18 Well Pad Trucking & Traffic Study

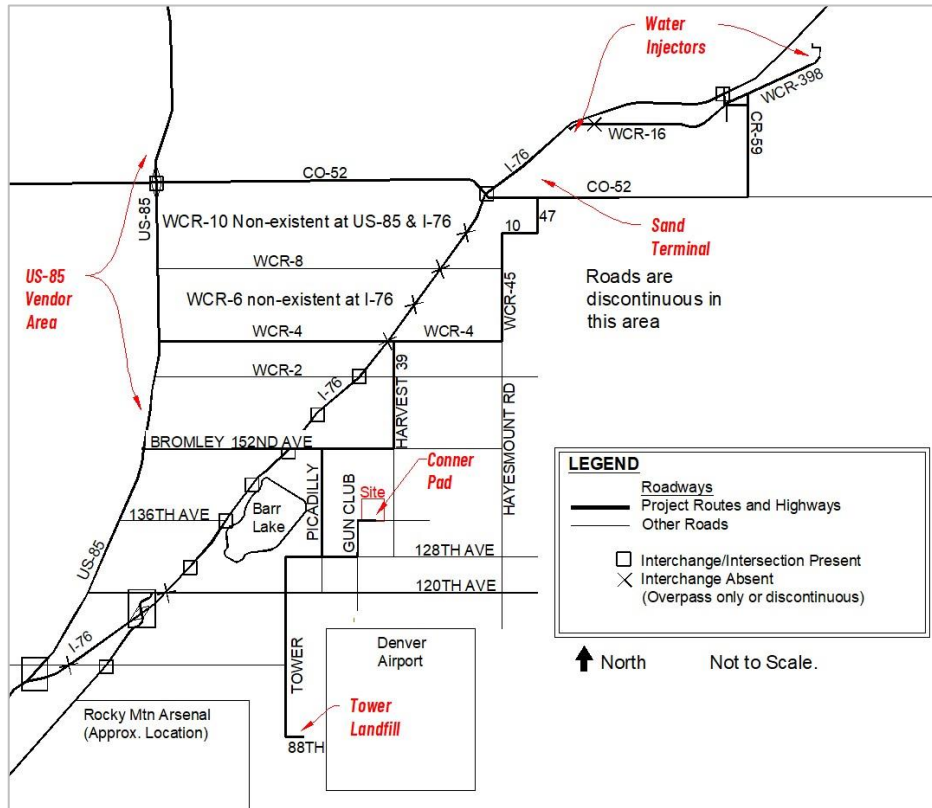


Figure 1. Vicinity Map

## Summary

### Site Description

The proposed Conner Well Pad is an oil and gas well pad located northeast of the intersection of Gun Club Road and East 136th Avenue. The pad will be surfaced with gravel and contain 16 wells with production facilities. The pad will be 8.052 acres during the Construction Phase, and 5.657 acres during the Production Phase.

### Timeline

The project timeline was defined as having a Construction Phase and a Production Phase, which are separated by a Site Occupation event. The Construction Phase will consist of pad and facility



construction, drilling, completions, and removal of frac plugs. Site Occupancy is defined by the wells being placed on flowback after completions. The Production Phase will consist of flowback, production, workover (repairs to wells), plugging the wells, and reclaim of the site.

Time horizons for the study are during flowback, and at five, ten and twenty years after Site Occupancy. The five- and twenty-year horizons are from the ADCO Development Standards and Regulations. Chapter 8. An additional time horizon was chosen during flowback, as this is the period of highest trucking traffic, immediately after Site Occupancy. These three horizons apply to the analysis of traffic impact. The ten-year horizon is from the Adams County Oil & Gas Traffic Impact Study (FHU, 2018), and it applies to the analysis of pavement impact and gravel surfaces impact.

## Routing > Traffic Impact > Pavement Impact

The project traffic was analyzed in terms of truck routing, traffic impact, and impact to road surfaces.

### Routing Summary

Routes for analysis were developed, beginning with the origin and destination of trucks.

Route analysis was performed, with an emphasis on the safety of both the truck drivers and the public, and the routes were ranked based on a list of factors. Truck routes as defined by jurisdictions were reviewed, where available. Analysis of the time gap available to make a left turn on 152nd Avenue at peak hour was performed. This time gap was compared with the time required to make a left turn with a loaded tractor-trailer, and an alternate route was added which eliminates the left turn. Light vehicles will not need to follow the truck route, as they will be able to turn onto 152<sup>nd</sup> Avenue or other east-west roads.

Routes may change based on selection and contracting of vendors; the availability of commodities and services at transloading points; vendor safety, trucking policies, and relocation of service yards; individual driver decision making, road work, decisions of government agencies, and traffic conditions. The routes chosen for analysis are representative of real-world routes.

The trucks will be routed north to Hudson, Keenesburg and the US-85 Vendor Area in Fort Lupton and Brighton, as well as to Tower Landfill and bulk fuel vendors in Commerce City.

Routes were analyzed in the office and a field visit was made to observe traffic. Recommended routes are Routes 2, 3, 6 and 7 as shown below. Routes 1, 4, and 5 were eliminated.

**Route 2:** Bulk Fuel will be routed from Commerce City. The route from the pad is via Gun Club Road, 128<sup>th</sup> Avenue, Tower Road, and 120<sup>th</sup> Avenue.

**Route 3:** Cuttings will be routed to the Tower Landfill via Gun Club Road, 128<sup>th</sup> Avenue, Tower Road and 88<sup>th</sup> Avenue.

**Route 6:** Supplies will be routed from the US-85 Vendor Area. The route from the pad is Gun Club Road, 128<sup>th</sup> Avenue, Hayesmount Road, WCR-45, and WCR-4.

**Route 7:** Sand and Flowback water will be routed from (sand) and to (water) Hudson and Keenesburg, respectively, via Gun Club Road, 128<sup>th</sup> Avenue, Hayesmount Road, WCR-45, and Weld County Roads as required.



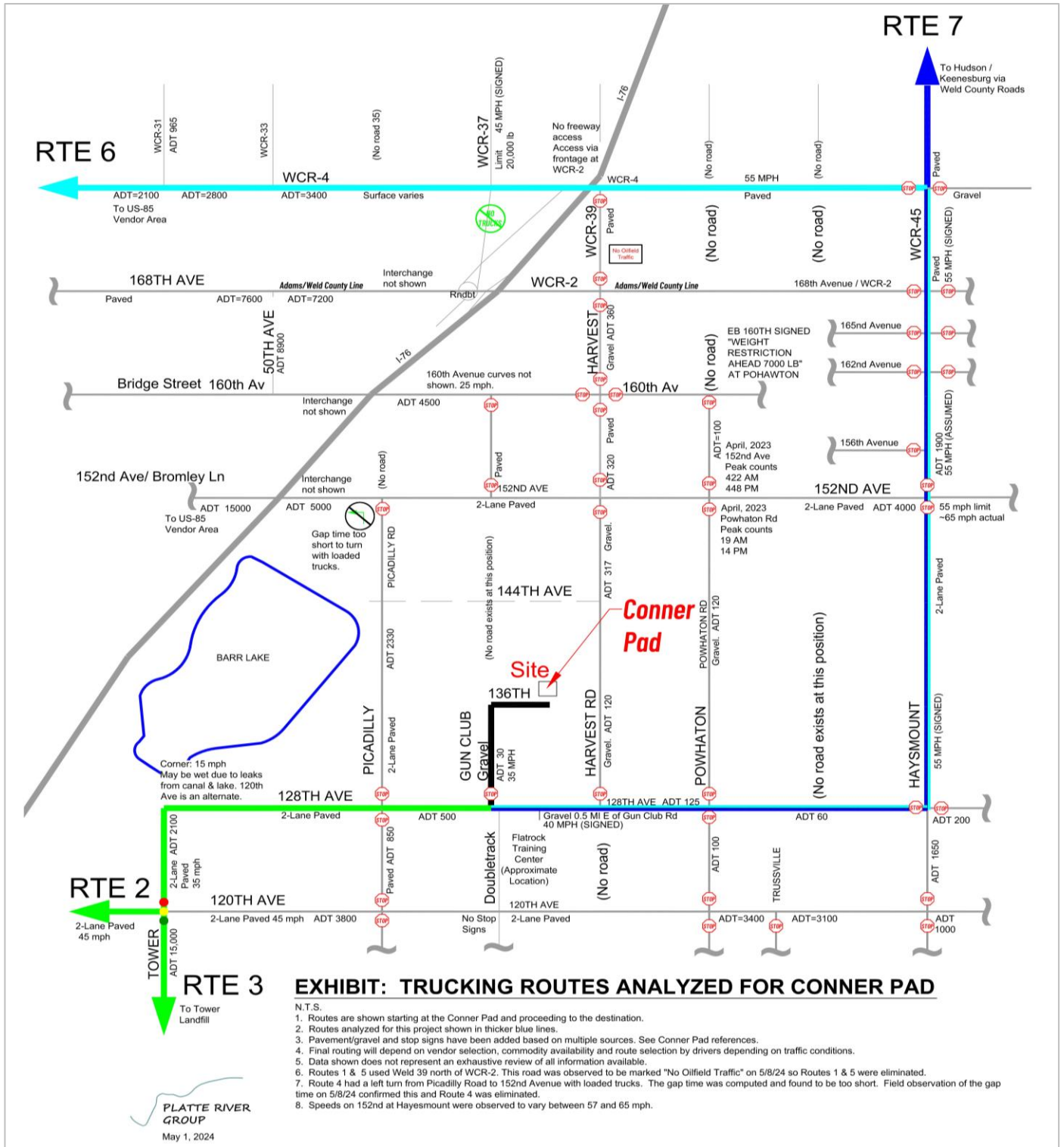


Figure 2. Routes Chosen for Analysis

Per ADCO DSR 8-02-06-01-05, we researched the "existing and committed transportation network." We gained insights from the information gathered, and Appendix B contains a map showing the roads where we can document that maintenance, such as mill-and-overlay, has taken place in recent years. We were unable to determine whether the pavement structure resulting from the repairs and maintenance is sufficient for trucking, due to the lack of information about the initial pavement structure.

## Traffic Impact Summary

It is understood that the County's review engineer will decide if a simulation in a program such as Synchro is required.

The table below contains the trip generation for the Production Phase. Per ADCO DSR Chapter 8, time horizons of five years and twenty years were analyzed. In addition, the traffic was analyzed during the early production period, which is called "flowback." This peak traffic period is typical for the heavy truck traffic associated with oil and gas development.

*Table 1. Trip Table*

CONNER PAD						
Peak Hour Trips						
Time Horizon	% In	Trips In	% Out	Trips Out	Total	Truck %
Production, Initial Flowback	50%	12	50%	12	24	26%
Production, Year 5	50%	1	50%	1	1	5%
Production, Year 20	50%	1	50%	1	1	2%

The site-generated traffic during flowback after fracturing is estimated at 232 vpd<sup>1</sup> (ADT) with 43% trucks. Peak hour trips in the table above are estimated at 1/10<sup>th</sup> of ADT.

## Impact to Pavement Summary

Impact to pavement and gravel surfaces analysis was performed. This analysis consists of generating a truck count, including large pickups pulling trailers, for the construction phase, and including the production phase through ten years. The ten-year horizon was used to be consistent with time horizon used for the analysis in the 2018 Oil & Gas Traffic Impact Study by Felsburg, Holt & Ullevig.

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<sup>1</sup> 116 inbound and 116 outbound vehicles per day. Truck percentage is less at peak hour than over the course of a day. Peaks in traffic were observed at shift changes and there are more light vehicles as shift workers arrive and leave in their personal vehicles.

## Pavement

Impact to paved road surfaces was evaluated in terms of ESAL’s (Equivalent Single Axle Loads) and was found to be within the expected range for this type of development. Paved roads in Adams County’s jurisdiction will experience just under 30,000 ESAL’s.

Table 2. Trips and ESAL’s

Conner Route	Loaded Trips	Empty Trips	Total Trips	ESALs (Includes loaded & empty)	Commodity
2	96	96	193	196	Bulk Fuel; Commerce City
3	230	230	460	647	Cuttings Trucks; Tower Landfill
6	2299	2299	4597	5913	Gravel, Drilling & Completions; Plugging; US-85 Vendor Area
7	10172	10172	20344	23202	Sand & Water; Hudson, Keenesburg
Total	12797	12797	25594	29959	Total

## Gravel

Impact to gravel surfaces was characterized in vehicles per day for Gun Club Road and the part of 128<sup>th</sup> Avenue which is gravel. The peak traffic, including site generated and background traffic, is less than 500 vehicles per day, which does not warrant paving.

## Mitigation

No unusual impacts were found.

Impacts must be managed over the two phases of the project (Construction and Production), and for the different surface types (gravel and paved). For Conner Pad, these types of mitigation are planned:

- Truck routes were developed, first and foremost, with safety in mind.
- For gravel roads, dust control and other Permit Conditions of Approval (COA’s). Permits from ECMC contain COA’s. It is expected that the Adams County permit will also contain COA’s.
- A Traffic Control Plan (TCP), with road signage, similar to that used in public works projects.
- For impact to pavement, we analyzed the ESAL’s, following the outline of the 2018 Adams County Oil and Gas Study (FHU, 2018). The number of ESAL’s is in the expected range: the primary mitigation for the impacts is the Traffic Impact Fee.

## Compliance with OGF Facility Checklist

- This plan has been designed to ensure public safety and maintain quality of life for other users of the County transportation system, adjacent residents, and affected property owners, and has been designed to satisfy the requirements of ADCO DSR, Chapter 8.

- Lifetime truck estimates are provided, during each phase of operations, both cumulatively and along each proposed access route. Routes may change based on selection and contracting of vendors; the availability of commodities and services at transloading points; vendor safety, trucking policies, and relocation of service yards; individual driver decision making, road work, decisions of government agencies, and traffic conditions. The routes chosen for analysis are representative of real-world routes.
- Maps and discussion of access routes are provided listing local government jurisdictions. Jurisdictions for the pavement impact are taken from the 2018 study by FHU.
- Detailed plans for the access and egress of the location were not available. A typical plan is shown.
- Turning radii of emergency vehicles cannot be analyzed at this time. A "will serve" letter was granted by the fire authorities.
- Vendors will check the turning radius of their equipment and find suitable equipment, if necessary, to access the site. For large equipment, a heavy-haul company will be hired by the vendor. The heavy-haul company may arrange to temporarily relocate items such as sign posts along the route. The heavy-haul company will file the required permits with the local jurisdiction(s).
- Road weight restrictions were found on two bridges on WCR-8 and 160<sup>th</sup> Avenue. These routes have not been used. A bridge with a 40T (80,000 lb) restriction for tractor trailers was found at the Beebe Seep Canal on WCR-4. This is only a restriction for extra-legal (permit) loads, so this road was left in the routing.
- Equipment is to be staged on the site and not on public roads.
- Pipelines planned are as follows: water for fracturing will be pipelined; oil and gas production will be pipelined; produced water will be trucked.

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## POCO Operating

# Conner 19-18 Well Pad

## Trucking & Traffic Study

### Study Scope

The study scope boundaries are as follows:

1. The regulations for Traffic Impact Studies (TIS) per Chapter 8 of the ADCO DSR were incorporated.

The limits of the study area were selected by considering the size and extent of the proposed development, the existing and future land use and traffic conditions at and around the site, and a review of adjacent streets, nearest arterial/arterial intersections, and site driveways. Please see the map below for the outline of the study area.

The present study considers the traffic at these time horizons: during early, high rate production when traffic will be high; at five years after site occupancy; and at 20 years after site occupancy. In order to route the trucks, it was necessary to look at the roads in the area shown in the map below, with the area outlined in violet being analyzed in more detail.

Vehicle flow, Peak Hour Traffic, and Volume to Capacity at peak hour were analyzed. We understand that if a study by a license PTOE is required, the review engineer will so state in their Comments.

2. Impact to Road Condition is analyzed in terms of ESAL's for paved roads and in terms of VPD for gravel roads. ESAL's are analyzed for the time period from the beginning of construction, through 10 years after site occupancy, consistent with the analysis in FHU, 2018.

The aerial extent of the Impacts to Road Condition (Appendix E) analysis includes roads which will be used for trucking, which are also on the map of Adams County Responsible Roads in the 2018 Oil and Gas Traffic Impact Study (FHU, 2018). Although the impact to roads in adjacent jurisdictions is not calculated, care has been taken to select roads that are appropriate for trucking (arterials and truck routes) in all jurisdictions. Routing constraints in the adjacent jurisdictions constrains the routes chosen within Adams County.

Adams County Responsible Roads (per FHU, 2018) used by the project and analyzed in this study are 136th Avenue, Gun Club Road, 128th Avenue and Hayesmount Road.



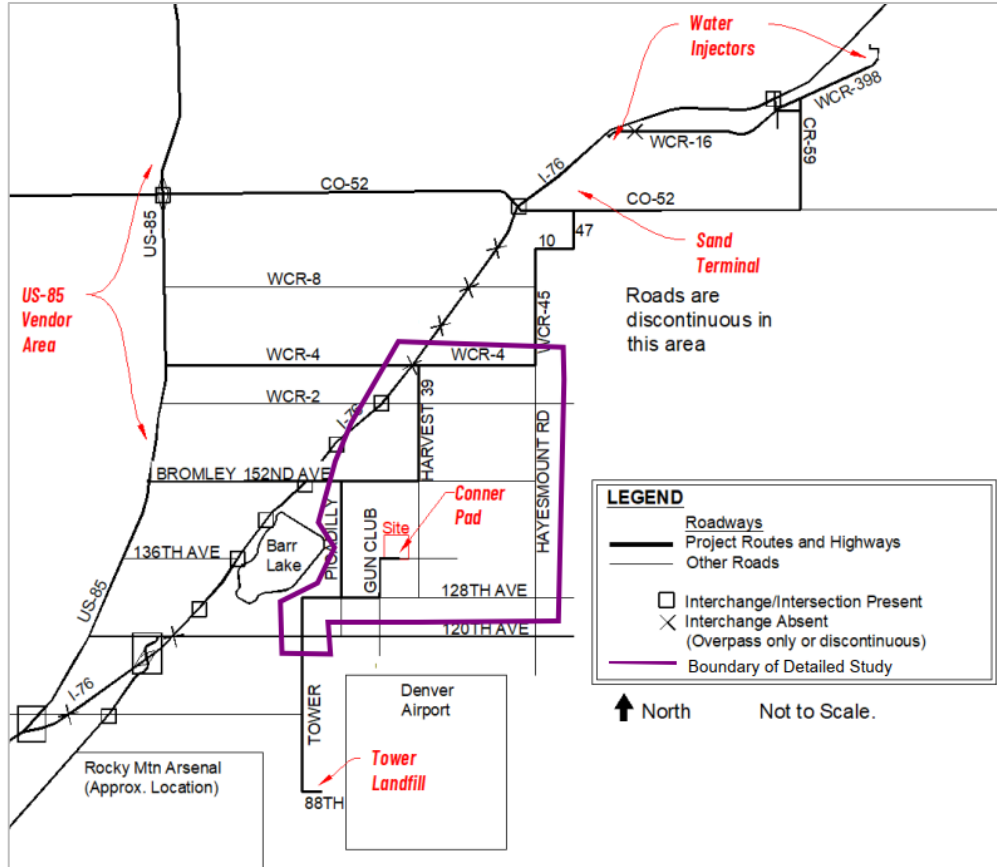


Figure 3. Aerial extent of study. Routing to destinations shown in red necessitated detailed study of the area outlined in violet.

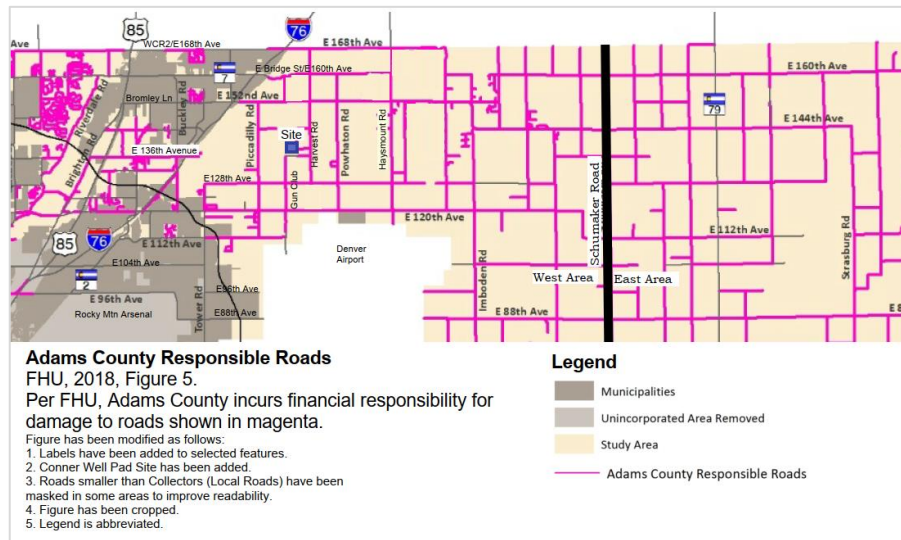


Figure 4. Adams County Responsible Roads. Used to determine jurisdictions for roads for impact to pavement.

## Regulatory Framework and Reference Documents

The following are the primary regulations and governing documents referenced for the present study.

### Adams County DSR (ADCO DSR, 2020)

The Adams County Development Standards and Regulations (ADCO DSR, 2020), Chapter 8, gives a list of requirements and an outline for traffic studies. The ADCO DSR incorporates the Transportation Master Plan (TMP, 2022) by reference, and calls for analysis at the 5-year and 20- to 25-year horizons of the TMP.

ADCO DSR, Chapter 7, Roadway Standards and Technical Criteria, gives requirements for road geometry.

### Adams County OG TIF Schedule Workbook (ADCO, 2024)

The Oil and Gas Transportation Impact Fee (TIF) Schedule Workbook is a spreadsheet that calculates TIF fees based on the following:

1. The number of wells permitted, regardless of whether those wells are ultimately drilled;
2. The well surface locations. Locations in Adams County are divided into a west and an east area. The dividing line between west and east for the purposes of O&G TIFs is Schumaker Road.
3. The pipelines installed for product transportation. The categories of pipelines are “Fresh Water Pipeline,” “Produced Water Pipeline,” and “Product Pipeline (petroleum).” Fresh water generally refers to water pumped into the wells during the completions process.

### Adams County Transportation Master Plan (TMP, 2022)

The TMP defines functional classifications for roads, plans for bike paths, and shows a general outline of preferred future zoning.

The functional classification of roads was used by Felsburg, Holt and Ullevig to develop their assumptions for the pavement structure in the Oil & Gas Traffic Impact Study, in which they calculated the Traffic Impact Fee assessed on oil and gas sites.

### Adams County Oil & Gas Traffic Impact Study (FHU, 2018)

The Oil & Gas Traffic Impact Study calculated the Traffic Impact Fee needed to offset the impacts to pavement due to oilfield traffic, and defined methods of study for paved and gravel surfaces on County roadways. In summary, impact to paved roads is quantified in ESALs, and impact to gravel roads is defined in terms of vehicles per day. Please see the original report by Felsburg, Holt and Ullevig for more detail.

### ECMC Regulations, Filings, and Conditions of Approval

Documents filed with the ECMC contain Conditions of Approval (COA's) and Best Management Practices (BMP's) which determine amounts of material to be hauled, or determine routes.

Documents for the Conner Pad 19-18 and for the nearby Wakeman 20-17 Pad were used as a reference.

### Sound Walls

The number of truckloads of sound wall materials is determined by the requirement on the Sundry Notice. Per the “Sundry Notice, Approved<sup>2</sup>,” for Conner Pad, Document Number 402790170, “Operator will install an engineered perimeter sound wall on all the sides of location during all drilling and completion operations.” The wall height is to be 32 feet.

### Waste Management

Drill cuttings and drilling fluids to be disposed will be hauled to Tower Landfill at 88<sup>th</sup> and Tower Road in Commerce City.

Per communication from POCO, flowback and produced water will be hauled to an approved disposal facility by a licensed transportation company. The flowback and produced water will not be pipelined.

## Zoning and Land Use

Per ADCO DSR 8-02-06-01-04, we reviewed zoning and land use.

### Research

There appear to be no Adams County proposals that will generate traffic that conflict with the proposed Conner Pad. The timing of the proposed BNSF transloading project in Weld County appears to be five to ten years from construction; if the project comes to fruition, it may improve the transportation network for trucks southeast of I-76.

The proposed Conner Pad appears compatible with both present day and proposed land uses. Please see Appendix C, Zoning and Land Use, for more detail.

## Site Location and Study Area Boundaries

The following content addresses the requirements of 8-02-06-01-02 and provides information on the site location and study area boundaries.

### PLSS Location and Assessor’s Parcel Number (APN)

The proposed Conner Pad is located on parcel APN 0156719300004 in SE ¼ SW ¼ of Section 19, Township 1 South, Range 65 West, 6th P.M., Adams County, Colorado. The Conner Pad site access will be in the alignment of 136<sup>th</sup> Avenue.

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<sup>2</sup> A similar document, the “Sundry Notice, Submitted” does not contain the COA’s.

## Location of Site Within the Region and Within Adams County

The site is located about two miles north of Denver International Airport, and three miles east of Interstate 76 (I-76). The site is about 0.4 mile east of the intersection of East 136th Avenue and Gun Club Road. Light vehicles such as cars and pickups can drive to or from the site from either US-85 or I-76 via the arterials Bromley Lane/152nd Avenue and 120th Avenue.

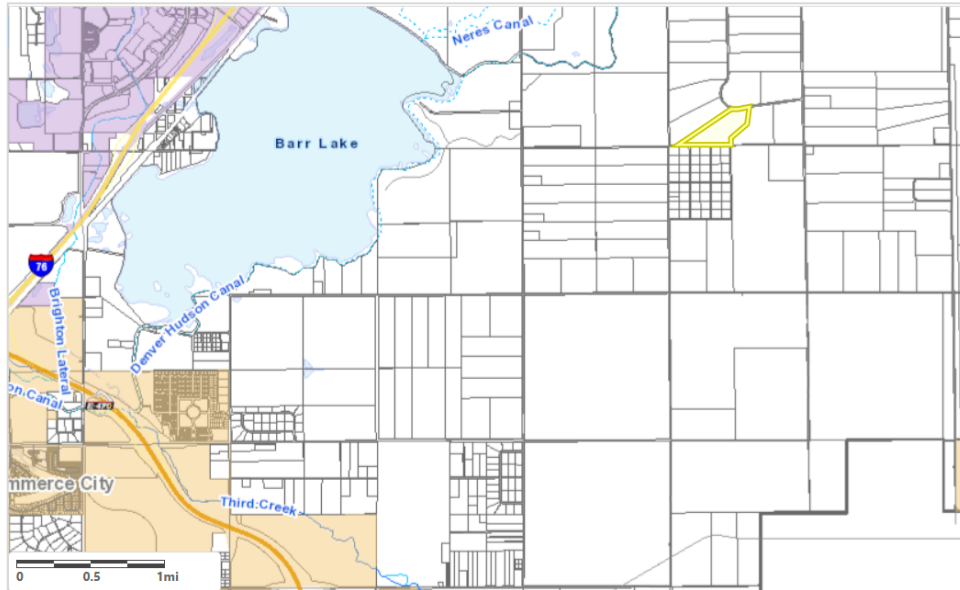


Figure 5. Location of Conner Parcel (highlighted) relative to area landmarks. ADCO GIS (2024).

The location of the site is shown on the map below relative to the arterials south of the County line as defined on Map 3.2 of the “Advancing Adams Transportation Master Plan”. (ADCO TMP, 2022).

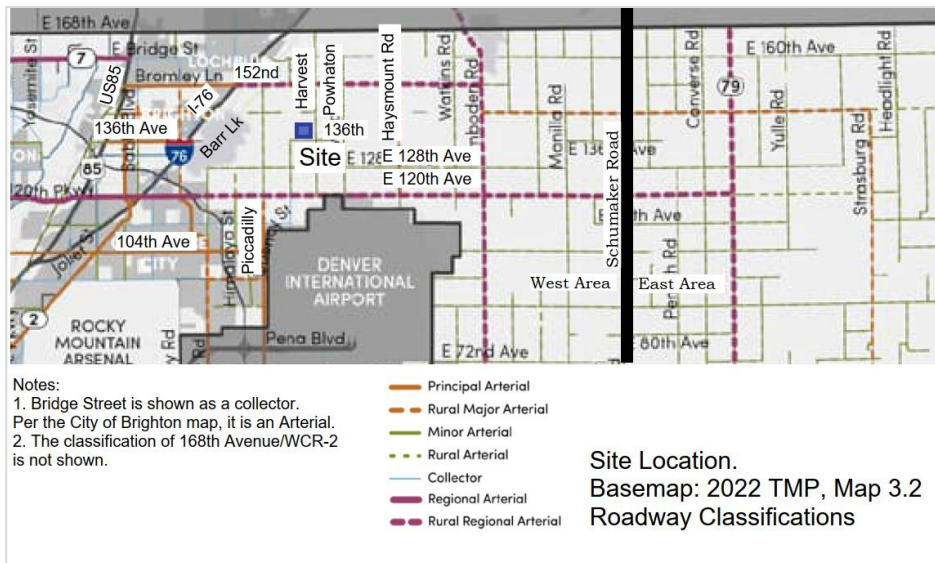


Figure 6. Location of Conner Pad relative to the arterial roadways. (TMP, 2022)

## Site Description

The following description is provided per Section 8-02-06-01-03.

### Site Layout

The proposed Conner Well Pad site will be an oil and gas well pad containing 16 wells. It will have a footprint at project buildout of 5.657 acres, and a footprint during construction of 8.052 acres.

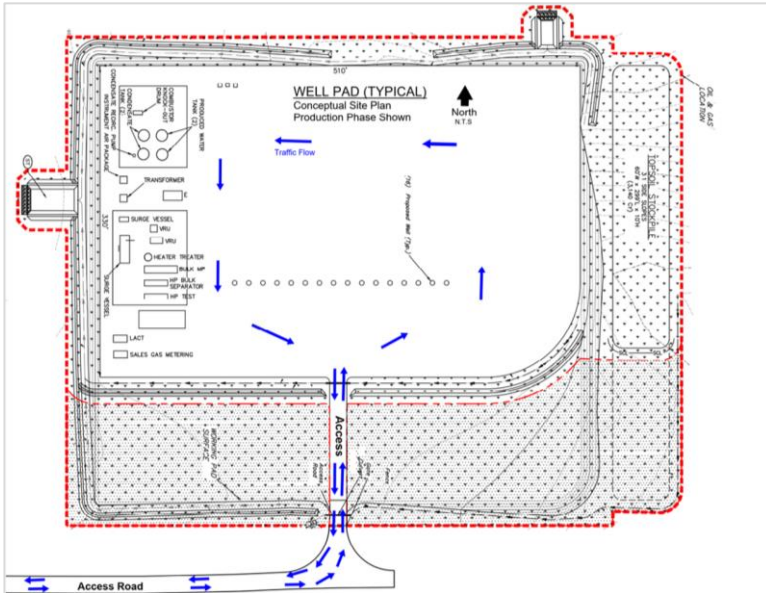


Figure 7. Conceptual Site Plan. (After Uintah, 2022). The access road is to extend from the pad west to Gun Club Road. Arrows shown indicate traffic flow and on-site circulation. Vehicles will exit and turn right onto the access road.

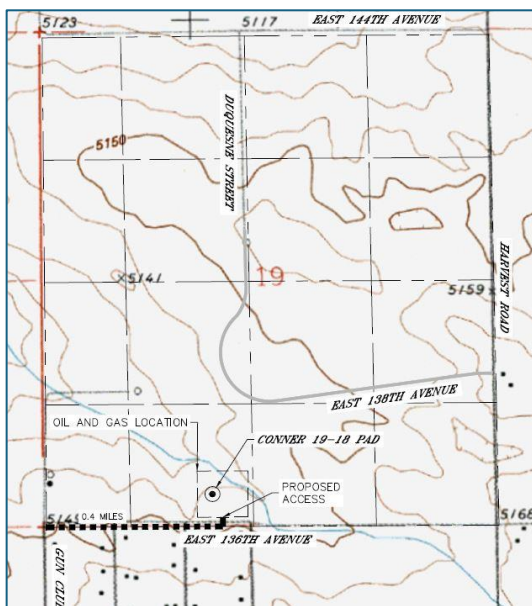


Figure 8. Excerpt from Access Plan. USGS Contours as a base.



## Topography

The topography in the area is higher on the southwest, with streams running in a northwesterly direction. The average slope is about 1%.

## Roadways Analysis

### Access and Internal Circulation

1. The site access will be located on the south side. Traffic will approach the site from the west on 136<sup>th</sup> Avenue and turn left onto the well pad. The vehicles will exit at the same access by turning right onto 136<sup>th</sup> Avenue. Vehicles exiting the site will proceed west on 136<sup>th</sup> Avenue to Gun Club Road and then turn south (left).
2. Internal circulation: Circulation will depend on the operation taking place. Routing will be determined by the person supervising the operations.

### Route selection

A working model of the truck and light vehicle routing was developed: actual routing will vary from the model. Commodities and services can be sourced from various locations. Road conditions may deteriorate or improve and traffic volumes will vary. Each driver will plan his route within these constraints, as well as constraints imposed by their employers. A driver might look at an online traffic map and modify his route if there is a crash or slowdown along the route he was planning to take. With that in mind, we considered the factors described below in choosing routes for analysis.

Initial routing was followed by an analysis of the gap time to turn left or proceed straight across an intersection with a loaded truck.

### Initial Routing

Trucks were routed to vendor locations. Light vehicles were assumed to follow the same routes. Vendor locations were mapped in GIS. Routes for trucks were developed by inspection of road maps and ranked by the criteria below. A numerical ranking scheme was used and is included in Appendix B. The following were considered:

1. Destinations.
  - Conner Well Pad.
  - Vendors.
  - Waste Disposal.
2. Truck routes were used. Roads signed “no trucks” were not used where known.
3. Safety was prioritized, for example:
  - Intersection control at left turns. A stop sign for the oncoming traffic at a left turn is advantageous, especially for a loaded truck.
  - Land use, for example, schools (Weld Central MS & HS, 1300 students), densely populated areas in which the housing is not adequately set back from the road.
  - In general, trucking in rural areas is safer than going through towns.

- Road geometry, for example: roundabouts are undesirable, as other vehicles may pull alongside the truck and a crash can result.
  - A roundabout on a slope is especially undesirable for tanker trucks and other loads with a high center of gravity.
  - Complex intersections can cause a driver to take a wrong turn, for example, if cross streets are too closely spaced to the intersection. It is simple to make a u-turn in a small vehicle, but not in a truck.
  - Prior accident history on a road or at an intersection.
4. Routes constraints were considered, for example:
    - a. Tower Landfill has only one access (Tower Road to 88<sup>th</sup> Ave).
    - b. There are no water injection facilities, and there are few vendors, in Adams County.
    - c. Road connectivity and continuity constrains route choice.
    - d. Bridge weight limits were incorporated.
  5. Functional classification of roadways. Highways, arterials, and Weld County “primary routes” are preferred.
  6. Directness of route.

## Gap Analysis

The gap time for a truck to turn left or proceed straight was calculated for routes that turned onto 152<sup>nd</sup> Avenue. It was found that the time was about 8 seconds. The time required for a truck to turn left is 16 seconds. An additional 10 seconds is needed for the truck to accelerate.

The intersections at 152<sup>nd</sup> Avenue were observed in the field. No trucks attempted to turn left during the observations. The longest time gaps were 22 and 23 seconds. The average was about 10. The shortest were too short to count. This route was eliminated.

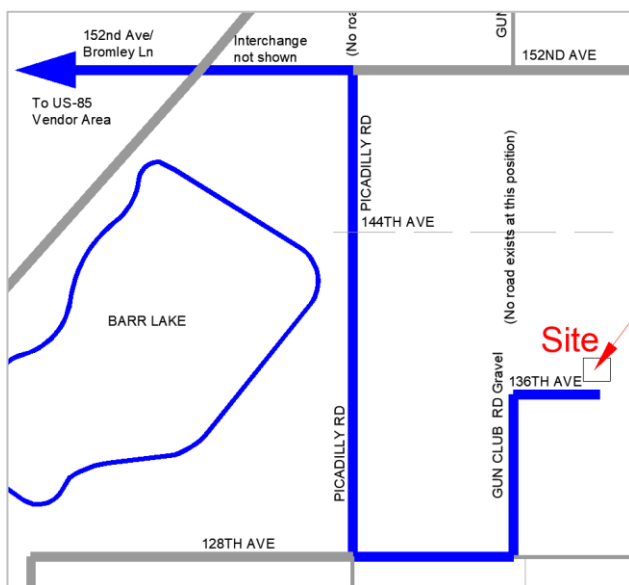


Figure 9. Route 4 was analyzed for the gap time for a truck to turn onto 152nd Avenue. The gap time is too short and this route was eliminated.

## Route List

The same routes were analyzed for Traffic Impact (Appx D) and Impacts to Road Condition (Appx E). The routes selected are listed below. Routes 1, 4 and 5 were eliminated: see Appendix B for those routes.

### Route 2: To Commerce City Vendors via 120th Ave (e.g. Fuel Trucks)

Jurisdiction	Road Name	Road Surface	Distance	Leg
ADCO	Access Rd 136th Av	2-Lane Gravel	0.4	136th Avenue west 0.4 miles to Gun Club Road.
ADCO	Gun Club Road	2-Lane Gravel	1	Turn south (left) on Gun Club Road, then drive approximately 1 mile to 128th Avenue
ADCO	128th Avenue	2-Lane Paved	3	Turn west (right) on 128th Avenue and drive 3 miles to Tower Road.
COMMERCE CITY	Tower Road	2-Lane Paved	1	Turn south (left) on Tower Road and drive about 1 mile to 120th Avenue.
COMMERCE CITY	120th Avenue	2-Lane Paved	as required	Turn west (right) on 120th Avenue and take routes as required to final destination.

### Route 3: To Tower Landfill

Jurisdiction	Road Name	Road Surface	Distance	Leg
ADCO	Access Road 136th Av	2-Lane Gravel	0.4	136th Avenue west 0.4 miles to Gun Club Road.
ADCO	Gun Club Road	2-Lane Gravel	1	Turn south (left) on Gun Club Road, then drive approximately 1 mile to 128th Avenue.
ADCO	128th Avenue	2-Lane Paved	3	Turn west (right) on 128th Avenue and drive 3 miles to Tower Road.
COMMERCE CITY	Tower Road	2-Lane Paved	5	Turn south (left) on Tower Road and drive about 5 miles to 88th Avenue.
ADCO	88th Avenue	2-Lane Paved	0.5	Turn east (left) on 88th Avenue (landfill entrance road) and drive 0.5 miles to the site entrance.

The loads that will go to Tower Landfill are drilling waste such as drill cuttings.

Per FHU, 2018, the part of Tower Road analyzed is in Commerce City. Per GIS, part of Tower Road may be in Adams County. To be consistent with the assumptions used to develop the Traffic Impact Fee, we used the jurisdiction per the Felsburg, Holt and Ullevig report.



**TRAFFIC STUDY – CONNER PAD**

**Route 6: Hayesmount to WCR-4 and WCR-45**

Jurisdiction	Road Name	Road Surface	Distance	Leg
ADCO	Access Road 136th Avenue	2-Lane Gravel	0.4	136th Avenue west 0.4 miles to Gun Club Road.
ADCO	Gun Club Road	2-Lane Gravel	1	Turn south (left) on Gun Club Road, then drive approximately 1 mile to 128th Avenue.
ADCO	128th Avenue	2-Lane Paved 2-Lane Gravel	0.5 3.5	Turn east (left) on 128th Ave, then drive 4 miles to Hayesmount Road
ADCO	Hayesmount Road	2-Lane Paved	3	Turn north (left) on Hayesmount Road, then drive 3 miles to 152nd Ave
ADCO	Hayesmount Road	2-Lane Paved	50 ft	Continue straight across 152nd (about 50 ft, 2-Lane paved road)
ADCO	Hayesmount Road	2-Lane Paved	2	Continue straight on Hayesmount Road to WCR-2/168th Avenue
Weld	WCR-45	2-Lane Paved	1	Continue straight on WCR-45 to WCR-4
Weld / Brighton / Lochbuie / Fort Lupton	WCR-4	2-Lane Paved	9.4	Turn west (left) on WCR-4 and drive to US-85. Weight limited bridge 40T (80,000 lb) for tractor-trailer at Beebe Seep Canal

**Route 7: Hayesmount to WCR-45 and on to Keenesburg, Hudson**

Jurisdiction	Road Name	Road Surface	Distance	Leg
ADCO	Access Road 136th Avenue	2-Lane Gravel	0.4	136th Avenue west 0.4 miles to Gun Club Road.
ADCO	Gun Club Road	2-Lane Gravel	1	Turn south (left) on Gun Club Road, then drive approximately 1 mile to 128th Avenue.
ADCO	128th Avenue	2-Lane Paved 2-Lane Gravel	0.5 3.5	Turn east (left) on 128th Ave, then drive 4 miles to Hayesmount Road
ADCO	Hayesmount Road	2-Lane Paved	3	Turn north (left) on Hayesmount Road, then drive 3 miles to 152nd Ave
ADCO	Hayesmount Road	2-Lane Paved	50 ft	Continue straight across 152nd (about 50 ft, 2-Lane paved road)
ADCO	Hayesmount Road	2-Lane Paved	2	Continue straight on Hayesmount Road to WCR-2/168th Avenue
Weld	WCR-45	2-Lane Paved	1	Continue straight on WCR-45 to WCR-10
Weld & Municipal	See "Leg"	Surfaces Vary	Varies	Take WCR-10 to WCR-47. Continue north on WCR-47 and go straight at CO-52 to the sand terminal. Otherwise, turn right on CO-52 to WCR-59, then turn left on WCR-59 to the injection wells.

## Existing and Committed Transportation Network

Per Section 8-02-06-01, we reviewed the existing and committed road network, including recent work by agencies. The results of this review are included in Appendix B.

## Existing & Future Traffic Conditions

Per 8-02-06-02, we reviewed traffic conditions.

### Crash Data

The following sets of GIS crash data are available from DRCOG.

1. We reviewed DRCOG data for locations associated with a high number of truck crashes. None of the locations identified as high truck crash areas by DRCOG are in the area where we will be operating.
2. We reviewed crash data for 2021 which was not specific to trucks. 152nd Avenue/Bromley Lane, 160th Avenue/Bridge Street, and 168th Avenue/WCR-2 have the most crashes.

### Delay Information

We reviewed Google traffic maps and found that delays at intersections are occurring now (at baseline conditions).

### Field Observations

Field observations were made on May 8, 2024 to observe general traffic and road conditions.

### Traffic Counts

We incorporated traffic count data from ADCO GIS (2024), FHU (2018), DRCOG Counts (2023) and from peak hour counts by All Traffic Data in April, 2024 at 152<sup>nd</sup> Avenue and Powhaton Road.

Using data from heterogeneous sources has limitations; however, not using data has more limitations. We used engineering judgement to develop round-number estimates of the Average Daily Traffic on different segments of road, which we used to estimate Volume to Capacity and Gap Time at intersections.

### Trip Generation

As there is no ITE trip generation method for well pads, trip generation was computed as described in Appendix D. Traffic during the production phase, including the initial flowback<sup>3</sup> at high volumes, is considered. In the trip generation, the following assumptions were made:

- Adams County will require that the oil shipping pipeline be operational prior to production of the wells. Therefore, oil will not be shipped by truck. (COGIS, 2024).

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<sup>3</sup> We are not analyzing the Construction Phase in the TIS, however, it is worth noting that the traffic during the construction, drilling, completions, and drill-out operations will be similar to the traffic during flowback in terms of volume and trucking percentage.

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- Natural gas will be shipped by pipeline, and not trucked; specialized facilities are required to ship gas by truck. These facilities are not proposed on any of the permits we reviewed. (COGIS, 2024).
- Water that flows from the wells ("flowback" and "produced" water) will be trucked to permitted disposal wells.

Per the ADCO DSR , the short-term planning horizon is defined as five years after Site Occupancy of the project, and long-term horizon is defined as twenty years after Site Occupancy of the project. In addition, we are providing an analysis during the initial flowback period, which occurs in the 30 days immediately after site occupation. The traffic volumes at 10 years, which is the time period used in the 2018 FHU study, are shown for reference. The following table summarizes the site generated traffic.

*Table 3. Trip Generation Table.*

<b>Conner Pad: Peak Hour Trips</b>						
	<b>% In</b>	<b>Peak Hour Trips In</b>	<b>% Out</b>	<b>Peak Hour Trips Out</b>	<b>Total</b>	<b>Truck %</b>
Production, Initial Flowback	50%	12	50%	12	24	26%**
Production, Year 5	50%	1	50%	1	1	5%
Production, Year 10*	50%	1	50%	1	1	3%
Production, Year 20	50%	1	50%	1	1	2%

*Notes: Numbers are rounded up to the nearest integer. For calculated values, see Appendix D.*

*\*Numbers at Year 10 are provided for reference only. Year 10 is used in calculating impact to road condition. See Appx E.*

*\*\* The trucking percentage at peak hour is 26%, which is lower than the average daily truck percentage (43%). The peak hour traffic has more light vehicles due to worker shift changes at peak hours.*

## Adjustments to Trip Generation Rates

8-02-06-04-02

A development of this type is not likely to attract trips from within area land uses, nor pass-by or diverted link trips from the adjacent roadway system, therefore no trip reduction was taken in this analysis.

## Trip Distribution

8-02-06-04-04

During the production phase, trucking results from produced water disposal. The trucks are routed to water disposal facilities north of the well pad. Light vehicles are workers arriving and leaving, and vendors delivering supplies such as replacement parts.

The distribution is assumed to be the same over the life of the pad.

## Future Traffic Forecast with the Proposed Development

Per 8-02-06-05, we forecast the traffic with and without the proposed development. A forecast of the traffic for with and without the proposed pad traffic is presented below. An initial value is selected,

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and growth is added at 2% per year. About one month of high flow production (“flowback”) occurs immediately after Site Occupation. During this phase, we anticipate Average Daily Traffic of 232 vpd. For the rest of the first year of production, we anticipate the traffic leveling off to an ADT of 18 vpd, after which the water production will decline, reducing the trucking.

*Table 4. Forecast Traffic*

**Traffic, Gun Club Road in Average Daily Traffic, Vehicles Per Day.**

Year, Serial Number	Year	Gun Club Road Forecast Traffic, ADT, vpd	Units	Conner Pad, ADT, vpd	Total Traffic, ADT, vpd
<b>0</b>	<b>2024</b>	30	<b>vpd</b>	0	30
1	2025	31	vpd	43	74
2	2026	31	vpd	18	49
3	2027	32	vpd	18	50
4	2028	32	vpd	8	40
<b>5</b>	<b>2029</b>	<b>33</b>	<b>vpd</b>	7	40
6	2030	34	vpd	6	40
7	2031	34	vpd	6	41
8	2032	35	vpd	6	41
9	2033	36	vpd	6	42
10	2034	37	vpd	6	43
11	2035	37	vpd	6	44
12	2036	38	vpd	6	44
13	2037	39	vpd	6	45
14	2038	40	vpd	6	46
15	2039	40	vpd	6	46
16	2040	41	vpd	6	47
17	2041	42	vpd	6	48
18	2042	43	vpd	6	49
19	2043	44	vpd	6	50
<b>20</b>	<b>2044</b>	<b>45</b>	<b>vpd</b>	6	51

2% per year growth has been added for each year for the existing traffic.  
 Conner Pad traffic has been projected using historical data from nearby wells.  
 Accounts for traffic after Site Occupation only, not Construction traffic.

## Traffic Impacts

8-02-06-06

We understand that we are to submit the Trip Generation for Staff Review. A determination of whether further steps, such as a Synchro simulation, will be needed will be made by County Staff. If a Synchro simulation or similar analysis is needed, it will be done by a PTOE licensed in Colorado.

The following preliminary values are presented. The PTOE may use different assumptions in his analysis if it is decided to proceed with a TIS.

## TRAFFIC STUDY – CONNER PAD

As a preliminary analysis, we have calculated Volume to Capacity Ratio for the highest traffic in the Production Phase. This scenario has 232 VPD. The associated trucking, which is 100 VPD, will be routed via Conner Route 7.

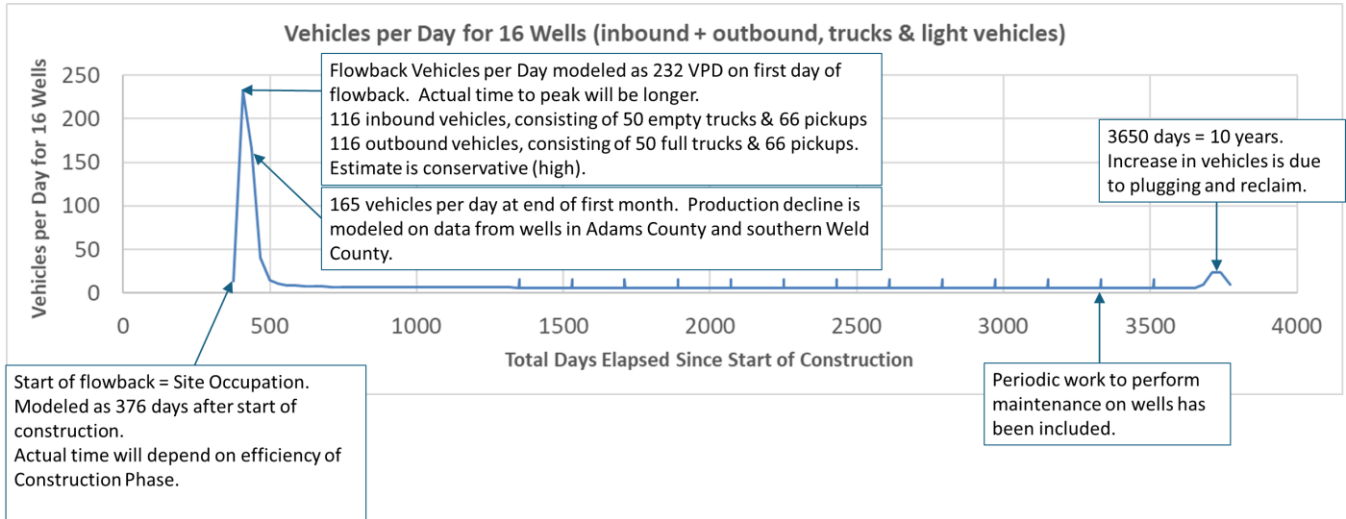


Figure 10. Production Phase Trucking. Small peaks in trucking are associated with maintenance of the wells. At the end of the life of the wells, trucking is associated with plugging the wells and reclaim of the pad.

**TRAFFIC STUDY – CONNER PAD**

*Table 5. Volume to Capacity Ratio During Flowback*

Road Name	Access Rd (136th)	Gun Club Rd	128th Av (Paved)	128th Av (Gravel)	Hayesmt	Hayesmt
Surface	2-Ln Grvl	2-Ln Grvl	2-Ln Pvd	2-Ln Grvl	2-Ln Pvd	2-Ln Pvd
Jurisdiction	ADCO	ADCO	ADCO	ADCO	ADCO	ADCO
From	Site	136th	Gun Club	128th Paved	128th Gravel	152nd
To	Gun Club	128th Paved	128th Grav	Hayesmt	152nd	WCR-45
Existing Traffic, ADT (VPD) (both directions)	0	30	500	125	1650	1900
Peak Hour Volume, Existing, VPH	0	3	50	13	165	190
Site Generated Traffic, VPD (per Day)	232	232	232	232	232	232
Pk Hr Vol, Site Generated, VPH, before truck factor adjustment	24	24	24	24	24	24
Trucks (26% Trucks) per Hour	6	6	6	6	6	6
Truck Factor	1.7	1.7	1.7	1.7	1.7	1.7
Trucks as passenger car equivalent per Hour	11	11	11	11	11	11
Light Vehicles (Cars & Pickups) per Hour**	18	18	0	0	0	0
Peak Hour Volume, Site Generated, PCPH*	28	28	11	11	11	11
Peak Hour Volume, Total (Background + Site Generated), VPH (per Hour)	28	31	61	24	176	201
Existing Capacity, VPH	50	50	2800	50	2800	2800
Volume / Capacity, Existing	No traffic	6.0%	1.8%	26.0%	5.9%	6.8%
Volume / Capacity, during Flowback	56.7%	62.7%	2.2%	47.2%	6.3%	7.2%

**Notes**

- 1 All paved roads have flexible asphalt pavement, not Portland cement concrete.
- 2 128th "paved" is a short section of road. A separate analysis is done for the paved section because the traffic volume is higher on this section.
- 3 Capacity for gravel roads is assumed to be 500 VPD. Peak hour capacity is assumed to be 500/10 = 50 VPH, or 25 VPH per lane.
- 4 Traffic counts are from ADCO GIS (2024), DRCOG (2022), and two peak hour counts at 152nd Ave and Powhatan Rd in 2024. Numbers have been averaged and rounded to develop estimated figures.
- 5 Adams County Responsible Roads (FHU, 2018, p 12) was used as the source of road jurisdiction data.

**For Site Generated Traffic**

- 6 The trucks move more slowly and take more space than do passenger vehicles. For this reason, they are converted to "passenger car equivalent" by multiplying by 1.7. The unit PCPH is Passenger Car Per Hour.
- 7

232 VPD is the volume during flowback, when loaded trucks will be outbound from the pad. There are estimated to be 50 outbound trucks per day, with the same number returning. Truck percentage for a whole day is 43%.

- 8 During peak hours, there is a higher percentage of light vehicles due to shift workers arriving in cars and pickups. Truck percentage is estimated at 26% during peak hour traffic.

\*\* The trucking route is longer to avoid a left turn onto 152nd. Light vehicles will be able to turn onto 152nd without difficulty and therefore will not use the same route as the trucks.

## Traffic Signals

Per 8-02-06-06-03, the need for future traffic signals will need to be considered. If traffic signal analysis is required, it will be performed by a PTOE.

At present, the intersections in the area are stop-sign controlled, with the exception of 120th Ave and Tower Road. Considering the site-generated traffic at the five- and twenty-year horizons of 6 VPD, the site-generated traffic appears to not trigger installation of a signal. Notwithstanding, a temporary signal can be a mitigation for issues that arise during construction traffic.

## Access Locations

The site access will be on the south side of the well pad. The distance to the nearest access is 0.4 miles<sup>4</sup>. The planning for the access is in progress. It is expected to be similar to the drawings submitted for the Wakeman Pad, which are included in Appendix A for reference.

## Turn Lane Storage Requirements

Per 8-02-06-06-04, an evaluation of the need for turn lanes is required.

The traffic at the 5- and 20-year horizons is low-volume and a turn lane will not be needed. For the construction and flowback period, traffic routing to eliminate left turns at 152nd Avenue will mitigate delays and minimize the risk of crashes due to vehicles turning.

## Sight Distance

Per 8-02-06-06-05, evaluation of sight distance is required. Due to the flat topography, sight distance is not anticipated to be an issue.

## Acceleration or Deceleration Lanes

Per 8-02-06-06-06, evaluation of acceleration or deceleration lanes is required.

If acceleration or deceleration lanes are required, the analysis will be provided by the PTOE.

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<sup>4</sup> Although on a map, streets are shown on a subdivision south of 136th Avenue, the subdivision has been demolished, and there are no plans to re-build it.



## Special Analysis: Impacts to Road Condition

Section 8-02-06-07 provides the County with opportunities to request specific focused traffic analysis relevant to the proposed development. Per the Oil and Gas Facility checklist, we have analyzed impacts to pavement and gravel surfaces. See also Appendix E.

Impact to road condition is expected due to trucking. This section provides an analysis in terms of Vehicles per Day for the gravel roads. An analysis is provided in terms of ESAL's for the paved roads.

In general, the routing is as follows:

- Routes are listed starting at the pad: for this analysis, the vehicles are assumed to return to the pad along the same route, in the opposite direction.
- Equipment and supplies are likely to be sourced from Brighton, Fort Lupton, or other areas in Weld County, hence, the majority of the traffic will flow north.
- Per the Waste Management Plan, waste streams will be trucked to the Tower Landfill. These trucks will be routed south on Picadilly Road to 128<sup>th</sup> Avenue, then west to Tower Road. They will drive south on Tower Road to 88<sup>th</sup> Avenue, and drive east on 88<sup>th</sup> Avenue to the landfill.

## Results of Evaluation of Impact to Road Condition

Evaluation of impact to road condition depends on the type of road surface. The impact to road condition is summarized below, for unimproved, gravel, and paved roads. The road segment to be utilized by Conner project trucks, the type of surface, the key parameters evaluation, and the result, are given.

### Impact to Road Condition: Unimproved Road

136th Avenue is an unimproved dirt road, which is currently used as a service road for a large powerline. A gravel road will be installed by the developer.

### Impact to Road Condition: Gravel Roads

In addition to the new entrance road, the project will utilize Gun Club Road and the gravel part of 128<sup>th</sup> Avenue. Unlike the Traffic Impact, in which the analysis is done from Site Occupation forward, the OGF checklist states that impact to roads is to be analyzed for the Construction Phase as well.

Table 6. Metrics for Gravel Roads

ROUTE	UNIMPROVED OR GRAVEL ROADS	TYPE	KEY METRICS	
All	Site Access (136th Avenue)	Unimproved	Gravel road to be installed.	
All	Gun Club Road	Gravel	Base VPD = 30 Project VPD = 232. Total VPD = 262	Project traffic has 50 truckloads per day (50 loaded, 50 return trips = 100 truck trips)
6 & 7	128th Avenue (eastbound)	Gravel	Base VPD = 125 Project VPD = 100 Total VPD = 225	

For the Construction Phase, we plan to focus on the permit Conditions of Approval (COA), such as those on the "Sundry Notice Approved" (Form 4), ECMC Document Number 402790170 for Conner Pad, page 4 of 5, Best Management Practice/Condition of Approval #23, "Dust Control," which reads in part:

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“Dust mitigation measures shall include but are not limited to the use of speed restrictions, regular road maintenance, restrictions of construction activities during high wind days, and silica dust controls when handling sand used in hydraulic fracturing operations. The access road will be constructed with road base aggregate material. Additional management practices such as road surfacing, wind breaks and barriers may be used.”

*Table 7. Construction Phase Vehicles per Day*

Activity	Days	Days Total	Vehicles per Day, 16 Well Pad	Average VPD In	Average VPD Out	Activity Description
			Inbound + Outbound			
<b>Pad, Road</b>	27	27	42	21	21	Build pad. Haul gravel.
<b>Facility</b>	32	59	16	8	8	Install 2 oil tanks, 2 water tanks, separators, etc.
<b>Facility</b>	27	86	11	6	6	Install soundproofing walls
<b>Drilling</b>	2	88	75	52	24	Set up drilling rig
<b>Drilling</b>	132	220	87	43	43	Drill wells - 24 Hour/Day operation
<b>Drilling</b>	2	222	75	24	52	Remove drilling rig
<b>Completion</b>	2	224	139	91	49	Set up completions equipment
<b>Completion</b>	128	352	99	49	49	Complete wells - 24 Hour/Day operation
<b>Completion</b>	2	354	139	49	91	Remove completions equipment
<b>Drill Out</b>	1	355	14	12	2	Set up coiled tubing equipment
<b>Drill Out</b>	20	375	8	4	4	Remove plugs
<b>Drill Out</b>	1	376	14	2	12	Remove coiled tubing equipment

Impact to gravel roads was estimated for the Production Phase also. The largest traffic volume will be in the 30 days after the wells begin producing, when the pad will generate the largest volume of traffic because of produced (flowback) water hauling. The traffic will then decline in magnitude, reaching very low levels after a few years.

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Table 8. Production Phase Truck and Light Vehicle Volume

<b>“Site Occupation” occurs between Construction and Production.</b>						
<b>Activity</b>	<b>Days</b>	<b>Days Total</b>	<b>Vehicles per Day, 16 Well Pad</b>	<b>Avg VPD In</b>	<b>Avg VPD Out</b>	<b>Activity Description</b>
<b>Production</b>	31	31	232	116	116	Initial Flowback
<b>Production</b>	1794	1825	6.34	3.17	3.17	Water production is 0.34 truckloads / day for the pad. There are 3 operator trips per day at this point in time - this is a very conservative (high) number. He drives a pickup. Trucks are 10%.
<b>Production</b>	1825	3650	6.17	3.08	3.08	Water production is 0.12 truckloads / day for the pad.
<b>Production</b>	3650	7300	6.09	3.04	3.04	Water production is 0.09 truckloads / day for the pad.

Table 9. Production Phase Flowback Truck and Light Vehicle Volume, First Month

<b>Conner Flowback, Day One and Day 31 Modeled Water Production in Truckloads</b>		
<b>Timeframe</b>	<b>VPD</b>	<b>Description</b>
First month's vehicles per day is	232	inbound + outbound
First month's trucks per day is	100	inbound + outbound, 50 truckloads
First month's pickups per day is	132	inbound + outbound
Truck percentage	43%	
2nd month's vehicles per day is	165	inbound + outbound
2nd month's trucks per day is	66	inbound + outbound, 50 truckloads
2nd month's pickups per day is	99	inbound + outbound
Truck percentage	40%	

The volume in the first 30 days after the wells begin flowing is estimated at 232 vehicles per day, with 43% trucks<sup>5</sup>. After one month’s time, the traffic is estimated to drop to 165 VPD.

All the vehicles, light and heavy, will use Gun Club Road. However, light vehicles do not have to use 128th Avenue: the trucks use that road because there is too much traffic on other roads, and they cannot turn safely. Light vehicles can go anywhere the driver wants to go. Therefore, the site-generated traffic count for 128th Avenue are 100 VPD, whereas for Gun Club Road, the site-generated traffic count is 232 VPD.

<sup>5</sup> These will be ordinary tractor-trailers with an approximate gross vehicle weight of 80,000 lb.

### Impact to Road Condition: Paved Roads

For paved roads, the expected total number of trucks, and the corresponding ESAL's, from the beginning of Construction to a time horizon 10 years after Site Occupation were calculated. The number of trips for calculating ESAL's is 25,594 trips. Each truck is counted once as it arrives and the pad, and counted again as it leaves. Large pickups towing trailers were counted; vehicles weighing 7300 lb and less were not counted, as the ESAL's from those vehicles are negligible.

Table 10. Trips and ESALs per Route

Conner Route	Loaded Trips	Empty Trips	Total Trips	ESALs (Includes loaded & empty)	Commodity (typical)
2	96	96	193	196	Bulk Fuel; Commerce City
3	230	230	460	647	Cuttings Trucks; Tower Landfill
6	2299	2299	4597	5913	Gravel, Drilling & Completions; Plugging; US-85 Vendor Area
7	10172	10172	20344	23202	Sand & Water; Hudson, Keenesburg
Total	12797	12797	25594	29959	Total

Please see Appendix E, “Potential Cumulative Impacts to Road Condition” for more detail on the calculations.

### Impact to Road Condition: Mitigation

Impacts must be managed over the two phases of the project (Construction and Production), and for the different surface types (gravel and paved). For Conner Pad, these types of mitigation are planned:

- Truck routing has been planned to improve safety.
- For gravel roads, dust control and other Permit Conditions of Approval (COA’s) will be implemented. Permits from ECMC contain COA’s. It is expected that the Adams County permit will also contain COA’s.
- A Traffic Control Plan (TCP), with road signage, similar to that used in public works projects can be implemented during periods of high traffic volume.
- For impact to pavement, we analyzed the ESAL’s, following the outline of the 2018 Adams County Oil and Gas Study (FHU, 2018). The number of ESAL’s is in the expected range. The primary mitigation for the impacts to pavement and gravel surfaces is the Traffic Impact Fee. The TIF allows the County to pool money from different sources and apply it where there is a need to improve the roads.

#### Traffic Impact Fee

Adams County assesses a Traffic Impact Fee for well pad development. The fee for this pad as currently planned is \$314,721. The analysis of VPD and ESALs aids in the understanding of how well the fee matches the impact.

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Table 11. Traffic Impact Fee

Fee Schedule					
Per Well Fee					
Fresh/Fracturing Water Pipeline	Produced Water Pipeline	Product Pipeline (petroleum)	Per Well Fee	Enter the number of wells being permitted	Totals
Will not use	Will not use	Will not use	\$ 36,523	0	\$ -
Will use	Will not use	Will not use	\$ 35,034	0	\$ -
Will not use	Will not use	Will use	\$ 21,112	0	\$ -
Will not use	Will use	Will not use	\$ 20,227	0	\$ -
Will use	Will not use	Will use	\$ 19,623	16	\$ 313,968
Will use	Will use	Will not use	\$ 18,738	0	\$ -
Will not use	Will use	Will use	\$ 4,816	0	\$ -
Will use	Will use	Will use	\$ 3,327	0	\$ -
Per Pad Fee					
Per Pad Fee, West of Schumaker Road					\$ 753
<b>Total Traffic Impact Fee</b>					<b>\$ 314,721</b>

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## Appendix A: Site Maps

## Pad Site Diagram

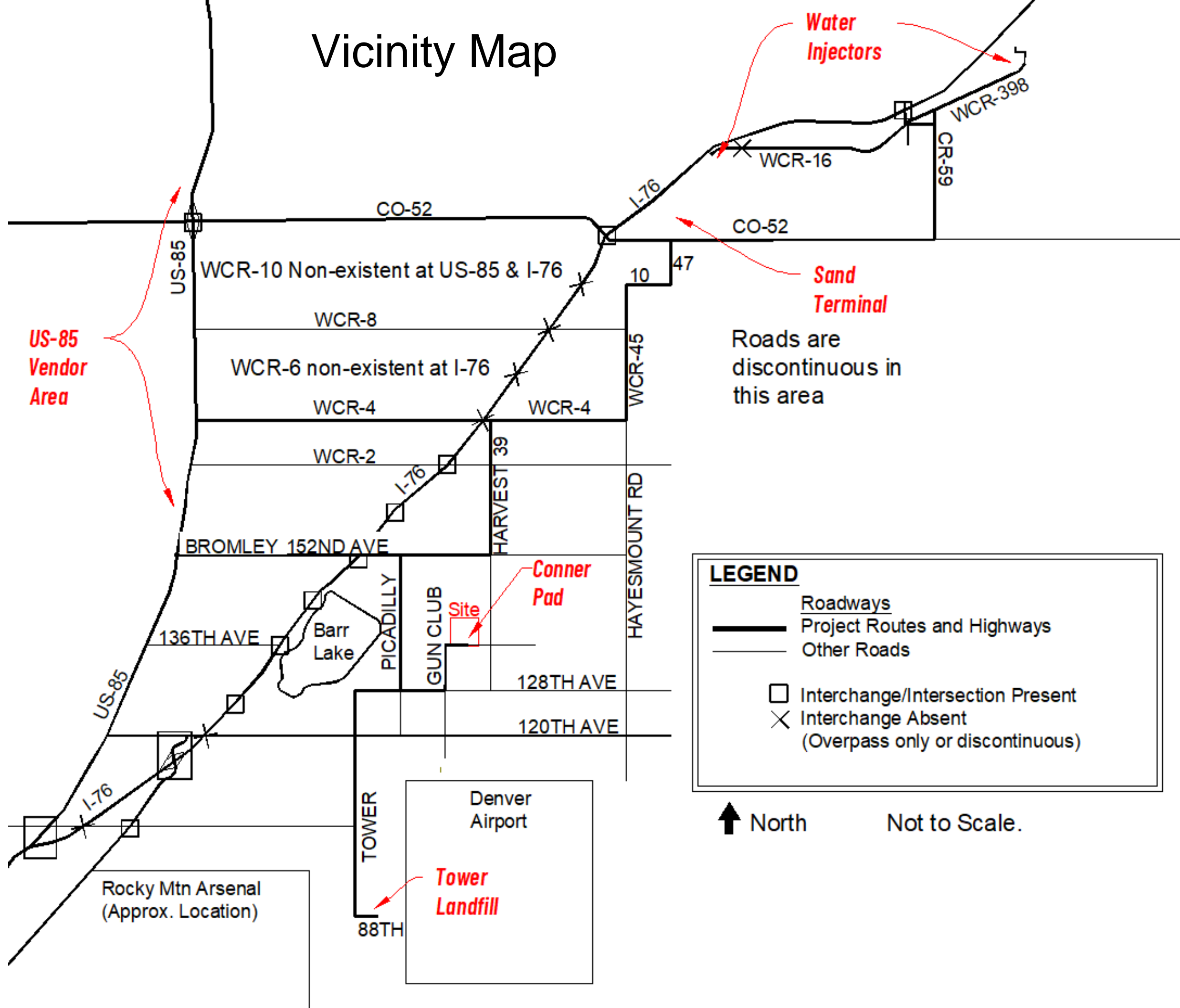
Diagrams showing the pad layout by phase for Conner Pad have not been incorporated in this report; diagrams for Wakeman Pad have been included for reference. Conner Pad will be similar to Wakeman Pad but rotated 90 degrees such that the entrance is on the south. The pad will be laid out similar to other well pads. Conner Pad will feature a single point of access on the south side.

During the Construction Phase, a sound wall will be required around the entire site per ECMC Conditions of Approval. The sound walls will prevent access to the site by unauthorized parties, and will prevent traffic to and from the site, other than at the access. Drainage & erosion control around the perimeter of the site is likely to consist of a “ditch and berm” system, which will aid in preventing site access in the Production Phase.

## Barr Lake

Roads in the region are truncated by Barr Lake and the associated ditch system. A map of the reservoir is included for reference. The ditch system extends downstream beyond Greeley. Much of the county road system is disrupted. Although passing through Weld County with freight to get to Nebraska is relatively simple, local trucking routes are challenging.

# Vicinity Map



**US-85 Vendor Area**

**Water Injectors**

**Sand Terminal**

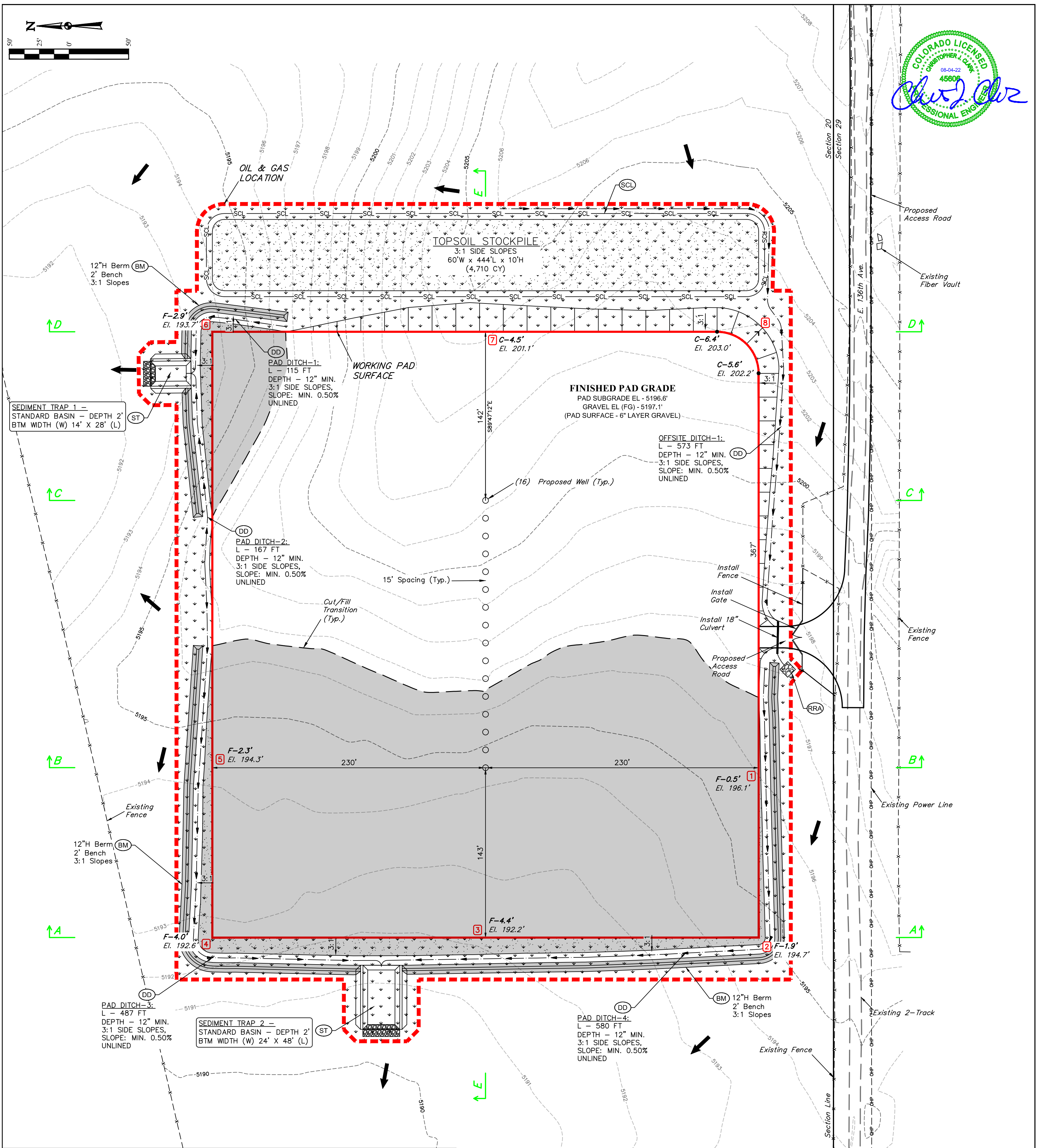
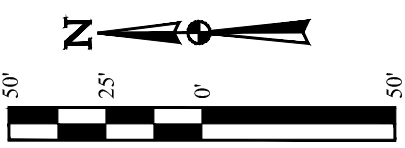
Roads are discontinuous in this area

## LEGEND

- Roadways
- Project Routes and Highways
- Other Roads
- Interchange/Intersection Present
- Interchange Absent (Overpass only or discontinuous)

↑ North

Not to Scale.



**LEGEND**

	WELL PAD CORNER STAKE		SEEDING AND MULCHING
	DESIGN "C" CUT OR "F" FILL AT CORNER STAKE		BERM
	EXISTING GROUND ELEV. AT CORNER STAKE (TRUNCATED LESS 5,000 FEET)		EXISTING FENCE
	DIVERSION DITCH		EXISTING POWER LINE
	OUTLET PROTECTION		EXISTING MAJOR CONTOUR
	SEDIMENT TRAP		EXISTING MINOR CONTOUR
	SEDIMENT CONTROL LOG		PROPOSED MAJOR CONTOUR
	RIP RAP APRON		PROPOSED MINOR CONTOUR
			WORKING PAD SURFACE
			OIL & GAS LOCATION

WORKING PAD SURFACE DISTURBANCE = 5.380 ACRES  
 DISTURBANCE DURING CONSTRUCTION = 2.427 ACRES

- NOTES:**
- Rounded corners shown at 35' radius.
  - Construct diversion ditches as needed.
  - Contours shown at 1' intervals.
  - Cut/Fill slopes 3:1 (Typ.).
  - Overall working pad surface = 510' x 460'

**UELS, LLC**  
 Corporate Office \* 85 South 200 East  
 Vernal, UT 84078 \* (435) 789-1017

**POCO OPERATING**

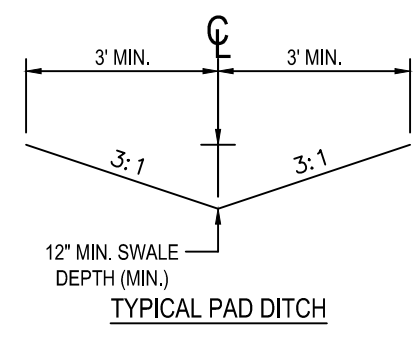
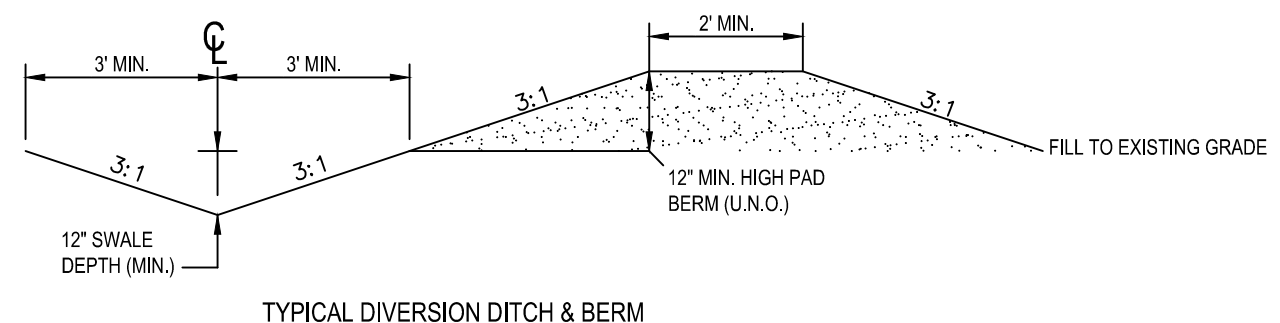
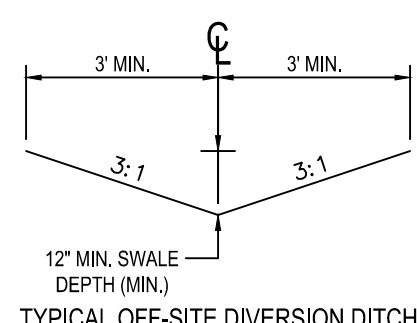
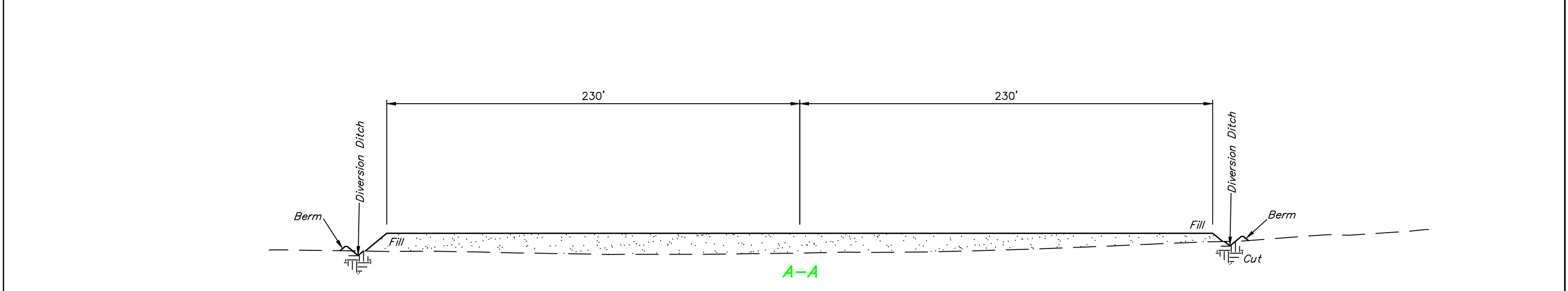
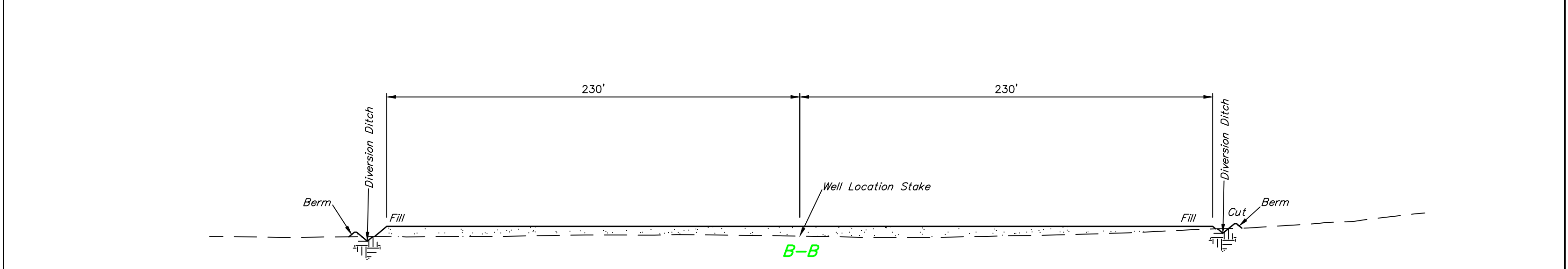
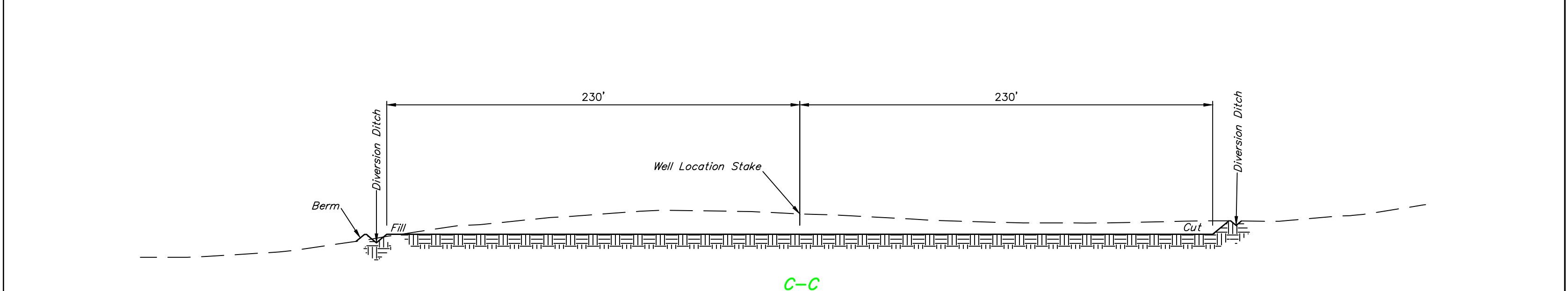
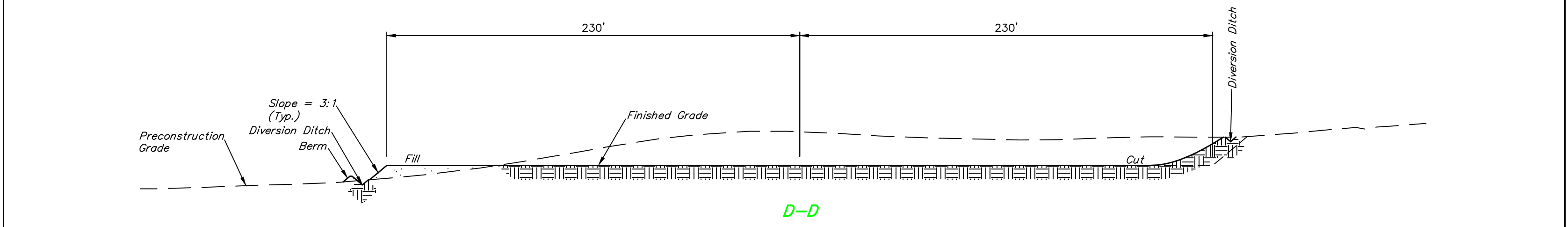
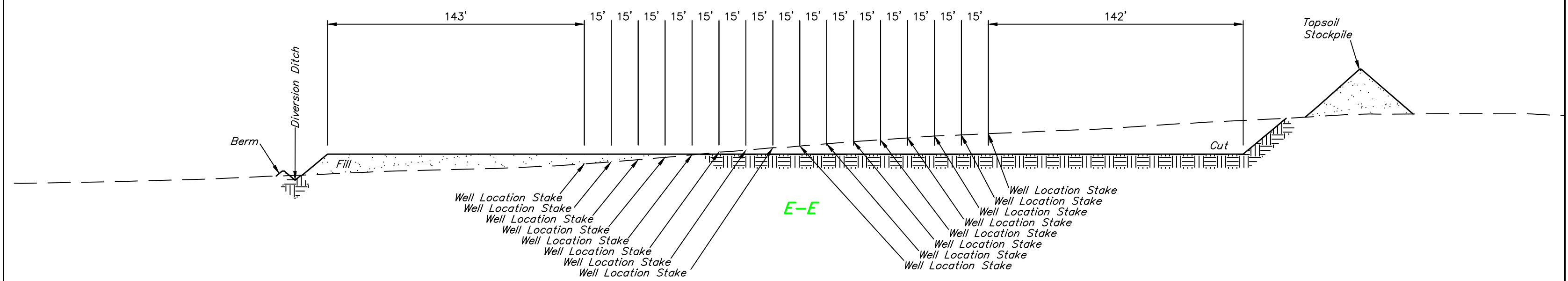
**WAKEMAN 20-17 PAD**  
 SW 1/4 SE 1/4, SECTION 20, T1S, R65W, 6th P.M.  
 ADAMS COUNTY, COLORADO

SURVEYED BY	ORION RICE	06-16-22	SCALE
DRAWN BY	M.D.	06-21-22	1" = 50'

**CONSTRUCTION LAYOUT - PLAN VIEW**



1" = 20'  
X-Section Scale  
1" = 50'

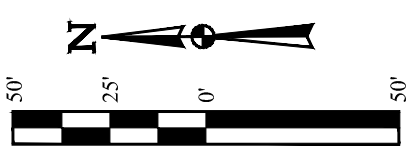
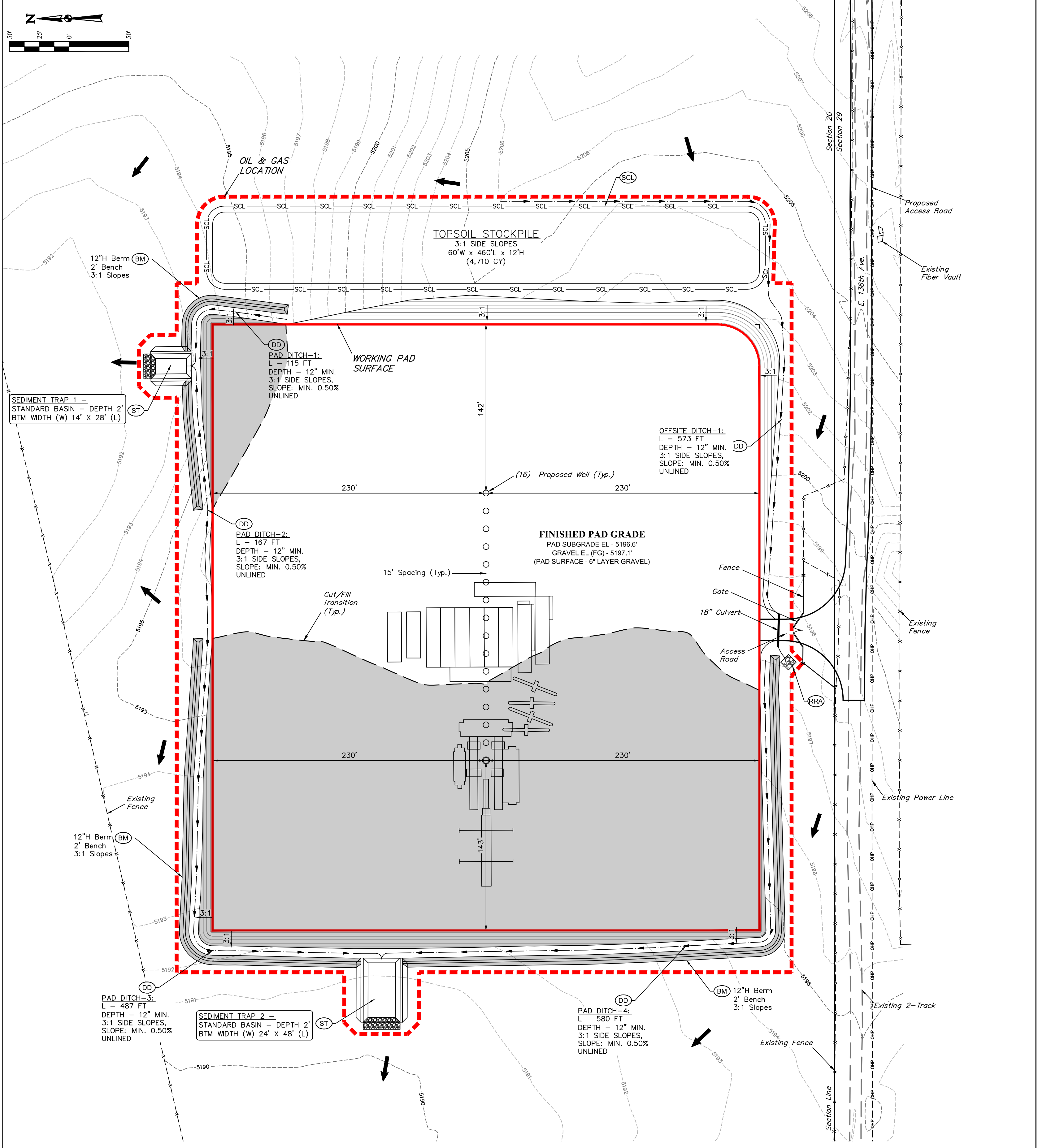


APPROXIMATE EARTHWORK QUANTITIES	
(6") TOPSOIL STRIPPING	4,710 Cu. Yds.
REMAINING LOCATION	12,860 Cu. Yds.
<b>TOTAL CUT</b>	<b>17,570 Cu. Yds.</b>
<b>FILL</b>	<b>12,860 Cu. Yds.</b>
EXCESS MATERIAL	4,710 Cu. Yds.
TOPSOIL	4,710 Cu. Yds.
GRAVEL BASE ON PAD (6")	4,340 Cu. Yds.
<b>DEFICIT UNBALANCE</b> (After Interim Rehabilitation)	<b>&lt;4,340 Cu. Yds.&gt;</b>

APPROXIMATE SURFACE DISTURBANCE AREAS	
WORKING PAD SURFACE DISTURBANCE	±5.380 ACRES
CONSTRUCTION DISTURBANCE	±2.427
<b>TOTAL OIL &amp; GAS LOCATION</b>	<b>±7.807</b>

APPROXIMATE SURFACE DISTURBANCE AREAS		
	DISTANCE	ACRES
TOTAL OIL & GAS LOCATION (LOD)	NA	±7.807
30' WIDE 2-TRACK UPGRADE DISTURBANCE	±2,185'	±1.505
30' WIDE ACCESS ROAD DISTURBANCE (NEW CONSTRUCTION)	±80'	±0.055
<b>TOTAL SURFACE USE AREA</b>		<b>±9.367</b>

**NOTES:**  
 • Fill quantity includes 5% for compaction.  
 • Calculations based on 6" of topsoil stripping.  
 • Cut/Fill slopes 3:1 (Typ.).



**SEDIMENT TRAP 1** -  
STANDARD BASIN - DEPTH 2'  
BTM WIDTH (W) 14' X 28' (L)

**PAD DITCH-1:**  
L - 115 FT  
DEPTH - 12" MIN.  
3:1 SIDE SLOPES,  
SLOPE: MIN. 0.50%  
UNLINED

**PAD DITCH-2:**  
L - 167 FT  
DEPTH - 12" MIN.  
3:1 SIDE SLOPES,  
SLOPE: MIN. 0.50%  
UNLINED

**PAD DITCH-3:**  
L - 487 FT  
DEPTH - 12" MIN.  
3:1 SIDE SLOPES,  
SLOPE: MIN. 0.50%  
UNLINED

**SEDIMENT TRAP 2** -  
STANDARD BASIN - DEPTH 2'  
BTM WIDTH (W) 24' X 48' (L)

**PAD DITCH-4:**  
L - 580 FT  
DEPTH - 12" MIN.  
3:1 SIDE SLOPES,  
SLOPE: MIN. 0.50%  
UNLINED

**TOPSOIL STOCKPILE**  
3:1 SIDE SLOPES  
60'W x 460'L x 12'H  
(4,710 CY)

**FINISHED PAD GRADE**  
PAD SUBGRADE EL - 5196.6'  
GRAVEL EL (FG) - 5197.1'  
(PAD SURFACE - 6" LAYER GRAVEL)

**LEGEND**

DD DIVERSION DITCH	EXISTING FENCE
OP OUTLET PROTECTION	EXISTING POWER LINE
ST SEDIMENT TRAP	EXISTING MAJOR CONTOUR
SCL SEDIMENT CONTROL LOG	EXISTING MINOR CONTOUR
RRA RIP RAP APRON	PROPOSED MAJOR CONTOUR
	PROPOSED MINOR CONTOUR
	WORKING PAD SURFACE
	OIL & GAS LOCATION

**NOTES:**  
• Contours shown at 1' intervals.  
• Overall working pad surface = 510' x 460'

**UELTS, LLC**  
Corporate Office \* 85 South 200 East  
Vernal, UT 84078 \* (435) 789-1017

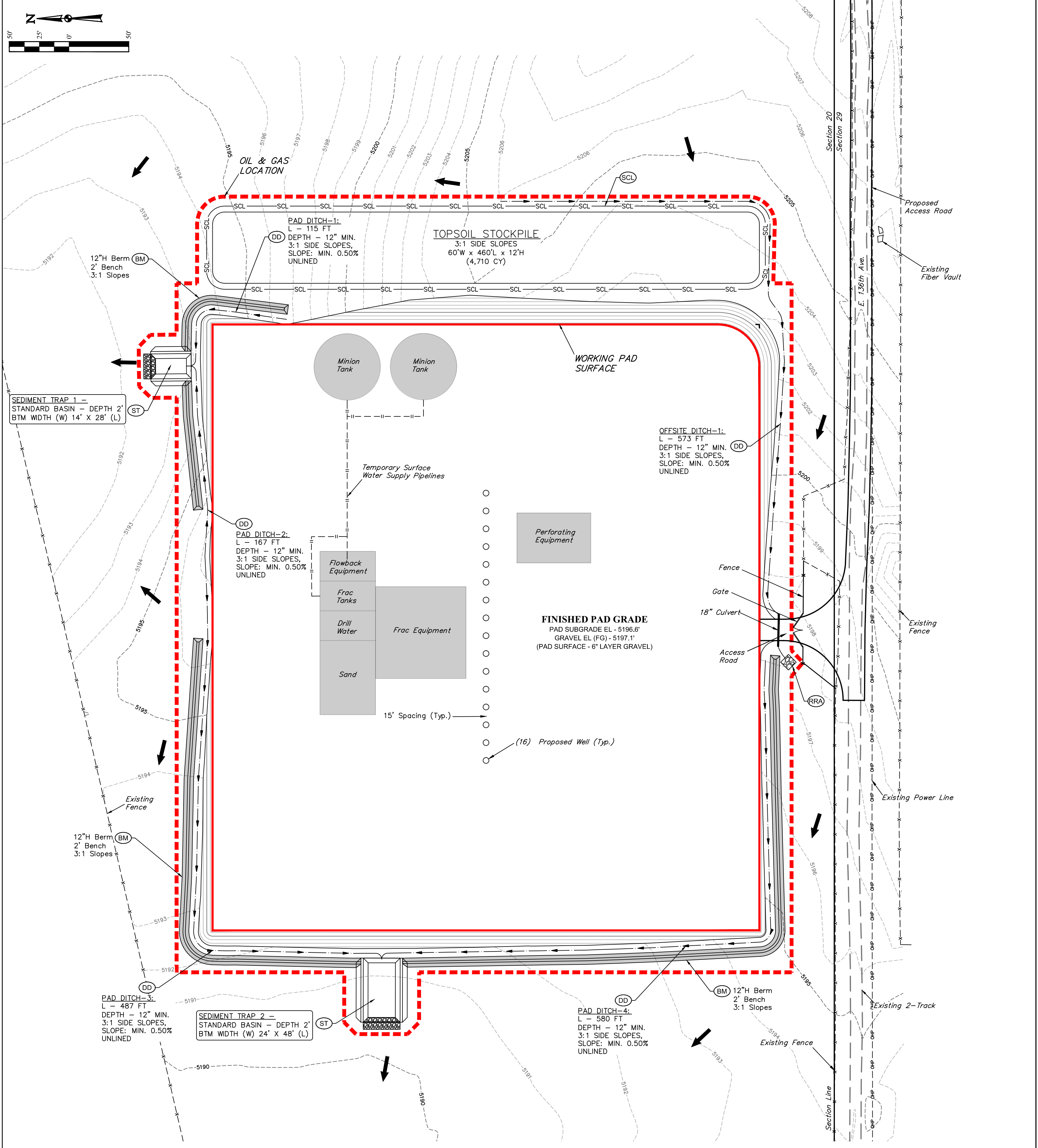
**POCO OPERATING**

**WAKEMAN 20-17 PAD**  
SW 1/4 SE 1/4, SECTION 20, T1S, R65W, 6th P.M.  
ADAMS COUNTY, COLORADO

SURVEYED BY	ORION RICE	06-16-22	SCALE
DRAWN BY	M.D.	06-21-22	1" = 50'

**PRELIMINARY DRILL RIG LAYOUT**





**LEGEND**

DD DIVERSION DITCH	EXISTING FENCE
OP OUTLET PROTECTION	EXISTING POWER LINE
ST SEDIMENT TRAP	EXISTING MAJOR CONTOUR
SCL SEDIMENT CONTROL LOG	EXISTING MINOR CONTOUR
RRA RIP RAP APRON	PROPOSED MAJOR CONTOUR
	PROPOSED MINOR CONTOUR
	WORKING PAD SURFACE
	OIL & GAS LOCATION

**NOTES:**  
 • Contours shown at 1' intervals.  
 • Overall working pad surface = 510' x 460'  
 • Cut/Fill slopes 3:1 (Typ.)

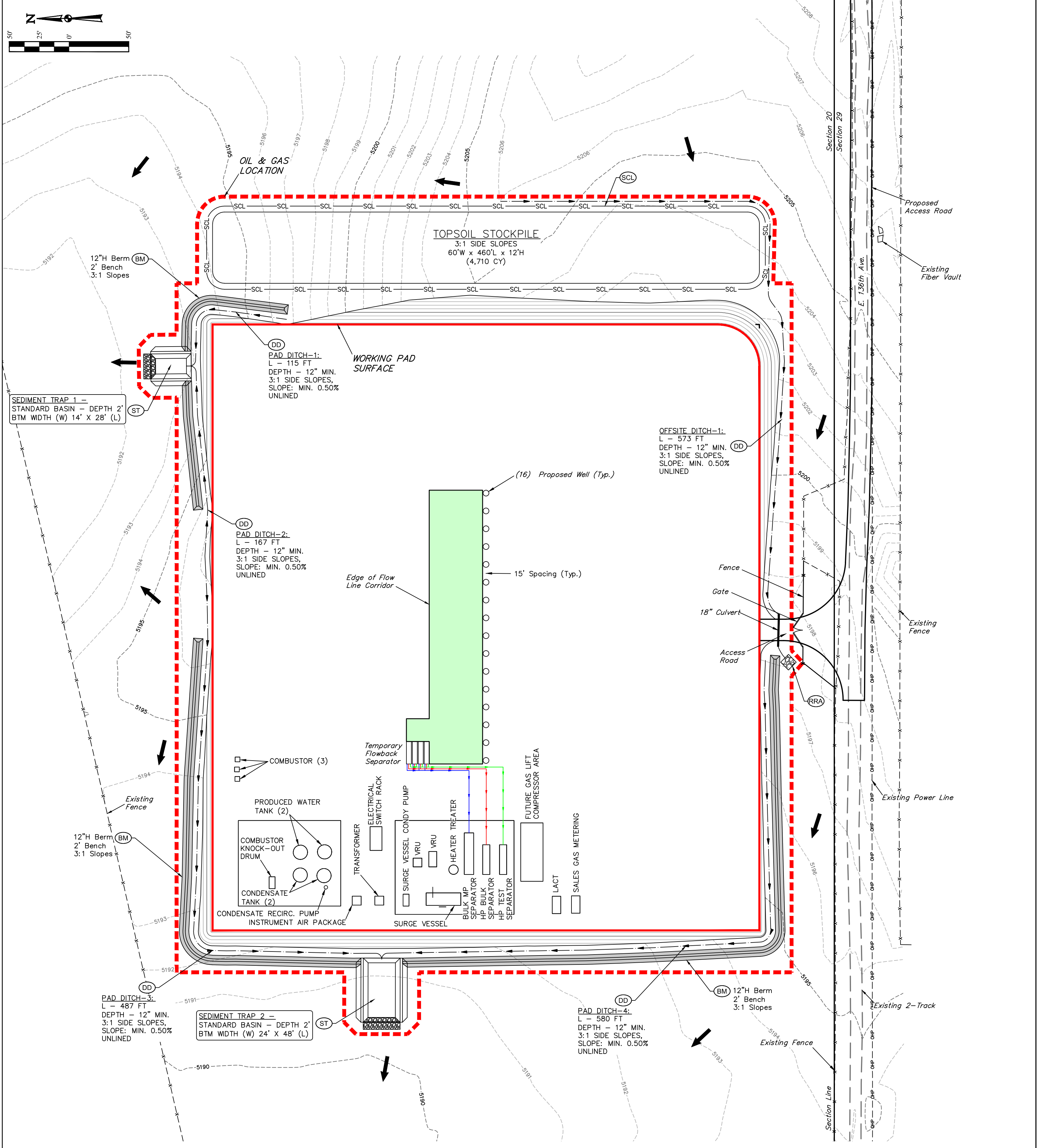
**UELTS, LLC**  
 Corporate Office \* 85 South 200 East  
 Vernal, UT 84078 \* (435) 789-1017

**POCO OPERATING**

**WAKEMAN 20-17 PAD**  
 SW 1/4 SE 1/4, SECTION 20, T1S, R65W, 6th P.M.  
 ADAMS COUNTY, COLORADO

SURVEYED BY	ORION RICE	06-16-22	SCALE
DRAWN BY	M.D.	06-21-22	1" = 50'

**PRELIMINARY WELL COMPLETION & STIMULATION LAYOUT**



**LEGEND**

	DD DIVERSION DITCH		EXISTING FENCE
	OP OUTLET PROTECTION		EXISTING POWER LINE
	ST SEDIMENT TRAP		EXISTING MAJOR CONTOUR
	SCL SEDIMENT CONTROL LOG		EXISTING MINOR CONTOUR
	RRA RIP RAP APRON		PROPOSED MAJOR CONTOUR
			PROPOSED MINOR CONTOUR
			WORKING PAD SURFACE
			OIL & GAS LOCATION

**NOTES:**

- Contours shown at 1' intervals.
- Overall working pad surface = 510' x 460'
- Cut/Fill slopes 3:1 (Typ.).

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 Corporate Office \* 85 South 200 East  
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REV: 2 09-25-23 P.M. (ADD LACT)

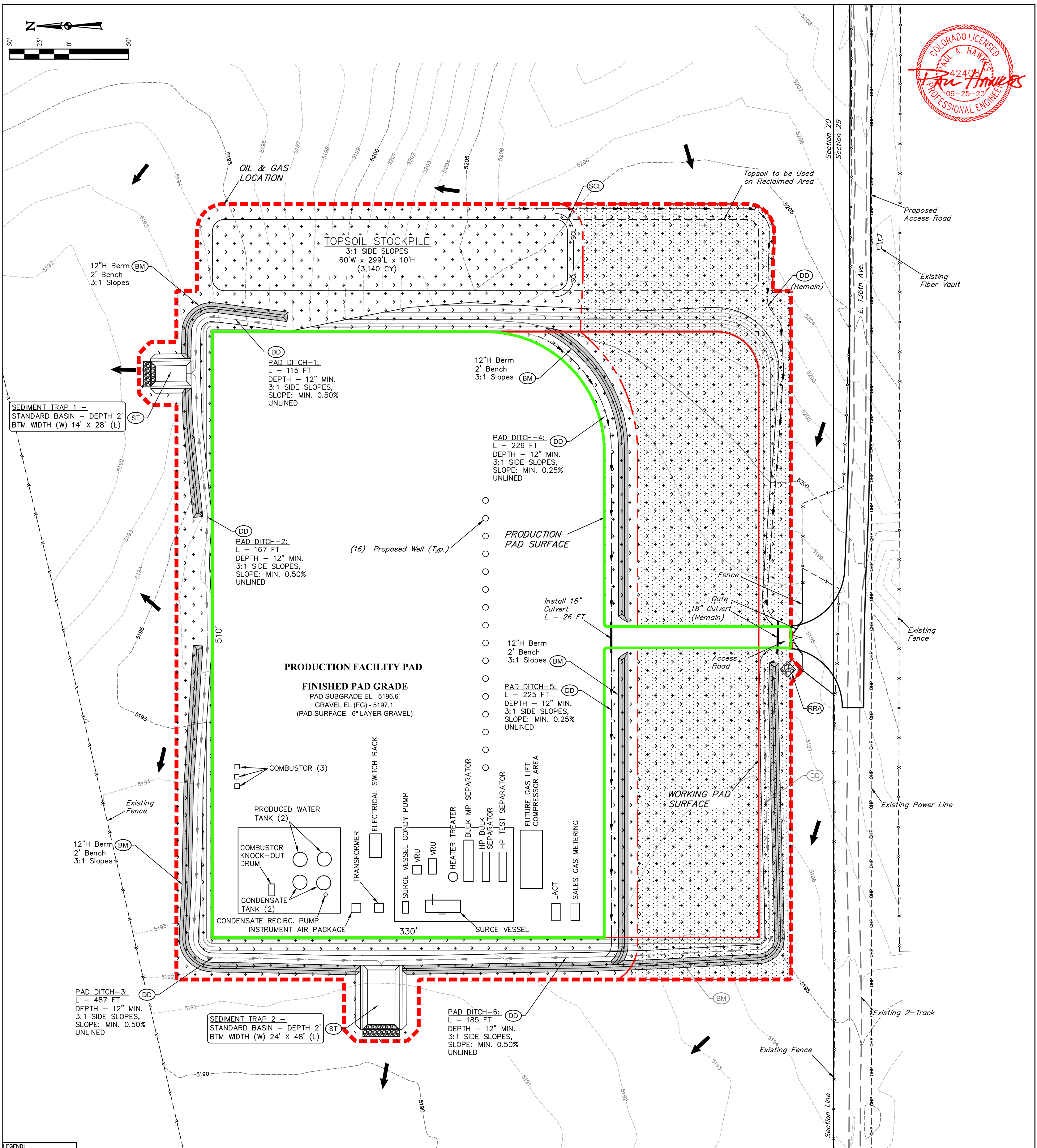
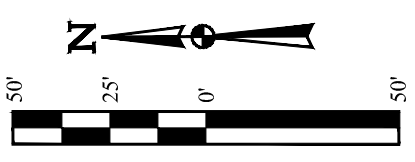
**POCO OPERATING**

**WAKEMAN 20-17 PAD**  
 SW 1/4 SE 1/4, SECTION 20, T1S, R65W, 6th P.M.  
 ADAMS COUNTY, COLORADO

SURVEYED BY	ORION RICE	06-16-22	SCALE
DRAWN BY	M.D.	06-21-22	1" = 50'

**PRELIMINARY FLOWBACK EQUIPMENT LAYOUT**





LEGEND:  
 Reclaimed Area

APPROXIMATE UN-RECLAIMED ACREAGE = ±5.797 ACRES  
 APPROXIMATE RECLAIMED ACREAGE = ±2.010 ACRES  
 TOTAL OIL & GAS LOCATION = ±7.807 ACRES

SIZE OF DISTURBED AREA AFTER INTERIM RECLAMATION IN ACRES (COGCC 2A REPORTABLE):  
 5.797 ACRES

LEGEND	
(DD) DIVERSION DITCH	(BM) BERM
(OP) OUTLET PROTECTION	(DD) DIVERSION DITCH TO BE RECLAIMED
(ST) SEDIMENT TRAP	(ST) SEDIMENT TRAP TO BE RECLAIMED
(SCL) SEDIMENT CONTROL LOG	(BM) BERM TO BE RECLAIMED
(SM) SEEDING AND MULCHING	-x-x-x- EXISTING FENCE
	-0000- EXISTING MAJOR CONTOUR
	-0000- PROPOSED MAJOR CONTOUR
	-0000- PROPOSED MINOR CONTOUR
	WORKING PAD SURFACE
	OIL & GAS LOCATION
	PRODUCTION PAD SURFACE
	LIMITS OF PERMANENT DISTURBANCE

NOTES:  
 • Contours shown at 1' intervals.  
 • Overall working pad surface = 510' x 460'  
 • Cut/Fill slopes 3:1 (Typ.).

**UENTAH**  
 ENGINEERING & LAND SURVEYING

**UELS, LLC**  
 Corporate Office \* 85 South 200 East  
 Vernal, UT 84078 \* (435) 789-1017

REV: 2 09-25-23 P.M. (ADD LACT)

**POCO OPERATING**

**WAKEMAN 20-17 PAD**  
 SW 1/4 SE 1/4, SECTION 20, T1S, R65W, 6th P.M.  
 ADAMS COUNTY, COLORADO

SURVEYED BY	ORION RICE	06-16-22	SCALE
DRAWN BY	M.D.	06-21-22	1" = 50'

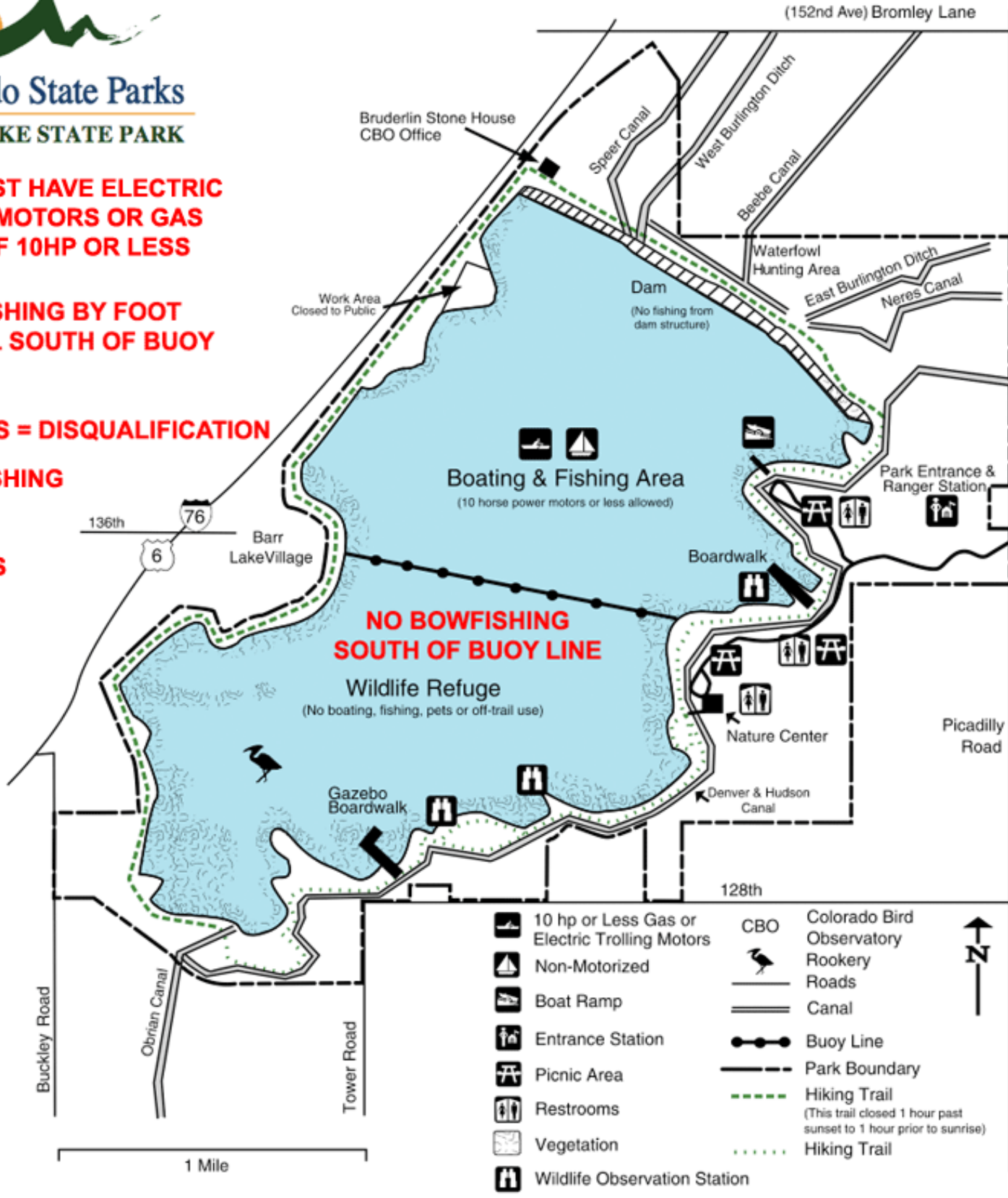
**FACILITY LAYOUT**

**BOATS MUST HAVE ELECTRIC TROLLING MOTORS OR GAS MOTORS OF 10HP OR LESS**

**NO BOWFISHING BY FOOT OR VESSEL SOUTH OF BUOY LINE.**

**VIOLATIONS = DISQUALIFICATION**

**NO BOWFISHING FROM DAM SURFACE OR CANALS**



Map of Barr Lake Reservoir, showing inlet, outlet and bypass canals.

136th Avenue, Tower Road, and 128th Avenue are all truncated by the reservoir. Many more roads are truncated by the six canals and their distribution downstream of the reservoir.





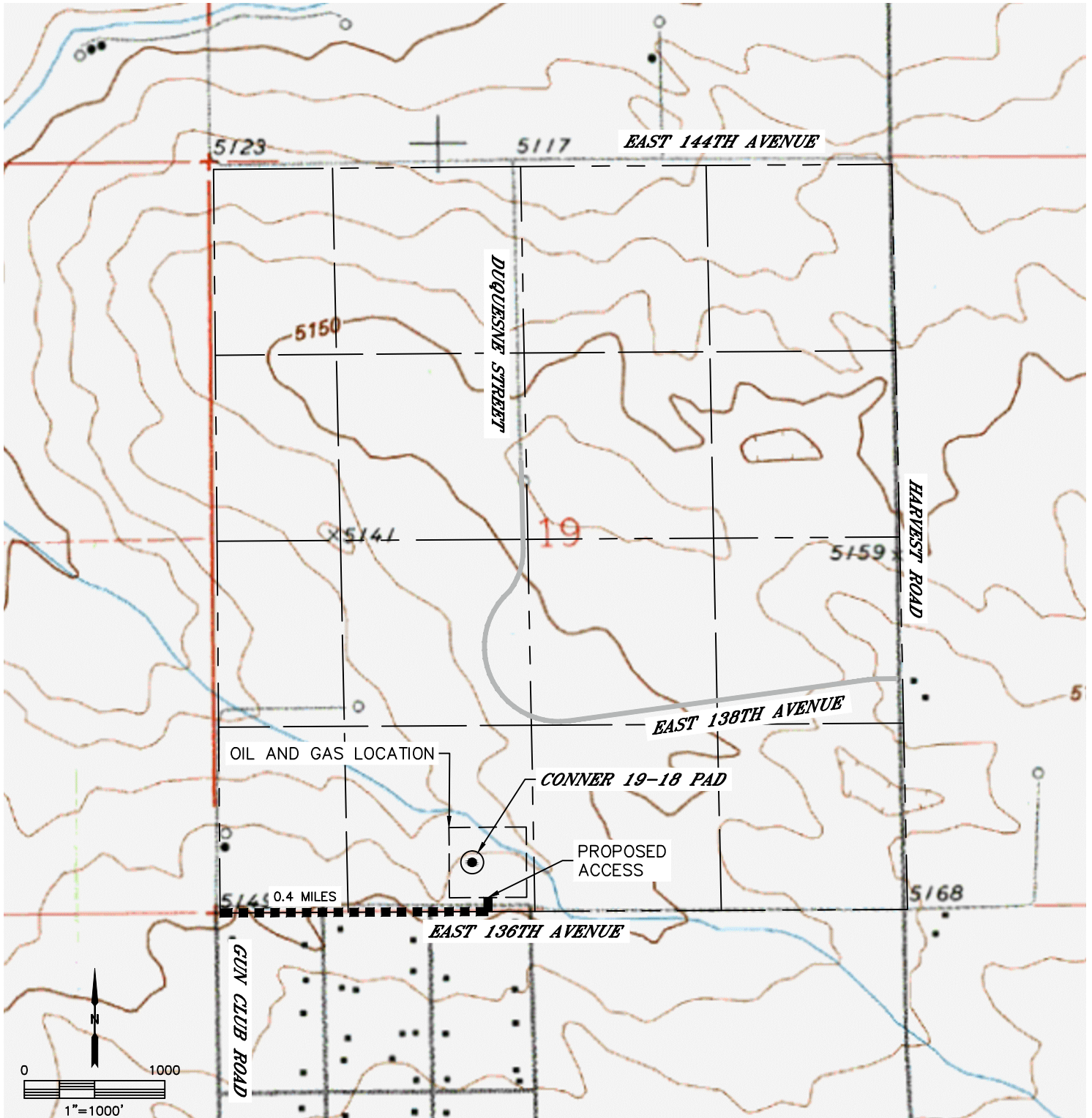
Lat40°, Inc. 6250 W. 10th Street, Unit 2, Greeley, CO 970-515-5294

# ACCESS ROAD MAP

**CONNER 19-18 PAD**

SECTION: 19  
TOWNSHIP: 1S  
RANGE: 65W  
6TH. P.M.  
ADAMS COUNTY, CO

DRIVING DIRECTIONS TO CONNER 19-18 PAD  
FROM THE INTERSECTION OF GUN CLUB ROAD AND EAST 136TH AVENUE, GO EAST ON EAST 136TH AVENUE FOR 0.4 MILES TO A PROPOSED ACCESS TO THE NORTH. GO NORTH ON PROPOSED ACCESS TO THE PROPOSED CONNER 19-18 PAD.





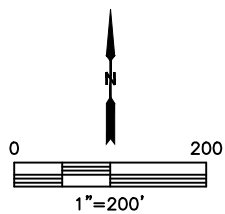


Lat40°, Inc. 6250 W. 10th Street, Unit 2, Greeley, CO 970-515-5294

# ACCESS ROAD MAP

CONNER 19-18 PAD

SECTION: 19  
TOWNSHIP: 1S  
RANGE: 65W  
6TH. P.M.  
ADAMS COUNTY, CO

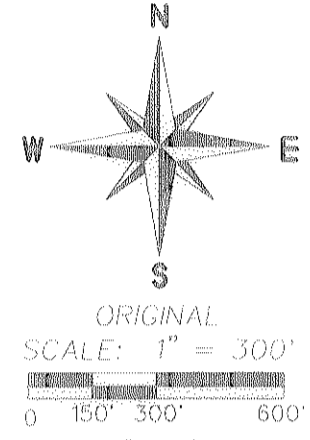




# LAND SURVEY PLAT "LETTERLY FARMS"

PART OF SECTION 19, TOWNSHIP 1 SOUTH,  
RANGE 65 WEST OF THE 6TH PRINCIPAL MERIDIAN,  
COUNTY OF ADAMS, STATE OF COLORADO.

LEGAL DESCRIPTIONS NOTE:  
FOR LEGAL DESCRIPTIONS OF THE PARCELS AND ROADS - SEE SHEET 2 OF 2.



(ORIGINAL 24" x 36" SHEET SIZE,  
REDUCED TO 1"=450' SCALE TO  
MEET ADAMS COUNTY 18" x 24"  
SHEET SIZE REQUIREMENTS.)

ROAD RIGHT-OF-WAY NOTE:  
THE PROPOSED ROAD R.O.W.'S  
ARE TO BE DEEDED TO ADAMS  
COUNTY.

- SURVEY NOTES:**
- BASIS OF BEARINGS IS ASSUMING THE EASTERLY LINE OF THE NORTHEAST 1/4 OF SECTION 19, T1S, R65W, BEING MONUMENTED AS SHOWN HEREON, AS BEARING SOUTH 00°00'00" WEST AS SHOWN ON SURVEY BY L.S. 32829, DATED AUGUST 15, 2003, WITH ALL OTHER BEARINGS SHOWN HEREON BEING RELATIVE THERETO.
  - INFORMATION REGARDING EASEMENTS AND RIGHTS-OF-WAYS OF RECORD WERE RESEARCHED BY AND OBTAINED FROM SECURITIY TITLE GUARANTY COMPANY'S COMMITMENT NO. Z096656A03-4 EFFECTIVE JUNE 9, 2004.
  - POSITIONAL TOLERANCE OF PROPERTY CORNER MONUMENT LOCATION TO MEASUREMENTS SHOWN EQUAL PLUS OR MINUS 0.2 OF A FOOT.
  - THE DEPENDENT RESURVEY OF TOWNSHIP 1 SOUTH, RANGE 65 WEST AS EXECUTED BY COMMISSIONER'S OF THE COURT, 1ST JUDICIAL DISTRICT, BRIGHTON, COLORADO, AND THE NOTES AND MAP OF THE CASE WERE DATED OCTOBER 06, 1919.
  - STATUTE OF LIMITATIONS NOTICE: ACCORDING TO COLORADO LAW YOU MUST COMMENCE ANY LEGAL ACTION BASED UPON ANY DEFECT IN THIS SURVEY WITHIN THREE YEARS AFTER YOU FIRST DISCOVER SUCH DEFECT. IN NO EVENT, MAY ANY ACTION BASED UPON ANY DEFECT IN THIS SURVEY BE COMMENCED MORE THAN TEN YEARS FROM THE DATE OF THE CERTIFICATION SHOWN HEREON.

**PARCEL GROSS ACREAGE SUMMARY:**

PARCEL 1	=	36.183 ACRES +/-
PARCEL 2	=	36.182 ACRES +/-
PARCEL 3	=	36.235 ACRES +/-
PARCEL 4	=	36.443 ACRES +/-
PARCEL 5	=	39.508 ACRES +/-
PARCEL 6	=	38.294 ACRES +/-
PARCEL 7	=	39.023 ACRES +/-
PARCEL 8	=	36.590 ACRES +/-
PARCEL 9	=	36.503 ACRES +/-
PARCEL 10	=	36.011 ACRES +/-
PARCEL 11	=	36.011 ACRES +/-

**PARCELS TOTAL** = 406.983 ACRES +/-  
**DUQUESNE & 138TH** = 9.254 ACRES +/-  
**PERIMETER 40'S +** = 13.693 ACRES +/-  
**W1/2 & SE1/4 SECTION 19** = 429.930 ACRES +/-

- LEGEND:**
- SECTION CORNERS, DESCRIBED AS SHOWN.
  - FOUND NO. 4 REBAR WITH YELLOW PLASTIC CAP, L.S. 32829.
  - SET NO. 5 REBAR WITH ORANGE PLASTIC CAP, L.S. 25937.

**(#24,303) PROPOSED PROPERTY ADDRESS NUMBER.**

OWNER : CCSW, LLC  
 CONTACT: DAVID CONNER  
 2 OSPREY CIRCLE  
 THORNTON, CO 80241  
 PHONE: 303-255-9313

**SURVEYOR'S CERTIFICATE:**  
 I, JOEL B. CROWE, A PROFESSIONAL LAND SURVEYOR LICENSED IN THE STATE OF COLORADO, ON THE BASIS OF MY KNOWLEDGE, INFORMATION AND BELIEF, DO HEREBY STATE, THAT AS A RESULT OF A FIELD SURVEY MADE TO NORMAL STANDARDS OF CARE, THE SURVEY SHOWN HEREON WAS MADE BY ME OR UNDER MY DIRECT RESPONSIBILITY, SUPERVISION AND CHECKING, ALL TO THE BEST OF MY KNOWLEDGE AND BELIEF.

DATE OF CERTIFICATION: 4-25-07  
 JOEL B. CROWE, L.S. 25937

SURVEY PLAT DEPOSIT INDEX CERTIFICATE:  
 DEPOSITED THIS 25th DAY OF April, 2007, AT 11:31 A.M.  
 IN THE INDEX OF ADAMS COUNTY LAND SURVEY PLATS.

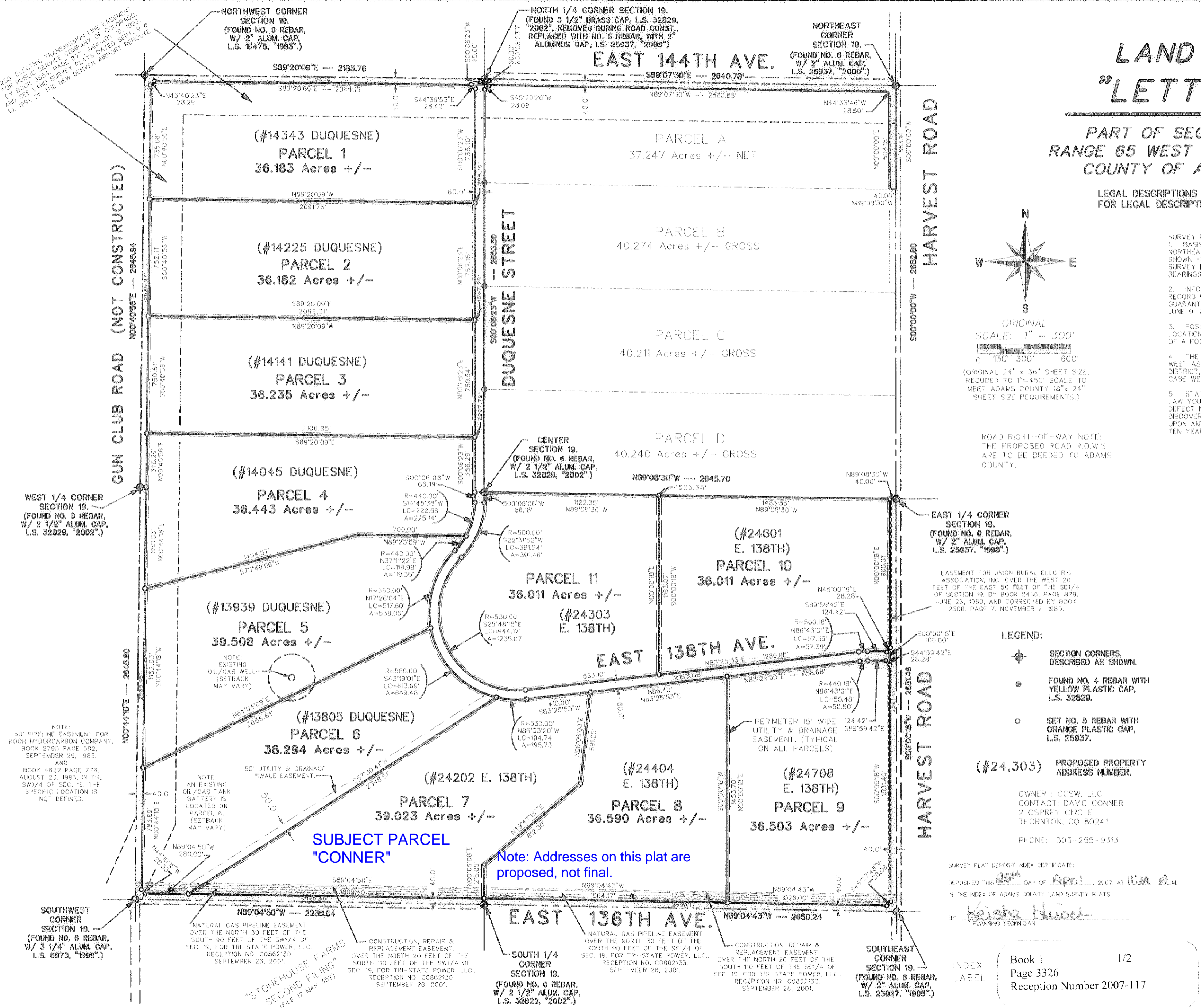
BY: Keisha Hines, PLANNING TECHNICIAN

INDEX LABEL: Book 1 Page 3326 Reception Number 2007-117

SHEET 1 OF 2.

**ALPHA SURVEYING CO.**  
 P.O. BOX 392, 1010 SO. FULTON AVE., FORT LUPTON, COLORADO 80821  
 PH: 303-857-2308 OR 303-857-2010, CELL: 303-550-3374  
 E-MAIL: ALPHASURVEYING@AOL.COM, FAX: 303-857-0707

PATH: D:\1915SLTR\PARCELS\SP5ABD.VCD	CONTACT: DAVID CONNER (11 PARCELS)
REVISIONS	BY DATE DWG BY: RC/JC
CURVE RADIUS, ACRES, ETC.	JC 4-25-07
DATE: JAN. 31, 2006	FDBK: DATA
PG: COLL.	FILE NO. 19-1S5-07A



230' ELECTRIC TRANSMISSION LINE EASEMENT FOR PUBLIC SERVICE COMPANY OF COLORADO, BY BOOK 3854, PAGE 871, JANUARY 10, 1992, AND SEE LAND SURVEY PLATS DATED SET. 1, 2 & 10, 1991, OF THE NEW DENVER AIRPORT REROUTE.

NORTHWEST CORNER SECTION 19, (FOUND NO. 8 REBAR, W/ 2" ALUM. CAP, L.S. 16475, "1993".)

NORTH 1/4 CORNER SECTION 19, (FOUND 3 1/2" BRASS CAP, L.S. 32829, "2002", REMOVED DURING ROAD CONST., REPLACED WITH NO. 6 REBAR, WITH 2" ALUMINUM CAP, L.S. 25937, "2008".)

NORTHEAST CORNER SECTION 19, (FOUND NO. 6 REBAR, W/ 2" ALUM. CAP, L.S. 25937, "2000".)

WEST 1/4 CORNER SECTION 19, (FOUND NO. 6 REBAR, W/ 2 1/2" ALUM. CAP, L.S. 32829, "2002".)

EAST 1/4 CORNER SECTION 19, (FOUND NO. 6 REBAR, W/ 2" ALUM. CAP, L.S. 25937, "1996".)

NOTE: EXISTING OIL/GAS WELL (SETBACK MAY VARY)

NOTE: AN EXISTING OIL/GAS TANK BATTERY IS LOCATED ON PARCEL 6, (SETBACK MAY VARY)

NATURAL GAS PIPELINE EASEMENT OVER THE NORTH 30 FEET OF THE SOUTH 90 FEET OF THE SW1/4 OF SEC. 19, FOR TRI-STATE POWER, LLC, RECEPTION NO. C0862130, SEPTEMBER 26, 2001.

CONSTRUCTION, REPAIR & REPLACEMENT EASEMENT, OVER THE NORTH 20 FEET OF THE SOUTH 110 FEET OF THE SW1/4 OF SEC. 19, FOR TRI-STATE POWER, LLC, RECEPTION NO. C0862133, SEPTEMBER 26, 2001.

SOUTH 1/4 CORNER SECTION 19, (FOUND NO. 6 REBAR, W/ 2 1/2" ALUM. CAP, L.S. 32829, "2002".)

NATURAL GAS PIPELINE EASEMENT OVER THE NORTH 30 FEET OF THE SOUTH 90 FEET OF THE SE1/4 OF SEC. 19, FOR TRI-STATE POWER, LLC, RECEPTION NO. C0862133, SEPTEMBER 26, 2001.

SOUTHEAST CORNER SECTION 19, (FOUND NO. 6 REBAR, W/ 2" ALUM. CAP, L.S. 23027, "1995".)

"STONEHOUSE FARMS SECOND FILING" (FILE 12 MAP 552)





## Appendix B: Roadway Maps

# Appendix B: Roadway Maps & Discussion

## Existing and Committed Transportation Network

Per Section 8-02-06-01, we reviewed the existing road network.

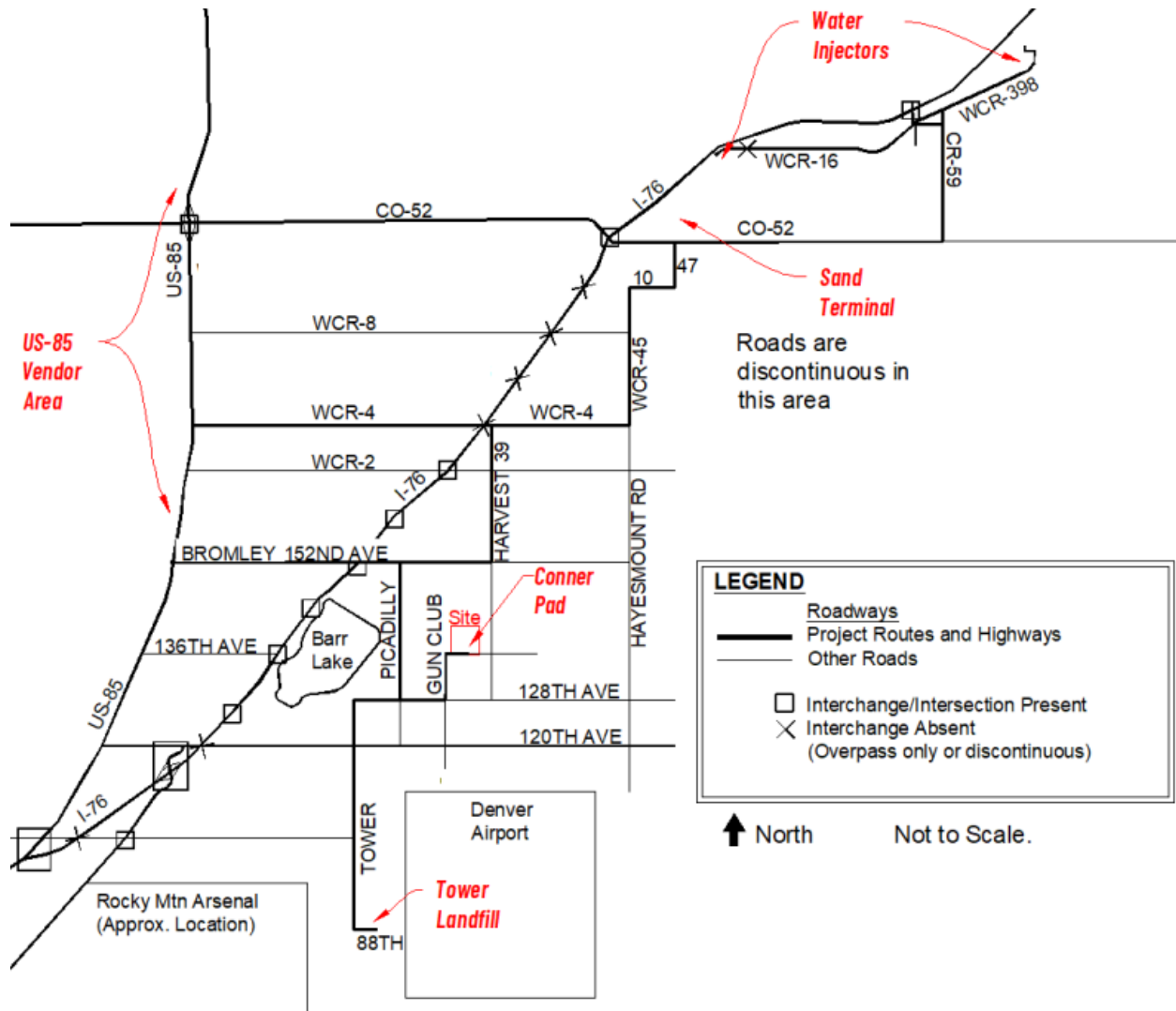


Figure 1. Roadways

## Existing Network

Primary roadways and intersections in the area are shown in Figure 1. East-west roads, from north to south, are:

- WCR-8 is classified as an arterial, however, it has a weight limited bridge at its overpass over I-76. It is of no use to the project due to this restriction. Freight studies mention this road as being of importance.



## APPENDIX B

---

- WCR-6 does not exist in most of the study area. It has high daily traffic in some areas, including trucks, and has a stop light at US-85.
- WCR-4 varies as to its jurisdiction, functional class, surface, and width. It is continuous over the length shown. Over most of the length shown, it is a two-lane paved road. It functions as an arterial in that it has good connectivity, and it does not traverse a lot of neighborhoods. It is a designated Truck Route in Lochbuie.
- WCR-2/168<sup>th</sup> Avenue passes through several jurisdictions. It is a paved, 2-lane road, increasing to 4 lanes in places, in the study area. The ADT's on this road are high compared to the number of lanes: there are only 2 lanes near US-85, yet the ADT's are 9000 to 10,000 VPD. We downloaded crash statistics for 2020 and 2021, and although we did not carry out a formal analysis, WCR-2/168<sup>th</sup> Ave appeared to have a lot of accidents, including two fatalities at the I-76 interchange in 2021. Although there are signs marking it as a truck route in Brighton, few truck drivers are choosing to use it. We tried to find out if it is a truck route in other jurisdictions, but we were not successful, either by online research, or by calling or emailing.
- 160<sup>th</sup> Avenue was not selected for route analysis. It has a weight limited bridge in the east part of the study area. It has numerous curves east of I-76 which are marked 25 mph.
- East 152<sup>nd</sup> Avenue is a paved east-west arterial having two through lanes. It does not have turn lanes in the study area. It has a posted speed limit of 55 miles per hour.

We did analyze it as a route, however, after receiving traffic counts, we analyzed the gap time for making a left hand turn at peak hour, and the gap time is too short. We observed the traffic on this road on May 8, 2024, between 6 pm and 6:30 pm, and counted the seconds between vehicles: this confirmed our calculation.

Empty trucks may be able to use 152<sup>nd</sup> Avenue, and it may have lower traffic at non-peak times.

- 136<sup>th</sup> Avenue is classified as a rural arterial roadway; however, the existing road is an unimproved dirt road with a single lane. We are considering the road installed in this alignment to be a site access road for the purposes of this report. Barr Lake Reservoir prevents 136<sup>th</sup> Avenue from being connected directly to I-76, and there are presently no destinations on this road other than a power plant and two proposed well pads. It is unlikely to be developed into an arterial in the near-to-medium term.

Rights-of-way and easements for this project are by others. However, we offer the following observations. One reason for having “functional classes” for roads is to reserve rights-of-way and easements for future development. We observe that existing

## APPENDIX B

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rights-of-way, with installed utilities, may determine where future rights-of-way can be reserved for an arterial roadway in the alignment of 136<sup>th</sup> Avenue, both in the case of Conner Pad and Wakeman Pad. (Alpha, 2006).

- East 128<sup>th</sup> Avenue varies from a two-lane paved road to a gravel road in this area. It does not have turn lanes in the study area.
- 120<sup>th</sup> Avenue is a paved east-west rural regional arterial roadway having two through lanes. It does not have turn lanes in the study area. It has a posted speed limit of 55 miles per hour.

North-South Roads, from west to east, are:

- Tower Road is a paved, four lane arterial, which narrows to a two-lane arterial north of 120<sup>th</sup> Avenue.
- Picadilly Road is a two-lane, paved arterial. It is of limited use due to the short gap time to turn from this road, or cross over 152<sup>nd</sup> Avenue, with loaded trucks. Since there is no water injection infrastructure in Adams County, and little transloading, any commercial traffic needs to be shuttled back and forth to other areas.

The pavement is thin as shown by coring and analysis by Rocksol for recent mill and overlay work south of 120<sup>th</sup> Avenue. The pavement was laid directly on subgrade. This does not match the assumptions used by FHU in their 2018 analysis, and in general, does not match the pavement structure of an arterial.

- Gun Club Road is discontinuous and varies in form. The section used by the project is approximately 20 to 24 feet wide and is surfaced with gravel.
- Harvest Road is a gravel road south of 152<sup>nd</sup> Avenue, and a paved, 2-lane road north of 152<sup>nd</sup> Avenue. It is functionally classified as an arterial.
- Powhaton Road is a gravel road. We are not planning to use it for Conner Pad.
- Hayesmount Road is a two-lane paved road in the study area. It is classified as an arterial. The pavement had completely failed when we last looked at this road in 2018; repair work was budgeted and the road appears to have been repaired recently. Coring data was not available for this road. It has the functional class 'arterial.'
- All intersections in the area are stop controlled intersections.

## Committed Network – Construction Projects

Per Section 8-02-06-01, we reviewed the committed road network, including recent work by agencies.

### Committed by Agencies

The 2022 *TMP* lists the following planned improvements for this area.

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- East 152<sup>nd</sup> Avenue between I-76 and Imboden Road: improve the road from a partially paved road to a paved 2-lane roadway. This 8.9-mile project has a planning level cost of \$58,363,000 and Adams County is the lead.
- Harvest Road between 120<sup>th</sup> Avenue and 168<sup>th</sup> Avenue: improve the road from gravel to a 2-lane paved roadway. This 6-mile project has a planning-level cost of \$38,913,000, and Adams County is the lead.

### Recent Work by Adams County

- The 2019 road paving package IFB-SS-2019.501 (Bidnet) contained a project to install a 5" overlay on Hayesmount Road, from 120<sup>th</sup> Avenue to 152<sup>nd</sup> Avenue.
- The 2024 road paving package IFB-MW-2024.208 (Bidnet) contains work on 168<sup>th</sup> Avenue from I-76 to Harvest (WCR-39), and on Picadilly Road near 120<sup>th</sup> Avenue. Information for a project on Yosemite is also included.
  - Although these are not the roads analyzed for the present study, Picadilly Road is in the same area and may have similar construction as the roads the Wakeman project proposes to use.
  - This bid package is interesting for the inclusion of soils and asphalt coring information which shows that Picadilly and Yosemite were constructed as local roads, with a thin layer of asphalt directly on subgrade.
  - The parameters given to Rocksol for the design of upcoming projects for both streets are consistent with local streets, and do not mention heavy trucking, such as oilfield trucking.
  - Picadilly Road was analyzed by Tetra Tech in their 2019 submittal for Warbler AUSR, in which they computed the cost for an overlay, given certain assumptions. The paper exercise of computing overlay thicknesses is only worthwhile if the assumptions are reasonable and the engineer making the calculations has all the information.
- Paving was completed on 152<sup>nd</sup> Avenue during 2023, per the ADCO website. See the ADCO *2023 Paving Program Overview Map*, Appendix B.
- Additional projects completed between 2017 and 2024 were identified from Bidnet and are shown on a map following this narrative.

### Committed by Developer

POCO intends to install a site access road in the 136<sup>th</sup> Avenue alignment. Although 136<sup>th</sup> Avenue is shown as an arterial on the 2022 TMP, it seems logical that an ordinary oilfield access road should be installed, rather than a road with utility easements for an arterial. The existing easements for utilities will need to be documented and maintained.

Although 136<sup>th</sup> Avenue is shown as an arterial on the Transportation Master Plan, there is no practical way to connect it to the larger network in the County, because Barr Lake cuts it off from I-76. Moreover, there is no existing traffic demand, and the future land use for the area is slated to be industrial and agricultural, with no proposed developments that would have large amounts of site-generated traffic.

## Routing Challenges

### Discontinuous County Roads

#### Weld County

Truck drivers overcome routing challenges daily. The following summarizes issues they encounter with County Roads along Interstate 76, from south to north. Their objective is to start at Conner well pad (136<sup>th</sup> Avenue and Gun Club Road) and reach Hudson (rail transloading), Keenesburg (water injectors) or the intersection of WCR-4 and US-85 (oilfield vendors).

WCR-2 has an interchange with I-76, and a truck can use WCR-2 to get on I-76 to go to Hudson or Keenesburg.

WCR-4 is continuous between I-76 and US-85, although it changes in width. There is no stoplight at US-85.

WCR-6 and WCR-10 are discontinuous due to lack of bridges over canals. WCR-6 does feature a stop light at US-85.

WCR-8 is continuous between I-76 and US-85, however, it has a weight-limited bridge at its overpass over I-76 which cannot be used for trucking. There is no stoplight at US-85.

WCR-12/CO-52 is north of vendors at US-85 and WCR-4, and results in “doubling-back,” additionally, the interchange with I-76 features two roundabouts on a grade on the west side.

Routing on the I-76 frontage roads can be used as a work-around in some cases, however, this routing is not for the faint of heart. The complex routing increases the skill-set needed for the drivers, and thus limits the available workforce.

#### Interstate 76

I-76 is less useful than it appears at first glance. It can be used to get to Keenesburg or Hudson, but does not provide connectivity to east-west routes.

Considering a route that starts at Conner pad and ends at the US-85 vendor area (US-85 and WCR-4) or at Keenesburg;

1. The following are potential “on ramps”:



## APPENDIX B

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- a. 128<sup>th</sup>, 136<sup>th</sup>, 144<sup>th</sup> Avenues: Ramps exist, but roads are truncated by Barr Lake. These ramps are not useful for this project.
  - b. 152<sup>nd</sup> Avenue (via Picadilly Road): On ramp to I-76 may be used.
  - c. 160<sup>th</sup> Avenue (via Harvest Road): On ramp to I-76 exists. Requires navigating curves in 160<sup>th</sup> Ave east of the freeway. However, from Harvest Road and 160<sup>th</sup> Avenue, if the driver proceeds 2 miles straight north on Harvest Road, he will arrive at WCR-4: county roads are the preferred route.
  - d. WCR-2/168<sup>th</sup> Avenue (via Picadilly Road): On ramp to I-76 exists. If the driver is going to Hudson or Keenesburg, they might choose this on ramp. However, it is more likely they would take Harvest Road/WCR-39.
2. The following are potential “off ramp” locations:
- a. WCR-4, WCR-6, WCR-8, WCR-10: No ramps. These roads are at the center of the US-85 Vendor Area. Additional constraints exist with these roads<sup>1</sup>.
  - b. WCR-12/12.5/CO-52 (Hudson): Off ramp. Take Main Street and Frontage Road east to sand terminal.
  - c. WCR-49: Off ramp. Take frontage road back to Hudson. Route results in “doubling back.”
  - d. Market Street (Keenesburg): Off ramp. Take county roads to injection facilities.

## Road Naming Conventions

The proposed site is on 136<sup>th</sup> Avenue, just east of Gun Club Road. This study is primarily concerned with roads in Adams County, however, the routing is determined by discontinuities in the roads in both Adams and Weld counties. There are gaps in the roads, and some roads do not connect to important facilities such as I-76.

- In Adams County, north-south roads on one-mile spacing are given names, and are called “roads.” The east-west roads, also on one-mile spacing, are numbered with even numbers, and are called “avenues.” The avenue numbers increase from south to north.
- In Weld County, most of the roads in the study area are referred to as “Weld County Road,” and abbreviated “WCR.” The roads are on one-mile spacing. North-south roads are given odd numbers, which increase from west to east. East-west roads are given even numbers, which increase from south to north.
- The east-west road on the county line is called 168<sup>th</sup> Avenue in Adams County, and WCR-2 in Weld County.

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<sup>1</sup> See Appendix B.

## Canals

Discontinuous roads are a pervasive and likely permanent feature of the area; the discontinuity determines truck routing in Adams and Weld counties. Barr Lake lies between the study area and I-76: although 144th, 136th, and 128th Avenues are shown as arterials, Barr Lake Reservoir, canals, and marshy areas in the area make it unlikely that these roads will be connected to I-76, or to their respective alignments west of the freeway.

Similarly disconnected east-west roads in Weld County exist due to the presence of the six discharge canals from Barr Lake, an irrigation reservoir. In addition to the Barr Lake discharge canals and their laterals, other canals, such as the Denver-Hudson Canal, also traverse the area in both counties. The Beebe Seep forms an anastomosing milieu of waterways and marshy areas.

Where a low-volume road crosses a canal, it has often not been economic to install a bridge, because the traffic on the road does not warrant it. As a result, east-west roads are truncated. These roads lack connections to I-76, and north-south roads lack connections to highways such as CO-52 (Weld County Road 12). For a map of Barr Reservoir showing the canals, see Appendix A.

## Routes Considered

The same routes were analyzed for Traffic Impact (Appx D) and Impacts to Road Condition (Appx E), and are listed below. Routes 1, 4 and 5 were eliminated.

### Route 1. To Water Disposal Sites (Keenesburg) and Sand Terminal (Hudson) via Weld County Roads

Jurisdiction	Road Name	Road Surface	Distance	Leg
ADCO	Access Road 136th Av	2-Lane Gravel	0.4	136th Avenue west 0.4 miles to Gun Club Road.
ADCO	Gun Club Road	2-Lane Gravel	1	Turn south (left) on Gun Club Road, then drive approximately 1 mile to 128th Avenue.
ADCO	128th Avenue	2-Lane Paved	1	Turn west (right) on 128th Avenue and drive 1 mile to Picadilly Road.
ADCO	Picadilly Road	2-Lane Paved	3	Turn north (right) on Picadilly Road and drive 3 miles to 152nd Avenue.
ADCO	152nd Avenue	2-Lane Paved	2	Turn east (right) on 152nd and drive 2 miles to Harvest Mile Road.
ADCO	Harvest Road	2-Lane Paved /Gravel	2	Turn north (left) on Harvest Road and drive about 2 miles to Weld County Line
Weld County	WCR-39	Gravel	1	Continue straight on WCR-39 and drive about 1 mile to WCR-4.
Weld County	WCR-4	2-Lane Paved	3	Turn east (right) on WCR-4 and drive about 3 miles to WCR-45.
Weld County	WCR-45	2-Lane Paved	3	Turn north on WCR-45 and drive about 3 miles to WCR-10.
Weld County	WCR-10	Gravel	1	Turn east (right) on WCR-10 and drive about 1 mile to WCR-47.
Weld County	WCR-47	Gravel	1	Turn north (left) on WCR-47 and drive 1 mile to CO-52.

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**Route 1A. To Sand Terminal (Hudson):**

Jurisdiction	Road Name	Road Surface	Distance	Sand Terminal:
Weld County	WCR-47	2-Lane Concrete	0.5	At WCR-47 and CO-52, continue straight across CO-52 for 0.5 miles to sand loading.

Sand is available at many transloading points, including in Commerce City, Fort Lupton and Brighton. Hudson was chosen for modeling purposes. Negotiation of contracts with vendors is generally not undertaken until permits are secured.

**Route 1B. To Injection Wells Keenesburg):**

Jurisdiction	Road Name	Road Surface	Distance	Injection Wells:
CDOT	CO-52	2-Lane Paved	6	At WCR-47 and CO-52, turn east (right) on CO-52 and drive about 6 miles to WCR-59.
Weld County	WCR-59	2-Lane Paved	3	Turn north (left) on WCR-59 and drive north 3 miles to Keenesburg.
Weld/Keenesburg	Local Roads	Paved/Gravel	as required	Take local roads to injectors.

Injection facilities are available in the US-85 Vendor Area as well. There are no injection facilities that can be used by this project in Adams, Arapahoe, or Denver Counties. The trucking will therefore be to the north.

**Route 2: To Commerce City Vendors via 120th Ave (e.g. Fuel Trucks)**

Jurisdiction	Road Name	Road Surface	Distance	Leg
ADCO	Access Rd 136th Av	2-Lane Gravel	0.4	136th Avenue west 0.4 miles to Gun Club Road.
ADCO	Gun Club Road	2-Lane Gravel	1	Turn south (left) on Gun Club Road, then drive approximately 1 mile to 128th Avenue
ADCO	128th Avenue	2-Lane Paved	3	Turn west (right) on 128th Avenue and drive 3 miles to Tower Road.
COMMERCE CITY	Tower Road	2-Lane Paved	1	Turn south (left) on Tower Road and drive about 1 mile to 120th Avenue.
COMMERCE CITY	120th Avenue	2-Lane Paved	as required	Turn west (right) on 120th Avenue and take routes as required to final destination.

**Route 3: To Tower Landfill**

Jurisdiction	Road Name	Road Surface	Distance	Leg
ADCO	Access Road 136th Av	2-Lane Gravel	0.4	136th Avenue west 0.4 miles to Gun Club Road.
ADCO	Gun Club Road	2-Lane Gravel	1	Turn south (left) on Gun Club Road, then drive approximately 1 mile to 128th Avenue.
ADCO	128th Avenue	2-Lane Paved	3	Turn west (right) on 128th Avenue and drive 3 miles to Tower Road.
COMMERCE CITY	Tower Road	2-Lane Paved	5	Turn south (left) on Tower Road and drive about 5 miles to 88th Avenue.
ADCO	88th Avenue	2-Lane Paved	0.5	Turn east (left) on 88th Avenue (landfill entrance road) and drive 0.5 miles to the site entrance.

The loads that will go to Tower Landfill are primarily drilling waste such as drill cuttings.

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Per FHU, 2018, the part of Tower Road analyzed is in Commerce City. Per GIS, part of Tower Road may be in Adams County. To be consistent with the assumptions used to develop the Traffic Impact Fee, we used the jurisdiction per the Felsburg, Holt and Ullevig report.

### Route 4: To US-85 Vendor Area via Bromley Lane

Jurisdiction	Road Name	Road Surface	Distance	Leg
ADCO	Access Road 136th Av	2-Lane Gravel	0.4	136th Avenue west 0.4 miles to Gun Club Road.
ADCO	Gun Club Road	2-Lane Gravel	1	Turn south (left) on Gun Club Road, then drive approximately 1 mile to 128th Avenue
ADCO	128th Avenue	2-Lane Paved	1	Turn west (right) on 128th Avenue and drive 1 mile to Picadilly Road.
ADCO	Picadilly Road	2-Lane Paved	3	Turn north (right) on Picadilly Road and drive 3 miles to 152nd Avenue.
ADCO	152nd Avenue	2-Lane Paved	0.9	Turn west (left) on 152nd Avenue and drive 0.9 miles to change in jurisdiction to Brighton
Brighton	152nd Avenue	4- to 6-Ln Paved	4	Straight on 152 <sup>nd</sup> , drive 4 miles to US-85.
CDOT	US-85	Paved Divided Highway	10	Turn north (right) on US-85 and drive north about 10 miles to the US-85 Vendor Area.

### Route 5: To US-85 Vendor Area via Harvest Road to WCR-4

Jurisdiction	Road Name	Road Surface	Distance	Leg
ADCO	Access Road 136th Av	2-Lane Gravel	0.4	136th Avenue west 0.4 miles to Gun Club Road.
ADCO	Gun Club Road	2-Lane Gravel	1	Turn south (left) on Gun Club Road, then drive approximately 1 mile to 128th Avenue.
ADCO	128th Avenue	2-Lane Paved	1	Turn west (right) on 128th Avenue and drive 1 mile to Picadilly Road.
ADCO	Picadilly Road	2-Lane Paved	3	Turn north (right) on Picadilly Road and drive 3 miles to 152nd Avenue.
ADCO	Harvest Road	2-Lane Paved	2	Turn east (right) and drive 2 miles to Harvest Mile Road.
ADCO	Harvest Road	2-Lane Paved/ Gravel	2	Turn north (left) on Harvest Road and drive about 2 miles to Weld County Line
Weld County	WCR-39	Gravel	1	Continue straight on WCR-39 and drive about 1 mile to WCR-4.
Weld / Brighton / Lochbuie / Fort Lupton	WCR-4	2-Lane Paved	6.4	Turn west (left) on WCR-4 and drive about 6.4 miles to US-85.

Route 5 eliminates the left hand turn from Picadilly Road to 152nd Avenue. Gap time at peak hour is too low to make this turn with a loaded truck. Other alternate routes are possible.

### Route 6: Haymount to WCR-4 and WCR-45

Jurisdiction	Road Name	Road Surface	Distance	Leg
ADCO	Access Road 136th Av	2-Lane Gravel	0.4	136th Avenue west 0.4 miles to Gun Club Road.



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ADCO	Gun Club Road	2-Lane Gravel	1	Turn south (left) on Gun Club Road, then drive approximately 1 mile to 128th Avenue.
ADCO	128th Avenue	2-Lane Paved 2-Lane Gravel	0.5 3.5	Turn east (left) on 128th Ave, then drive 4 miles to Hayesmount Road
ADCO	Hayesmount Road	2-Lane Paved	3	Turn north (left) on Hayesmount Road, then drive 3 miles to 152nd Ave
ADCO	Hayesmount Road	2-Lane Paved	50 ft	Continue straight across 152nd (about 50 ft, 2-Lane paved road)
ADCO	Hayesmount Road	2-Lane Paved	2	Continue straight on Hayesmount Road to WCR-2/168th Avenue
Weld	WCR-45	2-Lane Paved	1	Continue straight on WCR-45 to WCR-4
Weld / Brighton / Lochbuie / Fort Lupton	WCR-4	2-Lane Paved	9.4	Turn west (left) on WCR-4 and drive to US-85. Weight limited bridge 40T (80,000 lb) for tractor-trailer at Beebe Seep Canal

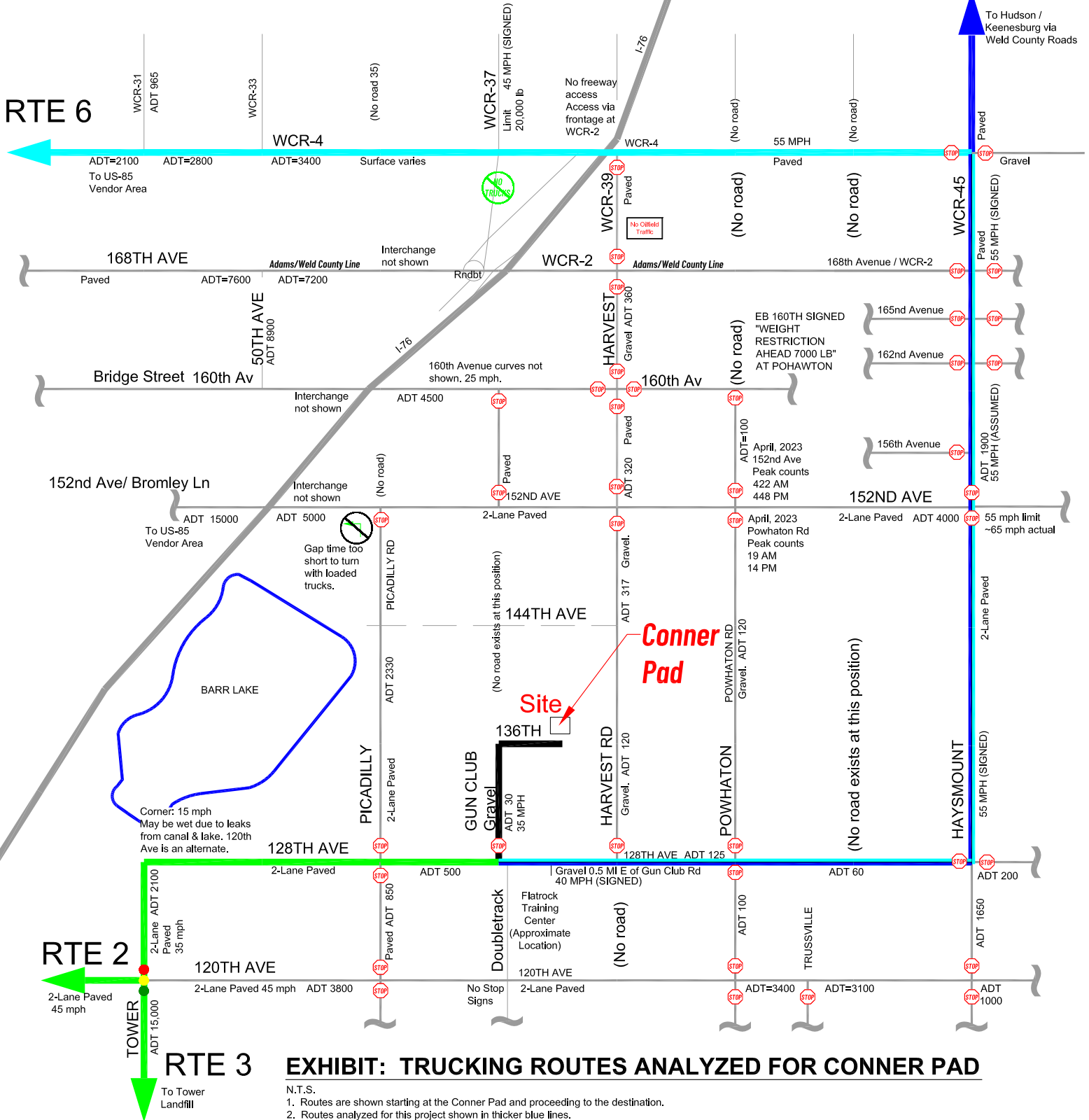
**Route 7: Hayesmount to WCR-45 and on to Keenesburg, Hudson**

Jurisdiction	Road Name	Road Surface	Distance	Leg
ADCO	Access Road 136th Avenue	2-Lane Gravel	0.4	136th Avenue west 0.4 miles to Gun Club Road.
ADCO	Gun Club Road	2-Lane Gravel	1	Turn south (left) on Gun Club Road, then drive approximately 1 mile to 128th Avenue.
ADCO	128th Avenue	2-Lane Paved 2-Lane Gravel	0.5 3.5	Turn east (left) on 128th Ave, then drive 4 miles to Hayesmount Road
ADCO	Hayesmount Road	2-Lane Paved	3	Turn north (left) on Hayesmount Road, then drive 3 miles to 152nd Ave
ADCO	Hayesmount Road	2-Lane Paved	50 ft	Continue straight across 152nd (about 50 ft, 2-Lane paved road)
ADCO	Hayesmount Road	2-Lane Paved	2	Continue straight on Hayesmount Road to WCR-2/168th Avenue
Weld	WCR-45	2-Lane Paved	1	Continue straight on WCR-45 to WCR-10
Weld	Weld County Roads	Surfaces Vary		Take WCR-10 to WCR-47. Continue north on WCR-47 and go straight at CO-52 to the sand terminal. Otherwise, turn right on CO-52 to WCR-59, then turn left on WCR-59 to the injection wells.

# FINAL ROUTES - SELECTED

RTE 6

RTE 7



## EXHIBIT: TRUCKING ROUTES ANALYZED FOR CONNER PAD

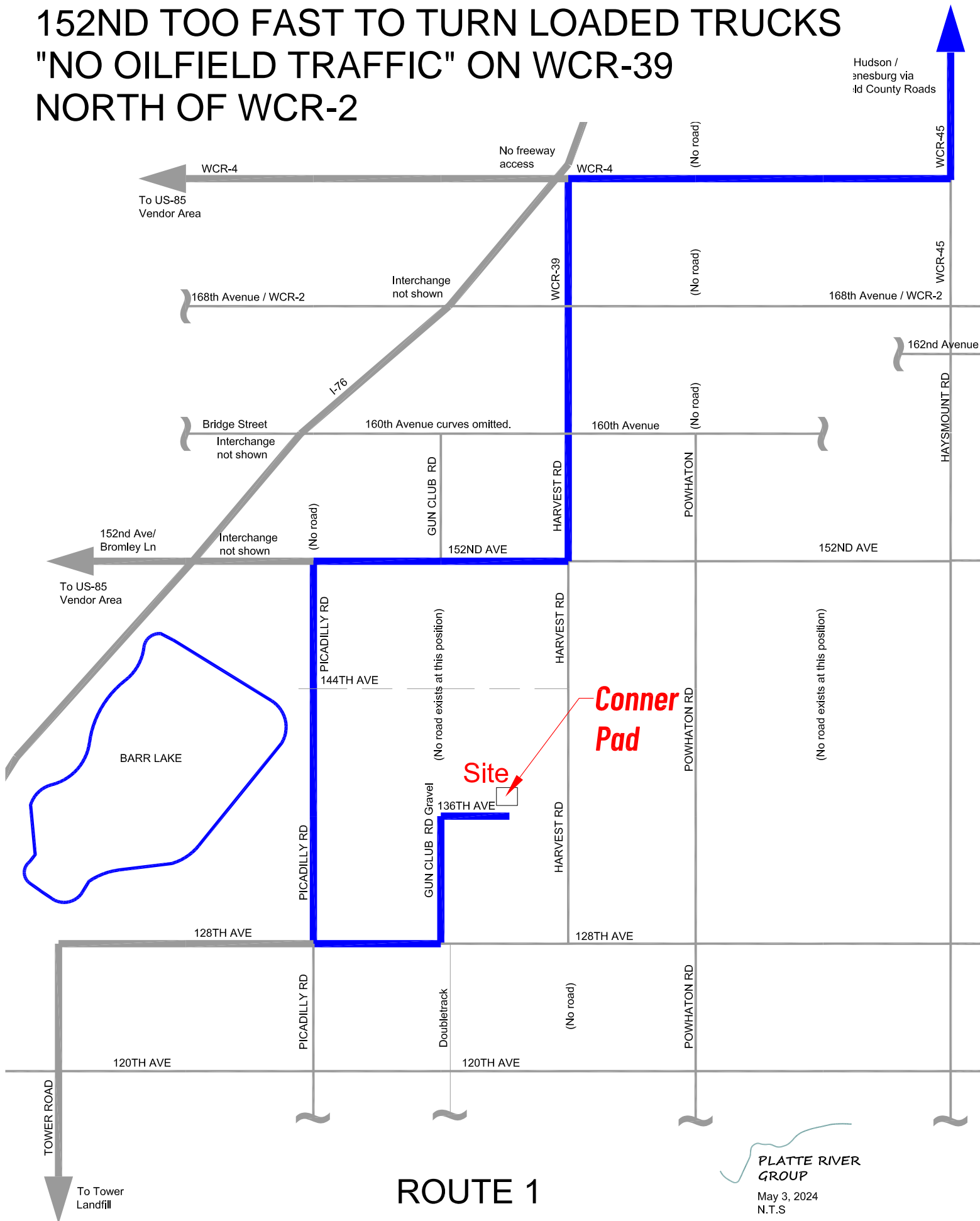
- N.T.S.
1. Routes are shown starting at the Conner Pad and proceeding to the destination.
  2. Routes analyzed for this project shown in thicker blue lines.
  3. Pavement/gravel and stop signs have been added based on multiple sources. See Conner Pad references.
  4. Final routing will depend on vendor selection, commodity availability and route selection by drivers depending on traffic conditions.
  5. Data shown does not represent an exhaustive review of all information available.
  6. Routes 1 & 5 used Weld 39 north of WCR-2. This road was observed to be marked "No Oildfield Traffic" on 5/8/24 so Routes 1 & 5 were eliminated.
  7. Route 4 had a left turn from Picadilly Road to 152nd Avenue with loaded trucks. The gap time was computed and found to be too short. Field observation of the gap time on 5/8/24 confirmed this and Route 4 was eliminated.
  8. Speeds on 152nd at Hayesmount were observed to vary between 57 and 65 mph.

# ROUTE 1 - ELIMINATED

## 152ND TOO FAST TO TURN LOADED TRUCKS

## "NO OILFIELD TRAFFIC" ON WCR-39

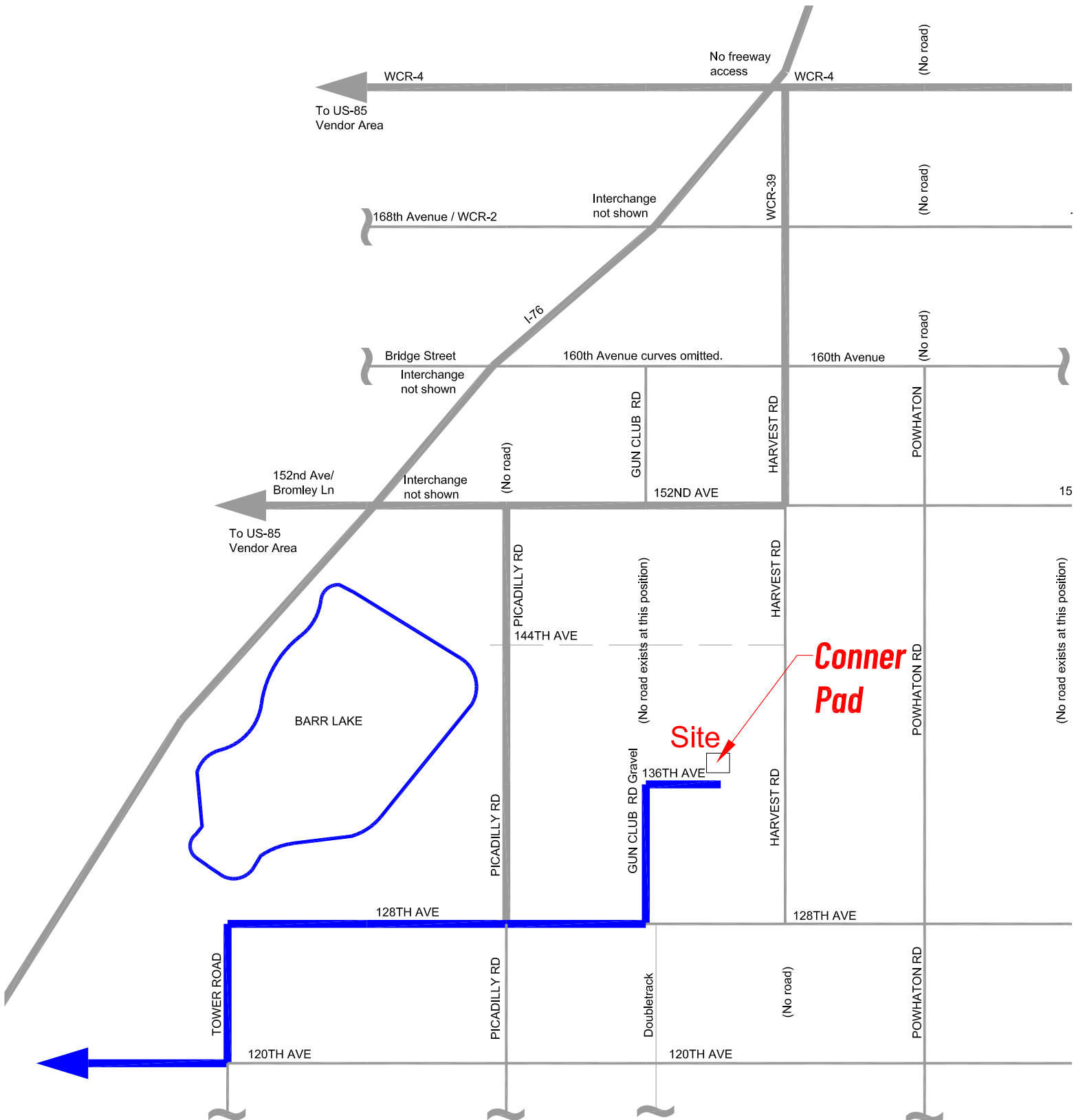
## NORTH OF WCR-2



# ROUTE 1

PLATTE RIVER GROUP  
May 3, 2024  
N.T.S

# ROUTE 2 - SELECTED. FUEL TRUCKS TO/FROM COMMERCE CITY



ROUTE 2

# ROUTE 3 - SELECTED. TOWER LANDFILL

To Hudson /  
Keenesburg via  
Weid County Road



## ROUTE 3

PLATTE RIVER  
GROUP  
May 1, 2024



# ROUTE 4 - ELIMINATED

## 152ND TOO FAST TO TURN LOADED TRUCKS



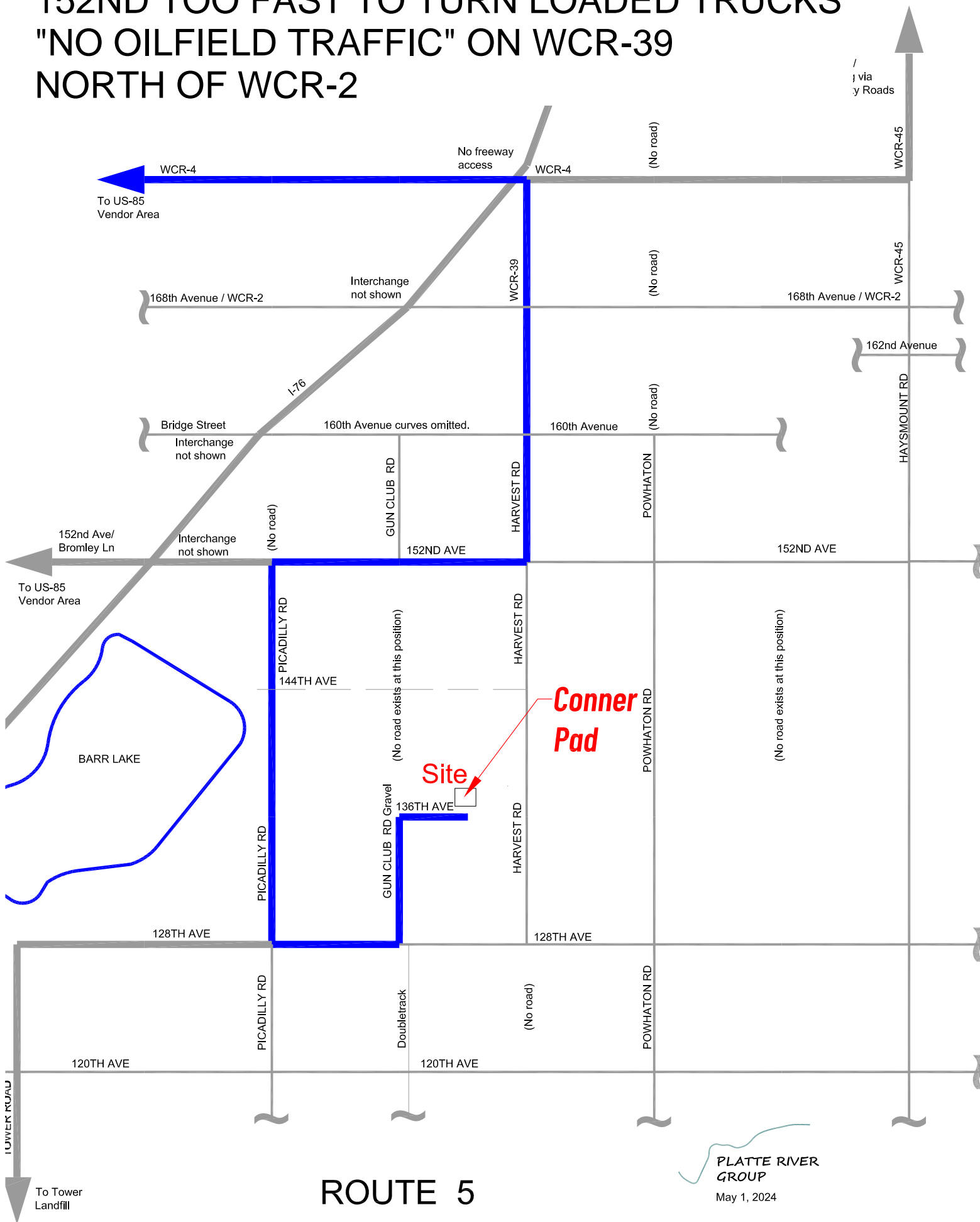
ROUTE 4

# ROUTE 5 - ELIMINATED

## 152ND TOO FAST TO TURN LOADED TRUCKS

## "NO OILFIELD TRAFFIC" ON WCR-39

## NORTH OF WCR-2



# ROUTE 5

PLATTE RIVER GROUP  
May 1, 2024

# ROUTES 6 & 7 - SELECTED LONGER, BUT BEST FOR SAFETY OBSERVED TRUCKS ON THIS ROUTE

ROUTE 7: Instead of turning at WCR-4, continue straight. Take county roads 45, 10, 47, CO-52, WCR-59 and local roads to sand loading and water injection.

## RTE 6 (via Haymount)

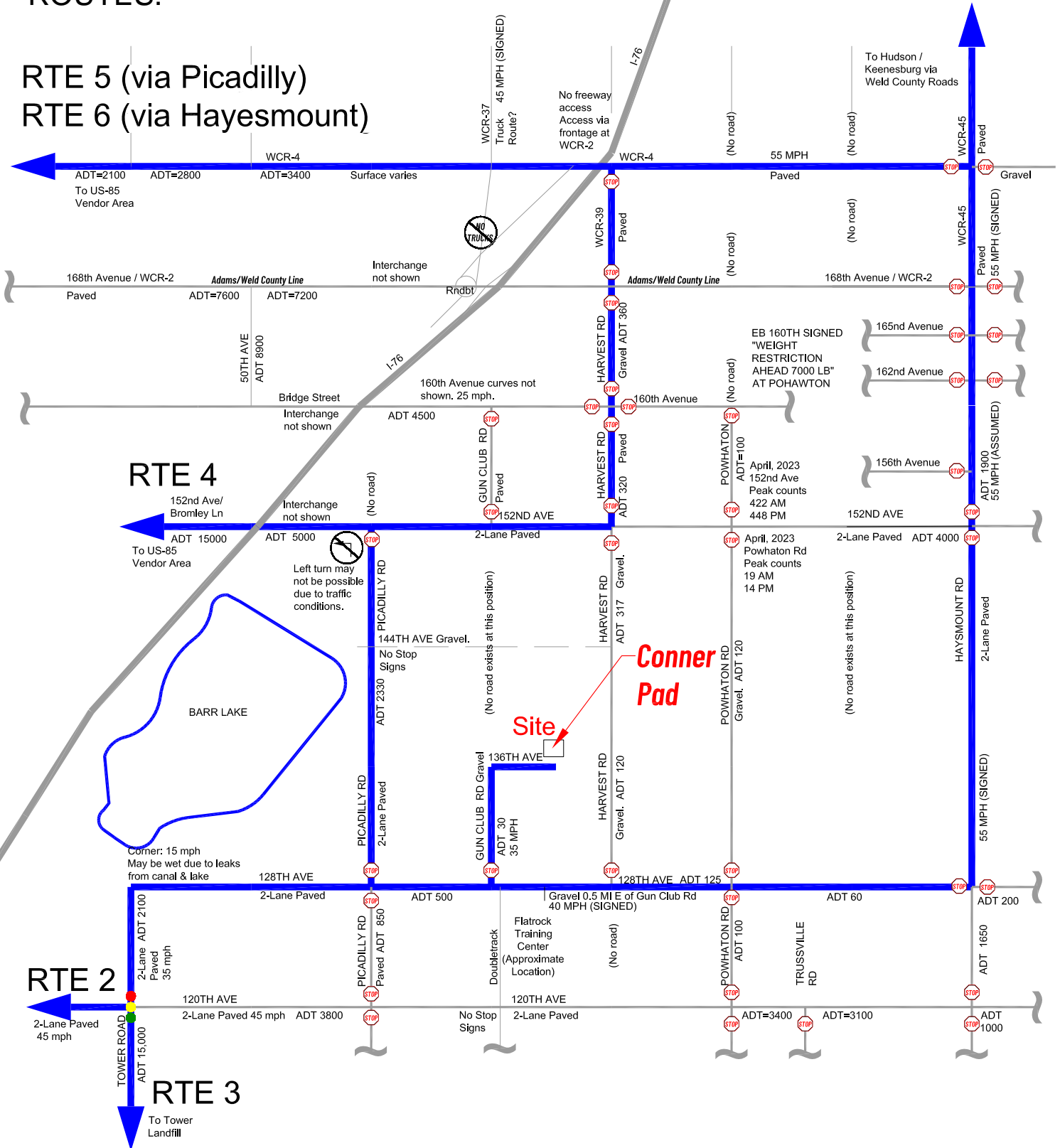


**ALL ROUTES, INCLUDING THOSE ELIMINATED AS TRUCK ROUTES.**

Frontage roads at Hudson are weight limit 20,000 lb

**RTE 7 (via Hayesmount)  
RTE 1 (via Picadilly)**

**RTE 5 (via Picadilly)  
RTE 6 (via Hayesmount)**



**EXHIBIT: TRUCKING ROUTES ANALYZED FOR CONNER PAD**

N.T.S.

1. Routes are shown starting at the Conner Pad and proceeding to the destination.
2. Routes analyzed for this project shown in thicker blue lines.
3. Pavement/gravel and stop signs have been added based on multiple sources. See Conner Pad references.
4. Final routing will depend on vendor selection, commodity availability and route selection by drivers depending on traffic conditions.
5. Data shown does not represent an exhaustive review of all information available.

**Route Selection Process**

Examine origins and destinations of vehicles and propose routes.

**Important considerations:**

Safety is the most important consideration. Realistic routing is important - choose routes that the driver will actually take. Choose routes that a person with a reasonable amount of experience, but not an expert on clever routing, will know about. Remember that the person may not have lived in Colorado their whole life.

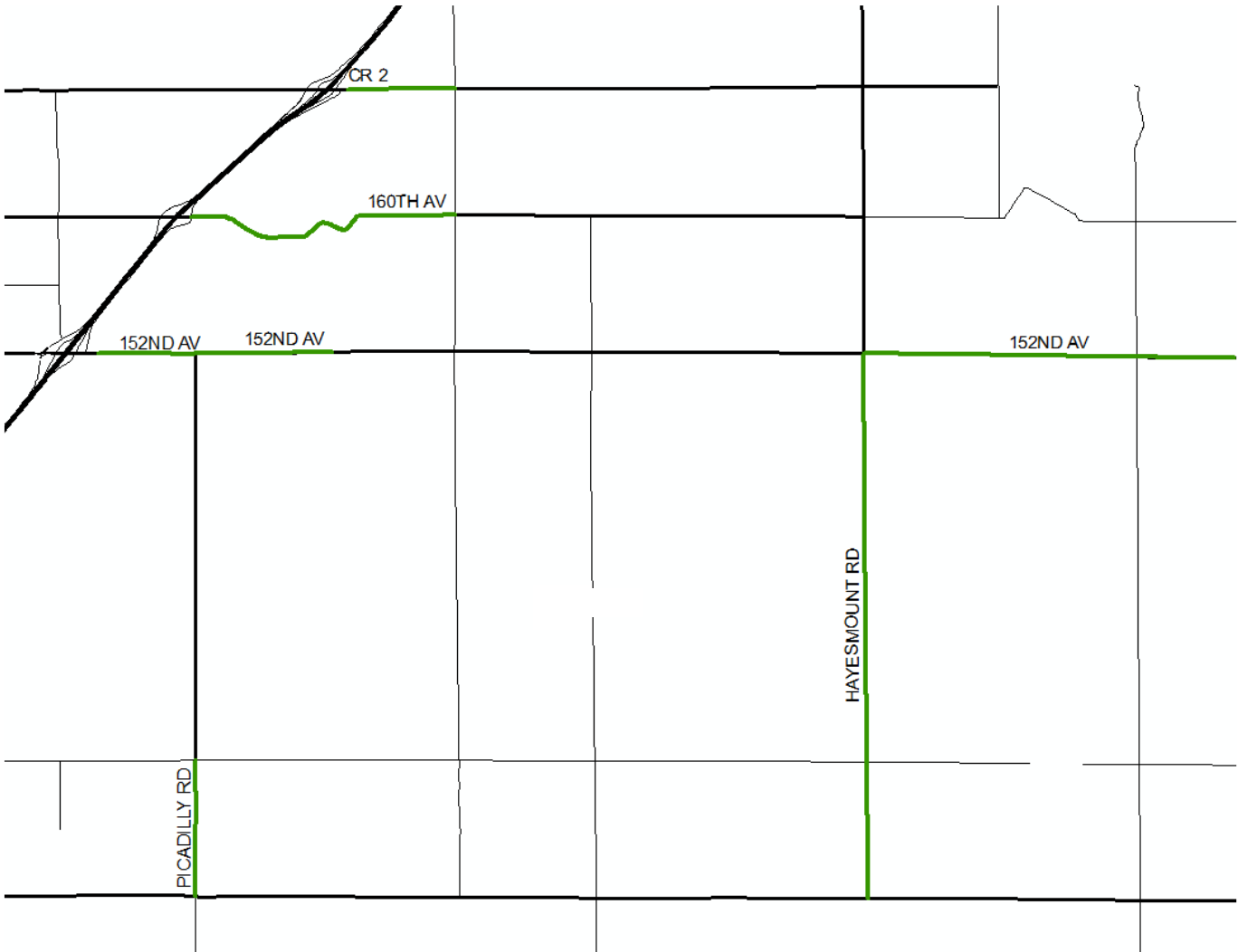
Scoring: Start with a score of ten. Add or deduct as follows:

<b>Consideration:</b>	<b>Add or Deduct:</b>	<b>Example</b>
Densely populated areas in which the housing is not adequately set back from the road, no sound walls, etc., schools, etc	-1	Many examples.
Narrow road, no shoulders	-1	CO-52, especially east of Hudson
Numerous stop lights when you are going straight	-1	-1 total, not -1 per light. More accidents occur in intersections than on straight stretches.
Stop light when you need to turn left; Stop sign for cross road where you need to turn left.	+1	Haysmount turning left on WCR-2; WCR-6 turning left to US-85
Left turn at busy intersection, loaded truck, no traffic light	-1	Powhaton & 152nd > Haysmount Rd is alternate route
Roundabout	-1	WB CO-52 & I-76
Roundabout on a grade	-2	Bridge St & US-85; CO-52 & I-76
Extra distance, up to mile	-1	
Extra distance, over one mile	-2	
Complex intersection (roads too closely spaced, etc)	-1	1st St./Bridge St/Roundabout/US-85/Kuner Road/Great Western Road
Route doubles the distance	-10	
Physically impossible. Missing ramp or discontinuous county roads .	Remove from list	I-76 to EB 136th, 144th, 128th; I-76 to WCR-4, WCR-6, WCR-8, WCR-10; Frontage roads do access WCR's.
Most people would not ever think of it, only people studying routes	-5	Going from Brighton to Keenesburg to get to Fort Lupton; Taking I-70 to get from Brighton to Liberty Services.
Road is not an arterial or highway, and does not lead immediately to the destination	-5	Many examples.
Prior accident history	-5	WCR-8 & US-85

Our route selection is not the same as in FHU, 2018. They give only high-level information about their route selection, however, it appears that they gave the VISUM algorithm seed routes, and had the algorithm route the trucks by the shortest route. This is because they were doing a high-level study instead of a particular pad.

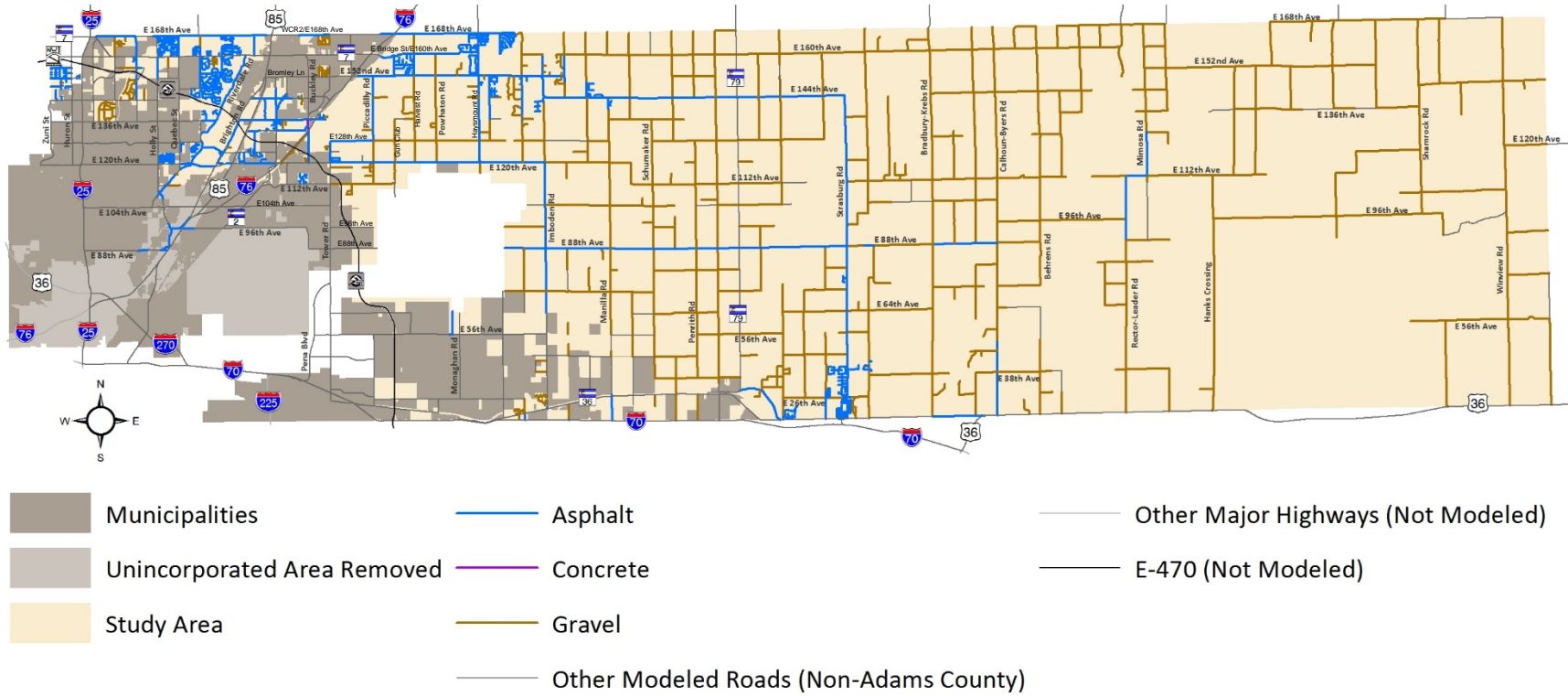


**Area Roads with Recent Capital Improvements  
2017 to 2023**  
Bidnet Data





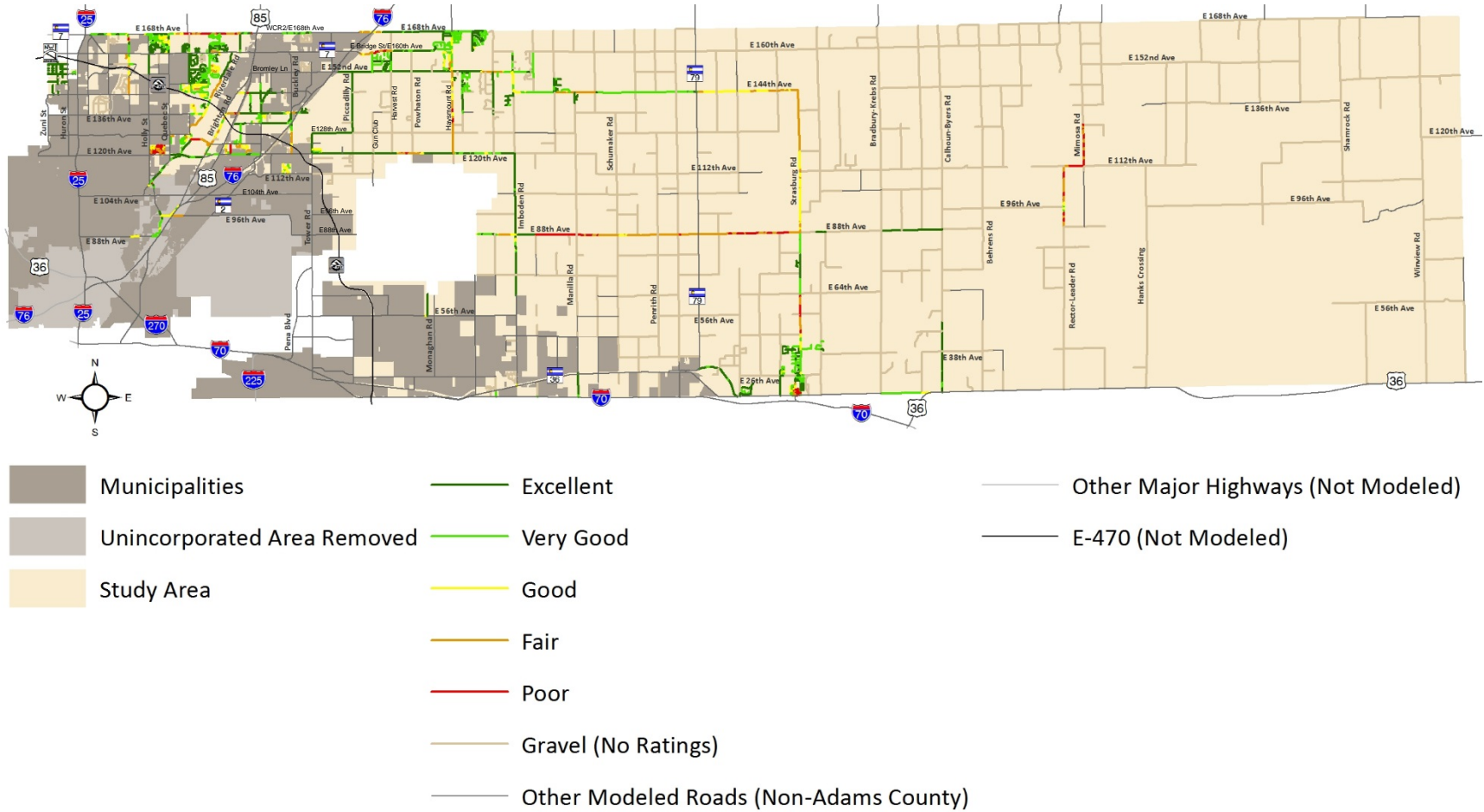
**Figure 6. Surface Types**



Sources: CDOT, 2017; Adams County, 2017;



**Figure 7. Existing Pavement Conditions**



Sources: CDOT, 2017; Adams County, 2017; Adams County Transportation Department, 2017

## Conner Traffic Impact Study

5/3/24 LLD

The following improvements and maintenance were planned or have been completed by Adams County.

Roadway	From	To	Length, ft	Type of work	Date	Data Source
Powhaton Road	E152nd Ave	E160th Ave	~5280	Reconstruct or Surface	2021	1
Harvest Road	160 <sup>th</sup> Ave	E168th Ave	~5280	Gravel Resurfacing	Completed 2017	3
Harvest Road	128 <sup>th</sup> Ave	136 <sup>th</sup> Ave	15825	Gravel Resurfacing	Completed 2017	3
Harvest Road	136 <sup>th</sup> Ave	152 <sup>nd</sup> Ave		Gravel Resurfacing	Planned 2018	
Hayesmount Road	E120th Ave	E152nd Ave	120 <sup>th</sup> to 152nd	Repaving	2019	4

### Data Sources:

1. 2021 Gravel Reconstruct & Surfacing Program List, Adams County, Colorado.
2. Study Session Agenda & Attachments. (March 15, 2022). Item Summary for “City and County Broomfield TIP FY 2022-2025 Project Submittal Support Form .” Adams County Board of County Commissioners.
3. 2017 Gravel Resurfacing – Program List. “Roadways highlighted in blue were completed in 2017. Roadways highlighted in red font moved to 2018 Program.”
4. Contract 2019.501 between Martin-Marietta and Adams County, Colorado.

## Appendix C: Zoning and Land Use



## Appendix C: Zoning and Land Use

### Zoning and Land Use

Per ADCO DSR 8-02-06-01-04, we reviewed zoning and land use. The proposed land use appears compatible with both present day and proposed land uses.

The proposed Conner Pad is located on parcel APN 0156719300004 in SE ¼ SW ¼ of Section 19, Township 1 South, Range 65 West, 6th P.M., Adams County, Colorado.

The Subject Parcel is zoned Agricultural-3 and is included in the Airport Noise and Airport Height Overlay Districts. The existing land-use is agricultural and residential. The present proposal adds an Oil and Gas Facility (OGF). (ADCO GIS, 2024).

The parcel is bordered to the south by a subdivision called Stonehouse Farms, which is zoned Agriculture 2 (A-2). Due to the proximity to Denver International Airport (DIA), the airport purchased this subdivision to prevent residential development in the flight paths.

Other parcels in the area are zoned Agriculture 3.

### Land Uses in Adjacent and Surrounding Parcels

Adjacent and surrounding parcels were researched per Section 8-02-06-01-04 using the Adams County GIS (ADCO GIS, 2024), Accela Citizen Access (ADCO Accela, 2024), as well as the Adams County Assessor and Recorder websites. The land use is agricultural, with residences and oil & gas wells.

### Land Use Proposals on Adjacent and Surrounding Parcels

POCO has submitted a proposal for Wakeman Pad, which is to be about one mile to the east. Because they will be managing both sites, any conflicts or congestion resulting from their operations can be managed by them.

We reviewed land use proposals on the nearby parcels (ADCO Building Eye, 2024), and proposals are listed below. A review of the proposals shows no effect on traffic.

## APPENDIX C

Table 1. Land Use Proposals Near Conner Pad

Project	Location	Rec'd	Status	Description
PRE2023-00055	Parcel 0156700000217 One mile E of Conner Pad	07/27/23	8/23/23 Closed via script due to Plan Coordination result	Conceptual review meeting to discuss a concept for solar energy system covering approximately 50 acres and an energy storage system of approximately 4 acres.
PRE2021-00073	13101 POWHATON RD	08/30/21	Closure task was marked complete by Ella Gleason on 10/01/2021. "Sent Conditional Use Permit application and info regarding Tri-County Health and Division of Water Resources. "	Event Center for the community and rental for any special events such as Quinceaneras, weddings, fundraisers, etc.
VSP2023-00012	14250 HARVEST RD	05/24/23	Seeking lot width variance for a lot width of 450 feet where a minimum lot width of 600 feet is required.	Board of Adjustment Approved 06/16/2023. Approved (5-0) with 7 Findings of Fact, 1 Condition, and 1 Note to the Applicant. Motion made by Mr. Green, seconded by Mr. Stanfield.
PRE2023-00051	14255 HARVEST RD	07/16/23	Closed, Case Withdrawn 8/15/23	Conceptual Review Meeting to discuss the creation of two single- family residential lots to be created from an existing 40-acre site.
PRE2019-00058	14550 HARVEST RD	05/22/19	6/19/2019 Closed via script due to Plan Coordination result	Outdoor equestrian arena in the A-3 district

## Existing Zoning and Land Uses in the General Vicinity

The existing zoning in the general vicinity of Conner Well Pad is Agriculture-2 and Agriculture-3.

We used aerial photos, Accela (Adams and Weld), Bidnet, and a field visit to observe land use in the area. The land use is agricultural, with residences on large lots. There are oil and gas wells on traditional spacing.

Some existing land uses which contribute trucking traffic. During field work in 2018 and 2024, we observed tractor-trailers hauling agricultural, residential landscaping, and residential construction materials.

People who purchase "acreage<sup>1</sup>" properties in rural areas often do so with a view to starting a business that cannot be located in a residential zone district. For example, in the general area,

---

<sup>1</sup> Properties that have a size of three to fifteen acres and are zoned for agriculture, and which also have a residence and a business.

## APPENDIX C

several parcels are owned by independent truck drivers. (ADCO Accela, 2024; Weld County Accela, 2024) Other parcels are owned by independent carpenters and concrete finishers.

Pavement structure in rural areas is not “designed and then installed.” It “evolves in place,” as remedial treatments are installed on top of the existing road. In rural areas, thin pavements or chip seal may be used on low volume roads for dust control. As development overtakes the area, the traffic volumes increase rapidly, and the roads become maintenance intensive.

It appears that Picadilly Road, the closest north-south arterial to the proposed site, may be an example of an evolving pavement. Picadilly Road is a two-lane, paved arterial. The pavement is thin as shown by coring and analysis by Rocksol for recent mill and overlay work south of 120<sup>th</sup> Avenue. Portions of the pavement were laid directly on subgrade. Bidnet (2017 - 2024).

Although there are oil wells in the area, a land use that is not present is oilfield service companies. Commercial traffic is shuttled back and forth to Weld County and its municipalities, and to Commerce City, resulting in impact to roads in both counties.

### Anticipated Zoning and Land Uses in the General Vicinity

Per Advancing Adams (ADCO TMP, 2022), the anticipated land use in the general vicinity is A-3, A-2, Public Facility, and Mixed-Use Commercial (MU-C). Mixed-Use Commercial land use is a new land use for this area. Mixed-Use Commercial serves as a land use for areas transitioning to industrial or heavy commercial development.

The two maps below show the anticipated land uses.

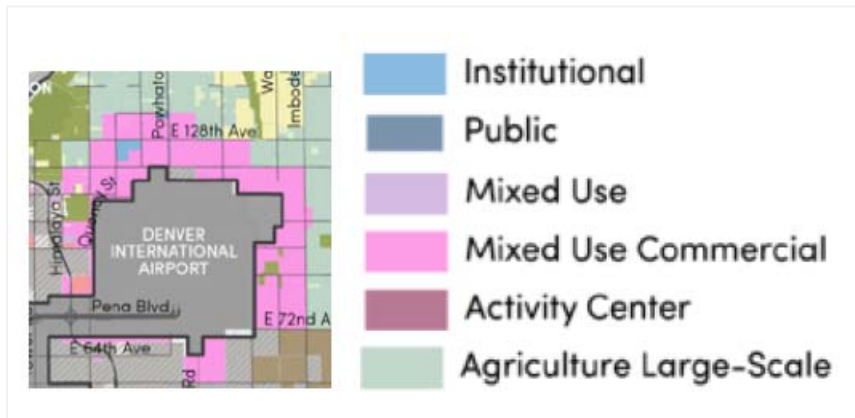


Figure 1. Excerpt from Map 2.1. Preferred Future Land Use Map in the Advancing Adams TMP. The proposed site is about 2 miles north of DIA.

## APPENDIX C

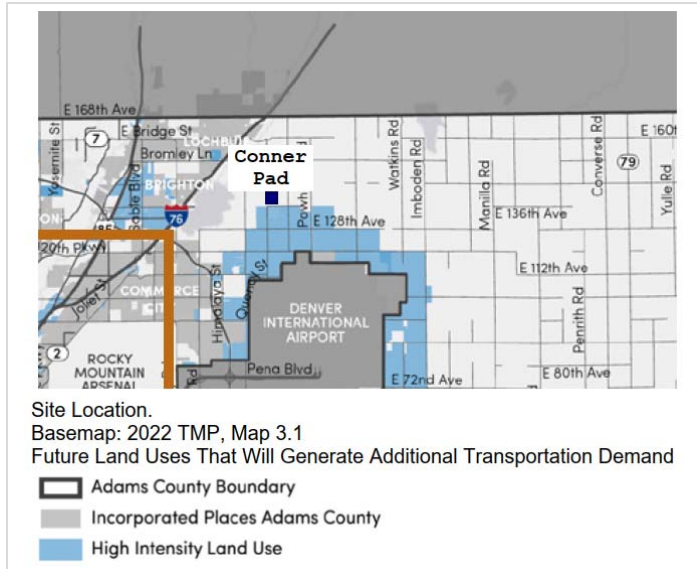


Figure 2. Location of Conner Pad relative to High Intensity Land Use areas identified in the Advancing Adams TMP.



**Legend**

- Special Zoning**
- ★ Use By Special Review
  - ★ AASI (1041)
  - ★ Certificate of Designation
  - ★ Conditional Use
  - ★ Conservation Plan
  - ★ Exemption
  - ★ Livestock Confinement Operation
  - ★ Waiver

**Highways (10,000 - 20,000)**

- Interstate
- Highway
- Tollway

- Building
- Parcels

**Zoning**

- A-1
- A-2
- A-3
- Conditions
- TOD
- R-E
- R-1-A
- R-1-C
- R-2
- R-3
- R-4
- M-H
- C-0
- C-1

1: 16,767



0.5 0 0.26 0.5 Miles

This map is a user generated static output from an Internet mapping site and is for reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable. THIS MAP IS NOT TO BE USED FOR NAVIGATION

**Notes**

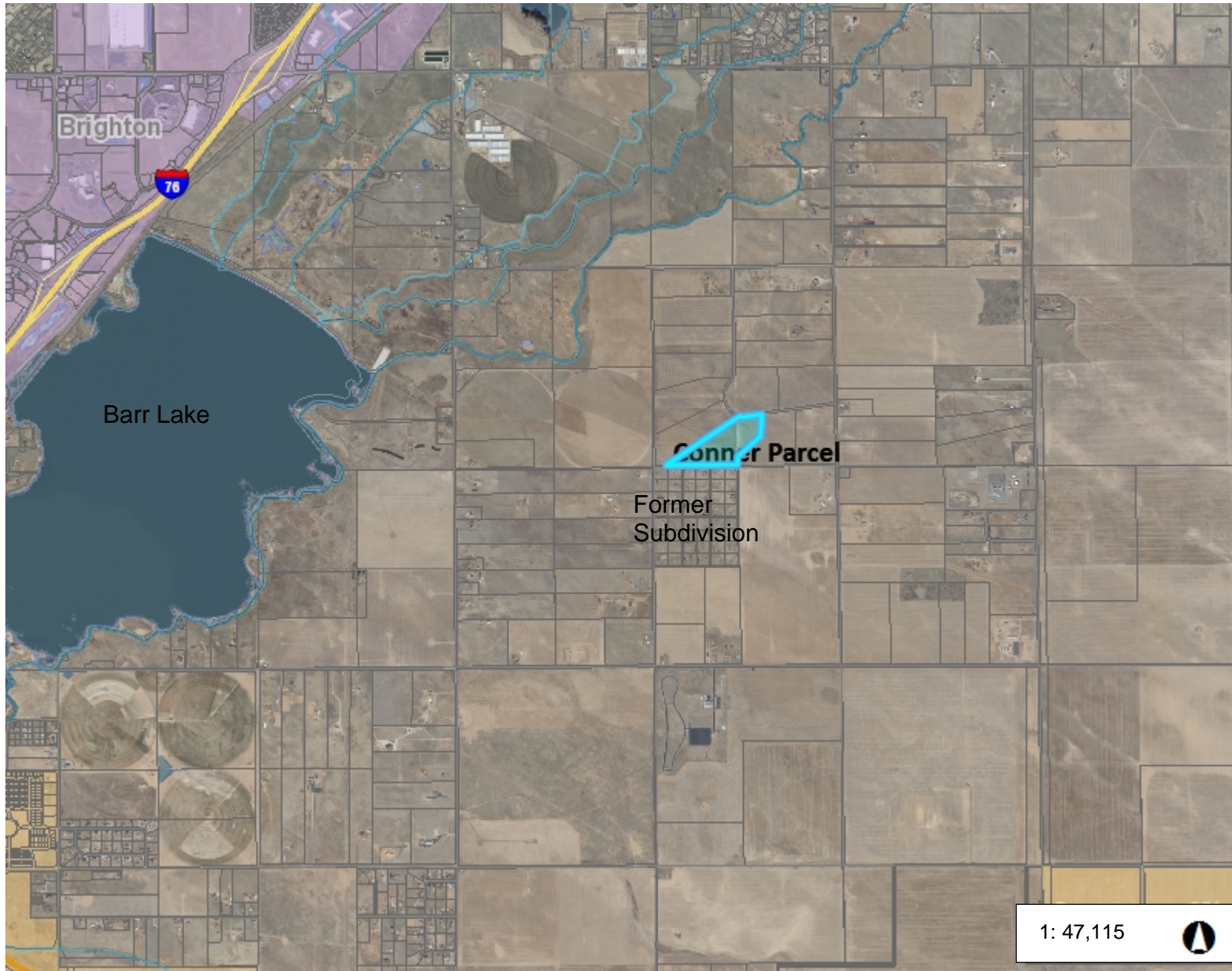
Conner Parcel with Zoning. The Subject Parcel is zoned agricultural.

May 5, 2024





# Conner Parcel



### Legend

- Lake
- Lake
- River
- Parks and Open Space
- Highways (< 20,000)
  - Interstate
  - Highway
  - Tollway
- Parcels
- County Boundary
- City
  - Brighton
  - Commerce City

1: 47,115

1.5 0 0.74 1.5 Miles

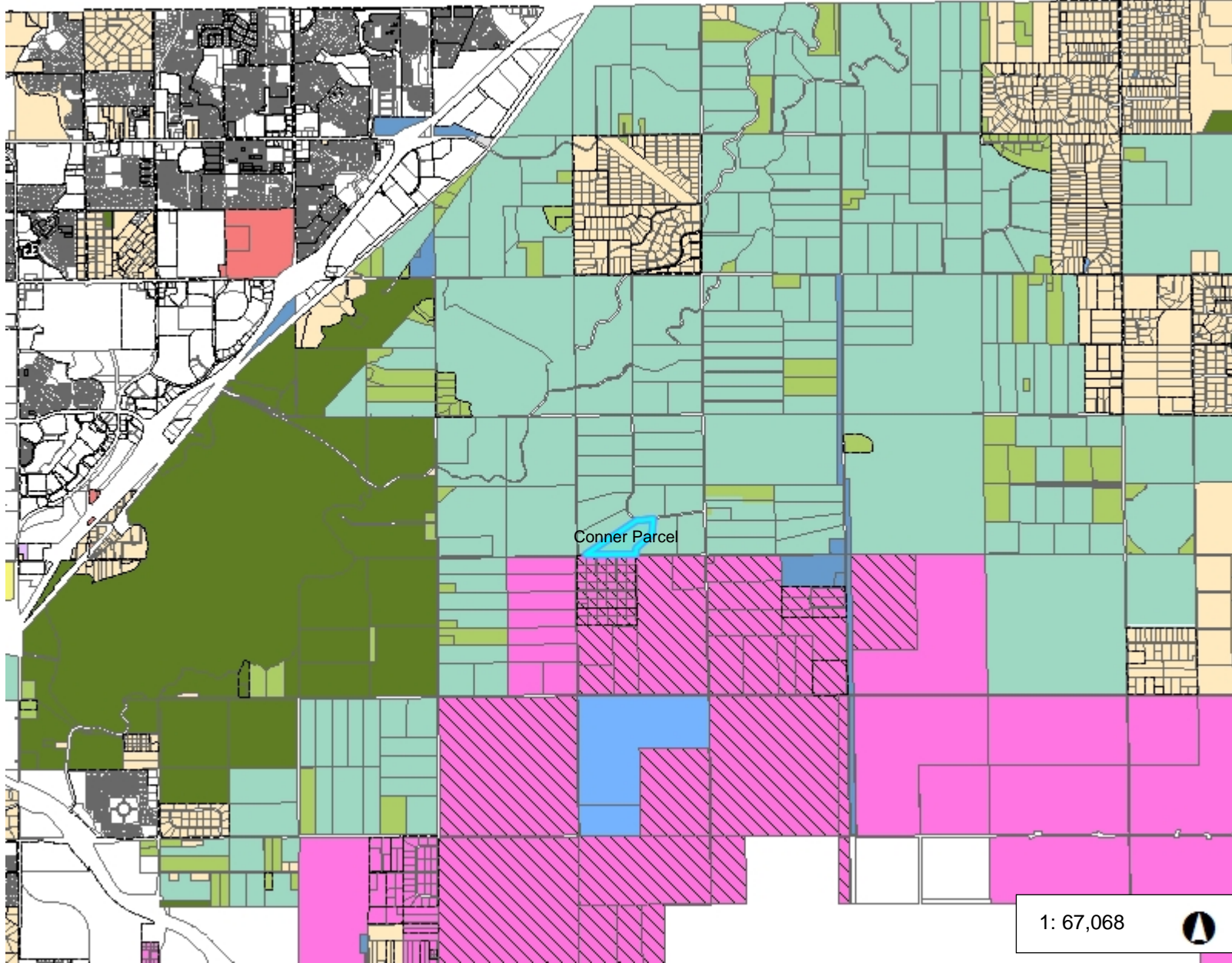
This map is a user generated static output from an Internet mapping site and is for reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable. THIS MAP IS NOT TO BE USED FOR NAVIGATION

### Notes

Area is developed with agricultural land uses, including dryland farming. The subdivision to the south of the Subject Parcel has been demolished.



# Anticipated Zoning - Advancing Adams



### Legend

- Subdivision
- Parcels
- Advancing Adams (Future Land Use)**
- Agriculture Large Scale
- Agriculture Small Scale
- Commercial
- Industrial High
- Industrial Low
- Industrial Medium
- Institutional
- Mixed Use
- Mixed Use Commercial
- Mixed Use Commercial\*
- Parks Open Space
- Plan - CASP
- Plan - Splendid Valley
- Plan - Square Lakes
- Plan - Welby
- Public
- Residential High
- Residential Low
- Residential Medium

1: 67,068

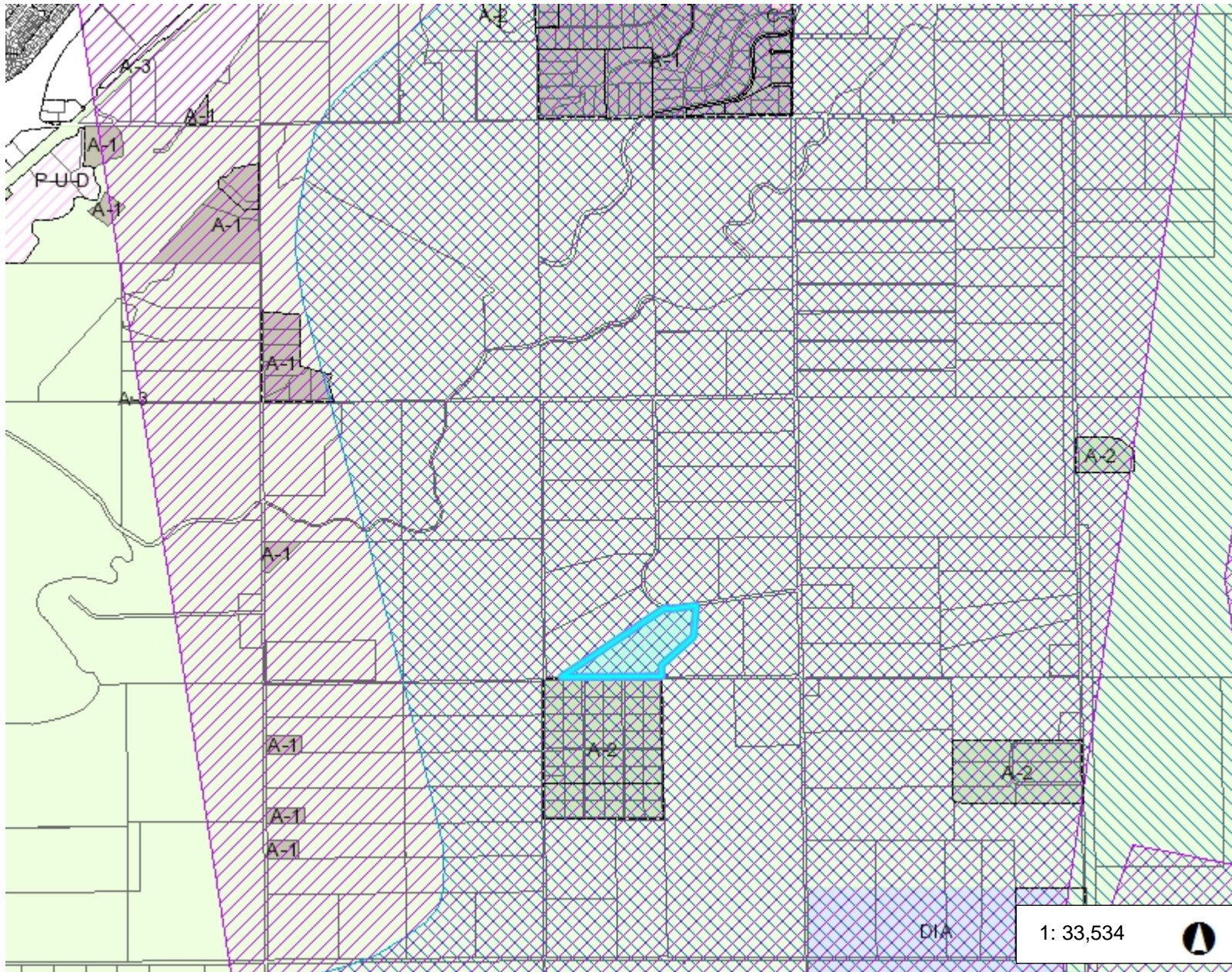
2.1 0 1.06 2.1 Miles

This map is a user generated static output from an Internet mapping site and is for reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable. THIS MAP IS NOT TO BE USED FOR NAVIGATION

### Notes

Advancing Adams County - Future Zoning





Legend

- Subdivision
- Height Overlay
- Noise Overlay
- Parcels
- Zoning**
- A-1
- A-2
- A-3
- Conditions
- TOD
- R-E
- R-1-A
- R-1-C
- R-2
- R-3
- R-4
- M-H
- C-0
- C-1
- C-2
- C-3
- C-4
- C-5
- I-1
- I-2
- I-3
- CO
- PL
- AV
- DIA

1: 33,534

1.1 0 0.53 1.1 Miles

This map is a user generated static output from an Internet mapping site and is for reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable. THIS MAP IS NOT TO BE USED FOR NAVIGATION

Notes

Airport Overlays



**Community & Economic Development  
Development Services**  
**Permit Number BDP13-0102 as of 5/6/2024**

4430 South Adams County Parkway, Suite W2000B  
Brighton CO 80601-8218  
(720) 523-6800

**Permit Information**

---

**GENERAL**

Received: 01/23/2013  
Location: 13482 ADDISH ST  
Parcel(s): 0156730202003  
Description: Demolish House & Outbuildings  
Permit Fees:

Note: The subdivision south of the proposed project site was demolished.

**BUILDING**

Type of Work	Other
Class of Work	Demolish
Building Use	Residential
Census Code	38 - Demolition
Existing Zoning	A-2
Plan Review Fee Required	No
Plan Review Performed	No

**Contractor**

---

American Demolition, Inc. P.O. Box 1025 Westminster, CO 80036 303-920-3366	B-1151
---	--------

**Inspections**

---

Inspection:  
Scheduled Date:  
Result:  
Comments:

---

## Appendix D: Trip Generation



**Average Vehicles Per Day Summary**

**Conner**

Activity	Days Elapsed	Days Total	Years since site occupation	Vehicles per Day, 16 Well Pad Outbound + Inbound	Truck %	Activity
Pad & Road	27	27	(Construction)	42	85%	Build pad. Haul gravel.
Facility	32	59	(Construction)	16	23%	Install 2 oil tanks, 2 water tanks, separators, etc.
Facility	27	86	(Construction)	11	13%	Install soundproofing walls
Drilling	2	88	(Construction)	75	60%	Set up drilling rig
Drilling	132	220	(Construction)	87	19%	Drill wells - 24 Hour/Day operation
Drilling	2	222	(Construction)	75	60%	Remove drilling rig
Completions	2	224	(Construction)	139	58%	Set up completions equipment
Completions	128	352	(Construction)	99	59%	Complete wells - 24 Hour/Day operation
Completions	2	354	(Construction)	139	58%	Remove completions equipment
Drill Out	1	355	(Construction)	14	34%	Set up coiled tubing equipment
Drill Out	20	375	(Construction)	8	25%	Remove plugs
Drill Out	1	376	(Construction)	14	34%	Remove coiled tubing equipment
<b>Site Occupation<sup>1</sup></b>						
Production	31	31	0.1	232	43%	Initial Flowback
Production	1794	1825	5	6.34	10%	Water production is 0.34 truckloads/day for the pad. There are 3 operator trips per day at this point in time - this is a very conservative (high) number. The operator drives a pickup. Truck percentage is 10%.
Production	1825	3650	10	6.17	4%	Water production is 0.12 truckloads/day for the pad. 3 operator trips per day are modeled.
Production	3650	7300	20	6.09	3%	Water production is 0.09 truckloads/day for the pad. 3 operator trips per day are modeled.

Notes:

1. Per ADCO DSR, 8-02-05, a short-term and a long-term horizon are defined for traffic studies. The short-term horizon year is defined as five years after occupancy of the project. The long-term horizon year is to be based on the 20- to 25-year planning horizon of the Adams County Transportation Plan. This study also presents data immediately after site occupation, when trucking trips are highest. For the pavement impact, a 10-year horizon is shown, as was used in the 2018 "Adams County Oil & Gas Traffic Impact Study (Revised Draft). (FHU, 2018)"

## Time and Peak Vehicles Summary

<b>Conner</b>		<b>Number of Wells</b>
<b>Number of wells</b>		16

<b>Pad &amp; Road</b>	<b>Days</b>	<b>Peak Trucks, Outbound + Inbound, per hour</b>	<b>Peak Pickups, Outbound + Inbound, per hour</b>	<b>Peak Vehicles per Hour, Outbound + Inbound</b>
Grading pad prior to gravel	10	2	2	4
Hauling gravel	5	20	2	22
Grading pad after gravel	5	2	2	4

<b>Facility</b>	<b>Days</b>	<b>Peak Trucks, Outbound + Inbound, per hour</b>	<b>Peak Pickups, Outbound + Inbound, per hour</b>	<b>Peak Vehicles per Hour, Outbound + Inbound</b>
Facility Construction	23	1	2	3

<b>Drilling</b>	<b>Days</b>	<b>Peak Trucks, Outbound + Inbound, per hour</b>	<b>Peak Pickups, Outbound + Inbound, per hour</b>	<b>Peak Vehicles per Hour, Outbound + Inbound</b>
Sfc: Move In, Rig Up (MIRU)/ Rig Down, Move out (RDMO)	1	8	10	18
Prod: Move In, Rig Up (MIRU)/ Rig Down, Move out (RDMO)	1	8	10	18
Total drill time per well	8	4	8	7
Drilling Days	132			

<b>Completions</b>	<b>Days</b>	<b>Peak Trucks, Outbound + Inbound, per hour</b>	<b>Peak Pickups, Outbound + Inbound, per hour</b>	<b>Peak Vehicles per Hour, Outbound + Inbound</b>
Rig In Frac (1 Day Rig In, 1 Rig Out)	2	12	10	22
Fracturing (Days per well)	8	12	8	20
Completions Days (Days total)	132			

<b>Drill Out</b>	<b>Days</b>	<b>Peak Trucks, Outbound + Inbound, per hour</b>	<b>Peak Pickups, Outbound + Inbound, per hour</b>	<b>Peak Vehicles per Hour, Outbound + Inbound</b>
Move In, Rig Up (MIRU)/ Rig Down, Move out (RDMO)	1	7	5	12
Drill Out, Total	20	2	3	5

### Site Occupation

<b>Production</b>	<b>Days</b>	<b>Peak Trucks, Outbound + Inbound, per hour</b>	<b>Peak Pickups, Outbound + Inbound, per hour</b>	<b>Peak Vehicles per Hour, Outbound + Inbound</b>
Production, Initial Flowback	365	6	18	24
Production, Year 5	365	0.03	0.6	0.6
Production, Year 10	365	0.02	0.6	0.6
Production, Year 20	365	0.01	0.6	0.6



## Sequence of Major Activities and Estimated Schedule

### Typical Drilling Pad

#### Northeastern Colorado

#### Access Road and Wellpad: Phase I-Pre-Drilling (25 - 35 days)

The existing access road will be upgraded and graveled to standards. Ripping and dozing will be done on the contour to prevent erosion while improving the road. Pad construction will be done simultaneously with road construction. The access road will be graveled concurrently with wellpad completion.

#### Phase II-Drilling and Completion (Drilling: 7 – 12 days per well, Completion: 5 – 10 days per well)

The drilling rig will be moved onto the pad over the bladed road and drilling will take place.

After the drilling rig is moved out a truck mounted service rig will be moved in for well completion activities. Water required for for these operations will be trucked to the site.

#### Phase III-Production (20 - 40 years)

The wells will be produced, with high flow rates tapering off to a stable flow rate over time. Oil and gas will be sent from the pad to other site via underground pipelines. Water will be trucked. Initially, the trucking traffic will be higher as the water pumped into a well during fracturing is recovered in a process called "flowback." After a month, the volume of water will decrease markedly.

The wells will produce for 20 to 40 years. During this time, there will be minimal vehicle traffic; between 1 and 3 pickup trucks per day may travel the road to check the wells and surface equipment. Depending on water production, a tanker truck may come to the site once every 1-30 days. Periodic downhole maintenance and repair will be done on an as needed basis, and trucks will arrive to perform these activities.

*Written by Lisa Denke, modeled after "Written Explanation" from the Adams County OGF2024-001 Request For Comments for Wakeman Pad.*

## Appendix D: Trip Generation

### Peak Hour Trips

The table below summarizes the peak hour trips from the Conner Well Pad. Trips are rounded up to the nearest whole number.

Table 1. Trip Generation Table. Numbers are rounded up to the nearest integer.

CONNER PAD						
Peak Hour Trips						
	% In	Peak Hour Trips In	% Out	Peak Hour Trips Out	Total	Truck %
Production, Initial Flowback	50%	12	50%	12	24	26%**
Production, Year 5	50%	1	50%	1	1	5%
Production, Year 10*	50%	1	50%	1	1	3%
Production, Year 20	50%	1	50%	1	1	2%

\*Numbers at Year 10 are provided for reference only. Year 10 is used in calculating impact to road condition. See Appx E.

\*\* The trucking percentage at peak hour is 26%, which is lower than the average daily truck percentage (43%). The peak hour traffic is mostly light vehicles due to worker shift changes at peak hours.

### Analysis Horizons

Per Chapter 8 of the ADCO DSR, analysis is provided for Year 5 and Year 20 after Site Occupancy. Because an initial period of about 30 days of high-volume traffic occurs as production/flowback starts, the traffic volumes for this time period are analyzed as well. Volumes at Year 10 are included for continuity with Appendix E.

## Background and Analysis:

### Site Location: PLSS Location and Assessor’s Parcel Number (APN)

The proposed Conner Pad is located on parcel APN 0156719300004 in SE ¼ SW ¼ of Section 19, Township 1 South, Range 65 West, 6th P.M., Adams County, Colorado. The Conner Pad site access will be in the alignment of 136<sup>th</sup> Avenue.



## Roadways

The site is located about two miles north of Denver International Airport, and two miles east of Interstate 76 (I-76).

The trucks will be routed north to Hudson, Keenesburg and the US-85 Vendor Area in Fort Lupton and Brighton, as well as to Tower Landfill and bulk fuel vendors in Commerce City.

A total of seven routes were analyzed and the following were chosen. Please see Appendix B for a map of routes.

Route 2: Bulk Fuel will be routed from Commerce City. The route from the pad is via Gun Club Road, 128<sup>th</sup> Avenue, Tower Road, and 120<sup>th</sup> Avenue.

Route 3: Cuttings will be routed to the Tower Landfill via Gun Club Road, 128<sup>th</sup> Avenue, Tower Road and 88<sup>th</sup> Avenue.

Route 6: Supplies will be routed from the US-85 Vendor Area. The route from the pad is Gun Club Road, 128<sup>th</sup> Avenue, Hayesmount Road, WCR-45, and WCR-4.

Route 7: Sand and Flowback water will be routed from (sand) and to (water) Hudson and Keenesburg, respectively, via Gun Club Road, 128<sup>th</sup> Avenue, Hayesmount Road, WCR-45, and Weld County Roads as required.

## Traffic Generating Activities

The traffic generating activities on the pad after Site Occupancy<sup>1</sup> are those of a typical oil and gas pad. These are based on the “Written Explanation” from the Adams County OGF2024-001 Request For Comments for Wakeman Pad and the ECMC (COGCC) filing “Waste Management Plan.”

## Trucking

Per the “Written Explanation”:

“The wells will be produced, with high flow rates tapering off to a stable flow rate over time.”

Specifically, the flow rates for the water production from the wells were estimated from existing horizontal wells in this area, including those at Ivey, Sharp, Dale, Raisa and Amen pads. These wells were completed in the Niobrara and Codell formations and featured fractured

---

<sup>1</sup> The activities after Site Occupancy are the subject of this Appendix; for activities prior to Site Occupancy, please refer to Appendix E. The routing for those activities is similar, except for drill cuttings, which will be routed to Tower Landfill near the Denver Airport, and fuel trucks, which will come from Commerce City.

**APPENDIX D**

completions like the proposed wells. Oil and natural gas will be pipelined and will not require trucking.

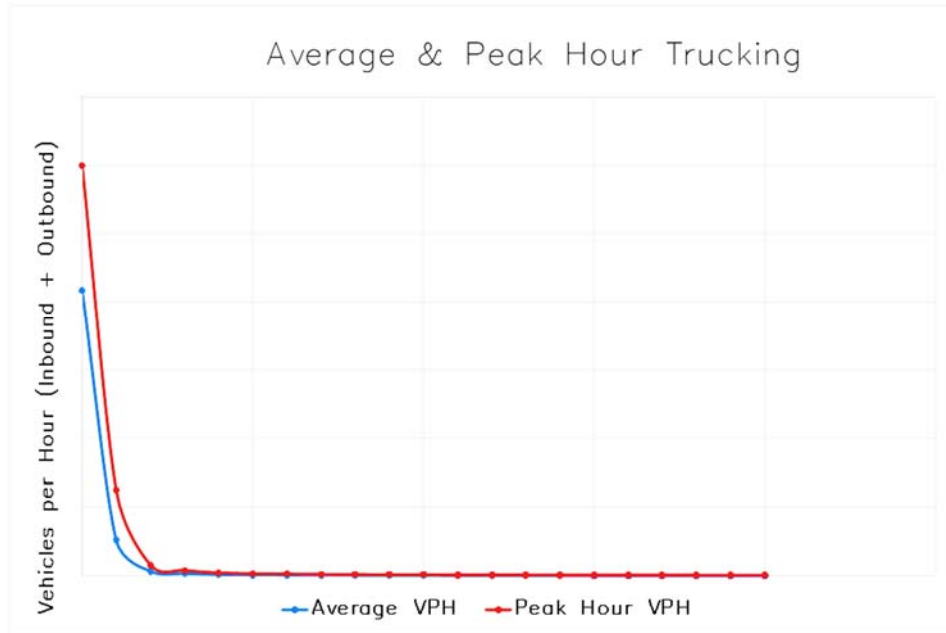


Figure 1. Water Production Decline Curves

Per the “Waste Management Plan”:

“Flowback and produced water will be hauled to an approved disposal facility by a licensed transportation company.” The disposal facilities assumed for this analysis are the following:

Table 2. Typical Injection Wells

Unique Well Identification #	WELL NAME	STATUS (MARCH 2024)	LOCATION (Nearest roads)
05-123-47682	SOUTH WELD SWD 1	INJECTING	US-85 JUST SOUTH OF WCR 6
05-123-37996	KMG 16-24I	INJECTING	WEST OF WCR 49 AT WCR 18
05-123-40973	NGL C5A	INJECTING	E & S OF I-76, UNINCORPORATED WELD AT KEENESBURG
05-123-47686	EWS 6	INJECTING	WCR 19 JUST NORTH OF WCR 18
05-123-42698 05-123-42433	NGL C2C NGL C2B	INJECTING	WCR 19 JUST SOUTH OF WCR 6
05-123-44047 05-123-48766	EWS 4A EWS 4B	INJECTING	EAST PART OF KEENESBURG, SOUTH AND EAST OF I-76

### Light Vehicles

Light vehicles such as pickup trucks were analyzed by observing traffic at existing well pads in Adams and Weld Counties. A volume in vehicles per day was developed from the observations.

### Average Vehicles per Day

Vehicles per day were inventoried for the trucks and and calculated for light vehicles.

Table 3. Average Vehicles per Day

Years since site occupation <sup>1</sup>	VPD, Wakeman Pad	Avg VPD In	Avg VPD Out	Truck %	Activity
0.1	232	116	116	43%	Initial Flowback
5	6	3	3		Water production is 0.34 truckloads/day for the pad. 3 operator trips per day. The operator drives a pickup.
10	6	3	3		Water production is 0.12 truckloads/day for the pad. 3 operator trips per day.
20	6	3	3		Water production is 0.09 truckloads/day for the pad. 3 operator trips per day.
Note:					
1. Per ADCO DSR, 8-02-05, a short-term and a long-term horizon are defined for traffic studies. The short-term horizon year is defined as five years after occupancy of the project. The long-term horizon year is to be based on the 20- to 25-year planning horizon of the Adams County Transportation Plan. This study also presents data immediately after site occupation, when trucking trips are highest. For the pavement impact, a 10-year horizon is shown to facilitate comparison with the 2018 "Adams County Oil & Gas Traffic Impact Study (Revised Draft). (FHU, 2018)"					

### Peak Hour Vehicles

The peak hour vehicles were estimated as the ADT divided by ten. This estimate was compared to field observations and found to be in good agreement. Peaks in traffic result from shift changes in the 24-hour operation.

The traffic volumes for light vehicles and trucks were added together to produce the site generated traffic in the table below. This data was then rounded up to the nearest integer value to arrive at the final trips.

APPENDIX D

Table 4. Peak Hour Trips, before rounding.

Production	Days	Peak Trucks, Outbound + Inbound, per hr	Peak Pickups, Outbound + Inbound, per hr	Peak Vehicles per hr, Outbound + Inbound
Production, Initial Flowback	30	6	17	23.2
Production, Year 5	365	0.03	0.6	0.6
Production, Year 10	365	0.02	0.6	0.6
Production, Year 20	365	0.01	0.6	0.6

Table 5. Peak Hour Trips, Rounded.

Peak Hour Trips						
	% In	Peak Hour Trips In	% Out	Peak Hour Trips Out	Total	Truck %
Production, Initial Flowback	50%	12	50%	12	24	26%
Production, Year 5	50%	1	50%	1	1	10%
Production, Year 10*	50%	1	50%	1	1	4%
Production, Year 20	50%	1	50%	1	1	3%

Adams County Responsible Roads  
 Select roads from other jurisdictions  
 Volume to Capacity Ratio

Loaded flowback water trucks from Conner Pad to Weld County disposal sites via Routes 6 or 7.

This scenario has 232 VPD total vehicles at peak flowback. Trucks leave via Hayesmount. This avoids a left turn on 152nd.

Trucks will take 128th Avenue east. Light vehicles will go to their destination by the shortest route, which likely be different.

Road Name	Access Rd (136th)	Gun Club Rd	128th Av (Paved)	128th Av (Gravel)	Hayesmt	Hayesmt	WCR-45	WCR-4
Surface	2-Ln Grvl	2-Ln Grvl	2-Ln Pvd	2-Ln Grvl	2-Ln Pvd	2-Ln Pvd	2-Ln Pvd	2-Ln Pvd
Jurisdiction	ADCO	ADCO	ADCO	ADCO	ADCO	ADCO	Weld	Weld
From	Site	136th	Gun Club	128th Paved	128th Gravel	152nd	Hayesmt	Hayesmt
To	Gun Club	128th Paved	128th Grav	Hayesmt	152nd	WCR-45	WCR-4	US-85
Length (miles)	0.4	1	0.5	3.5	3	2	1	9.4
<b>Background Traffic</b>								
Existing Traffic, ADT (VPD) (both directions)	0	30	500	125	1650	1900	1900	3400
Peak Hour Volume, Existing, VPH	0	3	50	13	165	190	190	340
<b>Site Generated Traffic</b>								
Site Generated Traffic, VPD (per Day)	232	232	232	232	232	232	232	232
Pk Hr Vol, Site Generated, VPH, before truck factor adjustment	24	24	24	24	24	24	24	24
Trucks (26% Trucks) per Hour	6	6	6	6	6	6	6	6
Truck Factor	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7
Trucks as passenger car equivalent per Hour	11	11	11	11	11	11	11	11
Light Vehicles (Cars & Pickups) per Hour**	18	18	0	0	0	0	0	0
Peak Hour Volume, Site Generated, PCPH*	28	28	11	11	11	11	11	11
Peak Hour Volume, Total (Background + Site Generated), VPH (per Hour)	28	31	61	24	176	201	201	351
Existing Capacity, VPH (per Hour, both lanes)	50	50	2800	50	2800	2800	2800	2800
Volume / Capacity, Existing	No traffic	6.0%	1.8%	26.0%	5.9%	6.8%	6.8%	12.1%
Volume / Capacity, during Flowback	56.7%	62.7%	2.2%	47.2%	6.3%	7.2%	7.2%	12.5%

**Notes**

- 1 All paved roads have flexible asphalt pavement, not Portland cement concrete.
- 2 128th "paved" is a short section of road. A separate analysis is done for the paved section because the traffic volume is higher on this section.
- 3 Capacity for gravel roads is assumed to be 500 VPD. Peak hour capacity is assumed to be 500/10 = 50 VPH, or 25 VPH per lane.
- 4 Traffic counts are from ADCO GIS (2024), DRCOG (2022), and two peak hour counts at 152nd Ave and Powhatan Rd in 2024. Numbers have been averaged and rounded to develop estimated figures.
- 5 Adams County Responsible Roads (FHU, 2018, p 12) was used as the source of road jurisdiction data.

**For Site Generated Traffic**

- 6 The trucks move more slowly and take more space than do passenger vehicles. For this reason, they are converted to "passenger car equivalent" by multiplying by 1.7. The unit PCPH is Passenger Car Per Hour.
- 7 232 VPD is the volume during flowback, when loaded trucks will be outbound from the pad. There are estimated to be 50 outbound trucks per day, with the same number returning. Truck percentage for a whole day is 43%.
- 8 During peak hours, there is a higher percentage of light vehicles due to shift workers arriving in cars and pickups. Truck percentage is estimated at 26% during peak hour traffic.

\*\* The trucking route is longer to avoid a left turn onto 152nd. Light vehicles will be able to turn onto 152nd without difficulty and therefore will not use the same route as the trucks.



**Gap Length for Turning from Minor Road to Major Road**

Major Road: 152nd Avenue East of I-76.

Minor Road: Picadilly Road, Northbound

Traffic Counts at Powhatan Road and 152nd Avenue (3 miles east of Picadilly Road).



**Purpose of calculation:**

Trucks can be routed from Conner Pad to the US-85 Vendor Area via several routes. 152nd Ave/Bromley Lane is a straightforward route, however, trucks would need to turn left onto 152nd at a two-way stop at Picadilly Road and 152nd Ave. The traffic on 152nd Ave does not stop. Another option is to turn right on 152nd Ave. Other routes, for example, using 128th or 120th Avenue exist as well.

Trucks to water disposal wells would be loaded, and would take longer to turn than would empty trucks.

Plan: Evaluate time gap between vehicles on 152nd Avenue. Compare to the time required to turn left from Picadilly Road onto 152nd with a tractor-trailer.

$q = k \cdot v$	$k = q/v$
Where:	
q= flow	vehicles/hour
v= speed	miles/hour
k= density	vehicles/mile/lane

	Eastbound	Westbound	Eastbound	Westbound	Effective	
	PM	PM	AM	AM	Gap - Both	
Calculate Density:					Lanes	
Input speed, v:	60	60	60	60	60	miles/hour
Input flow, q:	284	151	133	289	435	veh/hr/lane
Calculate density, k:	4.7	2.5	2.2	4.8	7.3	vehicles/mile/lane
Mile =	5280	5280	5280	5280	5280	ft

<b>Calculate Time Gap:</b>						
Headway, ha	12.7	23.8	27.1	12.5	8.3	seconds
Average Spacing, da	1115	2098	2382	1096	728	ft
Input Avg Vehicle Length	18	18	18	18	18	ft (on major road)
Average space gap	1097	2080	2364	1078	710	ft
Speed in feet/second	88	88	88	88	88	ft/sec
Average time gap = Average space gap / Speed in ft/sec						
<b>Average time gap =</b>	<b>12.5</b>	<b>23.6</b>	<b>26.9</b>	<b>12.3</b>	<b>8.1</b>	<b>seconds</b>

**Discussion:**

Per Palmer (2024), it takes a tractor-trailer 16 seconds to make a left turn, and another 10 seconds to reach 35 mph. When making a left turn, the truck would be crossing both lanes of 152nd Avenue. Given that the effective time gap is 8.1 seconds, at peak hour, it is advisable to route the loaded trucks by a different route.

The traffic we measured at Powhatan Road and 152nd is in agreement with the published data on agency websites, which shows volumes of about 5000 VPD on 152nd Avenue near I-76, and about 4000 VPD near Haysmount. If we estimate the average daily traffic as 10 times the peak hour traffic of 435 VPH, the ADT at Powhatan is 4350 VPD.

**References:**

Palmer, Allie. (2024). How to Safely Complete a Left Turn in a Tractor Trailer. Blog Post for Schneider Trucking. <https://schneiderjobs.com/blog/turn-left-with-tractor-trailer>. Accessed May, 2024.

Chandra, Satish. (2021). Concept of Critical Gap at Highways. <https://youtu.be/GntU6dyjsjE> Accessed May, 2024.

University of Idaho (2003). "Traffic Flow Theory" in Transportation Engineering: Online Lab Manual. [https://www.webpages.uidaho.edu/niatt\\_labmanual/chapters/trafficflowtheory/theoryandconcepts/TrafficFlowParameters.htm](https://www.webpages.uidaho.edu/niatt_labmanual/chapters/trafficflowtheory/theoryandconcepts/TrafficFlowParameters.htm)

## Appendix E: Impacts to Pavement

Road Condition Impact Summary				
Adams County Responsible Roads per FHU, 2018				
Conner		16 Wells		
ROUTE	UNIMPROVED OR GRAVEL ROADS	TYPE	KEY METRICS	
All	Site Access (136th Avenue)	Unimproved	Gravel road to be installed.	
All	Gun Club Road	Gravel	Base VPD = 30 Project VPD = 232. Total VPD = 262	Project traffic has 50 truckloads per day (50 loaded, 50 return trips = 100 truck trips)
6 & 7	128th Avenue (eastbound)	Gravel	Base VPD = 125 Project VPD = 100 Total VPD = 225	

A gravel site access road will be installed by the developer.  
 For gravel roads, additional maintenance may be needed during the construction phase and during early production (flowback).  
 There are fewer than 500 vehicles per day, therefore warrants for paving are not met.  
 After about 30 days of flowback, site-generated traffic will drop significantly.  
 Mitigation for periods of heavy traffic will include following COA's from the ECMC, as well as from Adams County.

Conner Route	Commodity	Total Trips	ESALs (Includes loaded & empty)
2	Bulk Fuel; Commerce City	193	196
3	Cuttings Trucks; Tower Landfill	460	647
6	Gravel, Drilling & Completions; Plugging; US-85 Vendor Area	4597	5913
7	Sand & Water; Hudson, Keenesburg	20344	23202
Total	Total	25594	29959

See Route Maps, following pages.

ESAL'S include all trucking, from start of construction through plugging. Production is included through 10 years, following FHU, 2018. Includes full and empty trips (both inbound and outbound). Impact in expected range.



Adams County Responsible Roads  
 Excerpt from FHU, 2018, Figure 5.  
 Per FHU, Adams County incurs financial responsibility for damages to roads shown in magenta.

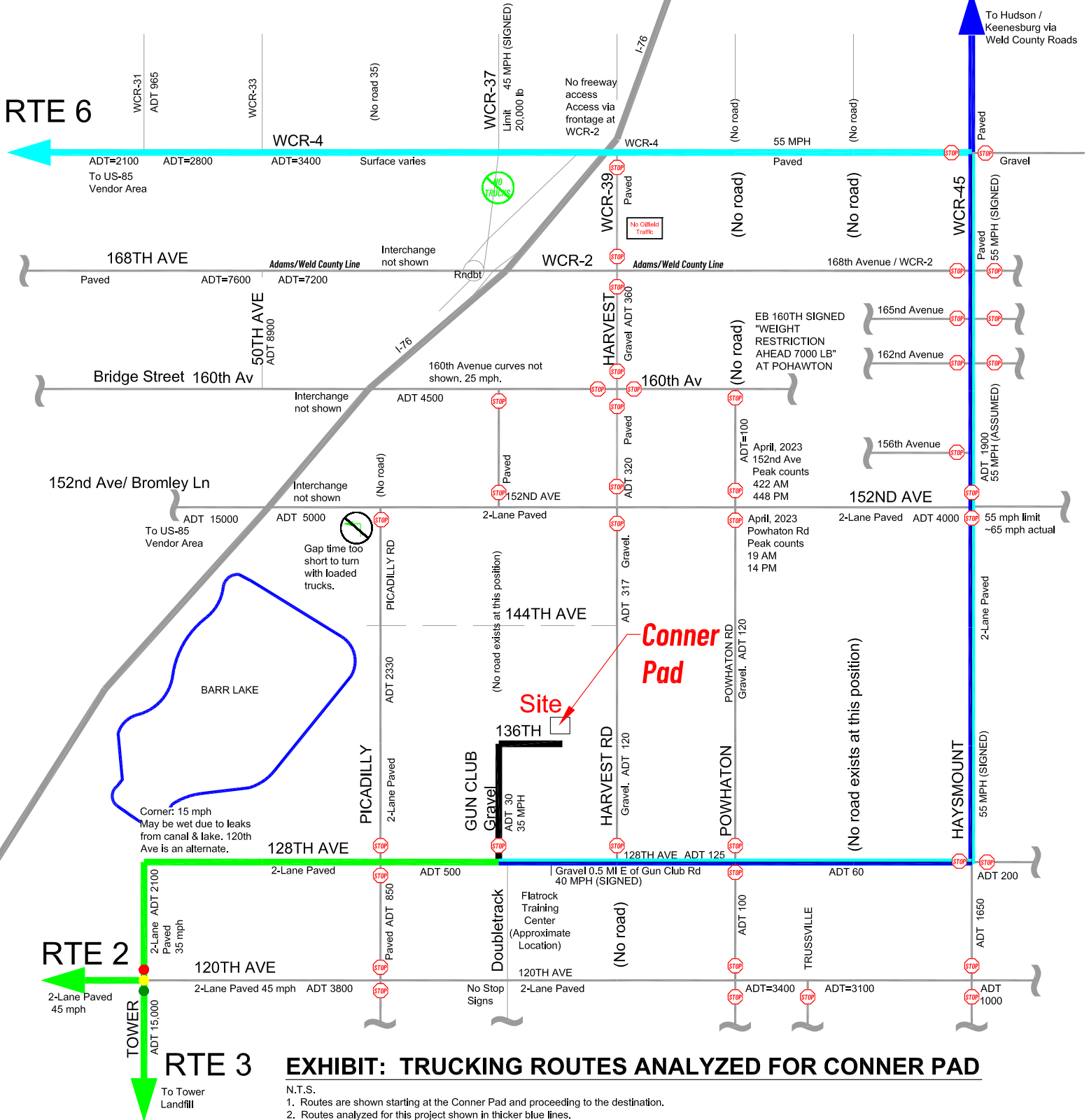
**Legend**

- Municipalities
- Unincorporated Area Removed
- Study Area
- Adams County Responsible Roads

# FINAL ROUTES - SELECTED

RTE 6

RTE 7



## EXHIBIT: TRUCKING ROUTES ANALYZED FOR CONNER PAD

- N.T.S.
1. Routes are shown starting at the Conner Pad and proceeding to the destination.
  2. Routes analyzed for this project shown in thicker blue lines.
  3. Pavement/gravel and stop signs have been added based on multiple sources. See Conner Pad references.
  4. Final routing will depend on vendor selection, commodity availability and route selection by drivers depending on traffic conditions.
  5. Data shown does not represent an exhaustive review of all information available.
  6. Routes 1 & 5 used Weld 39 north of WCR-2. This road was observed to be marked "No Offfield Traffic" on 5/8/24 so Routes 1 & 5 were eliminated.
  7. Route 4 had a left turn from Picadilly Road to 152nd Avenue with loaded trucks. The gap time was computed and found to be too short. Field observation of the gap time on 5/8/24 confirmed this and Route 4 was eliminated.
  8. Speeds on 152nd at Hayesmount were observed to vary between 57 and 65 mph.

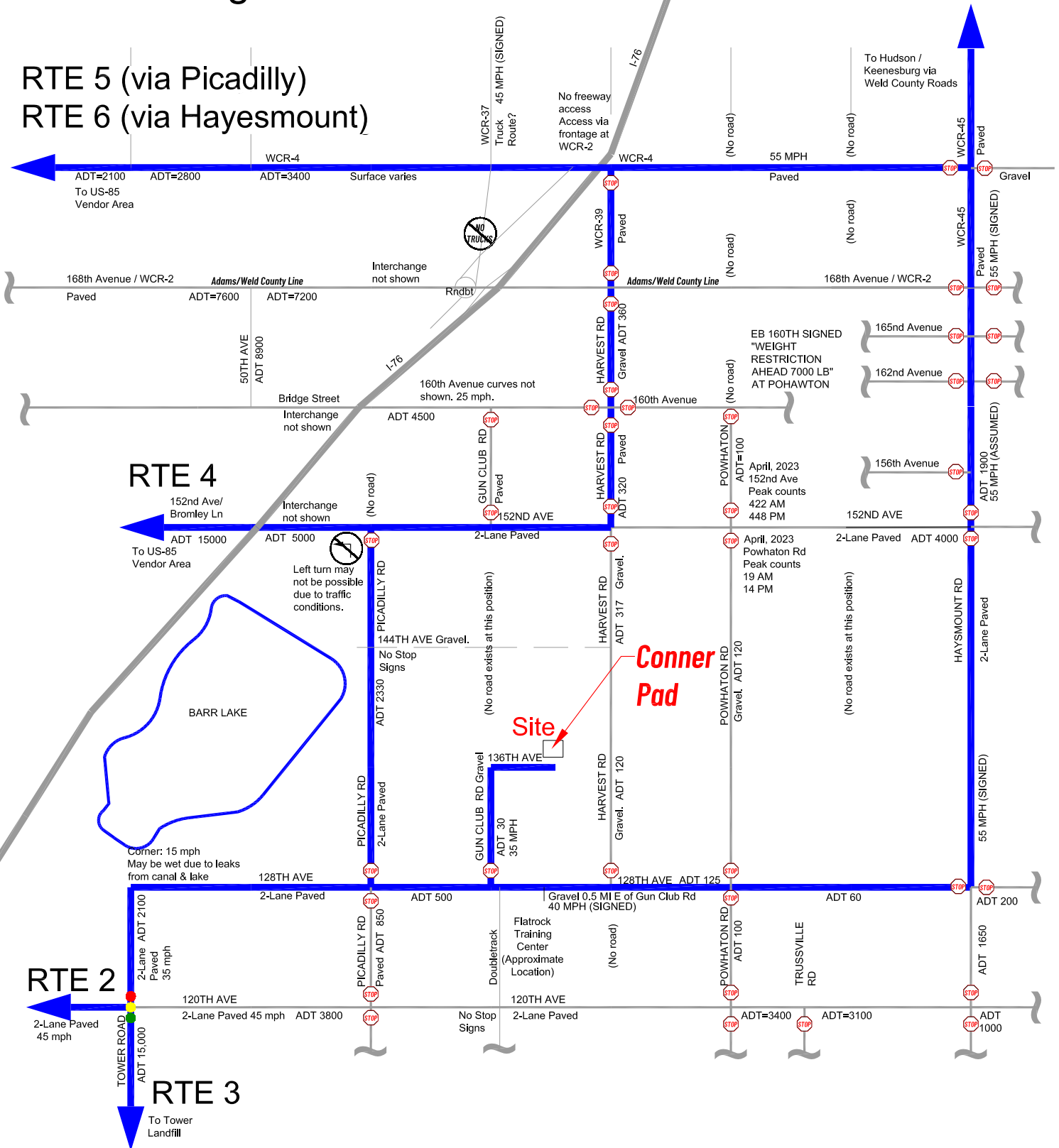


ALL ROUTES. Routes not used by trucks are viable for light vehicles.

Frontage roads at Hudson are weight limit 20,000 lb

RTE 7 (via Hayesmount)  
RTE 1 (via Picadilly)

RTE 5 (via Picadilly)  
RTE 6 (via Hayesmount)



**EXHIBIT: TRUCKING ROUTES ANALYZED FOR CONNER PAD**

N.T.S.

1. Routes are shown starting at the Conner Pad and proceeding to the destination.
2. Routes analyzed for this project shown in thicker blue lines.
3. Pavement/gravel and stop signs have been added based on multiple sources. See Conner Pad references.
4. Final routing will depend on vendor selection, commodity availability and route selection by drivers depending on traffic conditions.
5. Data shown does not represent an exhaustive review of all information available.

## Appendix E: Impacts to Pavement and Gravel Roads

### Method of Study

The method develops the ESALs for paved roads and Vehicles Per Day (VPD) for graveled roads, as follows:

#### Data Gathering

Data was collected, such as the dimensions of the pad site, depth and casing setting depth for the wells, diameter of hole to be drilled in each section, well trajectories, and production decline data. From this data, volumes of materials, such as casing pipe, oilwell cement, mix water, fracking materials, and drilling mud were calculated. Volumes and weights were converted to truckloads.

#### Vehicle Inventory

A Vehicles Per Day (VPD) count was developed for the site, with vehicle types. Vehicle type information includes:

- Vehicle function
- Vehicle loaded and empty weights
- Axle and wheel counts
- Vendor locations and other destinations, such as Tower Landfill

#### Route Selection and Vehicle Routing

Vehicles were assigned to routes, starting at the pad, and ending at destinations identified above. Routes are assumed to be the same on the inbound trip as the outbound trip. This process yielded a vehicle count, Vehicles Per Day (VPD) for each road segment.

#### Vehicle Trip Generation

For gravel roads, the VPD is the parameter used to quantify impact to road condition.

#### Total Trips and ESAL's

Together with the vehicle type information, the total vehicle count for paved roads was used to generate ESAL's for paved roads. ESAL's are Equivalent Single Axle Loads. ESAL analysis normalizes the weights of different vehicles. For a discussion of ESAL analysis, refer to FHU, 2018.

# Proposed Improvements

## Physical Description

The proposed development consists of an oil and gas well pad.

During a Construction Phase, a drilling pad and road will be installed. This pad will contain 16 wells with production facilities such as tanks, pipes, pumps, and compressors. In addition to the improvements located above ground, the wells require extensive materials of construction below ground that necessitate trucking. Waste products, such as drill cuttings and produced water, are trucked from the site.

After Site Occupation occurs, the Production Phase will begin. Trucking is less intense. After 20 to 30 years, the site will be decommissioned, with associated trucking. The trucking associated with the foregoing activities will have impacts to road condition, whether the roads are gravel or pavement.

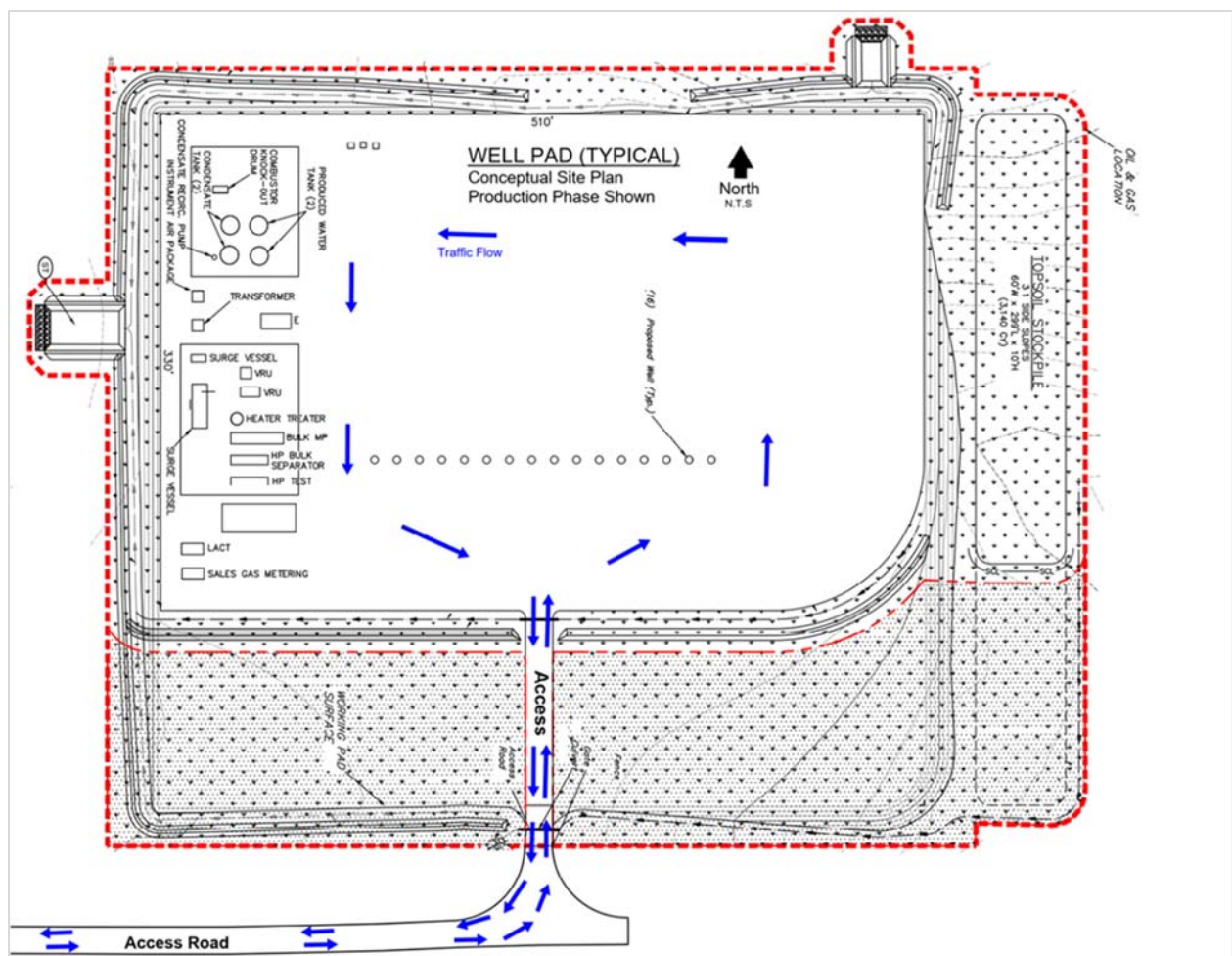


Figure 1. Conceptual Site Plan.

## APPENDIX E

Table 1. Materials and Equipment Used or Generated

Commodity	Vendor Locations (typical)
Gravel, pad construction equipment	Brighton
Facilities equipment (tanks, etc)	Evans, Brighton
Sound walls	Longmont
Drilling equipment and materials	Fort Lupton, Brighton, Cheyenne, LaSalle
Waste disposal	Tower Landfill – Commerce City
Water for fracturing	Local source, by pipeline
Sand and other materials for fracturing	Brighton, Hudson, Windsor
Coiled tubing & associated equipment	Brighton, Fort Lupton
Oil shipping, natural gas shipping	By pipeline
Produced water	Permitted disposal wells near Fort Lupton

Table 2. Schedule of activities

This Report	Sequence of Major Activities from "Written Explanation"	Description
Construction	Phase I-Pre-Drilling	This phase consists of construction of the access road and pad. Trucking of gravel will generate the most ESAL's.
Construction	Phase II-Drilling and Completion	This phase consists of drilling and fracking the wells. During this phase, two oil tanks, two water tanks, and other facilities equipment as listed in the <i>Written Explanation</i> will be installed.
	Site Occupation	Between the Drilling and Completion Phase, and the Production Phase, the "Site Occupation," will take place. The Site Occupation is a key date for the Traffic Impact Study, as described in Chapter 8 of the ADCO DSR.
Production	Phase III-Production	The wells will be produced, with high flow rates in first month tapering off to a stable flow rate over time. The drop in water production is expected to be steeper than the drop in oil and gas production. At the end of the Production Phase, the wells will be plugged, and the tanks, pipelines and gravel pad will be removed. The trucking for the decommissioning has been accounted for in the ESAL's for the production phase.

# Study Information

## Truck Count and Characteristics for ESAL’s Analysis

### Truck Inventory

We inventoried the trucks used for the development and collected the following information:

- Number of axles and wheels, full weight, empty weight, whether there are removable axles
- What the truck is used for, and at what point in the process
- How many trips the truck would make
- Typical destinations for the trucks.

### Truck Characteristics

In terms of ESAL’s analysis, a typical truck is described in the FHU 2018 study, page 27, Table 7, on the second and third lines in the table. The truck described by the first line would be atypical, and is an example showing the effects of having different number of axles.

% of Weight/Axle	30,000 lbs.	80,000 lbs.
$30^1 / 35^2 / 35^2$	$0.056 + 0.008 + 0.008 = \underline{0.073}$	$3.032 + 0.495 + 0.495 = \underline{4.022}$
$15^1 / 40^2 / 45^2$	$0.003 + 0.014 + 0.023 = \underline{0.041}$	$0.189 + 0.857 + 1.376 = \underline{2.422}$
$15^1 / 40^2 / 45^3$	$0.003 + 0.014 + 0.005 = \underline{0.023}$	$0.189 + 0.857 + 0.313 = \underline{1.359}$

*Scenarios are examples only, and assume a Serviceability Index of 2.5, Structural Number of 5, and Slab Depth of 12 inches.  
<sup>1</sup> = single axle, <sup>2</sup> = tandem axle, <sup>3</sup> = triple axle*

Figure 2. Example data from FHU, 2018. We verified that our calculations produce the same numbers.

For the water hauling, we assumed a similar truck. We verified that our spreadsheet calculation produces the same ESAL factors, given the same inputs, for this truck.

Based on the vehicles we are currently observing, about 80% of the water trucks are equipped like the 2<sup>nd</sup> line in the table, and the remaining 20% are like the 3<sup>rd</sup> line. We used a weighted average of those two lines for the ESAL’s for water trucks.

For trucks other than water trucks, we interviewed Subject Matter Experts and researched the weights and axle configurations to develop the ESAL’s for each category of vehicle.

Some other examples of ESAL’s for particular trucks include:

- A truck full of tubing pipe to install in the well typically weighs 85,000 lb full and 34,000 empty. It is usually a 5-axle, 18-wheel truck, and the resulting ESAL’s are 3.09 loaded and 0.07 empty.
- It is common to use rectangular 500-barrel tanks. They are pulled, empty, behind a truck as a semi-trailer. Because there are two axles under the tank, and three under the truck, together, they have 5 axles. The combination of the truck and tank has 0.29 ESAL’s – fewer than the water truck, because the empty tank does not weigh very much. The truck leaves the tank at the well



pad, and just the “bobtail” truck returns to the vendor. The bobtail truck exerts 0.03 ESAL’s on the pavement.

- For moving the drilling rig, some of the equipment requires heavy haul trucks that may have as many as 13 axles. The weight of the truck varies depending on what it is hauling. The heavy haul trucks exert 4.5 to 6.5 ESAL’s when loaded. When empty, they exert anywhere from 0.04 to 0.5 ESAL’s. As the truck is heavier, it needs more axles under it to spread the load and avoid damaging the road.

### Calculations

We calculated the ESALs for the project by multiplying the number of loads for each truck by the ESAL’s. We then assigned these trucks to routes to the destinations, and calculated how many ESAL’s would be applied to different road segments.

### Construction Phase vs Production Phase

We need different mitigation of impact for the Construction Phase than for the Production Phase.

- Construction Phase - We will focus on the guidelines in FHU, 2018 for Construction phase, as well as ECMC Conditions of Approval (COA’s) contained in the Sundry (ECMC, 2023a).
- Production Phase – For the Production Phase, we will follow the outline of FHU, 2018, Chapter 5.

The text below discusses mitigation for each type of road:

#### *Road Surfaces*

There are three types of road surfaces in the project area: unimproved, gravel, and paved.

#### *Unimproved Road (to be gravel)*

136th Avenue is an unimproved dirt road, which is currently used as a service road for a large powerline. A gravel road will be installed by the developer to replace it. There may be dust issues associated with the access road. The mitigation of these issues is addressed in the COA’s for the ECMC permit. For the **Construction Phase**, the permit Conditions of Approval (COA) on the "Sundry Notice Approved" (Form 4), page 4 of 5, Best Management Practice/Condition of Approval #3, "Dust Control," which reads in part:

“Dust mitigation measures shall include but are not limited to the use of speed restrictions, regular road maintenance, restrictions of construction activities during high wind days. The access road will be constructed with road base aggregate material.”

#### *Gravel Roads*

Gun Club Road and 128<sup>th</sup> Avenue are gravel roads that will be used by the project.

For the **Production Phase**, we estimated impact to gravel roads in terms of average VPD.

## APPENDIX E

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The largest traffic volume will be in the 30 days after the well is put on, when the pad will generate the largest volume of traffic because of produced (flowback) water hauling. The traffic will then decline in magnitude, reaching low levels after a few years.

While all the vehicles going to the pad will use Gun Club Road, we do not anticipate light vehicles using 128<sup>th</sup> Avenue. We plan to use 128<sup>th</sup> Avenue for loaded trucks because of constraints elsewhere, however, the light vehicles are not similarly constrained, so they will likely take the shortest route to where they need to go.

The volume in the first 30 days after the wells begin flowing is estimated to peak at 50 truckloads per day, which is 100 VPD after accounting for return trips. The existing traffic volume on 128<sup>th</sup> Avenue is between 60 and 200 VPD in the gravel part of the road. This would bring the traffic on 128<sup>th</sup> Avenue to 250 VPD.

This does not meet the threshold for paving (500 trips per day).

### *Paved Roads*

For paved roads, we calculated the expected total number of trucks, and the corresponding ESAL's, from the beginning of Construction to a time horizon 10 years after Site Occupation. We calculate that approximately 12,800 inbound trips, and the same number of outbound trips, will occur from the beginning of road and pad construction to the end of the tenth year of production. The number of trips for calculating ESAL's is thus about 25,600 trips.

Table 3. Truck Trips Summary

Conner Route	Loaded Trips	Empty Trips	Total Trips	ESALs (Includes loaded & empty)	Commodity
2	96	96	193	196	Bulk Fuel; Commerce City
3	230	230	460	647	Cuttings Trucks; Tower Landfill
6	2299	2299	4597	5913	Gravel, Drilling & Completions; Plugging; US-85 Vendor Area
7	10172	10172	20344	23202	Sand & Water; Hudson, Keenesburg
Total	12797	12797	25594	29959	Total

**APPENDIX E**

The breakdown of the truck trips by phase, including the ESAL's is as follows:

*Table 4. Truck trips by phase. The trucks are counted once when they enter the pad, and counted again when they leave, as if they were driving over a pneumatic vehicle counter.*

**Construction Phase**

Commodity	Conner Route	Total Trips	ESALs (Includes loaded & empty)
Bulk Fuel; Commerce City	2	193	196
	Drilling Ops	41	7
	Frac Operations	152	189
Cuttings Trucks; Tower Landfill	3	444	645
	Drilling Ops	444	645
Gravel, Drilling & Completions; Plugging; US-85 Vendor Area	6	3477	4362
	Drilling Ops	1724	2451
	Drillout Vehicles	48	90
	Facility	120	84
	Frac Operations	704	412
	Frac Rig In	23	35
	Pad & Road	706	1018
	Rig Move	92	196
	Sound Walls	60	75
Sand & Water; Hudson, Keenesburg	7	14208	16176
	Frac Operations	14208	16176
	Total	18322	21379

**Production Phase**

Commodity	Conner Route	Total Trips	ESALs (Includes loaded & empty)
Cuttings Trucks; Tower Landfill	3	16	3
	Workover	16	3
Gravel, Drilling & Completions; Plugging; US-85 Vendor Area	6	1120	1552
	Plugging	1080	1483
	Workover	40	68
Sand & Water; Hudson, Keenesburg	7	6136	7026
	Production	6104	6989
	Workover	32	37
	Total	7272	8580

**State of Colorado  
Oil and Gas Conservation Commission**

1120 Lincoln Street, Suite 801, Denver, Colorado 80203  
Phone: (303) 894-2100 Fax: (303) 894-2109



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<b>Submit By Other Operator</b>			
Document Number: <u>402790170</u>			
Date Received: <u>08/24/2021</u>			

**SUNDRY NOTICE**

Submit a signed original. This form is to be used for general, technical and environmental sundry information. For proposed or completed operations, describe in full in Comments or provide as an attachment. Identify Well by API Number; identify Oil and Gas Location by Location ID Number; identify other Facility by Facility ID Number.

OGCC Operator Number: 10694 Contact Name Meghan Grimes  
 Name of Operator: PROVIDENCE OPERATING LLC DBA POCO OPERATING Phone: (720) 441-0720  
 Address: 16400 DALLAS PARKWAY SUITE 400 Fax: ( )  
 City: DALLAS State: TX Zip: 75428 Email: mgrimes@providence-energy.com

Complete the Attachment Checklist  
OP OGCC

API Number : 05- 001 00 OGCC Facility ID Number: 459267  
 Well/Facility Name: Conner Well/Facility Number: Pad  
 Location QtrQtr: SESW Section: 19 Township: 1S Range: 65W Meridian: 6  
 County: ADAMS Field Name: \_\_\_\_\_  
 Federal, Indian or State Lease Number: \_\_\_\_\_

Survey Plat		
Directional Survey		
Srvc Eqpmt Diagram		
Technical Info Page		
Other		

**NOTE: This copy has sections that were not used crossed off. LLD**

**CHANGE OF LOCATION OR AS BUILT GPS REPORT**

- Change of Location     As-Built GPS Location Report     As-Built GPS Location Report with Survey

\* Well location change requires new plat. A substantive surface location change may require new Form 2A.

**SURFACE LOCATION GPS DATA** Data must be provided for Change of Surface Location and As Built Reports.

Latitude \_\_\_\_\_ GPS Quality Value: \_\_\_\_\_ Type of GPS Quality Value: \_\_\_\_\_ Measurement Date: \_\_\_\_\_  
 Longitude \_\_\_\_\_

**LOCATION CHANGE (all measurements in Feet)**

Well will be: \_\_\_\_\_ (Vertical, Directional, Horizontal)

Change of **Surface** Footage **From** Exterior Section Lines:        

Change of **Surface** Footage **To** Exterior Section Lines:        

Current **Surface** Location **From**    QtrQtr     Sec     Twp     Range     Meridian

New **Surface** Location **To**    QtrQtr     Sec     Twp     Range     Meridian

Change of **Top of Productive Zone** Footage **From** Exterior Section Lines:        

Change of **Top of Productive Zone** Footage **To** Exterior Section Lines:              \*\*

Current **Top of Productive Zone** Location **From**    Sec     Twp     Range

New **Top of Productive Zone** Location **To**    Sec     Twp     Range

Change of **Bottomhole** Footage **From** Exterior Section Lines:        

Change of **Bottomhole** Footage **To** Exterior Section Lines:              \*\*

Current **Bottomhole** Location    Sec     Twp     Range     \*\* attach deviated drilling plan

New **Bottomhole** Location    Sec     Twp     Range

Is location in High Density Area? \_\_\_\_\_

Distance, in feet, to nearest building \_\_\_\_\_, public road: \_\_\_\_\_, above ground utility: \_\_\_\_\_, railroad: \_\_\_\_\_,

property line: \_\_\_\_\_, lease line: \_\_\_\_\_, well in same formation: \_\_\_\_\_

Ground Elevation \_\_\_\_\_ feet    Surface owner consultation date \_\_\_\_\_

OTHER CHANGES

REMOVE FROM SURFACE BOND Signed surface use agreement is a required attachment

CHANGE OF WELL, FACILITY OR OIL & GAS LOCATION NAME OR NUMBER

From: Name CONNER Number PAD Effective Date: \_\_\_\_\_

To: Name \_\_\_\_\_ Number \_\_\_\_\_

**ABANDON PERMIT: Permit can only be abandoned if the permitted operation has NOT been conducted. Field inspection will be conducted to verify site status.**

WELL: Abandon Application for Permit-to-Drill (Form2) – Well API Number \_\_\_\_\_ has not been drilled.

PIT: Abandon Earthen Pit Permit (Form 15) – COGCC Pit Facility ID Number \_\_\_\_\_ has not been constructed (Permitted and constructed pit requires closure per Rule 905)

CENTRALIZED E&P WASTE MANAGEMENT FACILITY: Abandon Centralized E&P Waste Management Facility Permit (Form 28) – Facility ID Number \_\_\_\_\_ has not been constructed (Constructed facility requires closure per Rule 908)

OIL & GAS LOCATION ID Number: \_\_\_\_\_

Abandon Oil & Gas Location Assessment (Form 2A) – Location has not been constructed and site will not be used in the future.

Keep Oil & Gas Location Assessment (Form 2A) active until expiration date. This site will be used in the future.

**Surface disturbance from Oil and Gas Operations must be reclaimed per Rule 1003 and Rule 1004.**

**REQUEST FOR CONFIDENTIAL STATUS**

**DIGITAL WELL LOG UPLOAD**

**DOCUMENTS SUBMITTED** Purpose of Submission: \_\_\_\_\_

RECLAMATION

**INTERIM RECLAMATION**

Interim Reclamation will commence approximately \_\_\_\_\_

Per Rule 1003.e.(3) operator shall submit Sundry Notice reporting interim reclamation is complete and site is ready for inspection when vegetation reaches 80% coverage.

Interim reclamation complete, site ready for inspection.

Per Rule 1003.e(3) describe interim reclamation procedure in Comments below or provide as an attachment and attach required location photographs.

**Field inspection will be conducted to document Rule 1003.e. compliance**

**FINAL RECLAMATION**

Final Reclamation will commence approximately \_\_\_\_\_

Per Rule 1004.c.(4) operator shall submit Sundry Notice reporting final reclamation is complete and site is ready for inspection when vegetation reaches 80% coverage.

Final reclamation complete, site ready for inspection. Per Rule 1004.c(4) describe final reclamation procedure in Comments below or provide as an attachment.

**Field inspection will be conducted to document Rule 1004.c. compliance**

Comments:



**ENGINEERING AND ENVIRONMENTAL WORK**

NOTICE OF CONTINUED TEMPORARILY ABANDONED STATUS

Indicate why the well is temporarily abandoned and describe future plans for utilization in the COMMENTS box below or provide as an attachment, as required by Rule 319.b.(3).

Date well temporarily abandoned \_\_\_\_\_ Has Production Equipment been removed from site? \_\_\_\_\_

Mechanical Integrity Test (MIT) required if shut in longer than 2 years. Date of last MIT \_\_\_\_\_

SPUD DATE: \_\_\_\_\_

**TECHNICAL ENGINEERING AND ENVIRONMENTAL WORK**

Details of work must be described in full in the COMMENTS below or provided as an attachment.

NOTICE OF INTENT Approximate Start Date \_\_\_\_\_

REPORT OF WORK DONE Date Work Completed \_\_\_\_\_

- Intent to Recomplete (Form 2 also required)
- Change Drilling Plan
- Gross Interval Change
- Bradenhead Plan
- Other \_\_\_\_\_
- Request to Vent or Flare
- Repair Well
- Rule 502 variance requested. Must provide detailed info regarding request.
- Status Update/Change of Remediation Plans for Spills and Releases
- E&P Waste Mangement Plan
- Beneficial Reuse of E&P Waste

**COMMENTS:**

\_\_\_\_\_

**H2S REPORTING**

Data Fields in this section are intended to document Sample and Location Data associated with the collection of a Gas Sample that is submitted for Laboratory Analysis.

**Gas Analysis Report must be attached.**

H2S Concentration: \_\_\_\_\_ in ppm (parts per million) Date of Measurement or Sample Collection \_\_\_\_\_

Description of Sample Point:

\_\_\_\_\_

Absolute Open Flow Potential \_\_\_\_\_ in GCFD (cubic feet per day)

Description of Release Potential and Duration (If flow is not open to the atmosphere, identify the duration in which the container or pipeline would likely be opened for servicing operations.):

\_\_\_\_\_

Distance to nearest occupied residence, school, church, park, school bus stop, place of business, or other areas where the public could reasonably be expected to frequent: \_\_\_\_\_

Distance to nearest Federal, State, County, or municipal road or highway owned and principally maintained for public use: \_\_\_\_\_

**Best Management Practices**

<b>No</b>	<b>BMP/COA Type</b>	<b>Description</b>
1	Planning	Light Mitigation: Operator will install an engineered <b>perimeter sound wall on all sides</b> of location during all drilling and completion operations to block light from the buildings in the vicinity of the site. Light sources will be directed downward during all phases of operations.
2	<b>Dust control</b>	Dust mitigation measures shall include but are not limited to the use of speed restrictions, regular road maintenance, restrictions of construction activities during high wind days, and silica dust controls when handling sand used in hydraulic fracturing operations. The access road will be constructed with road base aggregate material. Additional management practices such as road surfacing, wind breaks and barriers may be used. In terms of silica dust controls when handling sand used in hydraulic fracturing operations, Operator's vendors will use an advanced Containerized Sand System for proppant delivery, storage on location and ultimately delivery to the blender and frac fluid system. The containers use gravity (not pneumatics) to drop sand into the blender's sand hopper that drastically reduces dust generation. This system also removes people and equipment from the proppant handling operations during fracturing treatments, considerably reducing exposures and EHS risks to individuals from dust and older sand handling equipment (like conveyor belts). Remote controls are used to open and close sand gates on the bins to further reduce silica dust exposure to workers and scales are used to weigh the boxes so people are not required to open boxes and visually inspect how much proppant is remaining. PPE is worn as required for each job/ task including respirators when exposure to silica dust require them.
3	Noise mitigation	Operator will install an engineered perimeter <b>sound wall 32' high</b> with a Sound Transmission Class (STC) rating of 27 or higher on all sides of location during all drilling and completion operations to provide noise relief for the buildings in the vicinity of the site. Operator will base the pad design for sound mitigation on engineering recommendations that include inputs from an ambient sound survey and noise impact modeling software. Operator will also spot and orientate equipment such as generators and pressure pumping equipment when possible in areas inside the walled off pad as recommended by the Modeling software to maximize effectiveness of the Acoustical Walls.
4	Odor mitigation	Operator will utilize Emission Control Devices to reduce odor emissions during production operations. Operator's primary form of Oil Based Mud odor control during drilling operations will be a product called Odor Armor that is mixed directly into the mud while drilling wells with OBM. Additionally, Operator will perform good housekeeping practices and inventory management to mitigate OBM odor, including promptly hauling off cuttings as they are generated to reduce the volume of cuttings on location, and prompt disposal of trash and rags that have been exposed to OBM. Operator will use solids control equipment that efficiently handles cuttings to minimize the amount of OBM in dried cuttings.

Total: 4 comment(s)

**Operator Comments:**

Per conversations with COGCC, new BMP's have been added to the existing approved Form 2A.

I hereby certify all statements made in this form are, to the best of my knowledge, true, correct, and complete.

Signed: \_\_\_\_\_ Print Name: Andrea Gross  
Title: Permit Agent Email: agross@upstreampm.com Date: 8/24/2021

Based on the information provided herein, this Sundry Notice (Form 4) complies with COGCC Rules and applicable orders and is hereby approved.

COGCC Approved: Housey, Melissa Date: 9/24/2021

**CONDITIONS OF APPROVAL, IF ANY:**

**Condition of Approval**

**COA Type**                      **Description**

0 COA	
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**General Comments**

<b><u>User Group</u></b>	<b><u>Comment</u></b>	<b><u>Comment Date</u></b>
Routing Review	A task has been opened for the OGLA Group to review the information provided by the operator.	08/25/2021

Total: 1 comment(s)

**Attachment List**

<b><u>Att Doc Num</u></b>	<b><u>Name</u></b>
402790170	SUNDRY NOTICE APPROVED
402822515	FORM 4 SUBMITTED

Total Attach: 2 Files



# **Water Quality Plan**

## **Conner 19-18**

**POCO Holdco, LLC**

**9635 Maroon Circle, Suite 450**

**Englewood, Colorado 80112**

**December 2023**



## 1.0 Introduction

The POCO Operating (POCO) Conner 19-18 pad (Site) is located in Section 19, Township 1 South, Range 65 West in Adams County, Colorado. The proposed facility will consist of 16 horizontal wells and associated production and storage equipment to the oil and gas production well pad and tank battery.

Operations at the Conner 19-18 production facility include the extraction and separation of condensate and natural gas as well as the storage of condensate and produced water. Equipment at the facility includes wellheads, separators, heater treaters, storage tanks and vapor recovery systems.

To prevent and mitigate potential impacts to surface and ground waters in the surrounding area, and in compliance with requirements of the United States Environmental Protection Agency (EPA), Colorado Department of Public Health and Environment (CDPHE) Water Quality Control Division (WQCD) and the Colorado Energy and Carbon Management (ECMC), POCO maintains and/or performs the following:

- Spill Prevention, Control, and Countermeasure (SPCC) Plan, per Title 40 Section 112 of the Code of Federal Regulations (40 CFR 112);
- Authorization to Discharge, Number COR403522, and a Construction Stormwater Management Plan (SWMP) in accordance with the Colorado Discharge Permit System (CDPS) COR400000 General Permit for Stormwater Discharges Associated with Construction Activity;
- Groundwater baseline monitoring pre- and post-spud in accordance with ECMC Rule 615; and
- Fluid Leak Detection Plan.

Facility environmental plans, the Authorization to Discharge and results of baseline groundwater monitoring are maintained at POCO's Englewood office and can be provided upon request.

## 2.0 Water Quality Management Practices

The following sections provide an overview of the contents of the plans, site-specific stormwater pollution control measures implemented to avoid adverse impacts to surface and ground waters in the area surrounding the facility, and private and community permitted water wells of public record within 1/2-mile of the facility.

POCO has identified private and community permitted water wells of public record within 1/2-mile of the Conner 19-18 facility as shown in Attachment A.

### 2.1 SPCC Plan

The SPCC Plan for the facility describes measures implemented by POCO to prevent oil discharges from impacting navigable waters and includes spill response measures to respond in a safe, effective, and timely manner to mitigate the impacts of a discharge if one does occur.

#### 2.1.1 Discharge Prevention Measures

Specific discharge prevention measures employed at the facility include:





- Conducting periodic inspections and providing training to oil handling personnel;
- Designation of a Person Responsible for Spill Prevention (PRSP);
- Annual discharge prevention briefings to share learnings each year in response to spill events;
- Procedures for loading/unloading oil;
- Closing of dike drains and inspection of rainwater discharge prior to discharge;
- Designed secondary containment to provide sufficient containment, inclusive of a 25-year, 24-hour precipitation event; and
- A program of flow line maintenance.

POCO constructs secondary containment structures for condensate and produced water storage in accordance with ECMC Rule 603 requirements which also meet the spill prevention criteria under the SPCC regulations. Aboveground piping containing condensate is installed within secondary containment berms, except for load lines, which may or may not be installed within the containment. General containment is provided for aboveground piping and flow-through process equipment not constructed or installed within tank berms.

Specific information on these discharge prevention measures is included in the SPCC Plan.

#### 2.1.2 Discharge or Drainage Controls

In accordance with 40 CFR Parts 112.7(c), 112.9(b), and 112.9(c)(2), the facility employs adequate discharge controls that include:

- Lined secondary containment with corrugated metal walls as the secondary containment system for condensate and produced water;
- Drip pots for condensate and/or produced water loading;
- Retention pond; and
- Spill kit with sorbent materials.

Additionally, while 40 CFR Part 112 does not require sized secondary containment for transfer areas used for the transfer of condensate and/or produced water from aboveground containers into tanker trucks, the transfer connections at the Conner 19-18 facility shall be located within the aboveground secondary containment of the tank battery.

#### 2.1.3 Spill Response

POCO has established spill response procedures to mitigate adverse impacts to surface and groundwaters related to a discharge of condensate or produced water as part of the SPCC Plan. As part of the spill response procedures, POCO has engaged with a 3<sup>rd</sup> party spill clean up contractor to provide services immediately upon the release of a large spill.



#### 2.1.4 Spill Notification

Section 4.0 of POCO's SPCC plan outlines the various written and verbal spill reporting and notification requirements that must be followed in the event of a spill or release at the facility. A summary table of reporting requirements and contacts are included in Appendix B of this plan. In the event of a release or spill at the facility, POCO shall refer to their SPCC plan for a comprehensive list of reporting and notification requirements.

#### 2.2 Stormwater Management Plan

In accordance with the CDPHE WQCD, COR400000 general permit, POCO applied for and was granted coverage under this general permit for the construction and early operations of the facility. As part of the application process, POCO had to develop and implement a SWMP for the facility that identifies potential pollutant sources (PPSs), inspection frequencies and stormwater control measures employed to prevent pollutants from discharging with stormwater from the facility.

##### 2.2.1 Potential Pollution Sources (PPS)

By identifying the PPSs at the facility, POCO can determine the type of stormwater management controls necessary to mitigate adverse impacts to surface and ground waters. The PPS identified in the facility SWMP include:

- Disturbed areas and soil stockpiles;
- Vehicle tracking;
- Loading operations for condensate, produced water and other chemicals;
- On-site waste management; and
- Small spills.

PPS identification is fluid and occurs throughout the life cycle of the facility; therefore, the stormwater management controls evolve over time to align with the discharge potential from the facility.

##### 2.2.2 Stormwater Management Controls

To reduce and/or eliminate adverse impacts to surface and ground waters, POCO implements stormwater management controls for each identified PPS. Typical stormwater management controls include:

- Secondary containment structures;
- Drainage swales;
- Retention pond;
- Surface roughening during construction phases to prevent erosion and sediment deposition;
- Installation of erosion control measures such as silt fence, erosion control blankets or wattles;
- Hydro-seeding of reclaimed areas;
- Vehicle track pads.



In addition to physical controls, POCO may implement non-structural control measures such as minimizing the area of disturbance, utilizing natural flow paths, employee training and routine inspections.

### 2.2.3 Groundwater Baseline Monitoring Program

In accordance with ECMC Rule 615 and ADS&R Section 4-11-02-03-1.23.b, POCO performs initial and subsequent groundwater monitoring. In accordance with ADS&R Section 4-11-02-03-1.23.b. Operator shall collect a sample from at least one up-gradient and two down-gradient water sources within a one-half mile radius of the facility. If no such water sources are available, operator shall collect samples from additional water sources within a radius of up to one mile from the facility until samples from a total of at least one up-gradient and two downgradient water sources are collected. Operators should give priority to the selection of water sources closest to the facility.

POCO will offer to sample all water wells within 1/2 mile before operations commence. An initial sampling is conducted in the 12 months prior to setting conductor pipe and subsequent sampling is conducted as follows:

#### ECMC Sampling Schedule:

- Between 6 and 12 months following completion
- Between 60 and 72 months following completion
- Every 5 years thereafter for the life of the well

#### Adams County Sampling Schedule:

Initial collection and testing of baseline samples from available water sources shall occur within twelve months prior to the commencement of drilling a well, or within twelve months prior to the re-stimulation of an existing well for which no samples were collected and tested during the previous twelve months.

Post-stimulation samples of available water sources shall be collected and tested pursuant to the following time frame:

- One sample within six months after completion;
- One sample between twelve and eighteen months after completion;
- One sample between sixty and seventy-two months after completion;
- For multi-well pads, collection shall occur annually during active drilling and completion.

Results of the sampling are reviewed and provided not only to the ECMC, but the water well owner or landowner. If sample results indicate thermogenic or a mixture of thermogenic and biogenic gas, the methane concentration increases by more than 5.0 mg/l between sampling periods, or methane increases to more than 10 mg/l, POCO shall notify the ECMC Director immediately. The frequency and longevity of the sampling program supports POCO's effort to reduce and/or eliminate adverse impacts to ground water related to operations.



### 3.0 Water Usage and Source Protection

POCO estimates that approximately 4,733,333 barrels of surface water will be required to complete the drilling and completion of the planned 16 wells at the Conner 19-18 facility. The water required to develop the Conner 19-18 facility will be delivered via temporary pipelines from either Barr Lake, Fulton Ditch, or the City of Brighton. POCO may contract with Tallgrass Water who can supply water from their own wells and retention ponds. The water will be stored on location in water tanks.

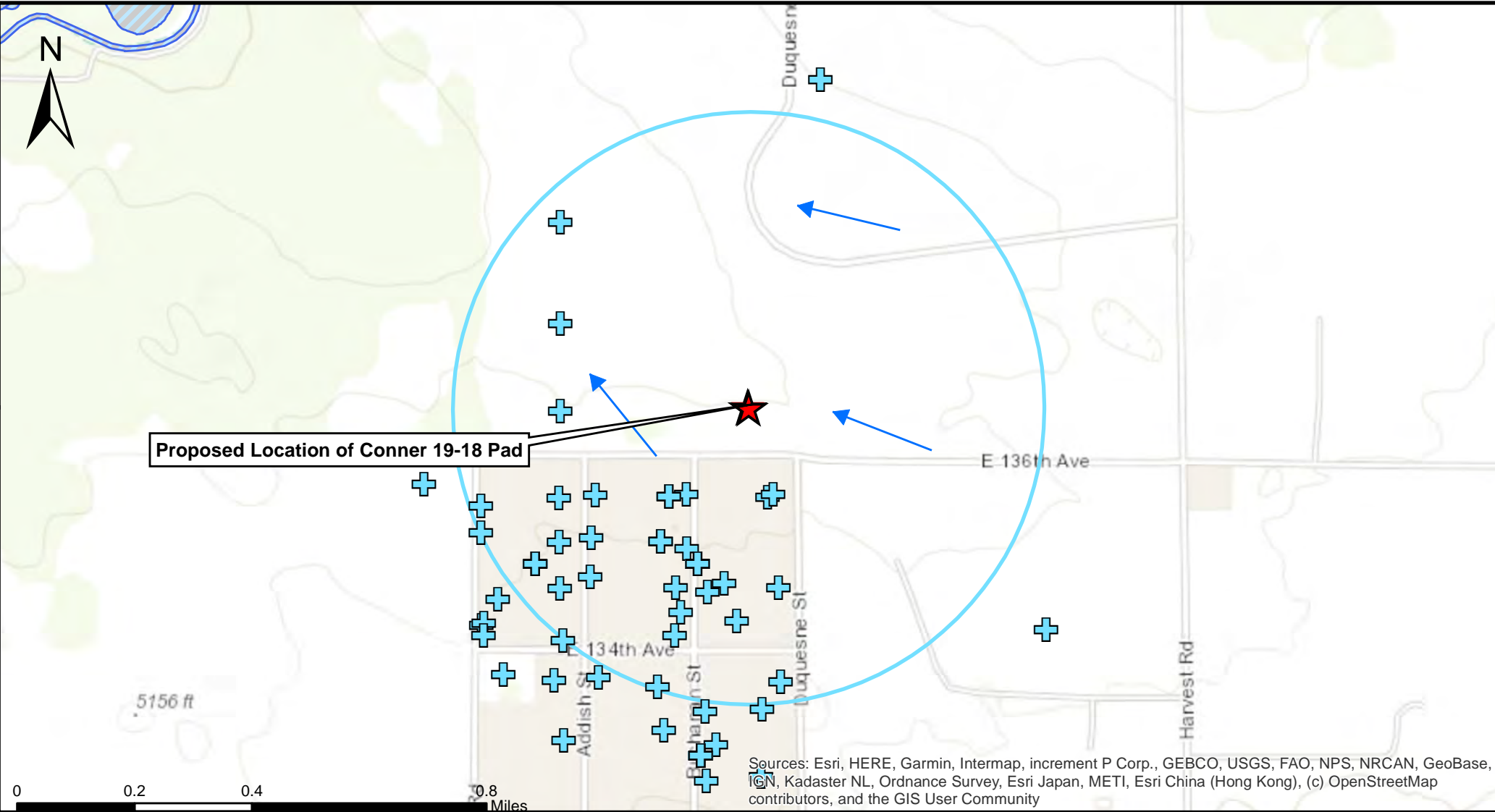
POCO will contract with NGL Water Solutions and/or Expedition Water Solutions for off-site disposal of wastewater via tanker truck.



POCO Operating






**ATTACHMENT A**  
Hydrography Map





Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

**MAP FEATURES**

-  Permitted Water Wells
-  Proposed Conner 19-18 Pad Location
-  Surface Flow Direction
-  1/2 Mile Site Buffer
-  Lake/ Pond

REVISION	DATE

**POCO Operating**  
**Conner 19-18**  
 Section 19, Township 1S, Range 65W  
 Adams County  
**Hydrography Map**

 5545 W. 56th Ave Unit E  
 Arvada, CO 80002  
 (303) 289-7520  
 www.aquionix.com

DRAWN BY: GS  
 DATE DRAWN: 11/03/2023  
 MAP SCALE: 1:15,000  
 COORD. SYSTEM: WGS\_1984\_Web\_Mercator\_Auxiliary\_Sphere



POCO Operating

**ATTACHMENT B**  
Discharge Contact List



**Discharge Contact List**

Upon discovery of a spill and after the immediate discharge response procedures outlined in Section 5.0 of the POCO Consolidated SPCC Plan have been completed, the discharge should be reported to the appropriate personnel and agencies by the Person Responsible for Spill Prevention. If unable to reach the Person Responsible for Spill Prevention, report the spill to listed contact at POCO or alternate.

<b>Contact Entity</b>	<b>Contact</b>	<b>Phone #</b>	<b>Circumstances</b>	<b>When-to-Notify</b>
<b>Person Responsible for Spill Prevention</b>				
POCO Holdco, LLC	Meghan Grimes (PRSP)	720-256-8774	Any discharge event, injury, fire	Immediately
<b>Emergency Response Contact List</b>				
Emergency Response	NA	911	Fire or injured personnel	Immediately
<b>Federal Discharge Contact List</b>				
National Response Center	NA	1-800-424-8802	Discharge reaching or threatening navigable waters	Immediately
EPA Region VIII	NA	1-800-227-8917	Discharge of 1,000 gallon or 2nd event of 42 gallon in navigable waters	Written Notification within 60 days (EPA Region VIII Regional Administrator)
<b>Colorado Discharge Contact List</b>				
ECMC	N/A	303-894-2100	Spill of exploration or production wastes > 20 bbls on state or private land	Within 24-Hours (ECMC Form 19 must be submitted with 72-hours)*
CPDHE	24-Hour Spill Reporting Line	1-877-518-5608	Spills of any size that impact or threaten to impact waters of the state	Immediately following discovery
Adams County LEPC	N/A	720-523-6602	Any spills that require notification as discussed above	As soon as possible
<b>Oil Spill Removal Organization</b>				
Freedom Drilling Services	Arin Hatfield	970-673-8465 (o) 303-827-8595 (m)	When assistance is needed with controlling and/or cleaning up a spill.	When it is determined that such assistance is needed.

\*Link to ECMC Form 19

[https://ECMC.state.co.us/forms/pdf\\_forms/form19.pdf](https://ECMC.state.co.us/forms/pdf_forms/form19.pdf)

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# WILDLIFE PROTECTION PLAN



## POCO Operating

**Conner 19-18 Pad**

Sec. 19 T1S R65W (SESW)

Adams County, Colorado

Surface: Fee

Submitted as an accompaniment to the Form 2A Application and  
Consistent with the requirements of Rule 304.c.(17) & 1201.a.

December 6, 2022

# Providence Energy Operating LLC Adams County, Colorado

## Wildlife Protection Plan

### Project Summary:

Providence Energy Operating LLC's ("POCO's") proposed Conner 19-18 Pad "Location" is in Township 1 South, Range 65 West, Section 19 in Adams County, Colorado. The proposed Location is fee surface with a total pad disturbance of 8.052 acres, which includes the active working pad surface of 5.374 acres. During the interim reclamation and production phase 2.395 acres will be reclaimed, leaving a disturbed production area of 5.657. Construction is anticipated to begin no sooner than April 2023.

### Introduction

The Wildlife Protection Plan serves as a framework for wildlife protection and communication tool to foster cooperative relationships between POCO and its stakeholders. Implementation of this plan will serve to avoid or minimize adverse effects to wildlife populations, and their associated habitats.

This Wildlife Protection Plan addresses POCO's plans to comply with all applicable operating requirements and includes a site-specific environmental site assessment. Additional measures may be implemented based on any new environmental constraints that arise.

### Location Description

The location boundaries are defined as the limits of disturbance (LOD) for the proposed pad. The location is in Section 19 of Township 1 South, Range 65 West in Adams County, Colorado.

### Operating Requirements

Below is a review of the operating requirements described in Rule 1202 and POCO's plans to adhere to those which are applicable to the location. POCO's contractors will also comply with all applicable operating requirements.

- A. The operating requirements identified in Rule 1202.a apply to Oil and Gas Operations statewide unless the Operator obtains a signed waiver from Colorado Parks and Wildlife (CPW) and the Director or Commission approves a Form 4, Sundry Notice or Form 2A documenting the relief.

In black bear habitat, Operators will install and utilize bear-proof dumpsters and trash receptacles for food-related trash at all facilities that generate trash.

***The Conner 19-18 is not located within black bear habitat***

- B. Operators will disinfect water suction hoses and water transportation Tanks withdrawing from or discharging into surface waters (other than contained Pits) used previously in another



river, intermittent or perennial stream, lake, pond, or wetland and discard rinse water in an approved disposal facility. Disinfection practices will be repeated prior to completing work and before moving to the next waterbody. Disinfection will be performed by scrubbing and pre-rinsing equipment away from water bodies to remove all mud, plants, and organic materials and then by implementing one of the following practices

Spray/soak equipment with a CPW-approved disinfectant solution capable of killing whirling disease spores and other aquatic nuisance species defined by CPW; or B. Spray/soak equipment with water greater than 140° Fahrenheit for at least 10 minutes. All equipment and any compartments they contain will be completely drained and dried between each use.

***POCO will utilize surface water to hydraulically fracture the 40 subject Conner 19-18 wells. POCO and its vendors will adhere to the above-listed requirements.***

- C. At new and existing Oil and Gas Locations, Operators will not situate new staging, refueling, or Chemical storage areas within 500 feet of the Ordinary High Water Mark ("OHWM") of any river, perennial or intermittent stream, lake, pond, or wetland.

***The Conner 19-18 is not within 500 feet of the OHWM of any river, perennial or intermittent stream, lake, pond, or wetland.***

- D. To prevent access by wildlife, including birds and bats, Operators will fence and net or install other CPW-approved exclusion devices on new Drilling Pits, Production Pits, and other Pits associated with Oil and Gas Operations that are intended to contain Fluids.

Such fencing and netting or other CPW-approved exclusion device will be installed within 5 days after the cessation of active drilling and completion activities and maintained until the Pit is removed from service and dried or closed pursuant to the Commission's 900 Series Rules.

The Director may require an operator to fence and net or install other CPW-approved exclusion devices on an existing Pit if the Director determines that the installation is necessary and reasonable to protect Wildlife Resources based on the analysis required by Rule 909.j, or other information that demonstrates additional protections for Wildlife Resources are appropriate.

Operators will properly maintain and repair all fences, nets, and CPW-approved exclusion devices required by this Rule 1202.a.(4).

***The Conner 19-18 location will not include Drilling Pits, Production Pits, or other Pits associated with Oil and Gas Operations. Operator agrees.***

- E. For trenches that are left open for more than 5 consecutive days during construction of Pipelines regulated pursuant to the Commission's 1100 Series Rules, Operators will install wildlife escape ramps at a minimum of one ramp per 1/4 mile of trench.

***If a trench is left open for more than 5 consecutive days during pipeline construction, POCO will install wildlife escape ramps at a minimum of one ramp per ¼ mile of trench.***

- F. When conducting interim and final Reclamation pursuant to Rules 1003 and 1004, Operators will use CPW-recommended seed mixes for Reclamation when consistent with the Surface Owner's approval and any local soil conservation district requirements.

***POCO will use CPW-recommended seed mixes for interim and final reclamation when consistent with the Surface Owner's approval and any local soil conservation district requirements.***

- G. Operators will use CPW-recommended fence designs when consistent with the Surface Owner's approval and any Relevant Local Government requirements.

***POCO will use CPW-recommended fence designs when consistent with the Surface Owner's approval and any Relevant Local Government requirements.***

- H. Operators will conduct all vegetation removal necessary for Oil and Gas Operations outside of the nesting season for migratory birds (April 1 to August 31). For any vegetation removal that must be scheduled between April 1 to August 31, Operators may implement appropriate hazing or other exclusion measures prior to April 1 to avoid take of migratory birds. If hazing or other exclusion measures are not implemented, Operators will conduct pre-construction nesting migratory bird surveys within the approved disturbance area prior to any vegetation removal during the nesting season. If active nests are located, Operators will provide work zone buffers around active nests.

***POCO will conduct all vegetation removal necessary for Oil and Gas Operations outside of the nesting season for migratory birds (April 1 to August 31). For any vegetation removal that must be scheduled between April 1 to August 31, POCO may implement appropriate hazing or other exclusion measures prior to April 1. If hazing or other exclusion measures are not implemented, POCO will assign a qualified contractor to conduct pre-construction nesting migratory bird surveys within the approved disturbance area prior to any vegetation removal during the nesting season. If active nest(s) are located, POCO will provide work zone buffers around active nests.***

- I. Operators will treat Drilling Pits, Production Pits, and any other Pit associated with Oil and Gas Operations containing water that provides a medium for breeding mosquitoes with Bti (*Bacillus thuringiensis v. israelensis*) or take other effective action to control mosquito larvae that may spread West Nile virus to Wildlife Resources. Such treatment will be conducted in a manner which will not adversely affect aquatic Wildlife Resources.

***The Conner 19-18 will not include Drilling Pits, Production Pits, or other Pits associated with Oil and Gas Operations.***

- J. Operators will employ the following minimum Best Management Practices on new Oil and

Gas Locations with a Working Pad Surface located between 500 feet and 1000 feet hydraulically upgradient from a High Priority Habitat identified in Rule 1202.c.(1). Q–S:

1. Contain Flowback and Stimulation Fluids in Tanks that are placed on a Working Pad Surface in an area with downgradient perimeter berming;
2. Construct lined berms or other lined containment devices pursuant to Rule 603.o around any new crude oil, condensate, and produced water storage tanks that are installed after January 15, 2021
3. Inspect the Oil and Gas Location on a daily basis, unless the approved Form 2A provides for different inspection frequency or alternative method of compliance;
4. Maintain adequate spill response equipment at the Oil and Gas Location during drilling and completion operations; and
5. Not construct or utilize any Pits, except that Operators may continue to utilize existing Pits that were properly permitted, constructed, operated, and maintained in compliance prior to January 15, 2021.

***The Conner 19-18 is not located between 500 feet and 1000 feet hydraulically upgradient from a High Priority Habitat identified in Rule 1202.c.(1). Q-S.***

- K. Operators will bore, rather than trench, Flowline and utility crossings of perennial streams identified as aquatic High Priority Habitat unless the Operator obtains a signed waiver from CPW and the Director or Commission approves a Form 4 or Form 2A documenting the relief. When installing culverts or bridges, such structures will not impact or prevent the passage of fish unless otherwise directed by CPW.

***Flowlines and utilities associated with the Conner 19-18 location will not cross any perennial streams identified as aquatic High Priority Habitat.***

Rules 1202.c and 1202.d describe operating requirements for proposed Oil and Gas Operations that are located within High Priority Habitats. This plan addresses proposed locations that are located outside of High Priority Habitat and, therefore, these rules do not apply to any locations for which this plan is provided.

### **Protective Measures**

Seasonal avoidance of important breeding, nesting, and winter habitats is the primary protection measure to reduce oil and gas development impacts on wildlife populations, productivity, and habitat use. Additional conservation measures will be incorporated through project design and/or as COA(s). POCO will also consult CPW when necessary, regarding protection measures. Lastly, data collected during monitoring efforts will be used to determine the appropriateness and effectiveness of these measures throughout POCO's project area. Protection measures may be reduced or adjusted if one or more of the following occur:

- Waiver: A lease stipulation may be waived if a determination is made by COGCC, in consultation with CPW, that the proposed action will not adversely affect the species in question.

- Exception: An exception to these protection measures may be granted by COGCC, in coordination with CPW, if POCO submits a plan which demonstrates that impacts from the proposed action will not be significant or can be adequately mitigated.
- Modification: Modifications may be made by CPW if it is determined that portions of the area do not include habitat protected by the stipulation.

Guidance for preparing PODs and/or protective measures applied as COAs provide a full range of practicable means to avoid or minimize harm to wildlife species and their habitats. POCO will minimize potential impacts to wildlife by incorporating general applicable Wildlife Protection Plan programmatic guidance into PODs. Not all measures may apply to each site-specific development area and means to reduce harm are not limited to those identified in the Wildlife Protection Plan. This guidance may change over time if new conservation strategies become available for Special Status Species or monitoring indicates the measure is not effective or unnecessary.

The operating requirements are considered features or project design criteria to be used during POD preparation. The design of projects can incorporate conservation needs for wildlife species or measures can be added as COAs. These types of conservation actions offer flexibility for local situations and help minimize or eliminate impacts to the species of interest.

### **Summary**

The Conner 19-18 location is not located within any mapped High Priority Habitats. Therefore, a Wildlife Mitigation Plan is not needed per 1201.b. and this Wildlife Protection Plan fulfills the obligations of Rule 1201.a. No sensitive wildlife resources were identified during the site visit and, therefore, no additional measures are recommended at this time. POCO and all associated contractors agree to adhere to all relevant operating requirements outlined in this Wildlife Protection Plan. In addition to the standard operating requirements, supplementary measures and protocols may be implemented in response to specific needs identified at the Site.

### **Best Management Practices**

Operator will use Best Management Practices (BMPs) to protect wildlife in the operations area. BMPs are but not limited to:

- The operator agrees to establish company guidelines to minimize wildlife mortality from vehicle collisions on road. Slow speed and increased awareness among employees and contractors should lessen impacts to wildlife.
- All open-vent exhaust stacks on production equipment shall be designed to prevent entry by birds and bats and to discourage nesting or perching. All tanks and above ground facilities shall be equipped with structures or devices that discourage nesting of raptors and corvids.
- The operator agrees to preclude the use of aggressive non-native grasses in habitat reclamation.
- Use remote monitoring of well production to the extent practicable

**References and Sources**

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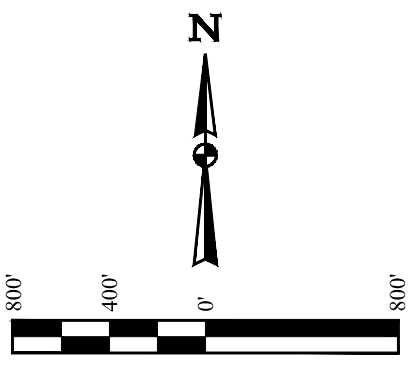
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**LEGEND**

- - - - - = OIL & GAS LOCATION
- = WORKING PAD SURFACE



5280' Offset  
from Working  
Pad Surface

**NOTES:**  
• There are no High Priority Habitats within 1 mile of the proposed working pad surface.

**POCO OPERATING**

CONNER 19-18 PAD  
SE 1/4 SW 1/4, SECTION 19, T1S, R65W, 6th P.M.  
ADAMS COUNTY, COLORADO

SURVEYED BY	GREG WEIMER, O.R.	06-15-22	SCALE
DRAWN BY	E.C.	08-03-22	1" = 800'

**WILDLIFE HABITAT DRAWING**



# CUMULATIVE IMPACTS PLAN



## POCO Operating

**Conner 19-18 Pad**

Sec. 19 T1S R65W (SESW)

Adams County, Colorado

Surface: Fee

Submitted as an accompaniment to the Form 2A Application  
and consistent with the requirements of Rule 427.a.

December 6, 2022

December 14, 2023



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## 1.0 INTRODUCTION

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This Cumulative Impacts Plan has been prepared pursuant to Rule 304.c.(19) of the Colorado Oil and Gas Commission and addresses the following resources:

- Air Resources
- Public Health
- Water Resources
- Terrestrial and Aquatic Wildlife Resources and Ecosystems
- Soil Resources
- Public Welfare

This plan documents how the Operator (POCO) will address cumulative impacts to resources identified pursuant to Rule 303.a.(5) that includes:

- A. A description of all resources for which cumulative adverse impacts are expected (Section 4.0);
- B. A description of specific measures taken to avoid or minimize the extent to which cumulative adverse impacts are increased (Section 5.0);
- C. A description of all measures taken to mitigate or offset cumulative adverse impacts to any of the resources (Section 6.0); and
- D. Additional information determined to be reasonable and necessary to the evaluation of cumulative impacts by the Operator, the Director, CDPHE, CPW, or the Relevant Local Government (Sections 1.0, 2.0, and 3.0).

The Cumulative Impacts Plan for the Providence Energy Operating LLC's ("POCO") Conner 19-18 Pad location was prepared based on the information in the Oil and Gas Location Assessment (Form 2A) and Cumulative Impacts Data Identification (Form 2B).

## 2.0 PROJECT DESCRIPTION

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The POCO Conner 19-18 Pad includes the drilling, completion, and production of up to 16 wells. The legal description for this Location is SESW of Section 19, Township 1 South, Range 65 West, 6th P.M., in Adams County, Colorado.

### 2.1 SURFACE DISTURBANCE

Construction of the proposed location is estimated to have a total disturbance of 8.052 acres. After completion of approximately 2.395 acres of interim reclamation, long-term disturbance would be reduced to an estimated 5.657 acres. Access road will be 2,002' and approximately 2.3 acres and 1.2 acres after final reclamation. Residual disturbance includes acreage that would remain unvegetated for the life of the project, which is estimated to be 35 years. Within six months of operations, site reclamation would be initiated for portions of the well pad not required for the continued operation of the well, weather permitting.

**Table 2-1 Estimated Surface Disturbance**

Project Feature	Length (miles)	Short-term Disturbance (acres)	Long-term Disturbance (acres)
Well Pad	NA	8.052	5.657
Access Road	0.38	2.30	1.2
<b>Location Total</b>	<b>0.38</b>	<b>10.352</b>	<b>6.857</b>

**3.0 CUMULATIVE IMPACT METHODOLOGY**

Cumulative impacts may result when impacts associated with project implementation are added to other similar impacts associated with past, present and reasonably foreseeable future actions. The Conner 19-18 location is sited in an agricultural area of Adams County, Colorado. Publicly available data sources including county, state, federal, and public domains, were used to characterize the past, present, and reasonably foreseeable development in the vicinity of the proposed project. Based on COGCC data, there are 4 oil and gas locations (16 wells) that are active and built within one mile.

Each resource addressed in this cumulative impacts analysis is assigned a spatial and temporal scale that establishes the extent of the analysis. The spatial component of this analysis is referred to as the “Cumulative Impact Analysis Area (CIAA). The CIAA varies by resource and can be relatively smaller for some resources, as for vegetation, or much larger as in the case for air quality. **Table 3-1** presents the geographic extent for each resource CIAA. The temporal boundary for most resources is the 35-year life of the project. For wildlife and vegetation that temporal boundary includes an additional 5 years toward achievement of agency-approved reclamation standards.

**Table 3-1 Geographic Scope for Cumulative Impact Analysis**

Resource	Cumulative Impact Analysis Area (CIAA)
Air Quality	1-mile radius
Public Health	1-mile radius
Water	½-mile radius
Terrestrial and Aquatic Wildlife Resources and Ecosystems	1-mile radius
Soils	Full extent of disturbance
Vegetation	1-mile radius
Public Welfare	1-mile radius



#### 4.0 SUMMARY OF RESOURCE IMPACTS

##### 4.1 AIR

##### 4.1.1 Resource Description

There are a variety of air emission sources at the Conner 19-18 location and within the CIAA including: agricultural fields, vehicle traffic, and oil and gas production sites. Implementation of the Conner 19-18 project would have a cumulative impact on air quality within the 1-mile CIAA. Demonstrated by the Emissions Inventory in Form 2B, the cumulative effects of the proposed project on air emissions in the CIAA would be minor.

##### 4.1.2 Direct and Indirect Impacts

CDPHE's February 21, 2017, report titled "Assessment of Potential Public Health Effects from Oil and Gas operations in Colorado" evaluated over 10,000 air samples in regions of Colorado where people are living near oil and natural gas development. It concluded that all measured air concentrations were below short- and long-term safe levels. In addition, the CTEH, LLC July 28, 2020 report titled "Compilation of Benzene Measurements Near Wellpads in Colorado: A Comparison to Heath Guideline Exposure Values" compiled over 6,500 air samples of benzene during various operational phases. Their findings showed 99.9% of measured values were below the acute value for benzene of 9 ppb. Based on these reports and findings, it is not anticipated that the proposed operations will present any potential acute or chronic, short- or long-term incremental impacts to public health.

Construction, drilling and completions operations will result in an increase in emissions for the surrounding area from both stationary and mobile sources. Emissions from truck traffic to and from the location will be increased during construction, drilling and completions.

##### Pre-Production Estimated Emissions

NOx	CO	VOCs	Methane	Ethane	CO2	N2O
151.31	17.95	21.94	0.51	0.53	9301.64	0

##### Post-Production Estimated Emissions

NOx	CO	VOCs	Methane	Ethane	CO2	N2O
4.13	16.96	27.445	8.97	17.35	1470	0.03

### **4.1.3 Cumulative Impacts**

Impacts to air resources would be minimized and mitigated by the measures described in Sections 5 and 6 of this Plan. Emissions would be permitted and regulated by the Colorado Department of Public Health and Environment, Air Pollution Control Division, and would be subject to appropriate controls to reduce emissions to minimal levels. Based on the level of emissions expected to be released as the result of implementation of this proposed project, the contribution to past, present, and reasonably foreseeable projects represents a minor cumulative increase to emissions in the air resources in the CIAA.

## **4.2 PUBLIC HEALTH**

As described in the Form 2B, The Public Health section refers to emissions of different pollutants that may be emitted from equipment and activities during drilling and/or completions operations on the Oil and Gas Location. The discussion of these emissions is addressed in the Air Resources section, above.

## **4.3 WATER RESOURCES**

### **4.3.1 Resource Description**

There are no water bodies (i.e., ponds, stream, rivers) in areas proposed for disturbance. Proposed facilities, of the location are in an area that is typically active agriculture crop production. There are no drainages included within areas proposed for disturbance. Within one mile of the working pad surface: Lutz Reservoir, Higgins Lake, Mayers Reservoir and three (3) un-named freshwater ponds. There are several additional un-named freshwater ponds according to topographical maps but are not present. Barr Lake and Brighton Lateral Ditch are greater than 1 mile from the working pad surface. They will not be impacted by this development. There is a mapped riverine, however it is a dry drainage.

### **4.3.2 Direct and Indirect Impacts**

Construction and operation of the proposed project could potentially impact water resources that exist within ½-mile of the proposed facilities based on the potential for increases in localized erosion and sedimentation rates. Implementation of the proposed Project could temporarily increase soil compaction on nearby existing roads, and on the proposed new portion of access road and well pad. As a result of the localized increases in soil compaction, there is the likelihood that surface runoff would be increased and would be higher than in undisturbed areas near the proposed project. Based on the lack of substantial pathways (surface drainages) near the proposed project and with the successful implementation of project-related soil erosion control measures, there is low likelihood of substantial sedimentation of intermittent drainages in the area.

### **4.3.3 Cumulative Impacts**

Construction and production activities at the proposed Conner 19-18 site combined with other past, present, and reasonably foreseeable activities in the area could increase the possibility for accidental releases of industrial products, including fuels, lubricants, and other petroleum products. Such accidental releases could impact local groundwater resources, if releases are of sufficient magnitude. The proposed Conner 19-18 location will store approximately 1600 barrels (bbls) of oil in 4 tanks; and 1600 bbls of produced water in 4 tanks;. Successful implementation of project-related best practices and mitigation measures will result in negligible cumulative impacts to local water resources.

Water would be obtained from existing, permitted sources of surface water including Barr Lake and Fulton Ditch, including an estimated 4,733,333 bbls of surface water.

#### **4.4 TERRESTRIAL ECOSYSTEM AND WILDLIFE RESOURCES**

##### **4.4.1 Resource Description**

The habitats within the proposed Conner 19-18 project area are characterized as disturbed. All of the proposed disturbance area is occupied by crop land. No trees, natural habitats, or other wildlife resources are known to exist in the area proposed for disturbance. There no High Priority Habitats within 1 mile of the project area.

##### **4.4.2 Direct and Indirect Impacts**

Based on the evaluation the proposed project, implementation of the proposed project would not have any direct impacts on special status species or their habitats because the proposed actions would occur in areas that were previously disturbed during the construction of the original pad. There is suitable raptor nesting habitat to the west of the proposed project.

Implementation of the proposed project could result in direct and indirect impacts to wildlife. There are no native plant habitats in areas proposed for disturbance; as such there would no direct impacts to native or special status plant species. Direct impacts are those that result in mortality, injury, and behavioral changes (for example: displacement) to wildlife. Direct impacts to wildlife typically occur during construction when wildlife is unable to avoid operating construction equipment and other project-related vehicles. Because the areas proposed for disturbance are not expected to offer high quality habitats for wildlife species, direct impacts would likely be negligible. Indirect impacts to wildlife typically include habitat loss, changes in local habitats based on the introduction of noxious weeds, and project-related increases in predator densities or concentrations. Indirect impacts to wildlife species are expected to be minimal, as no undisturbed wildlife habitats would be impacted through implementation of the proposed project.

##### **4.4.3 Cumulative Impacts**

Implementation of the proposed Conner 19-18 project would have a minor cumulative impact on locally occurring wildlife and wildlife habitats, as the project is proposed for an area typically used to grow commercial crops. No undisturbed, native habitats would be removed or altered during implementation of the proposed project. Implementation of the proposed project would not result in cumulative impacts on High Priority Habitats (HPH) because none exist in areas proposed for disturbance

#### **4.5 SOIL RESOURCES**

##### **4.5.1 Resource Description**

The proposed Conner 19-18 project area (including access road) includes Ascalon sandy loam (6.466 acres) and Truckton loamy sand (1.403 acres)

##### **4.5.2 Direct and Indirect Impacts**

Implementation of the proposed project, including surface disturbing activities, could result in soil compaction, and increased erosion and sedimentation. Compaction of soils can lead to decreases in water and air absorption. Severe compaction can also lead to a conversion from aerobic to anaerobic soil conditions, thereby altering organisms in the soil and subsequently causing changes in soil nutrient cycling.

### 4.5.3 Cumulative Impacts

Implementation of the proposed project will have a negligible cumulative impact on soil resources in the area. Past, present, and reasonably foreseeable projects and activities in the area have likely resulted in similar impacts to soil resources.

## 4.6 PUBLIC WELFARE

### 4.6.1 Noise

#### *Resource Description*

The proposed project is located in Adams County where agricultural operations and residential and commercial development has taken place. There are no RBUs within 2,000'. There are no high occupancy building units (HOBUs, not including school and daycares) within 5,280 feet of the proposed working pad. There are no schools or day care centers within 1 mile of the Location.

#### *Direct and Indirect Impacts*

The *unmitigated noise impact models* for drilling and fracking show an estimated sound level of 48-55.0 dBA for drilling and 52-59 dBA for fracking operations at the receiver. With the proposed mitigation measures of *16' tall sound walls*, *mitigated noise impact models* show a estimated sound levels to be between 40-46 dBA for drilling and 43-48 dBA for fracking operations. The noise barrier would decrease the overall noise level of the drilling operations by 8-10 dBA and 8-10 dBA for fracking operations at the receiver.

Receptors to increased noise levels due to operations related to construction of the Location, drilling, completions and flowback are the nearby RBUs. The typical primary noise sources generated by oil and gas drilling operations include the drilling rig engines, compressors, generators, mud pumps, shakers, and ancillary support equipment.

The maximum noise levels generated during oil and gas completions operations are produced from the truck mounted engines which drive the high-pressure pumps. Support equipment such as sand trucks, water pumps and generators have a small contribution to the over-all noise levels of the operations. Off-site fracturing noise levels typically do not vary greatly from operator to operator, but the off-site transmission of the noise can be affected by the surrounding topography of the fracture site.

#### *Cumulative Impacts*

With the use of 16' temporary sound walls during drilling, completions and flowback operations, short term noise impacts will not have cumulative impacts to the surrounding receptors. Noise levels will decrease significantly once all wells have been completed and are in production.

### 4.6.2 Odor

#### *Resource Description*

There will be a temporary increase in odors during pre-production operations from equipment and traffic exhaust and fluid management during drilling and completions operations.

#### *Direct and Indirect Impacts*

Implementation of the proposed project has the possibility of creating short-term and temporary changes to odors in the vicinity of the project. Such impacts would primarily occur during drilling and be associated with using oil-based mud and drill cuttings temporarily stored on the site.

#### ***Cumulative Impacts***

Implementation of the proposed project would result in short-term and temporary odor impacts within the ½ mile CIAA. These impacts would not be uncommon to other similar oil and gas projects in the region and would likely be familiar to most people that live or work in the area.

#### **4.6.3 Light**

##### ***Resource Description***

Proposed lighting to facilitate low-light working conditions will be exterior flood and spot type lighting. During drilling and completions operations, the proposed lighting will be temporary and be provided by portable light towers and lights permanently affixed to equipment (e.g., the drilling rig). The development of the project will require most of the work operations to be performed continuously (7-days a week & 24-hour a day). Proposed lighting will change for each work operation of each phase of the project. Lighting Best Management Practices (see Section V, below) will be used to minimize light pollution during all work operations of the proposed project. All lighting shall conform to Federal, State, and Industry recognized standards for both on-site workplace safety and off-site public and wildlife protection. Care will be taken to keep lighting levels at the specified levels on the lighting plans while providing safe, well-lit working areas. Care will also be taken to prevent unintended light from leaving the site and becoming a hazard or nuisance to the public or surrounding wildlife habitat.

##### ***Direct and Indirect Impacts***

The greatest potential for light impacts would occur during the drilling and completions phases of the proposed project. A sound wall would be constructed around the working pad surface and would serve to shield vehicle drivers on E. 136<sup>th</sup> Avenue from light sources during the drilling and completion phases of the project. Receptors to the north, east, and west of the project would be exposed to project-related light sources during the drilling and completions phases.

##### ***Cumulative Impacts***

There would not be any long-term permanent light-related cumulative impacts associated with implementation of the proposed project. It is expected that the permanent lighting utilized during Production Operations will not exceed the maximum permissible light levels.

## **5.0 MINIMIZATION MEASURES**

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In § 34-60-106 (2.5), C.R.S., the COGCC defines “minimizing adverse impacts” as

“providing necessary and reasonable protections to reduce the extent, severity, significance, or duration of an unavoidable direct, indirect, and cumulative adverse impacts to public health, safety, welfare, the environment, or wildlife resources from oil and gas operations.”

Minimization measures reduce impacts to the greatest degree that is practical and can include operational and mechanical controls. POCO has committed to the minimization measures listed in the following sections. These are the same minimization measures presented in the Operations Plan that was submitted as an attachment to the Project’s Form 2A.

### **5.1 AIR QUALITY**

- Measures associated with fugitive dust include:
- POCO will gravel all working surfaces and perform interim reclamation within six months of well drilling and completion.
- Utilize existing vegetation, trees slash or brush piles to cover disturbed areas not used for vehicle traffic.
- Application of fresh water to disturbed areas during construction and dry season.
- Operations will be confined to the location working surface.
- Continuous monitoring of disturbed areas to evaluate additional BMPs needed.
- Fresh water or magnesium chloride application to graveled surfaced of the Location and associated roads.
- Speed limit signs will be posted per surface owner agreement.
- Contractors will be notified of speed limits if no signs are posted.
- Regular road maintenance such as grading and adding additional gravel as needed.
- Remote technologies (for example, supervisory control and data acquisition (SCADA) will be used to monitor well operations. This will reduce emissions from vehicle traffic by reducing the number of vehicle trips to the site.
- Produced water storage tank emissions will be captured and routed to an emission control device that has at least 95 percent design destruction efficiency.
- Instrument air will be used to operate all pneumatic control valves on location.
- Tanks and vapor control systems will be designed and constructed in accordance with Air Quality Control Commission Regulation Number 7.
- A Leak Detection and Repair Program will be implemented. This will include monthly inspections using infrared cameras.
- There will be no emission-producing reserve pits.

### **5.2 PUBLIC HEALTH**

- Remote technologies (for example, supervisory control and data acquisition (SCADA) will be used to monitor well operations. This will reduce emissions from vehicle traffic by reducing the number of vehicle trips to the site.

### **5.3 WATER RESOURCES**

- A Stormwater Management Plan was prepared. This plan will guide site-specific efforts to protect Waters of the State that could receive stormwater runoff from the proposed location.
- There will be no staging, refueling, or chemical storage areas in the vicinity of onsite water resources.
- Potential pollutants located onsite will be sealed, wrapped, or covered when not in use so as to eliminate or minimize contact with stormwater runoff.
- Proper storage, safe-handling, good housekeeping and spill prevention practices will be used to prevent pollutants from leaving the site.
- During construction, disturbed slopes may be covered with coconut blankets, straw mulch, or straw wattles and maintained for the life of the project or until slopes are stabilized and revegetated.
- With appropriate landowner authorization, baseline water quality samples will be collected from agency-approved water wells in the vicinity of the proposed oil and gas location.



- Proposed wells will be equipped with technology that will allow for automatic well shut-in in the event of an unplanned release.

#### **5.4 TERRESTRIAL ECOSYSTEMS AND WILDLIFE RESOURCES**

- Proposed production facilities will be consolidated and centralized as much as possible in an effort to minimize impact to wildlife habitats.
- Fugitive dust control measures will be implemented.
- Screens and other nesting barriers will be installed on stacks, heater treater openings, and fired vessels to prevent nesting by migratory bird species.

#### **5.5 SOIL RESOURCES**

- Topsoil and Stormwater Management Plans were prepared for the proposed site and will include measures that will avoid and minimize impacts to soil resources. Some of these measures include the following:
  - Topsoil will be stripped from the disturbance area and will be stored onsite for future use.
  - Topsoil stockpiles will be protected from wind and water erosion.
  - Weed management practices will be used to prevent weed establishment on the topsoil stockpile.
  - Installation of coconut blankets, straw mulch, or straw wattles, sediment basins, swales, and perimeter ditches will be used to minimize erosion from disturbed areas.
  - Biweekly inspections by a third-party contractor of BMP integrity and effectiveness will be implemented. Deficiencies will be noted and submitted to the operator and addressed in a timely manner.
  - Construction activities will be curtailed during wet periods in an effort to avoid unnecessary soil disturbance.
  - All roads will be recontoured and revegetated to a stable condition, unless the landowner directs differently.
- Cut and fill areas will be regraded to match pre-project contours, to the extent possible.
- The topsoil stockpile will be graded to ensure all surface stability.
- Soils in areas associated with production operations or for subsequent drilling operations will be stabilized toward minimization of dust and erosion in these areas.
- A Spill Prevention, Control, and Countermeasure Plan was prepared and implemented toward protecting soils from spills and releases.

#### **5.6 PUBLIC WELFARE – NOISE, ODOR, AND LIGHT**

##### ***Public Welfare***

- Equipment, including welding trucks, will be equipped with fire extinguishers and spark arresters.
- Where public exposure to pipeline corridors is possible, warning signs will be installed to inform the public of the presence of the pipeline.
- Vehicle operators will be instructed to travel at low speeds and to stay on existing public roadways, project-related travel routes, and the well pad at all times.
- Vehicle trips to the location will be reduced through the use of technologies that allow for remote monitoring of the wells (for example, SCADA). Vehicle trips to the location will also be reduced via piping rather than trucking oil from location.

### **Noise**

- A 32' engineered sound wall will be erected around the Location.

### **Odor**

- Drilling rig engine exhausts are pointed straight up so as not to be directed towards any occupied buildings.
- To mitigate the effects of odor from POCO's operations, POCO employs only International Association of Oil & Gas Producers (IOGP) Group III drilling base fluids with <0.5 weight % aromatics and will not use drilling fluids based on diesel. These Group III drilling fluids are odorless and contain no BTEX.
- Drilling mud chillers are used to keep drilling fluid temperatures low.
- Low drilling fluid temperatures reduce the volume of fluid vaporized into the air.
- All drilling fluids will be routed through a closed loop system.
- No open earthen pits to store fluids or drill cuttings.
- Drill piping is wiped down each time the drilling operation "trips" out of the hole.
- Drill cuttings are placed in metal bins and covered to minimize odors prior to being transported to the designated waste management facilities.

### **Light**

- A 32' engineered sound wall will be erected around the location, which will also reduce light trespass toward passing traffic on E. 136th Ave, Gun Club Road and Harvest Rd.
- If light fixtures are attached to sound walls, they will be placed beneath the top of the wall and angled downward.
- LED fixtures will be used, when feasible, toward reducing skyglow.
- Lighting on the well pad will be of sufficient intensity to allow for safe pre-production activities.
- Direct lights to drilling and completion tasks only.

## **6.0 MITIGATION MEASURES**

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COGCC defines "mitigating adverse impacts" as:

"measures that compensate for unavoidable direct, indirect, and cumulative adverse impacts and loss of such resources from oil and operations".

Mitigation measures are used to offset the intensity or severity of impacts and can include compensatory actions and administrative controls. The following mitigation measures for resources based on the cumulative impact analysis described in this Plan will be implemented.

### **6.1 AIR QUALITY**

Minimization measures described in the previous section will address potential impacts associated air resources in the CIAA. No additional mitigation measures for air quality are included.

### **6.2 PUBLIC HEALTH**

HAP emissions are not expected to contribute to acute or chronic risks to human health within or beyond the well pad location. No additional mitigation measures are required.

### **6.3 WATER RESOURCES**

Minimization measures included in the site-specific SWMP combined with other measures listed in the previous section will address the potential for impacts to water resources in the CIAA. No other mitigation measures are required.

### **6.4 TERRESTRIAL ECOSYSTEMS AND WILDLIFE RESOURCES**

- As part of final reclamation, all roads and pads will be recontoured and revegetated to a condition similar to pre-project conditions.

### **6.5 SOIL RESOURCES**

### **6.6 MINIMIZATION MEASURES DESCRIBED IN THE PREVIOUS SECTION WILL ADDRESS POTENTIAL FOR IMPACTS TO SOIL RESOURCES IN THE CIAA. NO OTHER MITIGATION MEASURES ARE REQUIRED. PUBLIC HEALTH – NOISE, ODOR, AND LIGHT**

#### ***Noise***

- Minimization measures described in the previous section will address potential impacts associated with noise in the CIAA. No additional measures for noise are included.

#### ***Odor***

- Minimization measures described in the previous section will address potential impacts associated with odors in the CIAA. No additional mitigation measures for odors are included.

#### ***Light***

- Minimization measures described in the previous section will address potential impacts associated with project lighting in the CIAA.

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# DUST MITIGATION PLAN



## POCO Operating

**Conner 19-18 Pad**

Sec. 19 T1S R65W (SESW)

Adams County, Colorado

Surface: Fee

Submitted as an accompaniment to the Form 2A Application  
and consistent with the requirements of Rule 427.a. and the Adams County Oil and Gas Facility  
Permit.

June 6, 2024

# Providence Energy Operating LLC Adams County, Colorado

## Dust Mitigation Plan

### **Project Summary:**

Providence Energy Operating LLC's ("POCO's") proposed Conner 19-18 Pad "Location" is in Township 1 South, Range 65 West, Section 19 in Adams County, Colorado. The proposed Location is fee surface with a total pad disturbance of 8.052 acres, which includes the active working pad surface of 5.374 acres. During the interim reclamation and production phase 2.395 acres will be reclaimed, leaving a disturbed production area of 5.657.

### **Project Overview:**

POCO's Dust Mitigation Plan is intended to facilitate compliance with the applicable regulations of the Colorado Energy and Carbon Management Commission, the Colorado Department of Public Health and Environment, and Adams County.

POCO's development of the Conner 19-18 Pad ("Location") requires earth disturbing activities and travel on unpaved roads which has the potential to produce fugitive dust emissions.

Dust associated with the Location activities and traffic on roads will be minimized throughout all phases such that there are minimal visible dust emissions from the Location or associated roads to the maximum extent practicable given wind and other weather conditions.

When handling sand used in hydraulic fracturing operations, POCO's vendors will use an advanced Containerized Sand System for proppant delivery, storage on location, and delivery to the blender and frac fluid system. The containers use gravity (not pneumatics) to drop sand directly into the blender's sand hopper, basically eliminating dust generation. This system also removes people and equipment from the proppant handling operations during fracturing treatments, considerably reducing exposures and Environmental Health and Safety risks to individuals from dust generated by older sand handling equipment (like conveyor belts). Remote controls are used to efficiently open and close sand gates on the bins to further reduce silica dust creation. Zero pounds of silica dust are anticipated to migrate off the Conner 19-18 Pad location during completions operations.

Any chemical application will have Safety Data Sheets on location.

### **Compliance with Rule 427.a.**

#### 1. Location soil types:

AsB – Ascalon Sandy Loam, 0 to 3 percent slopes

TtB - Truckton loamy sand, 0 to 3 percent slopes

Access Road soil types:

AsB – Ascalon Sandy Loam, 0 to 3 percent slopes

TtB - Truckton loamy sand, 0 to 3 percent slopes

2. Proposed vehicle speed limit: 20 MPH or less on roads; 5 MPH or less on the Location.
3. Total disturbed area: 8.052 acres for the location, and production facilities.
4. The primary route to and from this location is via 128<sup>th</sup> Avenue and Gun Club Road, both of which are paved, which will inherently minimize dust. Approximately, 2,002' of new access road will need to be upgraded and/or constructed for the remainder of the access route. The upgraded/new access road is 1.379 acres. POCO will employ onsite dust mitigation measures in the construction of the location using a layer of crushed asphalt, observing speed restrictions, and using silica dust controls when handling sand used in hydraulic fracturing operations. Road surfacing material consist of limestone, scoria or river rock or as agreed upon by the private surface owner and Adams County.
5. Number of truck trips during the Construction, Drilling, Completion and Production stages:

<b>Development State</b>	<b>Time Frame</b>	<b>Traffic Per Stage Monthly</b>
Surface Construction	2 weeks	750
Drilling	18 weeks	2500
Completion	19 weeks	15,600
Production	360 weeks	2000 (drops significantly after 1 year)

6. Plan for Suppressing Fugitive Dust Caused by Wind:
  - POCO uses Project Canary Unit with Anemometer, which will measure wind speed. The predominate wind pattern has determined that the wind comes from the SSW and S. The Anemometer will be placed on the western side of the location.
  - If wind conditions are such that work cannot be completed without creating fugitive dust, action will be immediately taken to apply water to all dust-creating surfaces.
  - Regular road maintenance will be implemented to mitigate fugitive dust.
  - Avoid unnecessary, dust-generating work on high wind days.
  - Utilize gravel and/or crushed asphalt in high wind areas on specific portions of roads and location.
7. Best Management Practices:
  - POCO will gravel all working surfaces and perform interim reclamation within six months of well drilling and completion.
  - Utilize existing vegetation, trees slash, or brush piles to cover disturbed areas not used for vehicle traffic.
  - Application of fresh water to disturbed areas during construction and dry season.



- Operations will be confined to the location working surface.
- Continuous monitoring of disturbed areas to evaluate additional BMPs needed.
- Fresh water or magnesium chloride application to graveled surfaced of the Location and associated roads.
- Speed limit signs will be posted per surface owner agreement.
- Contractors will be notified of speed limits if no signs are posted.
- Regular road maintenance such as grading and adding additional gravel as needed.

# POCO Operating

Unit Placement Analysis | May 2024

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Conner19-18 Pad





# Canary Unit Placement Factors

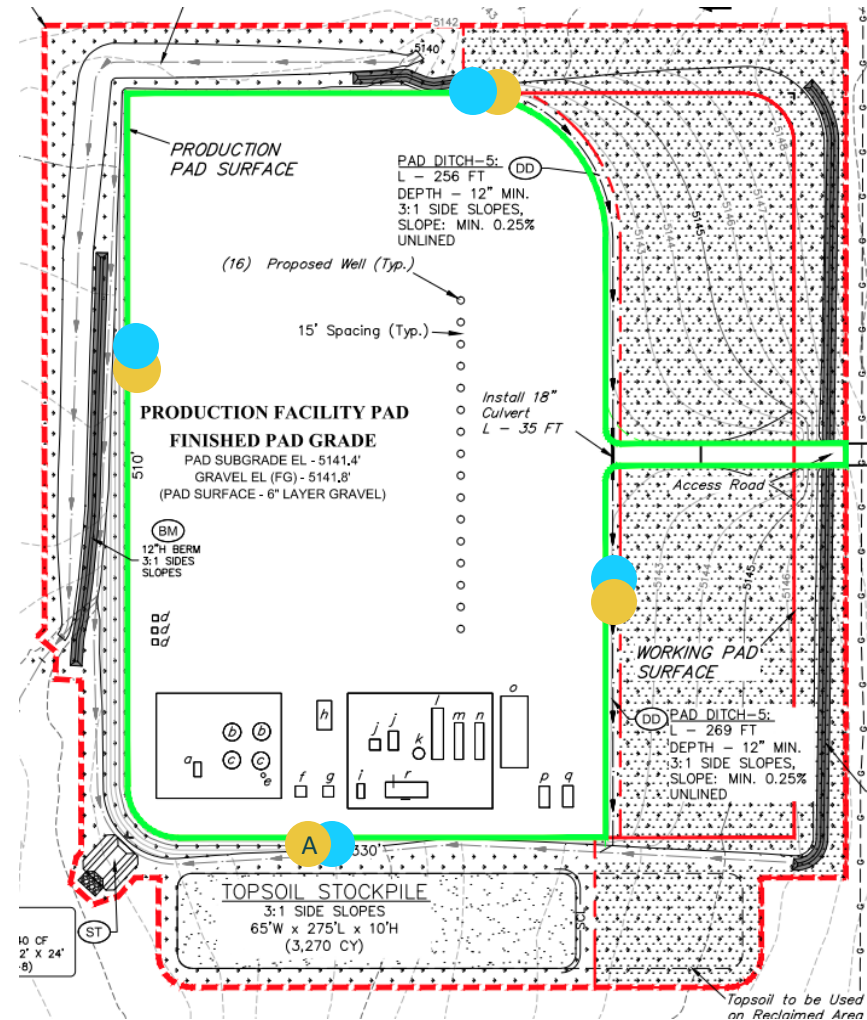
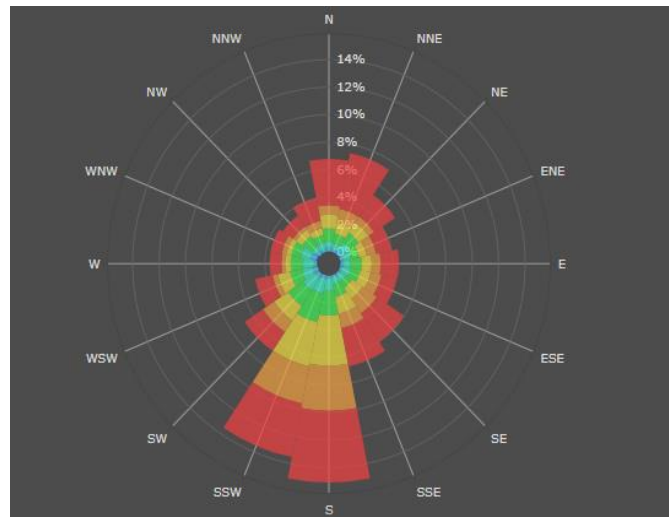
## CanaryX and S Units

1. Predominant wind direction(s)
2. Placement of at least 50' from any source of ignition around the perimeter of the pad
3. Units should be roughly 300' apart on larger pads
4. Place units minimum 10' above grade
5. Avoid shading to keep solar panels active
6. Avoid vehicle traffic and/or roads where units may be damaged
7. Ensure units are placed on company lease and avoid lease roads
8. Avoid placing units next to sound walls
9. Avoid placing units near sub-surface electrical infrastructure (call 811 before you dig)
10. Unit with anemometer should be placed in open area to gather best wind data (e.g. avoid congested area in equipment or topography)

# Conner 19-18 Pad

- 4 Canary S and X units co-located (8 Total)
- 4 Summa Canisters on Canary S units
- Locations approximate (pad edge, at least 50' from any ignition sources)
- Predominant wind direction in all speeds is from the SSW and S.

Wind Data from Nearby Canary Pad  
[May 2023 – May 2024]



- New Canary S Unit Placement (w/ Summa Canisters)
- New Canary X Unit Placement
- A Canary Unit w/ Anemometer



**From:** [Meghan.Grimes](#)  
**To:** [Andrea.Gross](#)  
**Subject:** RE: [EXTERNAL] Signatures Please  
**Date:** Friday, June 14, 2024 3:05:32 PM  
**Attachments:** [Conner OGF Application signed 2024.06.14.pdf](#)  
[Development-Engineering-Review Application signed 2024.06.14.pdf](#)



The FAA is currently experiencing delays in processing off-airport aeronautical studies. These delays are currently resulting in an approximate 15 additional days in processing time. The FAA will continue to work aeronautical studies on a first come, first served basis. Please take this possible delay into consideration when determining when to submit your case. If your submitted aeronautical study requires priority and 60 days has elapsed since submission, please contact the OEG Specialist for your state with the rationale for your request and it will be reviewed for escalation. The issue causing these delays is actively being mitigated and is expected to be resolved around August.

Obstruction Evaluation  
Version: 2023-SEP-18

**Project Submission Success**  
**Project Name:** POCO -000865760-24

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View Interim Cases  
View Proposed Cases  
View Supplemental Notices (Form 7450-2)  
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Circle Search for Airports  
General FAQs

Project POCO -000865760-24 has been submitted successfully to the FAA.

Your filing is assigned Aeronautical Study Number (ASN):  
**2024-ANM-3534-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](mailto: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 is in the text of the message.

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Meghan A. Grimes  
VP of Regulatory Affairs

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**From:** Andrea Gross <[agross@upstreampm.com](mailto:agross@upstreampm.com)>  
**Sent:** Friday, June 14, 2024 8:15 AM  
**To:** Meghan Grimes <[MGrimes@providence-energy.com](mailto:MGrimes@providence-energy.com)>  
**Subject:** [EXTERNAL] Signatures Please

Thanks!

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Adams County Oil and Gas Facility  
Permit

**Neighborhood Meeting Summary**





POCO Operating held a neighborhood meeting on October 26, 2022 as part of the Adams County permitting process. All parcel owners within 1 mile of the property line on which the proposed location will be permitted on, were invited to the informational neighborhood meeting. The meeting was held as an open house, with posters set up according to phases of operations. POCO Representatives, in charge or regulatory, land and operations were present to speak to each phase of operations and answer any questions. Three (3) people from 2 separate households attended the meeting as well as Greg Dean, Adams County Local Government Designee.

The majority of the comments received were regarding noise, royalty payments and anticipated road improvements. The conversations were very productive and informative.

Contact information was available to all attendees in order to continue communication with the operator.

# POCO OPERATING CONNER 19-18 PAD PROJECT

## LIGHT MITIGATION PLAN

SECTION 19, TOWNSHIP 1 SOUTH, RANGE 65 WEST, 6TH P.M.  
ADAMS COUNTY, COLORADO

Prepared For:

**POCO Operating**

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Prepared By:

**Uintah Engineering & Land Surveying, LLC**

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11-16-22



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## I. INTRODUCTION

This light mitigation plan is being prepared for the POCO Operating's Conner 19-18 Pad project. The project consists of the development of infrastructure to support the drilling and production of 16 oil and gas wells located in Adams County.

The purpose of this report is to demonstrate compliance with the various State and Local lighting regulations. This report will predict the light impacts that will occur during the different development phases (Pre-Production and Production) of the project and detail the various lighting mitigation standards and practices that will be used to limit light pollution and conform to the required lighting regulations. The intent of the project's lighting plan is to provide a safely lit workplace environment that protects the surrounding public and wildlife environment.

## II. GENERAL LOCATION AND DESCRIPTION

### A. LOCATION AND EXISTING CONDITIONS

The Conner 19-18 Pad is located on a 39-acre parcel of land owned by DS LLC in the SE1/4 SW1/4 of Section 19, Township 1 South, Range 65 West, 6th P.M. The site is located approximately 0.6 mile west of the intersection of E. 136<sup>th</sup> Ave. and Harvest Rd. The parcel is zoned agricultural-A, and the existing land-use is rangeland.

### B. PROPOSED DEVELOPMENT

The proposed development will include construction of infrastructure to support oil & gas gathering from the proposed well pad. The Pre-Production Phase will be the initial phase of the project beginning with the pad construction and will remain until all the wells have been drilled and hydraulically stimulated. The proposed Pre-Production Phase working pad surface (WPS) will be 5.4-acres (234,074 SF). The Production Phase will be the project's final phase and will include drill-out, flowback, and production activities. Due to the continuous nature of oil and gas operations, many of the pre-production activities mentioned above must be performed during night-time hours.

### C. PROPOSED LIGHTING

Proposed lighting to facilitate low-light working conditions will be exterior flood and spot type lighting. During drilling and completions operations, the proposed lighting will be temporary and be provided by portable light towers and lights permanently affixed to equipment (e.g., the drilling rig). The development of the project will require most of the work operations to be performed continuously (7-days a week & 24-hour a day). Proposed lighting will change for each work operation of each phase of the project. The light fixture schedules for the proposed lighting are included below in each work operation section.

Lighting Best Management Practices (see Section V, below) will be used to minimize light pollution during all work operations of the proposed project. All lighting shall conform to Federal, State, and Industry recognized standards for both on-site workplace safety and off-site public and wildlife protection (OSHA, FAA, COGCC, IESNA, and ANSI). Care will be taken to keep lighting levels at the specified levels on the lighting plans while providing safe, well-lit working areas. Care will also be taken to prevent unintended light from leaving the site and becoming a hazard or nuisance to the public or surrounding wildlife habitat.

### III. PRE-PRODUCTION PHASE FACILITY LIGHTING PLAN

The Pre-Production Phase will consist of the following work operations: Pad Construction Operations, Drilling Operations, and Hydraulic Stimulation Operations. The state and local governing lighting regulations for this section will be the COGCC's Rule 424, specifically 424.a.(2).A, which also includes Rule 424.c. Lighting photometric plans for all operations of the Pre-Production Phase should address adequate lighting to ensure on- and off-site safety during work operations while assessing the lighting impacts to the health, safety, and welfare of persons occupying building units within 2,000-feet, motorists on roads within 2,000-feet, and wildlife in high priority habitats within 2,000-feet. During this phase of the project, wall panels (e.g., visual/sound walls) will be placed along the perimeter of the WPS.

#### A. PAD CONSTRUCTION OPERATIONS

Pad Construction Operations typically consist of structure demolition, equipment haul-off, and grading of the proposed well pad to facilitate the development of the new wells. Pad Construction Operations also include placing necessary utilities to support the wells. It is anticipated that work for this operation will only occur during daylight hours, which is adequate for safely completing Pad Construction Operations. No lighting, permanent or temporary, is planned for Pad Construction Operations.

#### B. DRILLING OPERATIONS

Drilling Operations consist of bringing a drill rig onto the site and drilling the proposed wells. This work operation will take place continuously (7-days a week & 24-hour a day). Current development plans include utilizing a single drilling rig development scenario during Drilling Operations. Lighting will be temporary and be provided by portable light towers, lights affixed to the visual/sound walls, and lights permanently affixed to the drilling rig. A Drilling Operations Photometric Plan and a Drilling Rig Photometric Plan are attached as Appendix A. All proposed lighting for safely completing the Drilling Operations is listed below:

Table 1 – Drilling Operations Lighting Fixture Schedule.

Light Type	Number of Units	Approximate Height, FT (above GE)	Wattage per Unit	Lumens per Unit	Total Lumens
LED Flood Light Tower	4	25	1,400	154,000	616,000
LED Flood Light Wall Mount	8	25	1,400	90,342	722,736
Lights Permanently Affixed to Drill Rig	1	Varying		See Plan	See Plan
				<b>Total Lumens</b>	<b>1,338,736*</b>

*\*Plus, additional lighting permanently affixed to the drill rig.*

All lighting shall conform to the Lighting Photometric Plans and the Lighting Standards and Best Management Practices (BMPs) section of this report, fixture specification sheet and BUG calculation are included in Appendix F. If deemed necessary, additional light units may be utilized to address safety concerns. Contact a lighting engineer to verify that any additional lighting units and lighting BMPs will remain within the required lighting standards stated in this report.

#### C. HYDRAULIC STIMULATION OPERATIONS

Hydraulic Stimulation Operations consist of hydraulically fracturing (frac) the proposed wells. This work operation will take place continuously (7-days a week & 24-hour a day). Current development plans include utilizing a single frac crew development scenario during Hydraulic Stimulation Operations. Lighting will be temporary and

be provided by portable light towers and lights affixed to the visual/sound walls. A Hydraulic Stimulation Operations Lighting Plan is attached as Appendix B. All proposed lighting for safely completing the Hydraulic Stimulation Operations is listed below:

Table 2 – Hydraulic Stimulation Operations Lighting Fixture Schedule.

Light Type	Number of Units	Approximate Height, FT (above GE)	Wattage per Unit	Lumens per Unit	Total Lumens
LED Flood Light Tower	5	25	1,400	154,000	770,000
LED Flood Light Wall Mount	8	25	1,400	90,342	722,736
<b>Total Lumens</b>					<b>1,492,736</b>

All lighting shall conform to the Lighting Photometric Plans and the Lighting Standards and Best Management Practices (BMPs) section of this report, fixture specification sheet and BUG calculation are included in Appendix F. If deemed necessary, additional light units may be utilized to address safety concerns. Contact a lighting engineer to verify that any additional lighting units and lighting BMPs will remain within the required lighting standards stated in this report.

**D. REGULATIONS FOR LIGHTING IMPACTS TO HEALTH, SAFETY, AND WELFARE**

All lighting shall conform to the Lighting Photometric Plans and the Lighting Standards and Best Management Practices (BMPs) section of this report. As shown on the Drilling Operations Photometric Plan, Drilling Rig Photometric Plan, and Hydraulic Stimulation Operations Lighting Plan (Appendix A and Appendix B), lighting levels will be contained within the 100-foot offset of the WPS boundary during all work operations of Pre-Production Phase. As noted, lighting impacts for this phase of the project will be governed by Rule 424 of the COGCC. The following discusses the impacts to the public and surrounding habitat as defined Rule 424.c.(3):

1. Persons Occupying Building Units within 2,000-feet of the Oil and Gas Facility:
  - a. No Residential Buildings within 2,000 feet of the WPS.
2. Motorists on Roads within 2,000-feet of the Oil and Gas Facility:
  - a. E. 136<sup>th</sup> Ave. is approximately 305 feet to the south of the WPS. Gun Club Road is approximately 1,650 feet to the southeast. No impacts are anticipated to motorists on the road due to the implemented lighting BMPs and no direct light reaching the road.
3. Wildlife occupying any High Priority Habitat within 2,000-feet of the Oil and Gas Facility:
  - a. No High Priority Habitat within 2,000 feet of the WPS.

**IV. PRODUCTION PHASE FACILITY LIGHTING PLAN**

The Production Phase will be the final phase of the project. The Production Phase will consist of the following work operations: Drill-Out and Flowback Operations and Productions Operations. The state and local governing lighting regulations for this section will be the COGCC's Rule 424, specifically 424.a.(2).B., which also includes Rule 424.d.&e. Lighting photometric plans for all operations of the Production Phase should address adequate lighting to ensure on- and off-site safety during work operations while assessing the lighting impacts to the health, safety, and welfare of persons occupying building units within 2,000-feet, motorists on roads within 2,000-feet, and wildlife in high priority habitats within 2,000-feet. Additionally, lighting photometric plans for all operations of the Production Phase are required to conform to a zoning/land-use maximum permissible light level defined in Rule 424.d. The permissible light level is an overall average of the site's light intensity and is calculated by the



total lumens divided by the total WPS. The site is within an agricultural zoning/land-use, with a maximum permissible light level of 2.5 lumens per square foot (LM/SF). During a portion of this phase of the project, wall panels will be placed along the perimeter of the WPS. Wall panels will be removed for production operations.

**A. DRILL-OUT AND FLOWBACK OPERATIONS**

Drill-Out and Flowback Operations consist of recovering fluids following Hydraulic Stimulation Operations. Flowback Operations also consist of equipment and material mobilization from the site. The mobilization activities may continue approximately 7 days following the drill-out work. These work operations will take place continuously and simultaneously (7-days a week & 24-hour a day). Lighting will be temporary and be provided by portable light towers and lights affixed to the visual/sound walls. Permanent lighting affixed to poles at the production facility will also exist. The Drill-Out Operations Photometric Plan is attached as Appendix C. All proposed lighting for safely completing Drill-Out Operations is listed below:

*Table 3 – Drill-Out Operations Lighting Fixture Schedule.*

Light Type	Number of Units	Approximate Height, FT (above GE)	Wattage per Unit	Lumens per Unit	Total Lumens
LED Flood Light Tower	5	25	1,400	154,000	770,000
LED Flood Light Wall Mount	8	25	1,400	90,342	722,736
<b>Total Lumens</b>					<b>1,492,736</b>

All lighting shall conform to the Lighting Photometric Plans and the Lighting Standards and Best Management Practices (BMPs) section of this report, fixture specification sheet and BUG calculation are included in Appendix F. If deemed necessary, additional light units may be utilized to address safety concerns. Contact a lighting engineer to verify that any additional lighting units and lighting BMPs will remain within the required lighting standards stated in this report.

It is expected that the temporary lighting utilized during Drill-Out Operations will exceed the maximum permissible light level of 2.5 lumens per square foot (LM/SF) of the total WPS. The following is the calculated light levels for the Drill-Out Operations:

*Table 4 – Calculated Drill-Out Operations Permissible Light Levels.*

Description	Total Lumens	WPS (SF)	Maximum Permissible Light LM/SF	Calculated Permissible Light LM/SF
Drill-Out Temporary Lighting	1,798,895	234,074	2.5	7.7
<b>TOTAL LIGHT LEVEL</b>				<b>7.7</b>

With the placement of the 32-foot high wall panels, and utilizing lighting BMPs, it is expected that no direct light will extend beyond the boundary of the site. The Drill-Out Operations Photometric Plan in Appendix C, shows the calculated light distribution at the site during Drill-Out Operations. No direct light is anticipated to leave the 100-foot offset of the WPS. Lighting Standards and BMP, as described in Section V, will be implemented to prevent direct light from leaving the site.

The Flowback Operations Photometric Plan is attached as Appendix D. All proposed lighting for safely completing Flowback Operations is listed below:

Table 5 – Flowback Operations Lighting Fixture Schedule.

Light Type	Number of Units	Approximate Height, FT (above GE)	Wattage per Unit	Lumens per Unit	Total Lumens
LED Flood Light Tower	5	25	1,400	154,000	770,000
LED Flood Light Wall Mount	8	25	1,400	90,342	722,736
<b>Total Lumens</b>					<b>1,492,736</b>

All lighting shall conform to the Lighting Photometric Plans and the Lighting Standards and Best Management Practices (BMPs) section of this report, fixture specification sheet and BUG calculations are included in Appendix F. If deemed necessary, additional light units may be utilized to address safety concerns. Contact a lighting engineer to verify that any additional lighting units and lighting BMPs will remain within the required lighting standards stated in this report.

It is expected that the temporary lighting utilized during Flowback Operations will exceed the maximum permissible light level of 2.5 lumens per square foot (LM/SF) of the total WPS. The following is the calculated light levels for the Flowback Operations:

Table 6 – Calculated Flowback Operations Permissible Light Levels.

Description	Total Lumens	WPS (SF)	Maximum Permissible Light LM/SF	Calculated Permissible Light LM/SF
Flowback Temporary Lighting	1798,895	234,074	2.5	7.7
<b>TOTAL LIGHT LEVEL</b>				<b>7.7</b>

With the placement of the 32-foot high wall panels, and utilizing lighting BMPs, it is expected that no direct light will extend beyond the boundary of the site. The Flowback Operations Photometric Plan in Appendix D, shows the calculated light distribution at the site during Flowback Operations. No direct light is anticipated to leave the 100-foot offset of the WPS. Lighting Standards and BMP, as described in Section V, will be implemented to prevent direct light from leaving the site.

**B. PRODUCTION OPERATIONS**

Production operations consist of the daily gathering of the resources from the wells and maintenance of the permanent production equipment. Lighting will be permanent and will be installed on poles. The Production Operations Photometric Plan is attached as Appendix E. All proposed lighting for safely completing Production Operations is listed below:

Table 7 – Production Operations Lighting Fixture Schedule.

Light Type	Number of Units	Approximate Height, FT (above GE)	Wattage per Unit	Lumens per Unit	Total Lumens
LED Flood Light Pole Mount	7	25	1,400	43,737	4306,159
<b>Total Lumens</b>					<b>306,159</b>

All lighting shall conform to the Lighting Photometric Plans and the Lighting Standards and Best Management Practices (BMPs) section of this report, fixture specification sheet and BUG calculation are included in Appendix F. If deemed necessary, additional light units may be utilized to address safety concerns. Contact a lighting engineer to verify that any additional lighting units and lighting BMPs will remain within the required lighting standards stated in this report.

It is expected that the permanent lighting utilized during Production Operations will not exceed the maximum permissible light level of 2.5 lumens per square foot (LM/SF) of the total WPS. The following is the calculated light levels for the Production Operations:

Table 8 – Calculated Production Operations Permissible Light Levels.

Description	Total Lumens	WPS (SF)	Maximum Permissible Light LM/SF	Calculated Permissible Light LM/SF
Production Permanent Lighting	306,159	234,074	2.5	1.3
<b>TOTAL LIGHT LEVEL</b>				<b>1.3</b>

The Production Operations Photometric Plan in Appendix E, shows the calculated light distribution at the site during Production Operations. With this lighting configuration, this work operation is within the recommended regulatory limits. No direct light is anticipated to leave the 100-foot offset of the WPS.

**C. REGULATIONS FOR LIGHTING IMPACTS TO HEALTH, SAFETY, AND WELFARE**

All lighting shall conform to the Lighting Photometric Plans and the Lighting Standards and Best Management Practices (BMPs) section of this report. As shown on the Drill-Out Operation Photometric Plan, Flowback Operations Photometric Plan, and Production Operation Plan (Appendix C, Appendix, D, and Appendix E), lighting levels will be contained within the 100-foot offset of the WPS boundary during all work operations of the Production Phase. As noted, lighting impacts for this phase of the project will be governed by Rule 424 of the COGCC. The impacts to the public and surrounding habitat as defined Rule 424.d.(3):

1. Persons Occupying Building Units within 2,000-feet of the Oil and Gas Facility:
  - a. No Residential Buildings within 2,000 feet of the WPS.
2. Motorists on Roads within 2,000-feet of the Oil and Gas Facility:
  - a. E. 136<sup>th</sup> Ave. is approximately 305 feet to the south of the WPS. Gun Club Road is approximately 1,650 feet to the southeast. No impacts are anticipated to motorists on the road due to the implemented lighting BMPs and no direct light reaching the road.
3. Wildlife occupying any High Priority Habitat within 2,000-feet of the Oil and Gas Facility:
  - a. No High Priority Habitat within 2,000 feet of the WPS.

## V. LIGHTING STANDARDS AND BEST MANAGEMENT PRACTICES (BMPS) – RULE 424.b.

The following lighting BMPs will be used to minimize and control light pollution:

- Most work operations will take place 7-days a week & 24-hour a day. Care will be taken to keep lighting levels at the specified levels on the lighting plans while providing safe, well-lit working areas during night-time and other low-light conditions. Care will also be taken to prevent unintended light from leaving the site and becoming a hazard or nuisance to the public or surrounding wildlife habitat.
- During the Pad Construction Operations, no night-time work is anticipated. Daylight work will be performed during this work operation.
- All lighting shall conform to Federal, State, and Industry recognized standards for both on-site workplace safety and off-site public protection (OSHA, FAA, COGCC, IESNA, and ANSI). No direct light, except those governed by FAA standards, shall shine beyond the boundaries of the WPS, especially onto public roads, adjacent properties, and/or high priority habitats. All lighting shall conform to all COGCC, county, municipal, and any applicable governing body's standards.
- Temporary lighting will be 4-head LED flood lights on mobile 25-foot telescoping towers and 2-head LED flood lights wall mounted (BUG Rating is B3-U3-G5). All lighting will be capable of adjustment and will be directed inward and 45°-65° downward towards working areas on the WPS. No light should shine above the horizontal plane passing through the center point of the light source. Lights will be shielded with a photometric diffusion fabric or membrane tint to prevent direct or reflected direct light from leaving the site.
- Permanent lighting will be pole mounted floodlights (BUG Rating is B4-U0-G5). All lighting will be capable of adjustment and be directed downward.
- 32-foot high wall panels (e.g., visual/sound walls) will be placed along the perimeter of the WPS and will be removed for production operations. For workplace safety, no direct or reflected light shall shine towards the entrance of the WPS.
- Watch for and remove glare and reflection points during all work operations of the project from temporary or permanent structures, temporary lighting, vehicles, construction equipment, and clothing/PPE.
- Any lighting damaged and/or improperly directed or angled will be promptly fixed and/or corrected to conform to the lighting plan.
- Equipment shall be operated and/or orientated and/or shielded in such a manner that lights permanently affixed to equipment do not shine above the horizontal plane passing through the center point of the light source or shine beyond the boundary of the WPS.
- For all work operations, once temporary lighting is in place, a lighting self-audit of the site will be performed to ensure that no unintended light will leave the site and become a hazard or a nuisance.
- For any change to the lighting during any work operations, a lighting self-audit of the site will be performed to ensure that no unintended light will leave the site and become a hazard or a nuisance.
- For non-working or shut-down days where no personnel are on-site or in working areas, non-essential temporary lighting will be turned off. If no personnel are on-site and essential temporary lighting is needed, the essential temporary lighting will be inspected every 24 hours.
- All redundant, unused, or not-needed lights will be turned off.
- Any additional light units used to address workplace safety concerns that are not shown on the lighting photometric plans will be verified by a lighting engineer to ensure that the modified lighting will remain within the required lighting standards stated in this report.
- Where safely applicable, the following are suggestions to aid in controlling and minimizing the site's lighting levels:
  - Using automation, timers, or motion sensors
  - Using or changing fixtures to full cut-off lighting fixtures to shield and direct light

- Using or changing to lighting colors that reduce light intensity
- Adjusting or adding additional light shields such as photometric diffusion fabric or tinted membranes
- Adjusting or adding additional temporary wall panels (e.g., visual/sound walls)

REMAINDER OF PAGE INTENTIONALLY BLANK, FACILITY LIGHTING SECTION FOLLOWS

## **VI. PRE-PRODUCTION PHASE FACILITY LIGHTING – 424.c.**

Pre-Production Phase facility lighting will be temporary exterior lighting. To ensure the safety of all persons on- and off-site and to wildlife and their habitats, all lighting shall conform to the Lighting Photometric Plans, the Lighting Standards and the Best Management Practices (BMPs) section of this report.

The requirements of this section have already been incorporated in this report in Section III, above. Please refer to that section for the governing rules concerning safety and lighting impacts for this phase of the project.

## **VII. PRODUCTION PHASE FACILITY LIGHTING WHEN PERSONNEL ARE ON-SITE AND NOT ON-SITE – 424.d.& e.**

To ensure the safety of all persons on- and off-site and to wildlife and their habitats, all lighting shall conform to the Lighting Photometric Plans, the Lighting Standards and the Best Management Practices (BMPs) section of this report which discusses BMPs when personnel are both on-site and off-site.

For Drill-Out and Flowback Operations, lighting will be temporary and be provided by portable light towers and lights permanently affixed to construction and maintenance equipment. All temporary lighting shall conform to the Lighting Photometric Plans, the Lighting Standards and the Best Management Practices (BMPs) section of this report. For Production Operations, lighting will be permanent and provided by pole mounted lights. All permanent lighting shall conform to the Lighting Photometric Plans and the Lighting Standards and Best Management Practices (BMPs) section of this report.

The requirements of this section have already been incorporated in this report in Section IV and Section V, above. Please refer to those sections for the governing rules concerning lighting BMPs, safety, and lighting impacts for this phase of the project.

## **VIII. CUMULATIVE IMPACTS – 424.f.**

No cumulative impacts according to COGCC's Rule 424.f. are anticipated due to the implemented lighting BMPs and no direct light reaching a building unit within 1-mile. The lighting plan for this project was developed so that the cumulative impact of the proposed lighting will conform to the required 4 lux at any residential building unit or high occupancy building unit within 1-mile of the site, measured at 5.5 feet above grade in a direct line of sight to the brightest light fixture on-site (Rule 424). For further reference, additional lighting levels at various points of interest around and from the WPS have been provided for each work operation below. Proposed lighting for this project will be contained within the 100-foot offset of the WPS boundary.

Light intensity calculations shown on the lighting plans are in foot-candles, which is defined as one lumen per square foot (LM/SF). Light intensity levels vary across the site and are dependent on the height, location, and brightness of the light source. Light intensity levels are affected by the relative position and reflectivity of objects and/or surfaces on the site. Foot-candles can be converted to lux (LM/SM) by using the following conversion:  $1 \text{ Fc} = 10.8 \text{ lux}$ .



**A. PAD CONSTRUCTION OPERATIONS**

No lighting, permanent or temporary, is planned for Pad Construction Operations, so there will be no light intensity calculations.

**B. DRILLING OPERATIONS**

Based upon the light intensity calculations shown on the Drilling Operations Photometric Plan in Appendix A, the maximum foot-candle (Fc) observed within the WPS during Drilling Operations will be located directly beneath the temporary wall mounted light southwest of the drilling rig, calculated as 36.4 Fc. The maximum foot-candle at the entrance of the WPS is calculated at 0.0 Fc. The maximum foot-candle at the edge of the WPS will be 0.0 Fc. The maximum foot-candle at the 100-foot offset of the WPS boundary will be 0.0 Fc. The maximum foot-candle at public roads within 1-mile of the WPS boundary will be 0.0 Fc. The maximum foot-candle at building units within 1-mile of the WPS boundary will be 0.0 Fc. The following is a summary of the calculated and required light intensity levels:

*Table 9 – Drilling Operations Calculated Maximum Light Intensity at Points of Interest.*

<b>Point of Interest</b>	<b>Foot-Candle</b>	<b>Lux</b>	<b>Required</b>
Within the WPS	36.4	393.1	N/A
At the Entrance of the WPS	0.0	0.0	N/A
At the Edge of the WPS	0.0	0.0	N/A
100-foot offset of the WPS boundary	0.0	0.0	N/A
Public Roads within 1-Mile of the WPS	0.0	0.0	N/A
Building Units within 1-Mile of the WPS	0.0	0.0	4 Lux

**C. HYDRAULIC STIMULATION OPERATIONS**

Based upon the light intensity calculations shown on the Hydraulic Stimulation Operations Photometric Plan in Appendix B, the maximum foot-candle (Fc) observed within the WPS during Hydraulic Stimulation Operations will be located directly beneath the temporary wall mounted light located southeast of the proposed row of wells, calculated as 36.4 Fc. The maximum foot-candle at the entrance of the WPS is calculated at 0.0 Fc. The maximum foot-candle at the edge of the WPS will be 0.0 Fc. The maximum foot-candle at the 100-foot offset of the WPS boundary will be 0.0 Fc. The maximum foot-candle at public roads within 1-mile of the WPS boundary will be 0.0 Fc. The maximum foot-candle at building units within 1-mile of the WPS boundary will be 0.0 Fc. The following is a summary of the calculated and required light intensity levels:

*Table 10 – Hydraulic Stimulation Operations Calculated Maximum Light Intensity at Points of Interest.*

<b>Point of Interest</b>	<b>Foot-Candle</b>	<b>Lux</b>	<b>Required</b>
Within the WPS	36.4	393.1	N/A
At the Entrance of the WPS	0.0	0.0	N/A
At the Edge of the WPS	0.0	0.0	N/A
100-foot offset of the WPS boundary	0.0	0.0	N/A
Public Roads within 1-Mile of the WPS	0.0	0.0	N/A
Building Units within 1-Mile of the WPS	0.0	0.0	4 Lux

**D. DRILL-OUT OPERATIONS**

Based upon the light intensity calculations shown on the Drill-out Operations Photometric Plan in Appendix C, the maximum foot-candle (Fc) observed within the WPS during drill-out operations will be located directly beneath the temporary wall mounted light at the northeast of the wells, calculated as 36.4 Fc. The maximum foot-candle at the entrance of the WPS is calculated at 0.0 Fc. The maximum foot-candle at the edge of the WPS will be 0.0 Fc. The maximum foot-candle at the 100-foot offset of the WPS boundary will be 0.0 Fc. The maximum foot-candle at public roads within 1-mile of the WPS boundary will be 0.0 Fc. The maximum foot-candle at building units within 1-mile of the WPS boundary will be 0.0 Fc. The following is a summary of the calculated and required light intensity levels:

*Table 11 – Drill-Out Operations Calculated Maximum Light Intensity at Points of Interest.*

<b>Point of Interest</b>	<b>Foot-Candle</b>	<b>Lux</b>	<b>Required</b>
Within the WPS	36.4	393.1	N/A
At the Entrance of the WPS	0.0	0.0	N/A
At the Edge of the WPS	0.0	0.0	N/A
100-foot offset of the WPS boundary	0.0	0.0	N/A
Public Roads within 1-Mile of the WPS	0.0	0.0	N/A
Building Units within 1-Mile of the WPS	0.0	0.0	4 Lux

**E. FLOWBACK OPERATIONS**

Based upon the light intensity calculations shown on the Flowback Operations Photometric Plan in Appendix D, the maximum foot-candle (Fc) observed within the WPS during flowback operations will be located directly beneath the temporary wall mounted light at the northeast of the wells, calculated as 36.4 Fc. The maximum foot-candle at the entrance of the WPS is calculated at 0.0 Fc. The maximum foot-candle at the edge of the WPS will be 0.0 Fc. The maximum foot-candle at the 100-foot offset of the WPS boundary will be 0.0 Fc. The maximum foot-candle at public roads within 1-mile of the WPS boundary will be 0.0 Fc. The maximum foot-candle at building units within 1-mile of the WPS boundary will be 0.0 Fc. The following is a summary of the calculated and required light intensity levels:

*Table 12 – Flowback Operations Calculated Maximum Light Intensity at Points of Interest.*

<b>Point of Interest</b>	<b>Foot-Candle</b>	<b>Lux</b>	<b>Required</b>
Within the WPS	36.4	393.1	N/A
At the Entrance of the WPS	0.0	0.0	N/A
At the Edge of the WPS	0.0	0.0	N/A
100-foot offset of the WPS boundary	0.0	0.0	N/A
Public Roads within 1-Mile of the WPS	0.0	0.0	N/A
Building Units within 1-Mile of the WPS	0.0	0.0	4 Lux

**F. PRODUCTION OPERATIONS**

Based upon the light intensity calculations shown on the Production Operations Photometric Plan in Appendix E, the maximum foot-candle (Fc) observed within the WPS during production operations will be located directly beneath the south permanent light pole of the northern production equipment, calculated as 9.2 Fc. The maximum foot-candle at the entrance of the WPS is calculated at 0.0 Fc. The maximum foot-candle at the edge of the WPS will be located directly beneath the northwest permanent light pole of the northern production equipment, calculated as 12.6 Fc. The maximum foot-candle at the 100-foot offset of the WPS boundary will be 0.0 Fc. The maximum foot-candle at public roads within 1-mile of the WPS boundary will be 0.0 Fc. The

maximum foot-candle at building units within 1-mile of the WPS boundary will be 0.0 Fc. The following is a summary of the calculated and required light intensity levels:

*Table 13 – Production Operations Calculated Maximum Light Intensity at Points of Interest.*

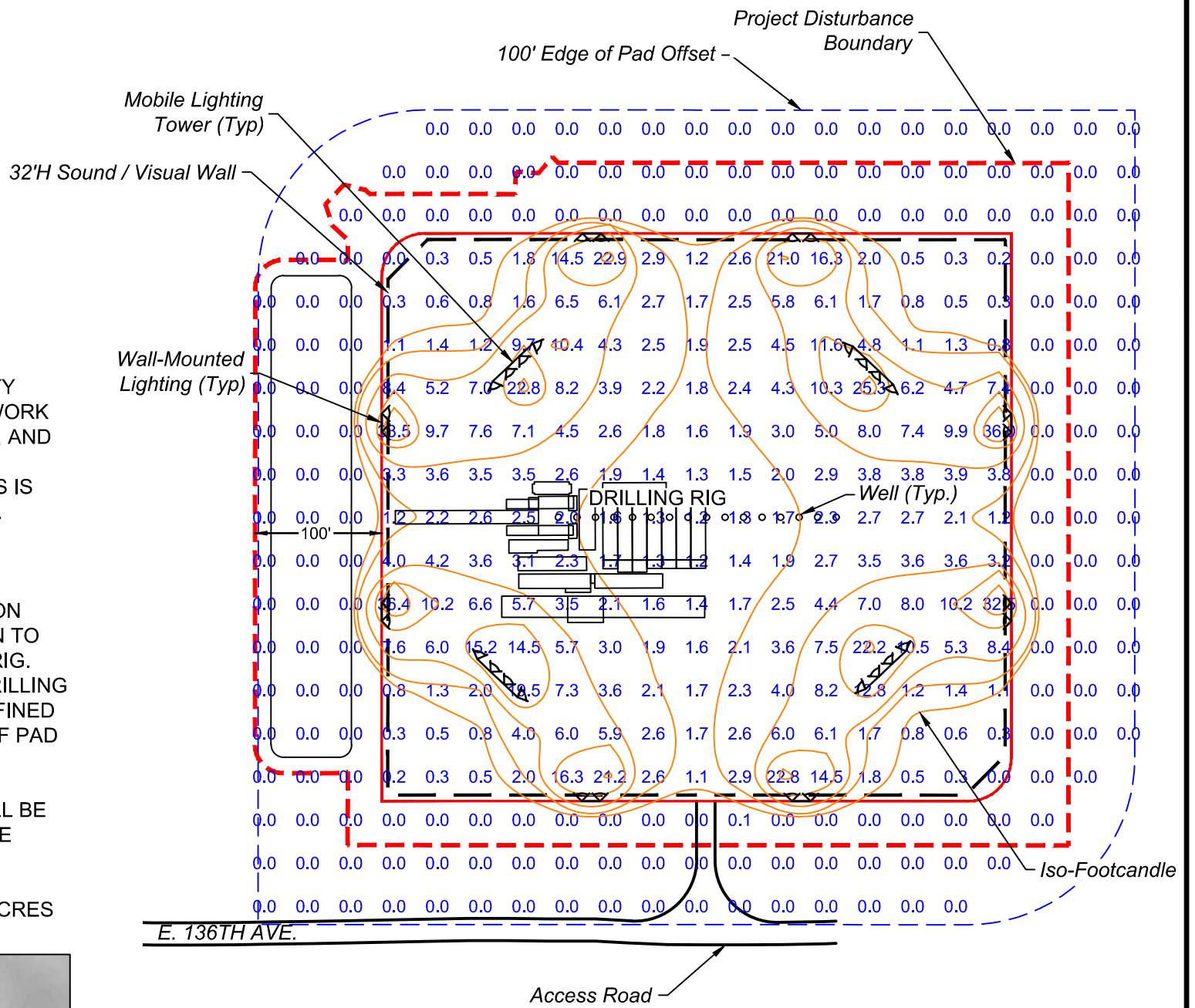
<b>Point of Interest</b>	<b>Foot-Candle</b>	<b>Lux</b>	<b>Required</b>
Within the WPS	9.2	99.4	N/A
At the Entrance of the WPS	0.0	0.0	N/A
At the Edge of the WPS	1.1	11.9	N/A
100-foot offset of the WPS boundary	0.0	0.0	N/A
Public Roads within 1-Mile of the WPS	0.0	0.0	N/A
Building Units within 1-Mile of the WPS	0.0	0.0	4 Lux

## IX. CONCLUSION

This report was prepared in compliance with State and Local lighting regulations, specifically COGCC's Rule 424. The proposed lighting configurations, as shown on the Lighting Photometric Plans for the Conner 19-18 Pad project, conforms with the State and Local lighting regulations requirements. To ensure the safety of all persons on- and off-site and to wildlife and their habitats, all lighting shall conform to the Lighting Photometric Plans and the Lighting Standards and Best Management Practices (BMP) section of this report.

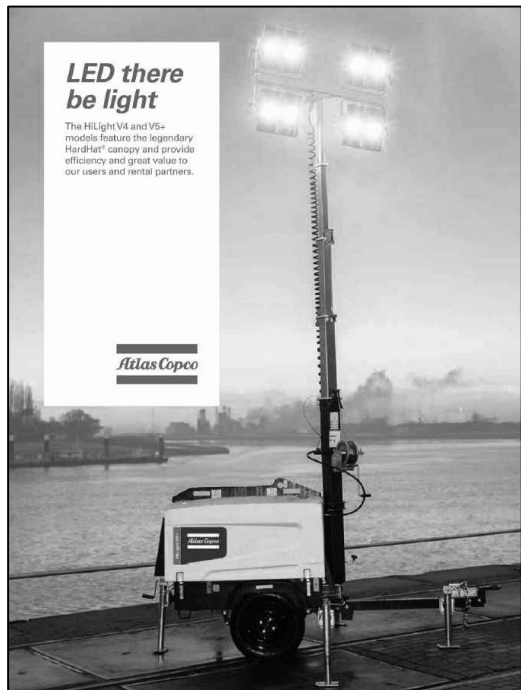
**X. APPENDIX**

APPENDIX A – DRILLING OPERATIONS LIGHTING PLAN



**NOTES:**

- MEASURED LIGHT INTENSITY LEVEL WITH RESPECT TO WORK AREAS, OUTDOOR SPACES, AND UNATTENDED EQUIPMENT AREAS. ILLUMINANCE UNITS IS GIVEN IN Fc [1 fc = 10.8 Lux].  
MAXIMUM = 36.4 Fc  
MINIMUM = 0.0 Fc
- LIGHTING LEVELS SHOWN ON THIS PLAN ARE IN ADDITION TO LEVELS ON THE DRILLING RIG. DIRECT LIGHTING FROM DRILLING OPERATIONS WILL BE CONFINED WITHIN THE 100 FT EDGE OF PAD OFF-SET BOUNDARY.
- DRILLING RIG LIGHTING WILL BE PRESENT ONLY DURING THE DRILLING PHASE.
- TOTAL PAD AREA = ± 5.37 ACRES



TYPICAL MOBILE TOWER LIGHTING



TYPICAL WALL MOUNTED LIGHTING

**1 DRILLING PAD SITE LIGHTING PHOTOMETRIC PLAN**  
SCALE: 1" = 150'

LIGHTING FIXTURE SCHEDULE									
SYMBOL	LIGHT UNIT DESCRIPTION	BUG RATING	MOUNTING INFO	VOLTS	LAMP QUANTITY	LUMENS / LAMP	UNITS QUANTITY	LUMENS / UNIT	TOTAL LUMENS
	4 HEAD FLOOD LIGHT LED MOBILE TEMPORARY LIGHTING TOWER	B3-U3-G5	25' TOWER	120	4	38,500	4	154,000	616,000
	2 HEAD LED FLOOD LIGHTS, WALL MOUNTED	B3-U3-G5	25' WALL	120	2	45,171	8	90,342	722,736



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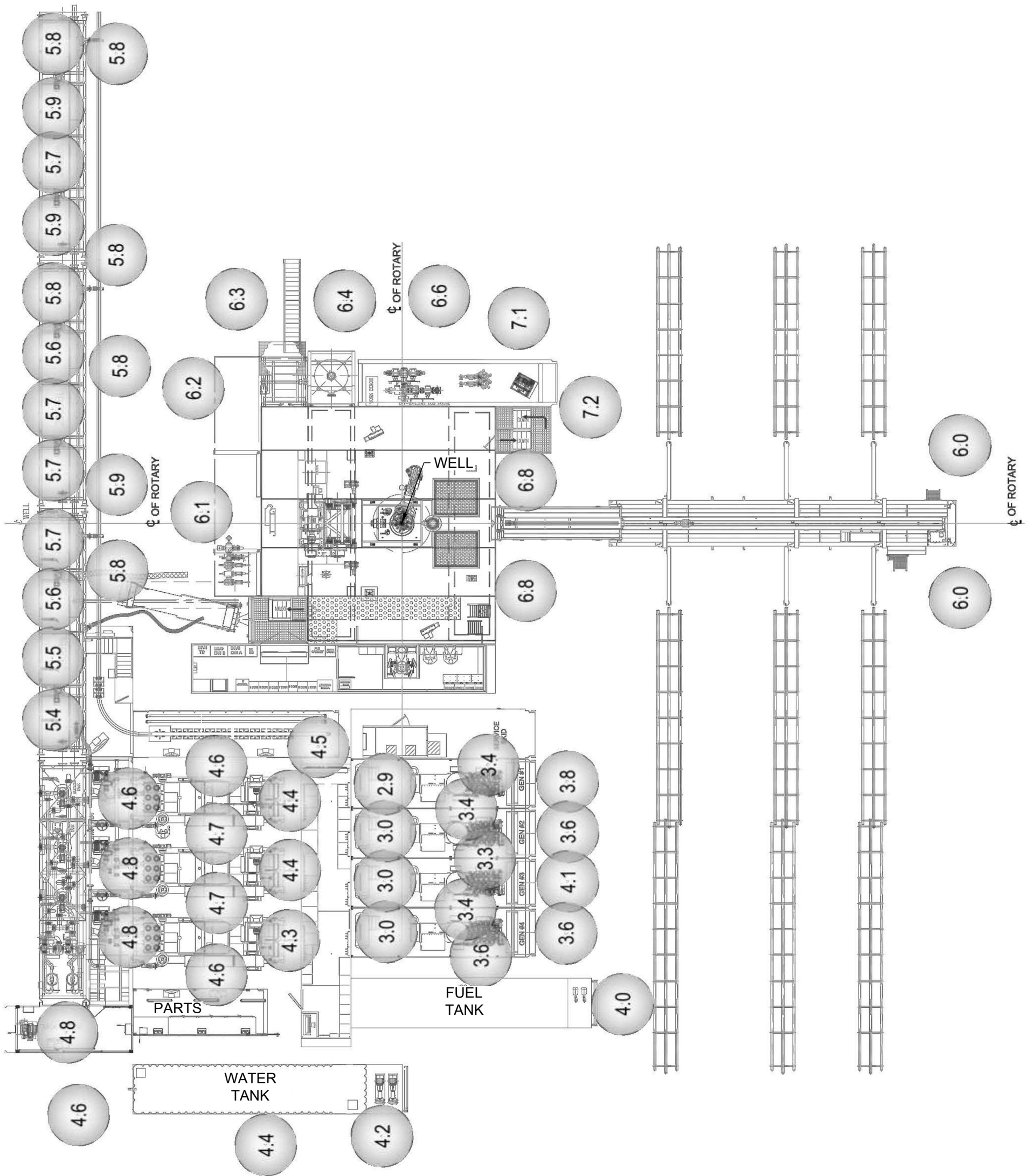
**POCO OPERATING**

**CONNER 19-18 PAD**  
SE 1/4 SW 1/4, SECTION 19, T1S, R65W, 6th P.M.  
ADAMS COUNTY, COLORADO

SCALE: AS NOTED	DRAWN BY: S.G.T.	DATE DRAWN: 11-11-2022
UELS FILE NO.: P - 2 0 3 1	REVISED: 12-15-2023 K.C.	

**DRILLING OPERATIONS PHOTOMETRIC PLAN**





**2 DRILLING RIG SITE LIGHTING PHOTOMETRIC PLAN**

SCALE: NO SCALE

NOTES:

1. MEASURED LIGHT INTENSITY LEVEL WITH RESPECT TO WORK AREAS, OUTDOOR SPACES, AND UNATTENDED EQUIPMENT AREAS. ILLUMINANCE UNITS IS GIVEN IN Fc [1 fc = 10.8 Lux].
2. LIGHTING LEVELS SHOWN ON THIS PLAN ARE IN ADDITION TO LEVELS ON THE DRILLING PAD SITE. DIRECT LIGHTING FROM DRILLING OPERATIONS WILL BE CONFINED WITHIN THE 100 FT EDGE OF PAD OFF-SET BOUNDARY.
3. DRILLING RIG LIGHTING WILL BE PRESENT ONLY DURING THE DRILLING PHASE.

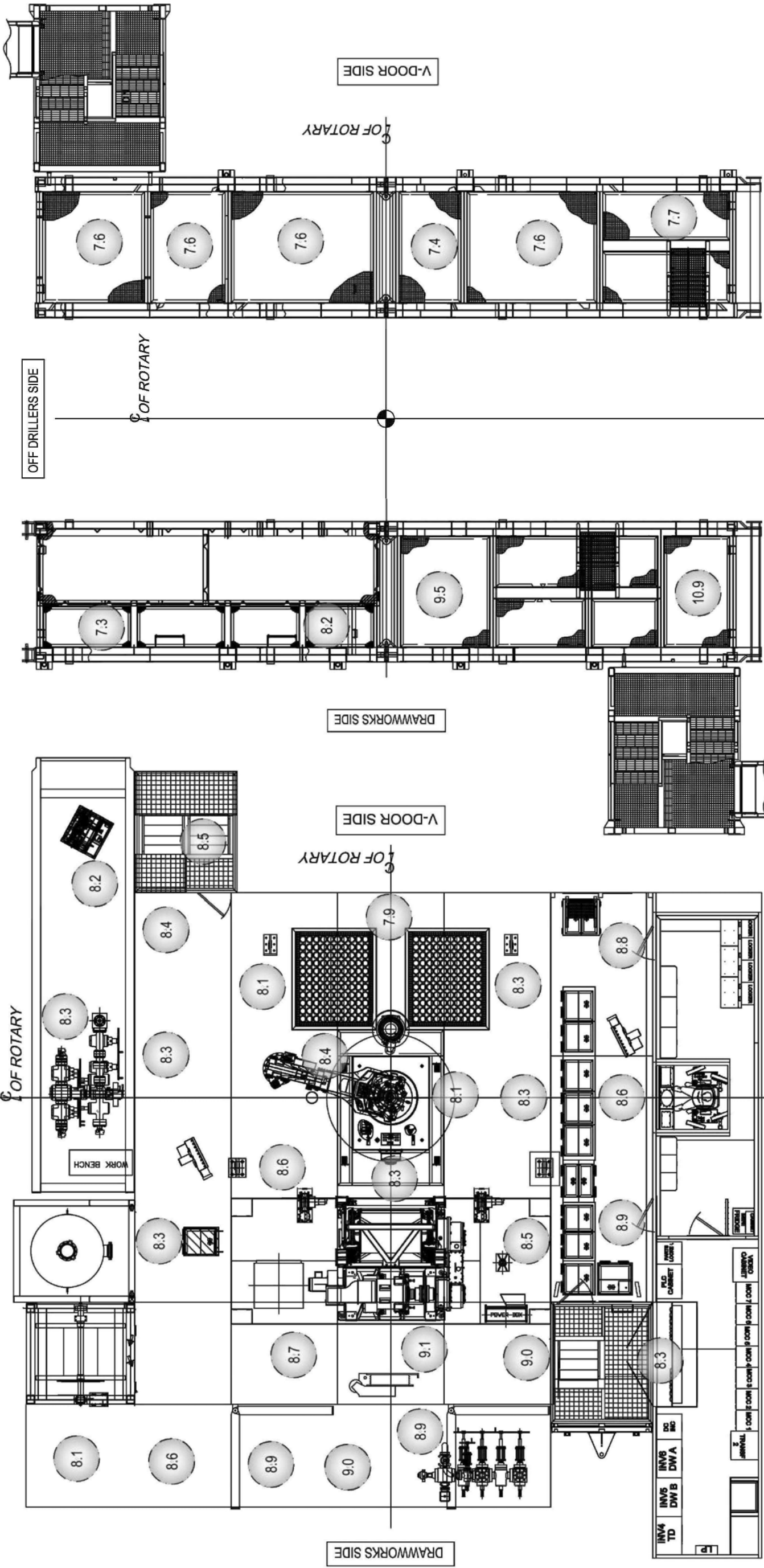
**POCO OPERATING**

**CONNER 19-18 PAD**  
**SE 1/4 SW 1/4, SECTION 19, T1S, R65W, 6th P.M.**  
**ADAMS COUNTY, COLORADO**



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<b>DRILLING OPERATIONS PHOTOMETRIC PLAN</b>		

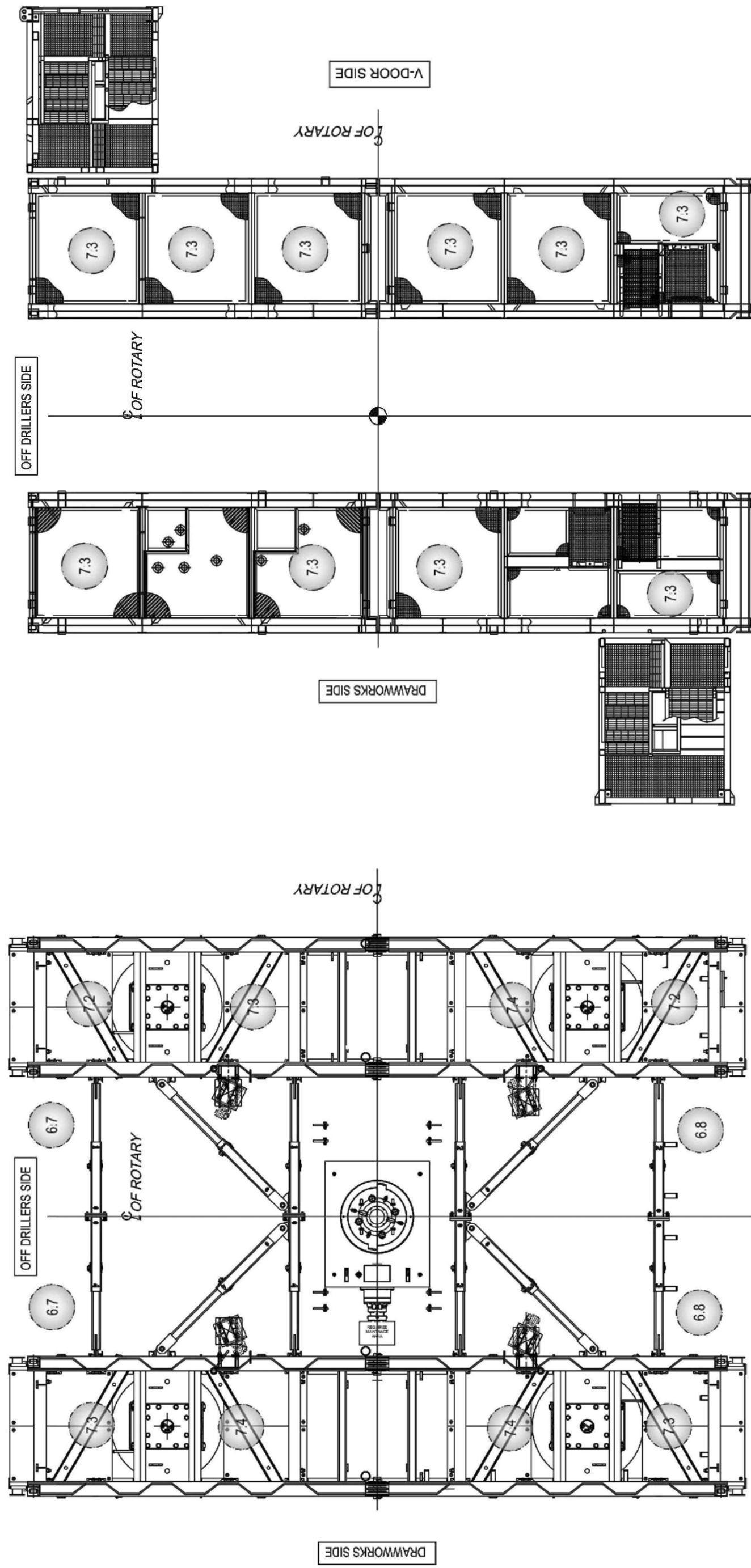


PLAN VIEW @ MIDDLE  
SUBSTRUCTURE BOX

PLAN VIEW @ DRILLFLOOR

3 DRILLING RIG LIGHTING PHOTOMETRIC PLAN  
SCALE: NO SCALE





PLAN VIEW @ TOP  
SUBSTRUCTURE BOX

PLAN VIEW @ BOTTOM  
SUBSTRUCTURE BOX

**4** DRILLING RIG LIGHTING PHOTOMETRIC PLAN  
SCALE: NO SCALE



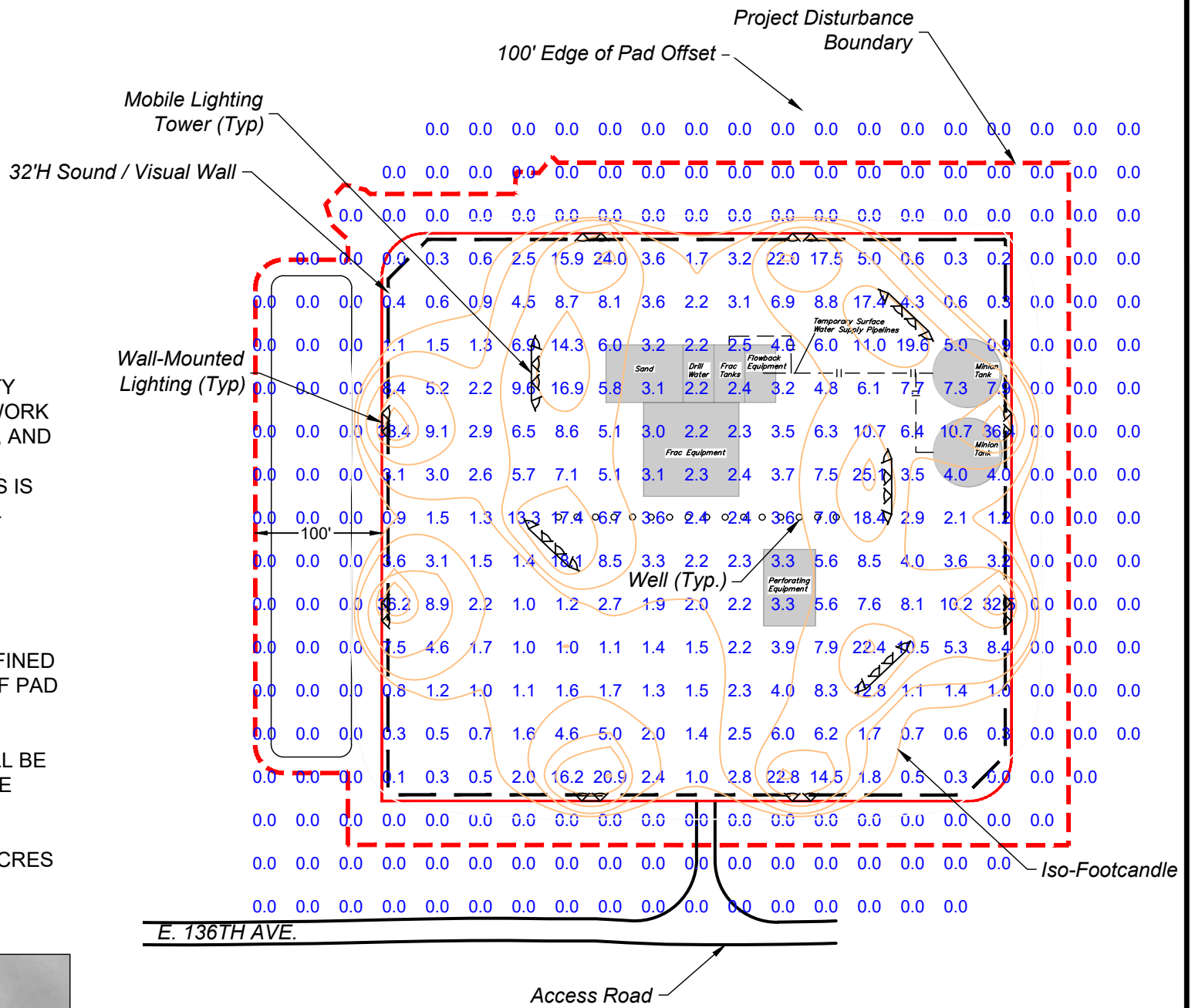
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**POCO OPERATING**

CONNER 19-18 PAD  
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ADAMS COUNTY, COLORADO

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DRILLING OPERATIONS PHOTOMETRIC PLAN		

APPENDIX B – HYDRAULIC STIMULATION OPERATIONS LIGHTING PLAN



**NOTES:**

1. MEASURED LIGHT INTENSITY LEVEL WITH RESPECT TO WORK AREAS, OUTDOOR SPACES, AND UNATTENDED EQUIPMENT AREAS. ILLUMINANCE UNITS IS GIVEN IN Fc [1 fc = 10.8 Lux].  
 MAXIMUM = 36.4 Fc  
 MINIMUM = 0.0 Fc
2. DIRECT LIGHTING FROM HYDRAULIC STIMULATION OPERATIONS WILL BE CONFINED WITHIN THE 100 FT EDGE OF PAD OFF-SET BOUNDARY.
3. DRILLING RIG LIGHTING WILL BE PRESENT ONLY DURING THE DRILLING PHASE.
4. TOTAL PAD AREA = ± 5.37 ACRES



TYPICAL MOBILE TOWER LIGHTING



TYPICAL WALL MOUNTED LIGHTING

**1 DRILLING PAD SITE LIGHTING PHOTOMETRIC PLAN**  
 SCALE: 1" = 150'

LIGHTING FIXTURE SCHEDULE									
SYMBOL	LIGHT UNIT DESCRIPTION	BUG RATING	MOUNTING INFO	VOLTS	LAMP QUANTITY	LUMENS / LAMP	UNITS QUANTITY	LUMENS / UNIT	TOTAL LUMENS
	4 HEAD FLOOD LIGHT LED MOBILE TEMPORARY LIGHTING TOWER	B3-U3-G5	25' TOWER	120	4	38,500	5	154,000	770,000
	2 HEAD LED FLOOD LIGHTS, WALL MOUNTED	B3-U3-G5	25' WALL	120	2	45,171	8	90,342	722,736



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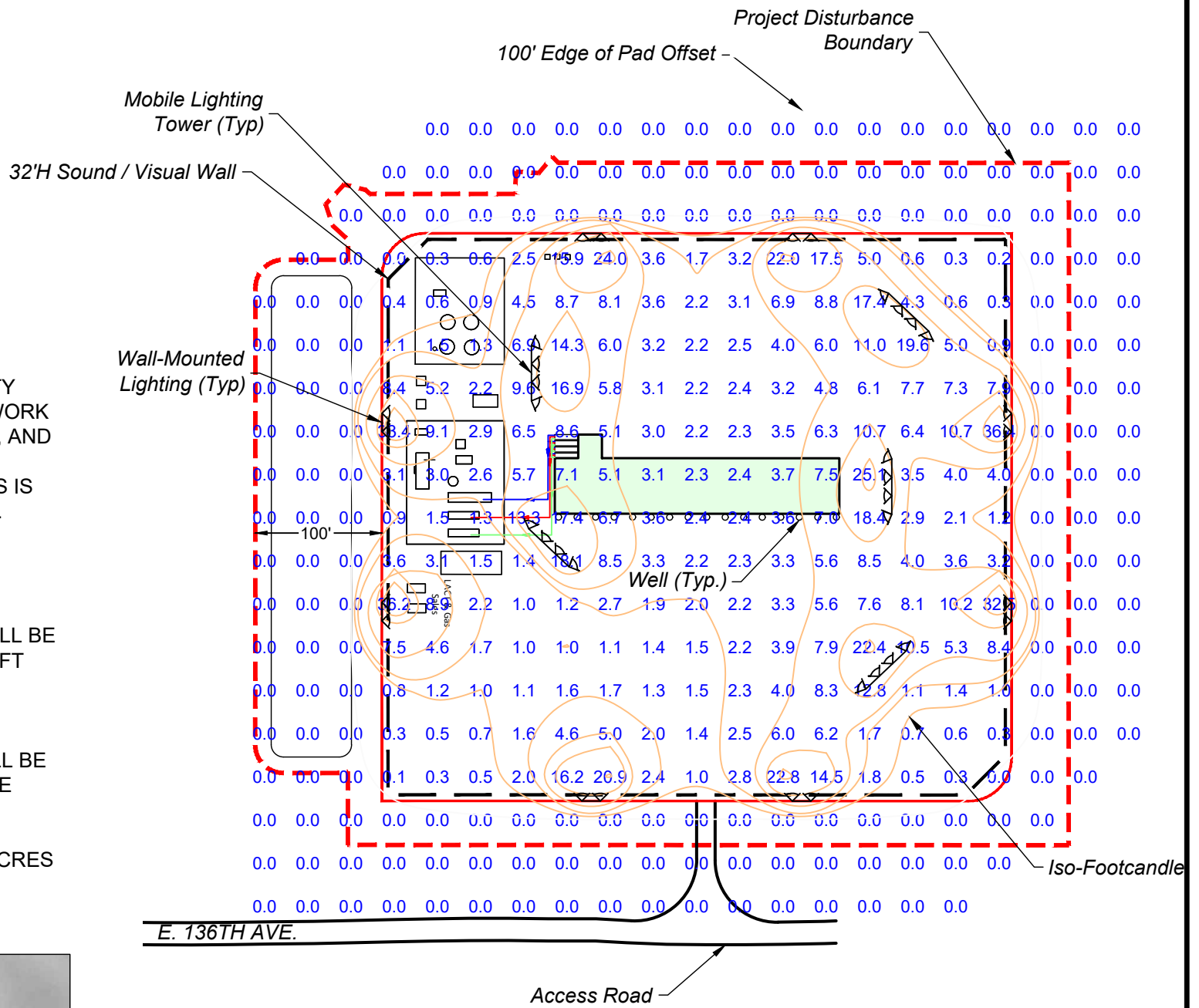
**POCO OPERATING**

**CONNER 19-18 PAD**  
 SE 1/4 SW 1/4, SECTION 19, T1S, R65W, 6th P.M.  
 ADAMS COUNTY, COLORADO

SCALE: AS NOTED	DRAWN BY: S.G.T.	DATE DRAWN: 11-11-2022
UELS FILE NO.: P - 2 0 3 1	REVISED:	
<b>HYDRAULIC STIMULATION OPERATIONS PHOTOMETRIC PLAN</b>		

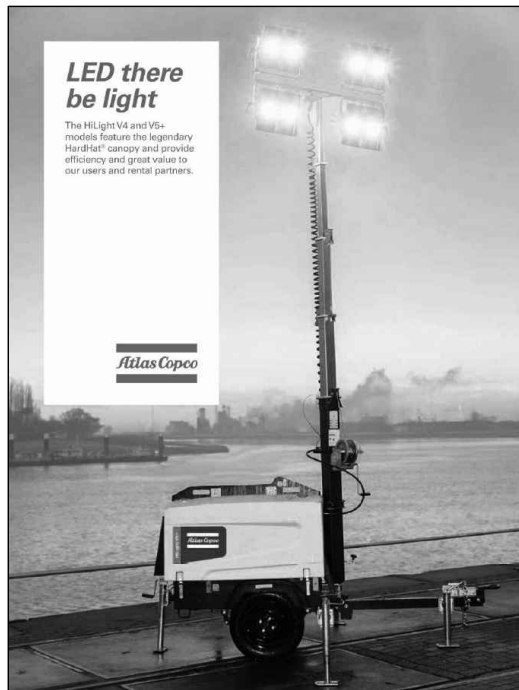
APPENDIX C – DRILL-OUT OPERATIONS PHOTOMETRIC PLAN





**NOTES:**

1. MEASURED LIGHT INTENSITY LEVEL WITH RESPECT TO WORK AREAS, OUTDOOR SPACES, AND UNATTENDED EQUIPMENT AREAS. ILLUMINANCE UNITS IS GIVEN IN Fc [1 fc = 10.8 Lux].  
 MAXIMUM = 36.4 Fc  
 MINIMUM = 0.0 Fc
2. DIRECT LIGHTING FROM DRILL-OUT OPERATIONS WILL BE CONFINED WITHIN THE 100 FT EDGE OF PAD OFF-SET BOUNDARY.
3. DRILLING RIG LIGHTING WILL BE PRESENT ONLY DURING THE DRILLING PHASE.
4. TOTAL PAD AREA = ± 5.37 ACRES



TYPICAL MOBILE TOWER LIGHTING



TYPICAL WALL MOUNTED LIGHTING

**1 DRILLING PAD SITE LIGHTING PHOTOMETRIC PLAN**  
 SCALE: 1" = 150'

LIGHTING FIXTURE SCHEDULE									
SYMBOL	LIGHT UNIT DESCRIPTION	BUG RATING	MOUNTING INFO	VOLTS	LAMP QUANTITY	LUMENS / LAMP	UNITS QUANTITY	LUMENS / UNIT	TOTAL LUMENS
	4 HEAD FLOOD LIGHT LED MOBILE TEMPORARY LIGHTING TOWER	B3-U3-G5	25' TOWER	120	4	38,500	5	154,000	770,000
	2 HEAD LED FLOOD LIGHTS, WALL MOUNTED	B3-U3-G5	25' WALL	120	2	45,171	8	90,342	722,736

**POCO OPERATING**

**CONNER 19-18 PAD**  
 SE 1/4 SW 1/4, SECTION 19, T1S, R65W, 6th P.M.  
 ADAMS COUNTY, COLORADO

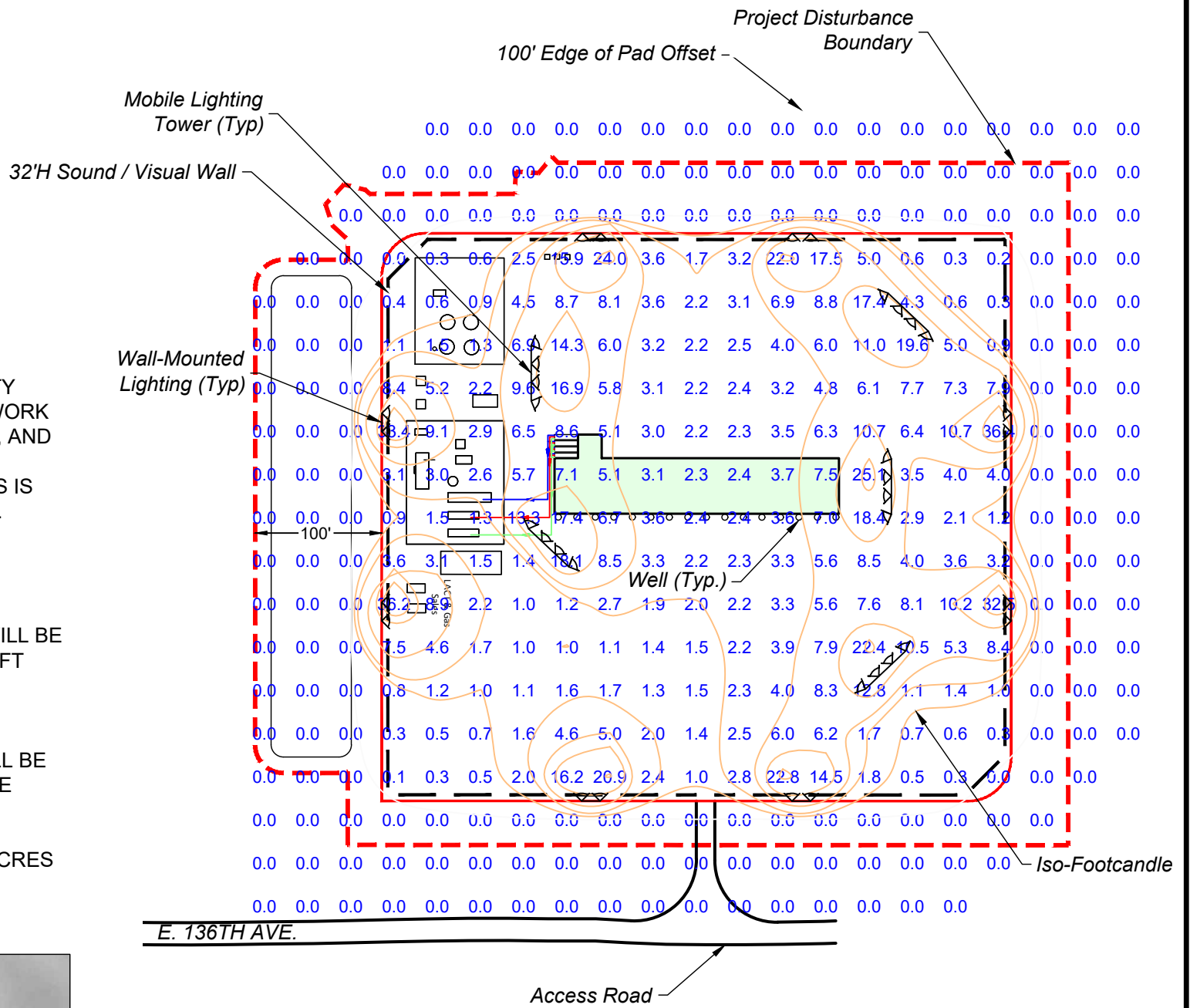
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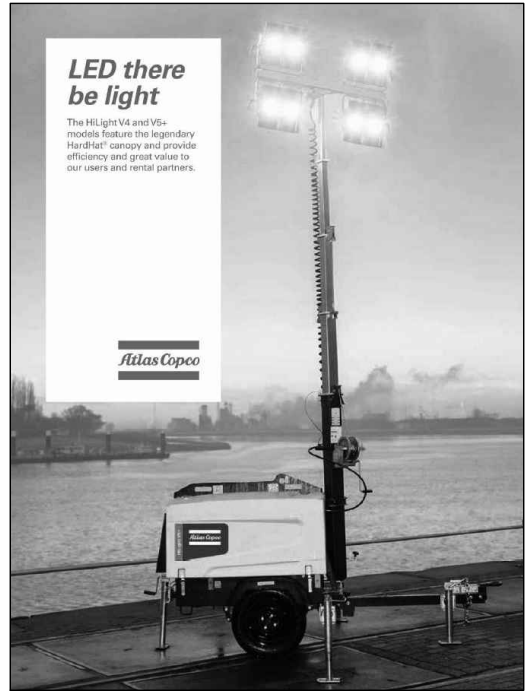
**DRILL-OUT OPERATIONS PHOTOMETRIC PLAN**

APPENDIX D – FLOWBACK OPERATIONS PHOTOMETRIC PLAN



**NOTES:**

1. MEASURED LIGHT INTENSITY LEVEL WITH RESPECT TO WORK AREAS, OUTDOOR SPACES, AND UNATTENDED EQUIPMENT AREAS. ILLUMINANCE UNITS IS GIVEN IN Fc [1 fc = 10.8 Lux].  
 MAXIMUM = 36.4 Fc  
 MINIMUM = 0.0 Fc
2. DIRECT LIGHTING FROM FLOWBACK OPERATIONS WILL BE CONFINED WITHIN THE 100 FT EDGE OF PAD OFF-SET BOUNDARY.
3. DRILLING RIG LIGHTING WILL BE PRESENT ONLY DURING THE DRILLING PHASE.
4. TOTAL PAD AREA = ± 5.37 ACRES



TYPICAL MOBILE TOWER LIGHTING



TYPICAL WALL MOUNTED LIGHTING



TYPICAL POLE MOUNTED LIGHTING

**1 DRILLING PAD SITE LIGHTING PHOTOMETRIC PLAN**  
 SCALE: 1" = 150'

LIGHTING FIXTURE SCHEDULE									
SYMBOL	LIGHT UNIT DESCRIPTION	BUG RATING	MOUNTING INFO	VOLTS	LAMP QUANTITY	LUMENS / LAMP	UNITS QUANTITY	LUMENS / UNIT	TOTAL LUMENS
	4 HEAD FLOOD LIGHT LED MOBILE TEMPORARY LIGHTING TOWER	B3-U3-G5	25' TOWER	120	4	38,500	5	154,000	770,000
	2 HEAD LED FLOOD LIGHTS, WALL MOUNTED	B3-U3-G5	25' WALL	120	2	45,171	8	90,342	722,736



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**POCO OPERATING**  
**CONNER 19-18 PAD**  
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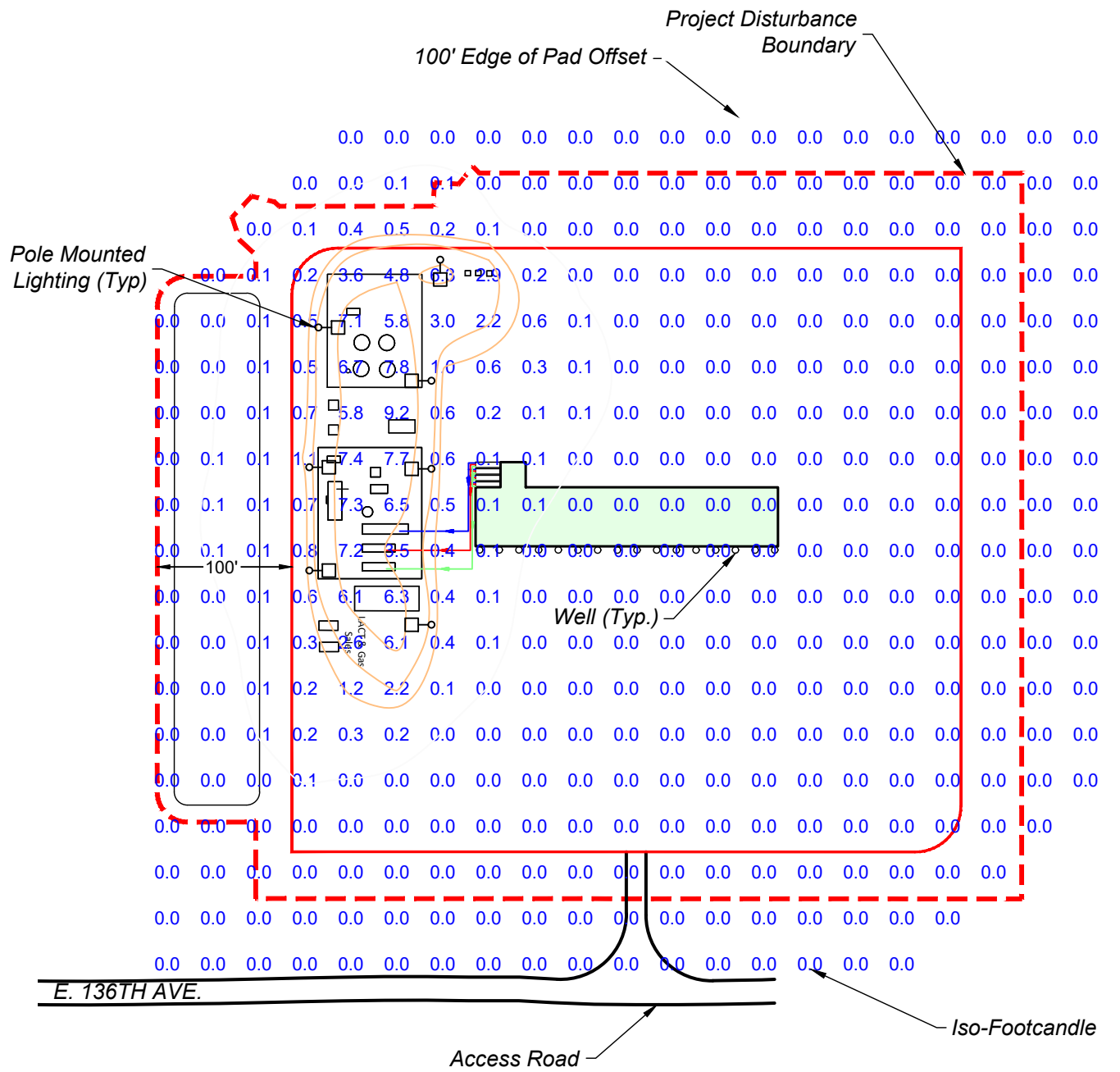
SCALE: AS NOTED	DRAWN BY: S.G.T.	DATE DRAWN: 11-11-2022
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**FLOWBACK OPERATIONS PHOTOMETRIC PLAN**

APPENDIX E – PRODUCTION OPERATIONS PHOTOMETRIC PLAN



1" = 120'



NOTES:

1. MEASURED LIGHT INTENSITY LEVEL WITH RESPECT TO WORK AREAS, OUTDOOR SPACES, AND UNATTENDED EQUIPMENT AREAS. ILLUMINANCE UNITS IS GIVEN IN Fc [1 fc = 10.8 Lux].  
 MAXIMUM = 9.2 Fc  
 MINIMUM = 0.0 Fc
2. DIRECT LIGHTING FROM FLOWBACK OPERATIONS WILL BE CONFINED WITHIN THE 100 FT EDGE OF PAD OFF-SET BOUNDARY.
3. DRILLING RIG LIGHTING WILL BE PRESENT ONLY DURING THE DRILLING PHASE.
4. TOTAL PAD AREA = ± 5.37 ACRES



TYPICAL POLE MOUNTED LIGHTING

**1** DRILLING PAD SITE LIGHTING PHOTOMETRIC PLAN  
 SCALE: 1" = 150'

LIGHTING FIXTURE SCHEDULE									
SYMBOL	LIGHT UNIT DESCRIPTION	BUG RATING	MOUNTING INFO	VOLTS	LAMP QUANTITY	LUMENS / LAMP	UNITS QUANTITY	LUMENS / UNIT	TOTAL LUMENS
	1 HEAD LED FLOOD LIGHT, POLE MOUNTED, EX. FACILITIES	B4-U0-G5	25' POLE	120	1	43,737	7	43,737	306,159



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POCO OPERATING

CONNER 19-18 PAD  
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<b>PRODUCTION OPERATIONS PHOTOMETRIC PLAN</b>		

APPENDIX F – LIGHT FIXTURE SPECIFICATION SHEETS





# HiLight V4 S

# HiLight V5+ S

The HiLight V4 S and V5+ S light towers are perfect for multiple applications. For the ultimate in fuel economy and reliability, the LED HiLight V5+ is our premium offering. Its LED lighting technology provides a wide range of benefits and represents outstanding lifetime value for our customers. The second model, the HiLight V4 is the leading solution within the 4000W metal halide light tower segment. Both models offer assured robustness and extended safety features.



LIGHT COVERAGE  
**43,055 ft<sup>2</sup>**  
AVG. 20LUXES

LIFE SPAN  
**6,000 Hrs**  
METAL HALIDE

**0.56 g/h**



Manual vertical mast

HardHat<sup>®</sup> technology   
Spillage free frame

LIGHT COVERAGE  
**53,819 ft<sup>2</sup>**  
AVG. 20LUXES

LIFE SPAN  
**50,000 Hrs**  
LED

**0.185 g/h**



	BATTERY	DIESEL				ELECTRIC		
	HiLight Z3+	HiLight B5+	HiLight V5+ S	HiLight V4 S	HiLight V4W	HiLight E3+	HiLight P2+	HiLight V2+   V3+

	Light coverage ft <sup>2</sup>	32,292 (average 10 luxes)	53,819 (average 20 luxes)	53,819 (average 20 luxes)	43,055 (average 20 luxes)	43,055 (average 20 luxes)	32,292 (average 10 luxes)	21,527 (average 10 luxes)	21,527 (average 10 luxes)
	Lamps	LED	LED	LED	Metal halide	Metal halide	LED	LED	LED
	Mast	Vertical Hydraulic Battery Powered Noise & CO2 free	Vertical Hydraulic	Vertical manual	Vertical manual	Vertical manual	Vertical manual	Vertical manual	Vertical manual
	Features	Battery Powered Noise & CO2 free	Compact box	HardHat® canopy	HardHat® canopy	HardHat® canopy	Electric	Electric	Electric

Performance data									
Rated frequency	Hz	60	60	60	60	60	60	60	60
Rated voltage	VAC	120	120	120	120	120-240	120	120	120
Rated power (PRP)	kW	-	2.7	2.7	6.8	8	-	-	-
Operating temperature (min/max)	°F (°C)	-4/ 122 (-20/ 50)	-4/ 104 (-20/ 40)	-13 / 122 (-25 / 50)	-13 / 122 (-25 / 50)	-13 / 122 (-25 / 50)	-	-	-
Sound power level (LwA)	dB(A)	-	82	86	94	89	-	-	-
Sound pressure level (LpA) at 7m	dB(A)	-	55	63	73	64	-	-	-
Engine									
Model		-	Kubota Z481	Kubota Z482	Kubota Z482	Kubta D1105	-	-	-
Speed	rpm	-	1800	1800	3600	1800	-	-	-
Rated net output (PRP)	kW	-	3	3	8.1	10	-	-	-
Coolant		-	Water	Water	Water	Water	-	-	-
Number of cylinders		-	1	2	2	3	-	-	-
Alternator									
Model		-	Meccalte LT3/74	Meccalte LT3/75	Sincro EK 2 MCT	DP06/AG164	-	-	-
Rated output	kVA	-	3.5	4.5	7.5	8	-	-	-
Insulation / Enclosure protection	class / IP	-	H / 20	H / 21	H / 23	H / 23	-	-	-
Fuel consumption									
Fuel tank capacity	gallon (l)	-	34.3 (230)	28 (105)	28 (105)	42 (160)	-	-	-
Autonomy	h	18-32	220	150	50	90	-	-	-
Power output									
Auxiliary Power	W	-	1,200	1,200	2,400	7,200	-	-	-
Outlets		-	120 VAC, 10A, GFCI Duplex (NEMA 5-20R)	120 VAC, 10A, GFCI Duplex (NEMA 5-20R)	120 VAC, 20A, GFCI Duplex (NEMA 5-20R)	121 VAC, 20A, GFCI Duplex (NEMA 5-20R) 240VAC, 30A, TL (NEMA L5-30R)	-	-	-
Lights									
Floodlights		LED	LED	LED	Metal halide	Metal halide	LED	LED	LED
Wattage	W	4x 160	4 x 350	4 x 350	4 x 1,000	4 x 1,000	4 x 160	320	320   4 x 120
Luminous Flux	Lumen	4 x 16,000	4 x 38,500	4 x 38,500	4 x 110,000	4 x 110,000	4 x 16,000	28,000	28,000   4 x 12,000
Mast									
Type		Hydraulic, vertical, 5 section	Hydraulic, vertical, 5 section	Manual vertical, 5 section	Manual vertical, 5 section	Manual vertical, 5 section	Manual	Manual	Manual
Rotation	degrees	340	340	360	360	360	0	0	0
Maximum height	ft (m)	26 (7.9)	26 (7.9)	25 (7.5)	25 (7.5)	25 (7.5)	23 (7)	11 (3.4)	17 (5)
Maximum speed wind	mph (kph)	50 (80)	50 (80)	51 (80)	51 (80)	59 (95)	52 (80)	32(50)	32 (50)
Enclosure and trailer									
Type		Box type Forklift pockets	Box type Forklift pockets	DOT US Compliant Unibody trailer with 4 point leveling system	DOT US Compliant Unibody trailer with 4 point leveling system	DOT US Compliant Unibody trailer with 4 point leveling system	-	-	Trailer with Bumpers in PE
Base Frame		-	Spillage free frame	Spillage free frame	Spillage free frame	Spillage free frame	-	-	-
Enclosure		Galvanneal Steel Canopy & Powder coating painting	Galvanneal Steel Canopy & Powder coating painting	Gull-wing Hard Hat Doors	Gull-wing Hard Hat Doors	Gull-wing Hard Hat Doors	Hard Hat Canopy	-	-
Dimensions and weight									
Dimensions in transport Up-right Towbar (L x W x H)	in (m)	-	-	77 x 48 x 102 (1.95 x 1.22 x 2.59)	77 x 48 x 102 (1.95 x 1.22 x 2.59)	74 x 53 x 98 (1.88 x 1.34 x 2.49)	-	-	-
Dimensions in transport - Towed (L x W x H)	in (m)	46 x 46 x 97 (1.16x 1.16x 2.46)	46 x 46 x 97 (1.16x 1.16x 2.46)	110 x 48 x 102 (2.79 x 1.22 x 2.59)	110 x 48 x 102 (2.79 x 1.22 x 2.59)	110 x 53 x 98 (2.79 x 1.34 x 2.49)	48 x 32 x 84 (1.2 x 0.8 x 2.14)	19.7 x 19.7 x 87 (0.5 x 0.5 x 2.2)	45 x 335 x 79 (1.1 x 0.85 x 2)
Weight	lb (kg)	2160(980)	2160(980)	1,768 (802)	1,970 (894)	2,041 (926)	608 (276)	99 (45)	243 (110)



**IES ROAD REPORT**

**PHOTOMETRIC FILENAME : 350W 38500 LUMEN LED\_30D.IES**

**DESCRIPTIVE INFORMATION (From Photometric File)**

IESNA:LM-63-2002

[TEST]

[TESTLAB]

[TESTDATE]

[ISSUEDATE]

[OTHER]

[MANUFAC]

[LUMCAT] fl-350-85x135

[LUMINAIRE] fl-350-85x135

[LAMPCAT] LED

[LAMP] LED

[\_CONVERT] Luminaire test position and photometric web converted from original test data

**CHARACTERISTICS**

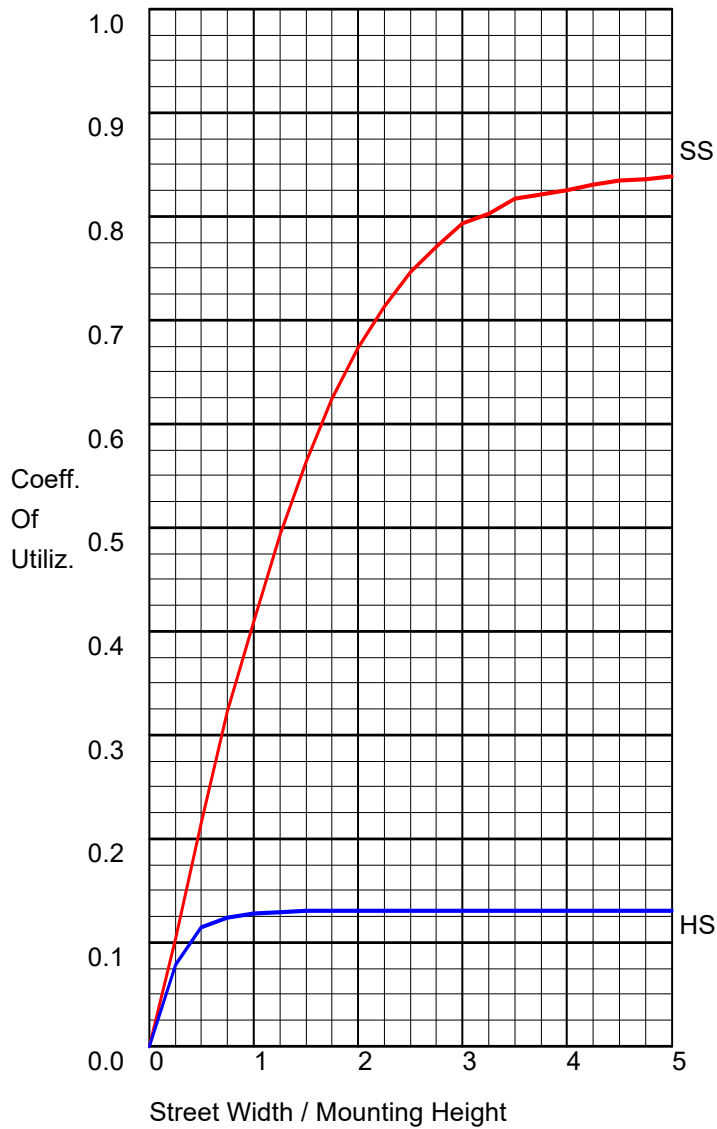
IES Classification	Type IV
Longitudinal Classification	Medium
Lumens Per Lamp	37338 (1 lamp)
Total Lamp Lumens	37338
Luminaire Lumens	37345
Downward Total Efficiency	99 %
Total Luminaire Efficiency	100 %
Luminaire Efficacy Rating (LER)	97
Total Luminaire Watts	386
Ballast Factor	1.00
Upward Waste Light Ratio	0.01
Maximum Candela	26112.25
Maximum Candela Angle	67.5H 70V
Maximum Candela (<90 Degrees Vertical)	26112.25
Maximum Candela Angle (<90 Degrees Vertical)	67.5H 70V
Maximum Candela At 90 Degrees Vertical	1300.775 (3.5% Lamp Lumens)
Maximum Candela from 80 to <90 Degrees Vertical	12466.58 (33.4% Lamp Lumens)
Cutoff Classification (deprecated)	Non-Cutoff

**IES ROAD REPORT**  
**PHOTOMETRIC FILENAME : 350W 38500 LUMEN LED\_30D.IES**

**LUMINAIRE CLASSIFICATION SYSTEM (LCS)**

	Lumens	% Lamp	% Luminaire
FL - Front-Low (0-30)	2894.2	7.8	7.8
FM - Front-Medium (30-60)	13146.5	35.2	35.2
FH - Front-High (60-80)	15017.0	40.2	40.2
FVH - Front-Very High (80-90)	866.9	2.3	2.3
BL - Back-Low (0-30)	1604.2	4.3	4.3
BM - Back-Medium (30-60)	2657.2	7.1	7.1
BH - Back-High (60-80)	606.9	1.6	1.6
BVH - Back-Very High (80-90)	18.3	0.0	0.0
UL - Uplight-Low (90-100)	353.2	0.9	0.9
UH - Uplight-High (100-180)	180.1	0.5	0.5
Total	37344.5	99.9	100.0
BUG Rating	B3-U3-G5		

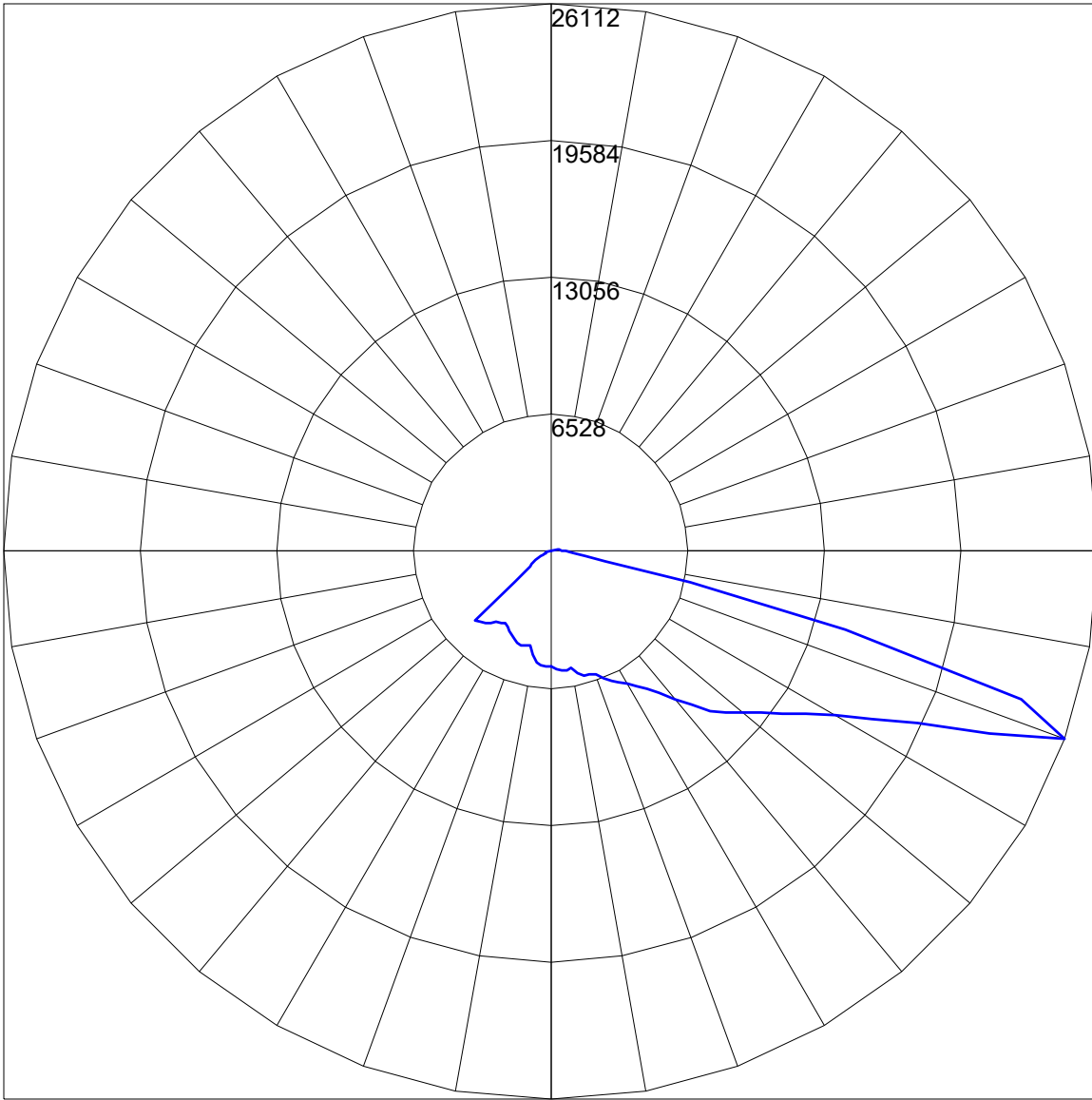
**COEFFICIENTS OF UTILIZATION**



**FLUX DISTRIBUTION**

	Lumens	Percent Of Lamp
Downward Street Side	31924.7	85.5
Downward House Side	4886.6	13.1
Downward Total	36811.3	98.6
Upward Street Side	533.0	1.4
Upward House Side	0.3	0.0
Upward Total	533.3	1.4
<b>Total Flux</b>	<b>37344.6</b>	<b>100.0</b>

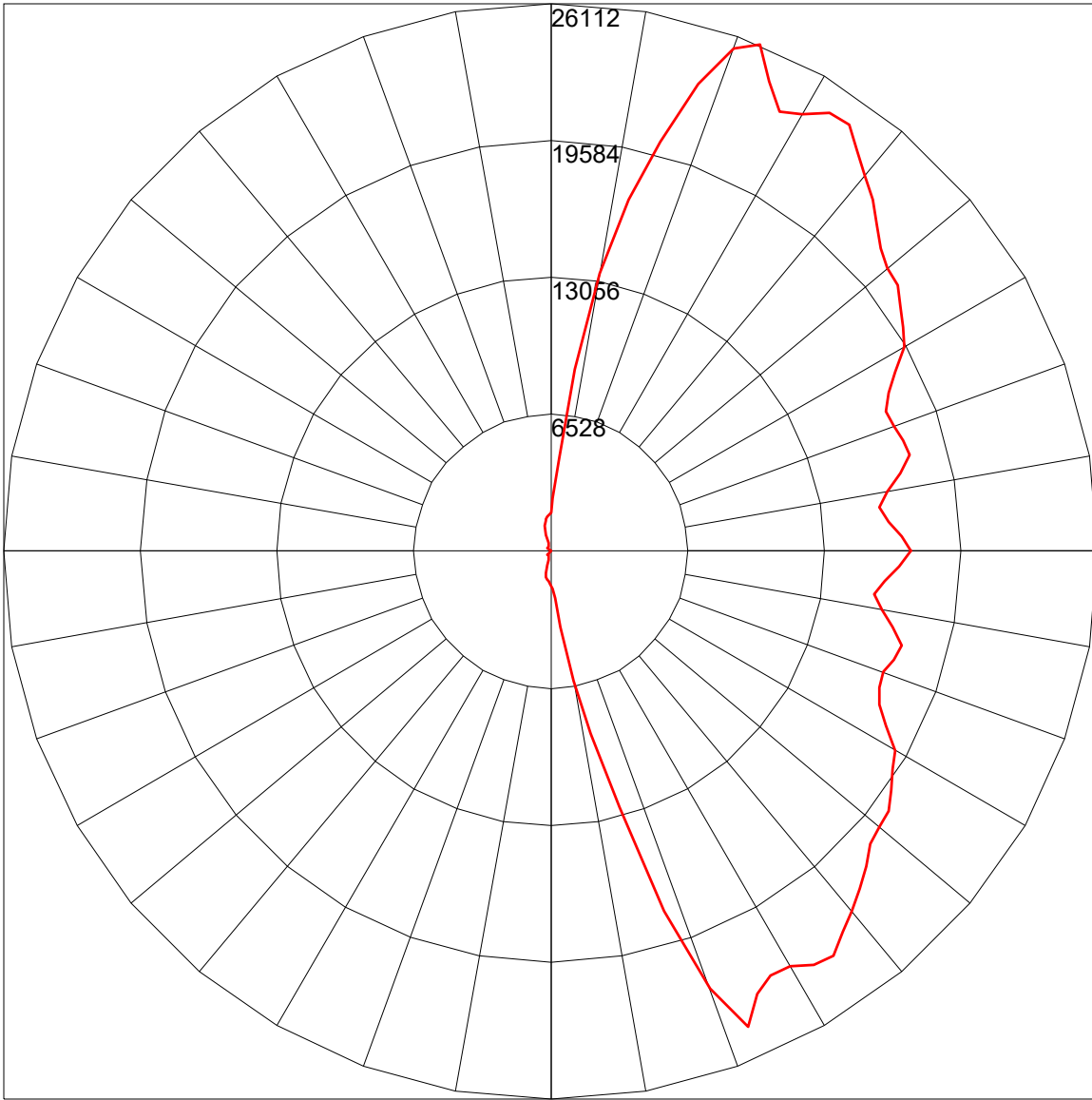
POLAR GRAPH



Maximum Candela = 26112.25 Located At Horizontal Angle = 67.5, Vertical Angle = 70  
Vertical Plane Through Horizontal Angles (67.5 - 247.5) (Through Max. Cd.)

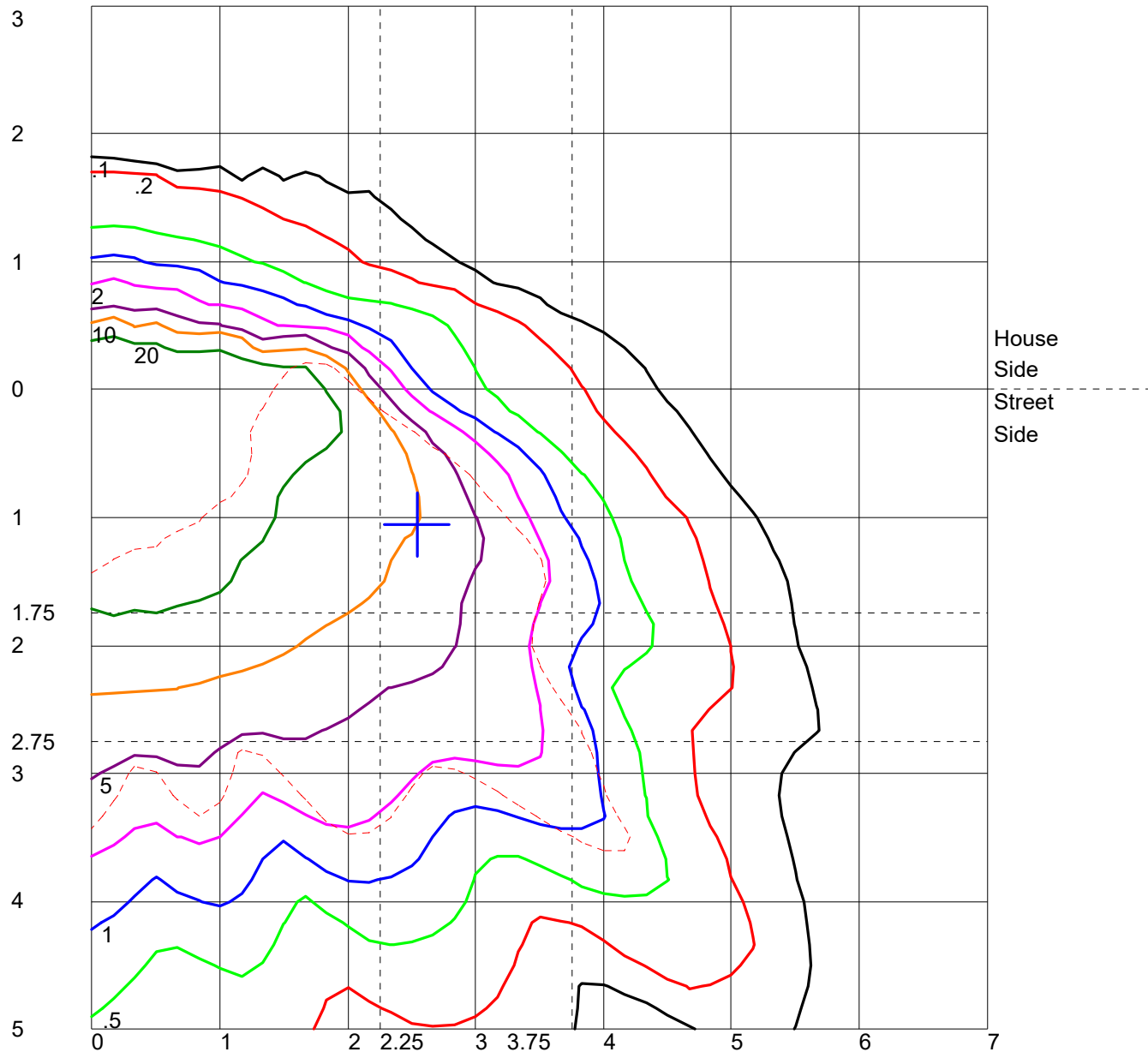


POLAR GRAPH



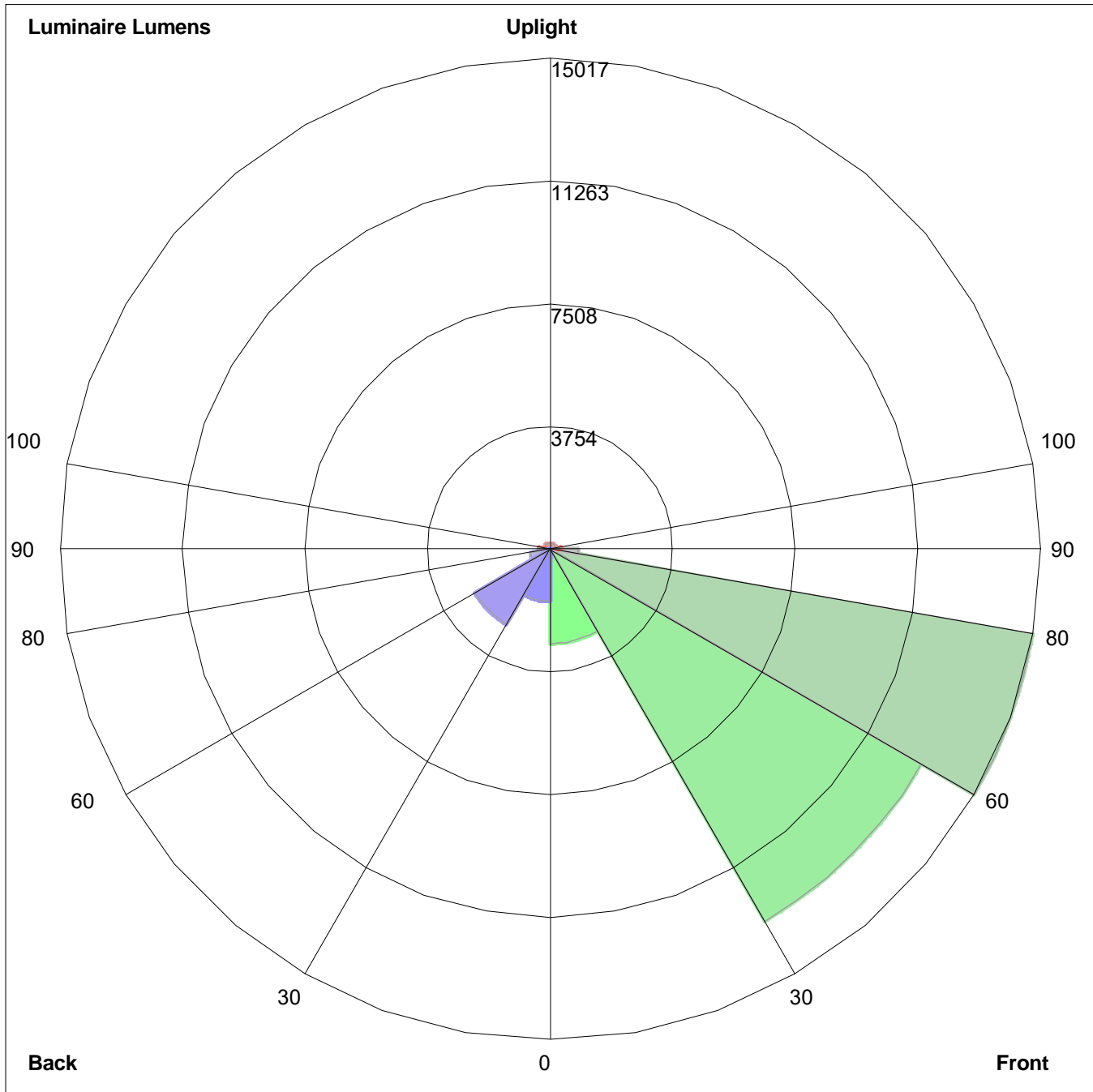
Maximum Candela = 26112.25 Located At Horizontal Angle = 67.5, Vertical Angle = 70  
Horizontal Cone Through Vertical Angle (70) (Through Max. Cd.)

ISOFOOTCANDLE LINES OF HORIZONTAL ILLUMINANCE



Distance In Units Of Mounting Height  
 Values Based On 10 Foot Mounting Height  
 1/2 Maximum Candela Trace Shown As Dashed Curve  
 (+) = Maximum Candela Point

LUMINAIRE CLASSIFICATION SYSTEM (LCS) GRAPH



Luminaire Lumens:  
Front: Low=2894.2, Medium=13146.5, High= 15017.0, Very High=866.9  
Back: Low=1604.2, Medium=2657.2, High=606.9, Very High=18.3  
Uplight: Low=353.2, High=180.1

BUG Rating : B3-U3-G5



Ultra high output, high efficiency LED floodlight with NEMA Types: 7H x 6V, 6H x 4V, 4H x 6V, 5H x 5V and 3H x 3V. patent-pending "Air-Flow" technology ensures long LED and driver lifespan. Use for general and security lighting for large areas, building façades, signs and landscapes.

Color: Bronze

Weight: 66.1 lbs

**Project:**

**Type:**

**Prepared By:**

**Date:**

### Driver Info

Type	Constant Current
120V	2.65A
208V	1.59A
240V	1.38A
277V	1.17A
Input Watts	325.9W

### LED Info

Watts	300W
Color Temp	5000K (Cool)
Color Accuracy	72 CRI
L70 Lifespan	100,000 Hours
Lumens	45,171
Efficacy	138.6 lm/W

## Technical Specifications

### Compliance

#### UL Listed:

Suitable for wet locations. Suitable for ground mounting.

#### IESNA LM-79 & LM-80 Testing:

RAB LED luminaires and LED components have been tested by an independent laboratory in accordance with IESNA LM-79 and LM-80.

### Optical

#### NEMA Type:

NEMA Beam Spread of 7H x 6V

### Performance

#### Lifespan:

100,000-Hour LED lifespan based on IES LM-80 results and TM-21 calculations

### Construction

#### IP Rating:

Ingress Protection rating of IP66 for dust and water

#### Maximum Ambient Temperature:

Suitable for use in up to 40°C (104°F)

#### Effective Projected Area:

EPA = 4

#### Cold Weather Starting:

Minimum starting temperature is -40°C (-40°F)

#### Thermal Management:

Superior thermal management with external "Air-Flow" fins

#### Lens:

Tempered glass lens

#### Housing:

Die-cast aluminum housing and door frame

#### Mounting:

Heavy-duty slipfitter for 2 3/8"OD pipe

#### Reflector:

Specular and semi-specular vacuum-metalized polycarbonate

#### Gaskets:

High-temperature silicone gaskets

## Technical Specifications (continued)

### Construction

#### Finish:

Formulated for high durability and long-lasting color

#### Green Technology:

Mercury and UV free. RoHS-compliant components.

#### Tilt Increment:

Rotates in 6 degree increments

### LED Characteristics

#### LEDs:

Multip-chip, high-output, long-life LEDs

#### Color Consistency:

7-step MacAdam Ellipse binning to achieve consistent fixture-to-fixture color

#### Color Stability:

LED color temperature is warrantied to shift no more than 200K in color temperature over a 5-year period

#### Color Uniformity:

RAB's range of Correlated Color Temperature follows the guidelines of the American National Standard for Specifications for the Chromaticity of Solid State Lighting (SSL) Products, ANSI C78.377-2017.

### Electrical

#### Drivers:

Constant Current, 1050mA, 50/60 Hz, 120-277V, 4 kV surge protection, 120V: 2.65A, 208V: 1.59A, 240V: 1.38A, 277V: 1.17A, THD <20%, Power Factor: 99%

#### THD:

9.26% at 120V, 12.56% at 277V

#### Power Factor:

99.3% at 120V, 96.6% at 277V

#### Note:

All values are typical (tolerance +/- 10%)

### Other

#### Equivalency:

Equivalent to 1000W Metal Halide

#### Warranty:

RAB warrants that our LED products will be free from defects in materials and workmanship for a period of five (5) years from the date of delivery to the end user, including coverage of light output, color stability, driver performance and fixture finish. RAB's warranty is subject to all terms and conditions found at [rablighting.com/warranty](http://rablighting.com/warranty).

#### Buy American Act Compliance:

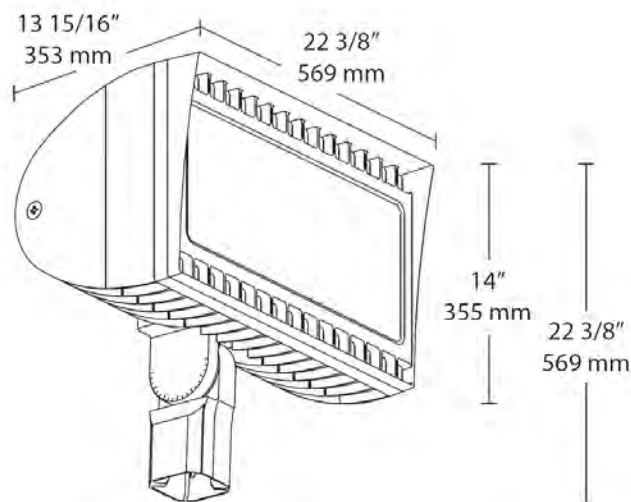
RAB values USA manufacturing! Upon request, RAB may be able to manufacture this product to be compliant with the Buy American Act (BAA). Please contact customer service to request a quote for the product to be made BAA compliant.

### Listings

#### DLC Listed:

This product is listed by Design Lights Consortium (DLC) as an ultra-efficient premium product that qualifies for the highest tier of rebates from DLC Member Utilities. DLC Product Code: PF5PMFXJ

### Dimensions



### Features

- 300W replaces 1000 MH floodlights
- 100,000-hour LED lifespan
- 5-Year, No-Compromise Warranty

## Ordering Matrix

Family	Wattage	Mounting	Color Temp	NEMA Type	Finish	Driver Options	Options	Other Options
FXLED	300	SF						
	<b>200</b> = 200W <b>300</b> = 300W	<b>SF</b> = Slipfitter <b>T</b> = Trunnion	<b>Blank</b> = 5000K (Cool) <b>N</b> = 4000K (Neutral) <b>Y</b> = 3000K (Warm)	<b>Blank</b> = 7H x 6V <b>B64</b> = 6H x 4V <b>B55</b> = 5H x 5V <b>B33</b> = 3H x 3V <b>B46</b> = 4H x 6V	<b>Blank</b> = Bronze <b>W</b> = White	<b>Blank</b> = 120-277V <b>/480</b> = 480V <b>/BL</b> = Bi-Level (Slipfitters only) <sup>1</sup> <b>/D10</b> = 0-10V Dimming	<b>Blank</b> = No option <b>/PCS</b> = 120V Swivel <b>/PCS2</b> = 277V Swivel <b>/PCT</b> = 120-277V Twistlock <b>/PCT4</b> = 480V Twistlock <b>/PCS4</b> = 480V Swivel <b>/LC</b> = Lightcloud® Controller	<b>USA</b> = BAA Compliant <b>Blank</b> = Standard

<sup>1</sup> Slipfitter models only





**IES ROAD REPORT**  
**PHOTOMETRIC FILENAME : RABFXLED300SF\_30D.IES**

**DESCRIPTIVE INFORMATION (From Photometric File)**

IESNA:LM-63-2002  
 [TEST] DLF20180512001-1a  
 [TESTLAB] Deliver Co. Ltd.  
 [MANUFAC] RAB LIGHTING INC. RC LIGHTING  
 [ISSUEDATE] 05/12/18  
 [\_CONVERT] Luminaire test position and photometric web converted from original test data

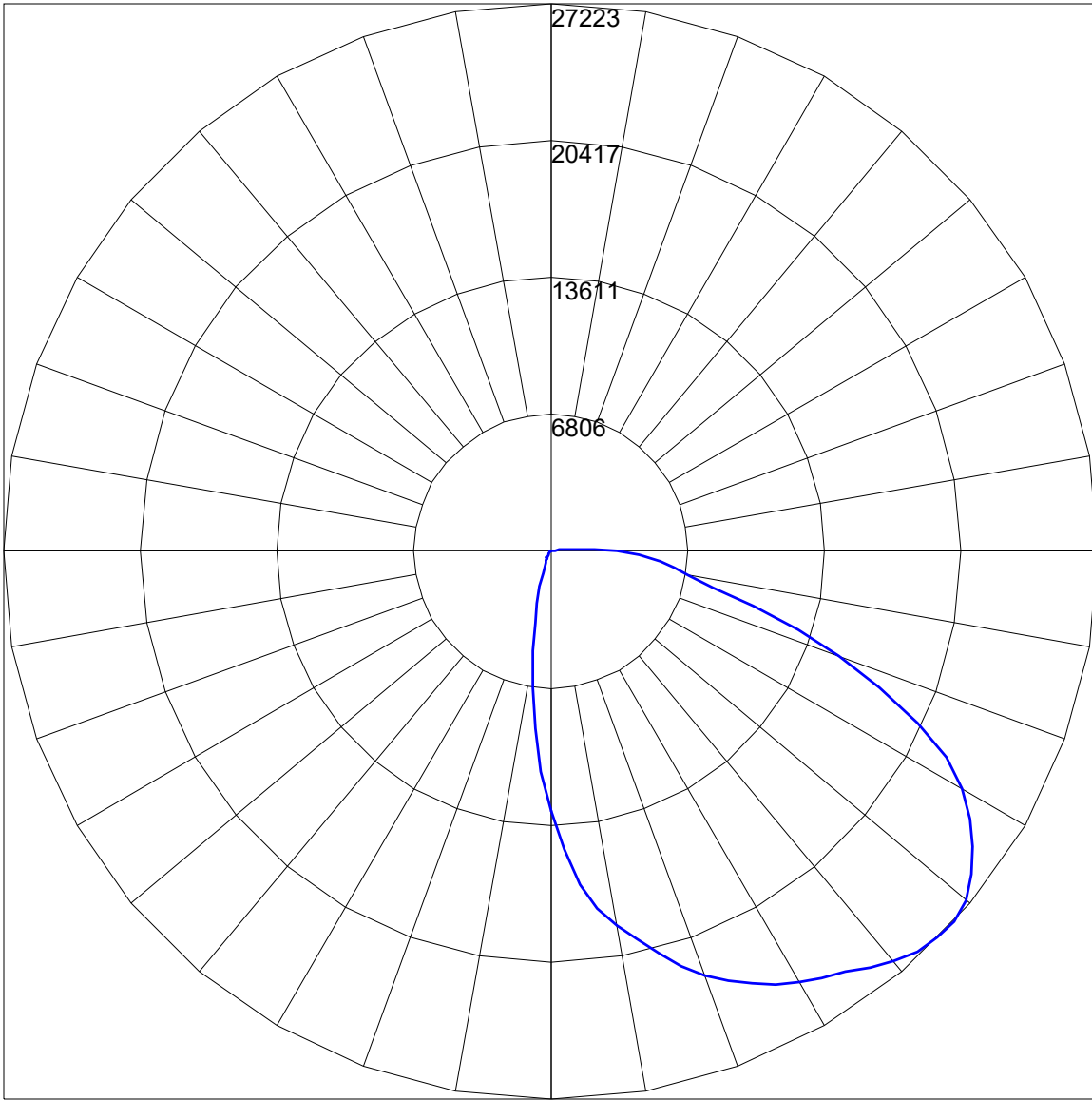
**CHARACTERISTICS**

IES Classification	Type IV
Longitudinal Classification	Very Short
Lumens Per Lamp	N.A. (absolute)
Total Lamp Lumens	N.A. (absolute)
Luminaire Lumens	45134
Downward Total Efficiency	N.A. (absolute)
Total Luminaire Efficiency	N.A. (absolute)
Luminaire Efficacy Rating (LER)	138
Total Luminaire Watts	325.921
Ballast Factor	1.00
Upward Waste Light Ratio	0.01
Maximum Candela	27222.949
Maximum Candela Angle	360H 47.5V
Maximum Candela (<90 Degrees Vertical)	27222.949
Maximum Candela Angle (<90 Degrees Vertical)	360H 47.5V
Maximum Candela At 90 Degrees Vertical	3383.779 (7.5% Luminaire Lumens)
Maximum Candela from 80 to <90 Degrees Vertical	7519.438 (16.7% Luminaire Lumens)
Cutoff Classification (deprecated)	N.A. (absolute)

**LUMINAIRE CLASSIFICATION SYSTEM (LCS)**

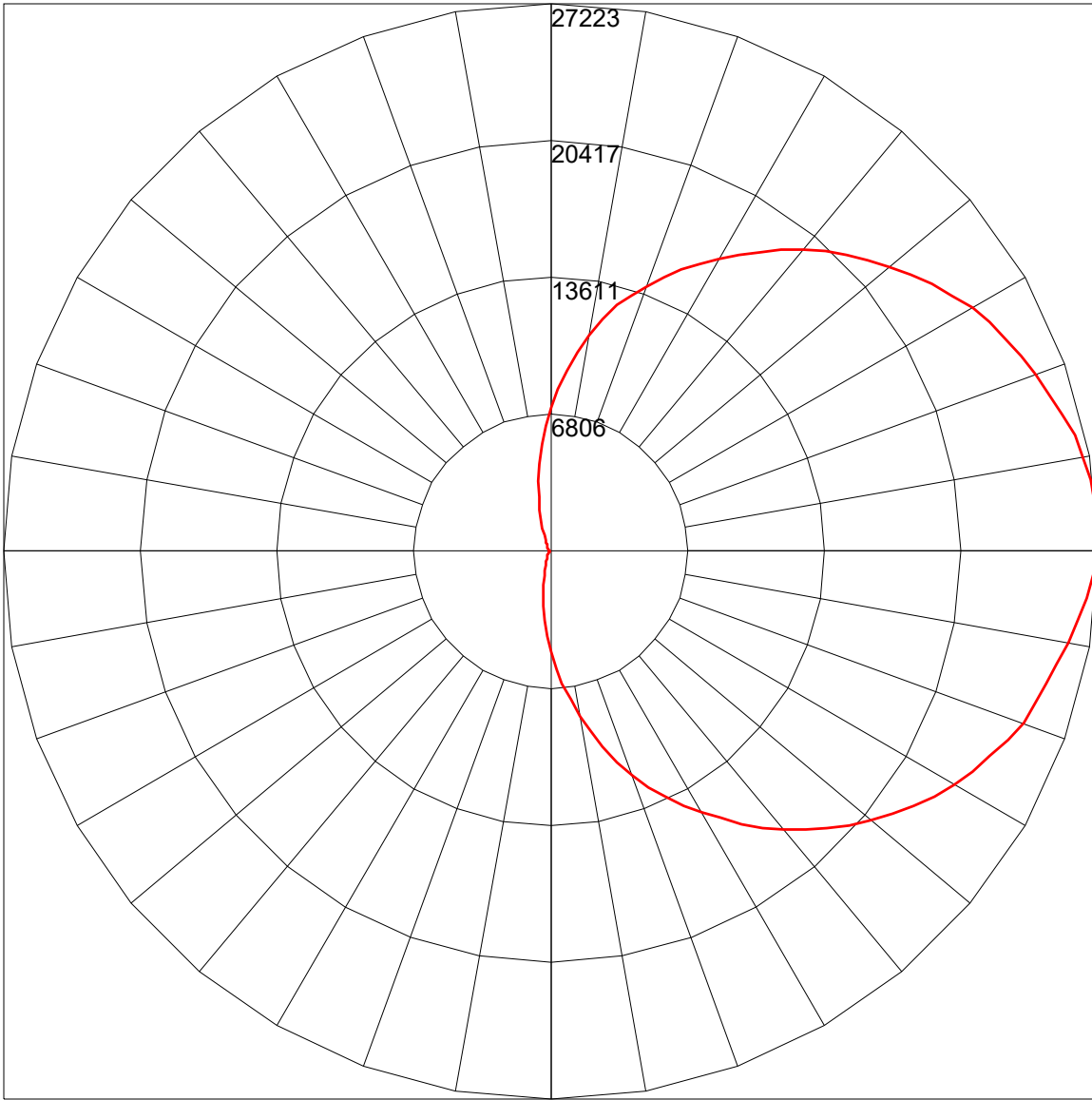
	Lumens	% Lamp	% Luminaire
FL - Front-Low (0-30)	7859.9	N.A.	17.4
FM - Front-Medium (30-60)	21395.0	N.A.	47.4
FH - Front-High (60-80)	10409.2	N.A.	23.1
FVH - Front-Very High (80-90)	1598.0	N.A.	3.5
BL - Back-Low (0-30)	2114.1	N.A.	4.7
BM - Back-Medium (30-60)	1264.3	N.A.	2.8
BH - Back-High (60-80)	112.0	N.A.	0.2
BVH - Back-Very High (80-90)	3.2	N.A.	0.0
UL - Uplight-Low (90-100)	305.4	N.A.	0.7
UH - Uplight-High (100-180)	72.5	N.A.	0.2
<b>Total</b>	<b>45133.6</b>	<b>N.A.</b>	<b>100.0</b>
<b>BUG Rating</b>	<b>B3-U3-G5</b>		

POLAR GRAPH



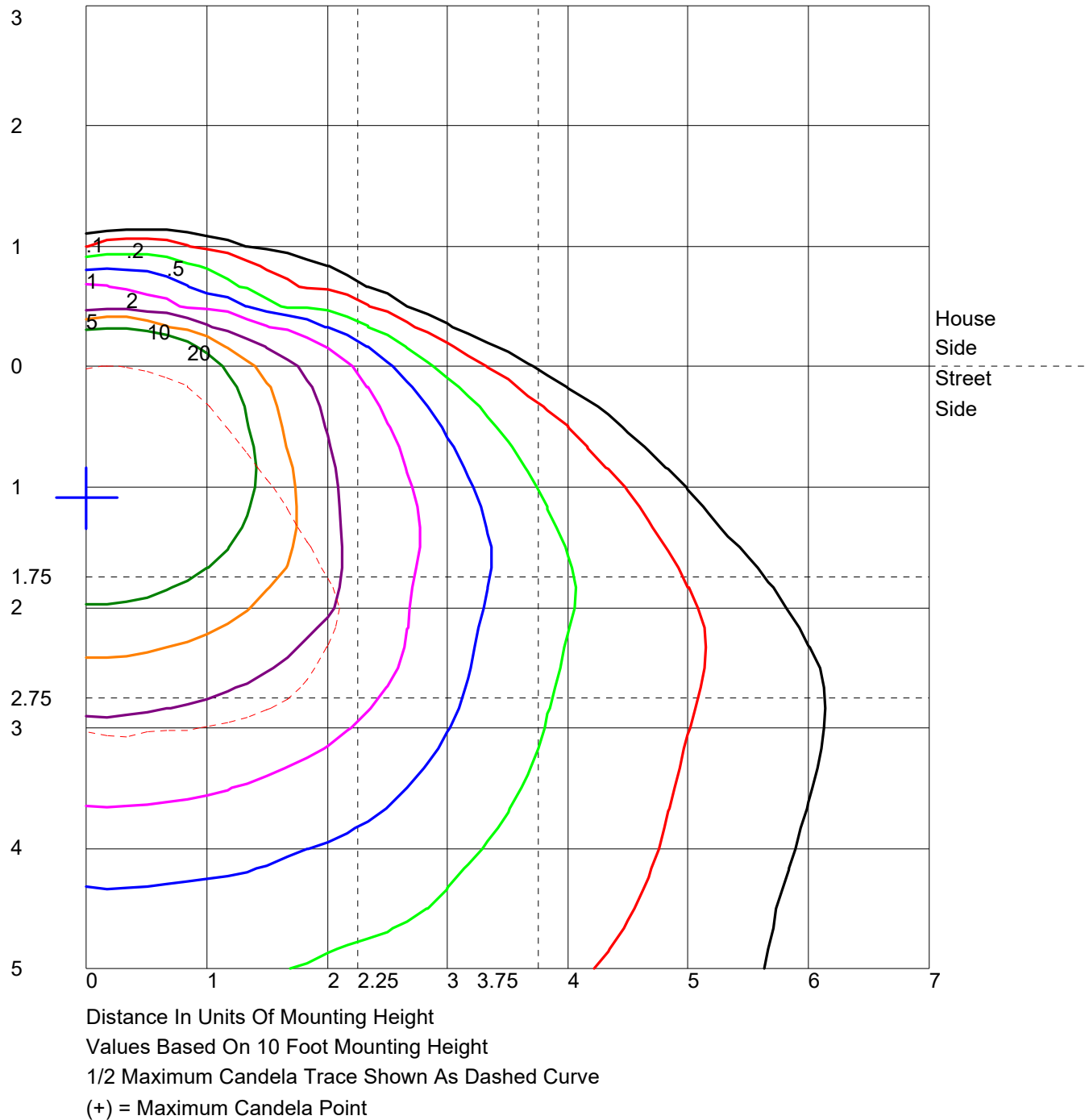
Maximum Candela = 27222.949 Located At Horizontal Angle = 360, Vertical Angle = 47.5  
Vertical Plane Through Horizontal Angles (360 - 180) (Through Max. Cd.)

POLAR GRAPH

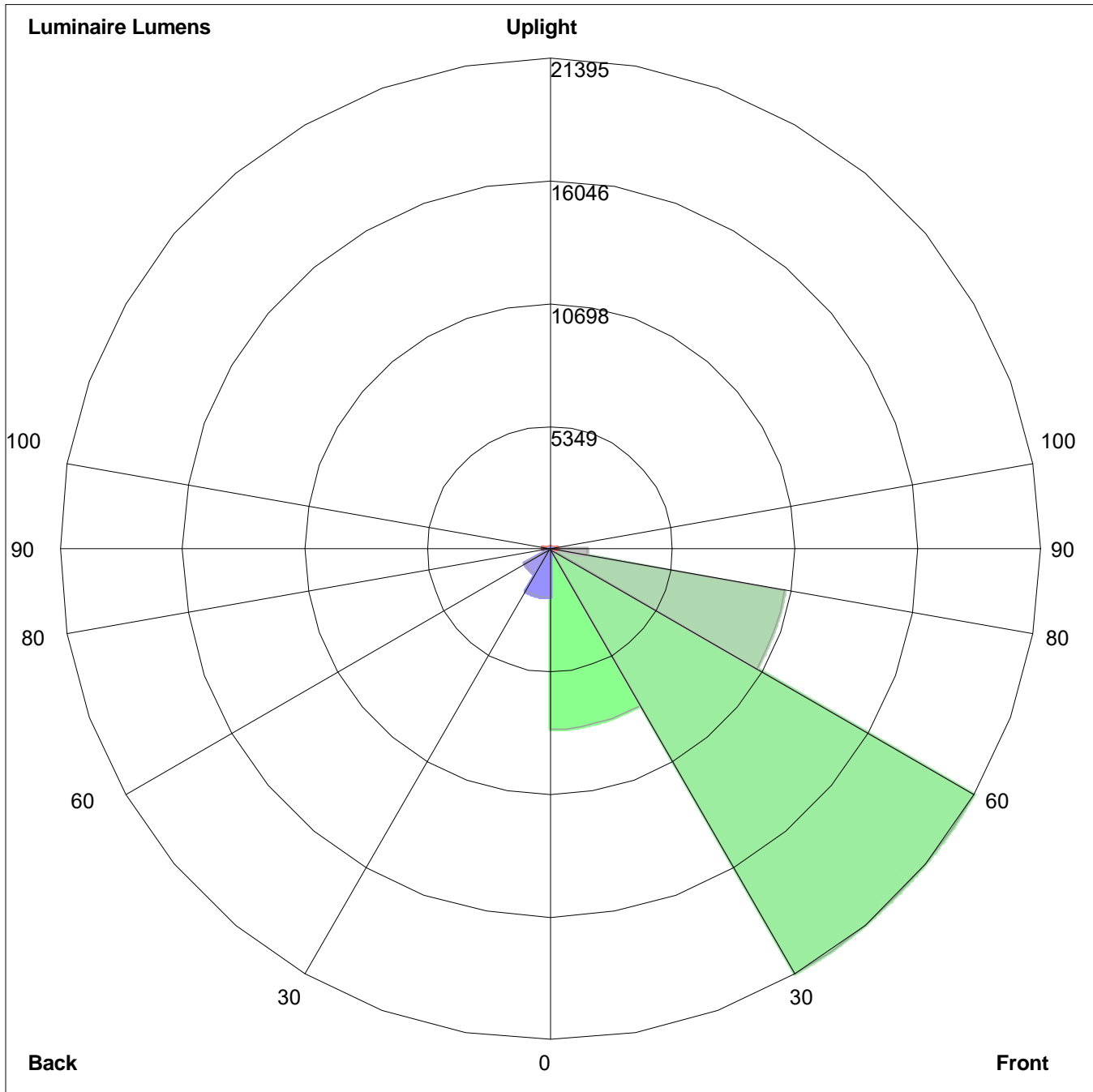


Maximum Candela = 27222.949 Located At Horizontal Angle = 360, Vertical Angle = 47.5  
Horizontal Cone Through Vertical Angle (47.5) (Through Max. Cd.)

ISOFOOTCANDLE LINES OF HORIZONTAL ILLUMINANCE



LUMINAIRE CLASSIFICATION SYSTEM (LCS) GRAPH



Luminaire Lumens:  
 Front: Low=7859.9, Medium= 21395.0, High=10409.2, Very High= 1598.0  
 Back: Low=2114.1, Medium=1264.3, High=112.0, Very High=3.2  
 Uplight: Low=305.4, High=72.5

BUG Rating : B3-U3-G5

**Job Name:**

Providence Energy LTD - Well Pad - Lighting

**Catalog Number:**SLM LED 42L SIL FT UNV DIM 40  
70CRI PCI(VOLTAGE)BRZ IL

Notes:

**Type:****SITE**

FLC21-10453



Catalog #: \_\_\_\_\_ Project: \_\_\_\_\_

Prepared By: \_\_\_\_\_ Date: \_\_\_\_\_ Type: \_\_\_\_\_

# Slice Medium (SLM)

## Outdoor LED Area Light



IP66

**OVERVIEW**

Lumen Package	9,000 - 48,000
Wattage Range	63 - 401
Efficacy Range (LPW)	112 - 156
Weight lbs(kg)	30 (13.6)

**QUICK LINKS**
[Ordering Guide](#)
[Performance](#)
[Photometrics](#)
[Dimensions](#)
**FEATURES & SPECIFICATIONS****Construction**

- Rugged die-cast aluminum housing contains factory prewired driver and optical unit. Cast aluminum wiring access door located underneath.
- Fixtures are finished with LSI's DuraGrip® polyester powder coat finishing process. The DuraGrip finish withstands extreme weather changes without cracking or peeling. Other standard LSI finishes available. Consult factory.
- Shipping weight: 37 lbs in carton.

**Optical System**

- State-of-the-Art one piece silicone optic sheet delivers industry leading optical control with an integrated gasket to provide IP66 rated seal.
- Proprietary silicone refractor optics provide exceptional coverage and uniformity in distribution types 2, 3, 5W, FT, FTA and AM.
- Silicone optical material does not yellow or crack with age and provides a typical light transmittance of 93%.
- Zero uplight.
- Available in 5000K, 4000K, and 3000K color temperatures per ANSI C78.377. Also available in phosphor converted amber with peak intensity at 610nm.
- Minimum CRI of 70
- Integral louver (IL) and house-side shield (IH) options available for improved backlight control without sacrificing street side performance. See page 3 for more details.

**Electrical**

- High-performance driver features overvoltage, under-voltage, short-circuit and over temperature protection.
- 0-10V dimming (10% - 100%) standard.
- Standard Universal Voltage (120-277 VAC) Input 50/60 Hz or optional High Voltage (347-480 VAC).
- L80 Calculated Life: >100k Hours (See Lumen Maintenance on Page 5)
- Total harmonic distortion: <20%
- Operating temperature: -40°C to +50°C (-40°F to +122°F). 42L and 48L lumen packages rated to +40°C.
- Power factor: >.90
- Input power stays constant over life.
- Field replaceable 10kV surge protection device meets a minimum Category C Low operation (per ANSI/IEEE C62.41.2).
- High-efficacy LEDs mounted to metal-core circuit board to maximize heat dissipation
- Driver is fully encased in potting material for moisture resistance and complies with FCC standards. Driver and key electronic components can easily be accessed.

**Controls**

- Optional integral passive infrared Bluetooth™ motion and photocell sensor. Fixtures operate independently and can be commissioned via iOS or Android configuration app.
- LSI's AirLink™ wireless control system options reduce energy and maintenance costs while optimizing light quality 24/7.

**Installation**

- A single fastener secures the hinged door, underneath the housing and provides quick & easy access to the electrical compartment.
- Included terminal block accepts up to 12 ga. wire.
- Utilizes LSI's traditional B3 drill pattern. (See drawing on page 9)

**Warranty**

- LSI luminaires carry a 5-year limited warranty. Refer to <https://www.lsiindustries.com/resources/terms-and-warranty.aspx> for more information.

**Listings**

- Listed to UL 1598 and UL 8750.
- Meets Buy American Act requirements.
- IDA compliant; with 3000K color temperature selection.
- Title 24 Compliant; see local ordinance for qualification information.
- Suitable for wet locations.
- IP66 rated Luminaire per IEC 60598-1.
- 3G rated for ANSI C136.31 high vibration applications applications are qualified.
- DesignLights Consortium® (DLC) qualified product. Not all versions of this product may be DLC qualified. Please check the DLC Qualified Products List at [www.designlights.org/QPL](http://www.designlights.org/QPL) to confirm which versions are qualified.
- Patented Silicone Optics (US Patent NO. 10,816,165 B2)







Type: \_\_\_\_\_

## Slice Medium Outdoor LED Area Light

### ORDERING GUIDE

[Back to Quick Links](#)

TYPICAL ORDER EXAMPLE: **SLM LED 36L SIL FTA UNV DIM 50 70CRI ALSCS04 BRZ IL**

Luminaire Prefix	Light Source	Lumen Package	Light Output	Distribution	Orientation <sup>2</sup>	Voltage	Driver
SLM - Slice Medium	LED	9L - 9,000 lms 12L - 12,000 lms 18L - 18,000 lms 24L - 24,000 lms 30L - 30,000 lms 36L - 36,000 lms 42L - 42,000 lms 48L - 48,000 lms Custom Lumen Packages <sup>1</sup>	SIL - Silicone	2 - Type 2 3 - Type 3 5W - Type 5 Wide FT - Forward Throw FTA - Forward Throw Automotive AM - Automotive Merchandise	(blank) - standard (no rotation) L - Optics rotated left 90° R - Optics rotated right 90°	UNV - Universal Voltage (120-277V) HV - High Voltage (347-480V)	DIM - 0-10V Dimming (0-10%)

Color Temp	Color Rendering	Controls (Choose One)	Finish	Options
50 - 5,000 CCT 40 - 4,000 CCT 30 - 3,000 CCT AMB - Phosphor Converted Amber <sup>12</sup>	70CRI - 70 CRI	(Blank) - None  <b>Wireless Controls System</b> ALSC - AirLink Synapse Control System ALSCS02 - AirLink Synapse Control System with 12-20' Motion Sensor ALSCS04 - AirLink Synapse Control System with 20-40' Motion Sensor ALBCS1 - AirLink Blue Wireless Motion & Photo Sensor Controller (8-24' mounting height) <sup>4</sup> ALBCS2 - AirLink Blue Wireless Motion & Photo Sensor Controller (25-40' mounting height) <sup>4</sup> <b>Stand-Alone Controls</b> EXT - 0-10V Dimming leads extended to housing exterior CR7P - 7 Pin Control Receptacle ANSI C136.41 <sup>6</sup> IMSBT1 - Integral Bluetooth™ Motion and Photocell Sensor max 8-24' mounting height <sup>4,5</sup> IMSBT2 - Integral Bluetooth™ Motion and Photocell Sensor max 25-40' mounting height <sup>4,5</sup> <b>Button Type Photocells</b> PCI120 - 120V PCI208-277 - 208 -277V PCI347 - 347V	BLK - Black BRZ - Dark Bronze GMG - Gun Metal Gray GPT - Graphite MSV - Metallic Silver PLP - Platinum Plus SVG - Satin Verde Green WHT - White	(Blank) - None IH - Integral Houseside Shield <sup>2</sup> IL - Integral Louver (Sharp Spill Light Cutoff) <sup>2</sup>

#### Accessories Ordering Information<sup>7</sup>

Controls Accessories	
Description	Order Number
Twist Lock Photocell (120V) for use with CR7P <sup>8</sup>	122514
Twist Lock Photocell (208-277) for use with CR7P <sup>8</sup>	122515
Twist Lock Photocell (347V) for use with CR7P <sup>8</sup>	122516
Twist Lock Photocell (480V) for use with CR7P <sup>8</sup>	1225180
AirLink 5 Pin Twist Lock Controller <sup>8</sup>	61409
AirLink 7 Pin Twist Lock Controller <sup>8</sup>	661410
Pole-Mounted Occupancy Sensor (24V)	663284CLR <sup>9</sup>
Shorting Cap for use with CR7P <sup>8</sup>	14932

Fusing Accessories <sup>11</sup>	
Description	Order Number
Single Fusing (120V)	FK120
Single Fusing (277V)	FK277
Double Fusing (208V, 240V)	DFK240
Double Fusing (480V)	DFK480
Double Fusing (347V)	DFK347

Mounting Accessories <sup>9</sup>	
Description	Order Number
Round Pole Adapter (3" Round/Tapered Poles)	408273CLR
Round Pole Adapter (4" Round Poles)	379967CLR
Round Pole Adapter (5" Round Poles)	379968CLR
Universal Mounting Bracket	684616CLR
Adjustable Slip Fitter (2" - 2 3/8" Tenon)	688138CLR
Quick Mount Pole Bracket (Square Pole)	687073CLR
Quick Mount Pole Bracket (4-5" Round Pole)	689903CLR
15 Tilt Quick Mount Pole Bracket (Square Pole)	688003CLR
15 Tilt Quick Mount Pole Bracket (4-5" Round Pole)	689905CLR
Wall Mount Bracket	382132CLR
Wood Pole Bracket (6" Minimum Pole Diameter)	751219CLR

Shielding & Miscellaneous Accessories	
Description	Order Number
Integral Louver/Shield	690981
Internal Houseside Shield	743415
10' Linear Bird Spike Kit (6' Recommended per Luminaire)	736795

#### FOOTNOTES:

- Custom lumen and wattage packages available, consult factory. Values are within industry standard tolerances but not DLC listed.
- Not available on "Type 5W" distribution.
- Consult factory for availability.
- Not available in HV.
- IMSBT is field configurable via the LSI app that can be downloaded from your smartphone's native app store. Consult Factory for 347-480V.

- Control device or shorting cap must be ordered separately. See Accessory Ordering Information.
- Accessories are shipped separately and field installed.
- Fusing must be located in hand hole of pole.
- "CLR" denotes finish. See Finish options.
- Only available with ALSC/ALSCH control options.
- Fusing must be located in hand hole of pole.
- Only available in 9L and 12L Lumen Packages. Consult factory for lead time and availability.



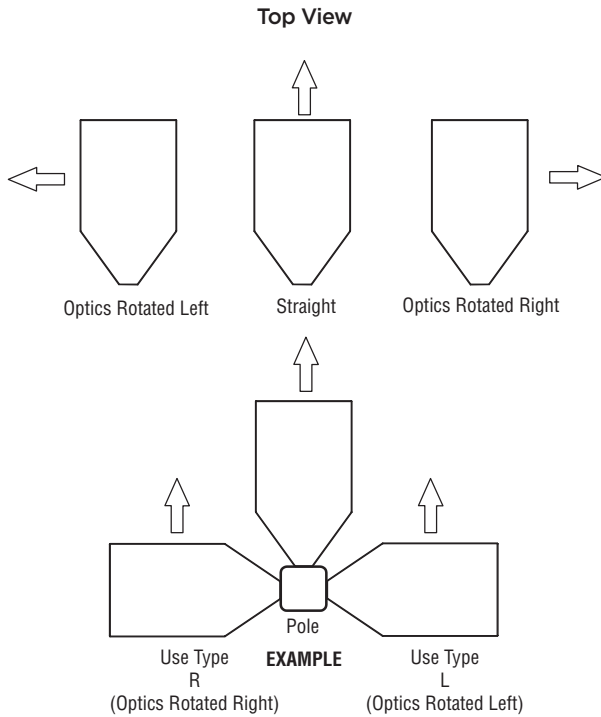


Type: \_\_\_\_\_

## Slice Medium Outdoor LED Area Light

### OPTICS ROTATION

### ACCESSORIES/OPTIONS



### Integral Louver (IL) and House-Side Shield (IH)

Accessory louver and shield available for improved backlight control without sacrificing street side performance. LSI's Integral Louver (L) and Integral House-Side Shield (IH) options deliver backlight control that significantly reduces spill light behind the poles for applications with pole locations close to adjacent properties. The design maximizes forward reflected light while reducing glare, maintaining the optical distribution selected, and most importantly eliminating light trespass. Both options rotate with the optical distribution.

Luminaire Shown with Integral Louver (IL)



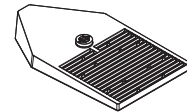
Luminaire Shown with IMSBT Option



### 7 Pin Photoelectric Control

7-pin ANSI C136.41-2013 control receptacle option available for twist lock photocontrols or wireless control modules. Control accessories sold separately. Dimming leads from the receptacle will be connected to the driver dimming leads (Consult factory for alternate wiring).

Fixture Shown with CR7P





Type: \_\_\_\_\_

## Slice Medium Outdoor LED Area Light

### PERFORMANCE

[Back to Quick Links](#)

Delivered Lumens*												
Lumen Package	Distribution	CRI	3000K CCT			4000K CCT			5000K CCT			Wattage
			Delivered Lumens	Efficacy	BUG Rating	Delivered Lumens	Efficacy	BUG Rating	Delivered Lumens	Efficacy	BUG Rating	
9L	2	70	9411	149	B2-U0-G2	9603	152	B2-U0-G2	9603	152	B2-U0-G2	63
	3		9548	152	B2-U0-G2	9743	155	B2-U0-G2	9743	155	B2-U0-G2	
	5W		9261	147	B3-U0-G2	9450	150	B3-U0-G2	9450	150	B3-U0-G2	
	FT		9464	150	B2-U0-G2	9657	153	B2-U0-G2	9657	153	B2-U0-G2	
	FTA		9531	151	B2-U0-G2	9725	154	B2-U0-G2	9725	154	B2-U0-G2	
	AM		9649	153	B2-U0-G1	9845	156	B2-U0-G1	9845	156	B2-U0-G1	
12L	2	70	12533	147	B3-U0-G2	12788	150	B3-U0-G2	12788	150	B3-U0-G2	85
	3		12714	150	B2-U0-G2	12974	153	B2-U0-G2	12974	153	B2-U0-G2	
	5W		12333	145	B4-U0-G2	12584	148	B4-U0-G2	12584	148	B4-U0-G2	
	FT		12603	148	B2-U0-G2	12861	151	B2-U0-G2	12861	151	B2-U0-G2	
	FTA		12692	149	B3-U0-G2	12950	152	B3-U0-G2	12950	152	B3-U0-G2	
	AM		12848	151	B3-U0-G1	13111	154	B3-U0-G2	13111	154	B3-U0-G2	
18L	2	70	18421	136	B3-U0-G3	18797	139	B3-U0-G3	18797	139	B3-U0-G3	135
	3		18691	138	B3-U0-G3	19072	141	B3-U0-G3	19072	141	B3-U0-G3	
	5W		18128	134	B4-U0-G2	18498	137	B4-U0-G2	18498	137	B4-U0-G2	
	FT		18526	137	B3-U0-G3	18904	140	B3-U0-G3	18904	140	B3-U0-G3	
	FTA		18656	138	B3-U0-G3	19037	141	B3-U0-G3	19037	141	B3-U0-G3	
	AM		18886	140	B3-U0-G2	19271	143	B3-U0-G2	19271	143	B3-U0-G2	
24L	2	70	24847	141	B4-U0-G3	25354	144	B4-U0-G3	25354	144	B4-U0-G3	176
	3		25210	143	B3-U0-G4	25724	146	B3-U0-G4	25724	146	B3-U0-G4	
	5W		24451	139	B5-U0-G3	24950	142	B5-U0-G3	24950	142	B5-U0-G3	
	FT		24987	142	B3-U0-G4	25497	145	B3-U0-G4	25497	145	B3-U0-G4	
	FTA		25162	143	B4-U0-G3	25676	146	B4-U0-G3	25676	146	B4-U0-G3	
	AM		25473	145	B3-U0-G2	25993	148	B3-U0-G2	25993	148	B3-U0-G2	
30L	2	70	31109	134	B4-U0-G3	31743	137	B4-U0-G3	31743	137	B4-U0-G3	232
	3		31562	136	B4-U0-G4	32206	139	B4-U0-G4	32206	139	B4-U0-G4	
	5W		30612	132	B5-U0-G3	31237	135	B5-U0-G3	31237	135	B5-U0-G3	
	FT		31283	135	B4-U0-G4	31921	138	B4-U0-G4	31921	138	B4-U0-G4	
	FTA		31503	136	B4-U0-G3	32146	139	B4-U0-G3	32146	139	B4-U0-G3	
	AM		31892	137	B3-U0-G3	32543	140	B4-U0-G3	32543	140	B4-U0-G3	
36L	2	70	36846	129	B4-U0-G3	37597	131	B4-U0-G3	37597	131	B4-U0-G3	286
	3		37383	131	B4-U0-G4	38146	133	B4-U0-G4	38146	133	B4-U0-G4	
	5W		36258	127	B5-U0-G4	36998	129	B5-U0-G4	36998	129	B5-U0-G4	
	FT		37052	130	B4-U0-G4	37808	132	B4-U0-G4	37808	132	B4-U0-G4	
	FTA		37313	130	B4-U0-G4	38075	133	B4-U0-G4	38075	133	B4-U0-G4	
	AM		37774	132	B4-U0-G3	38545	135	B4-U0-G3	38545	135	B4-U0-G3	
42L	2	70	42623	121	B5-U0-G4	43492	124	B5-U0-G4	43492	124	B5-U0-G4	352
	3		43245	123	B4-U0-G5	44127	125	B4-U0-G5	44127	125	B4-U0-G5	
	5W		41943	119	B5-U0-G4	42799	122	B5-U0-G4	42799	122	B5-U0-G4	
	FT		42863	122	B4-U0-G5	43737	124	B4-U0-G5	43737	124	B4-U0-G5	
	FTA		43163	123	B5-U0-G4	44044	125	B5-U0-G4	44044	125	B5-U0-G4	
	AM		43696	124	B4-U0-G3	44588	127	B4-U0-G3	44588	127	B4-U0-G3	
48L	2	70	45975	114	B5-U0-G4	46914	116	B5-U0-G4	46914	116	B5-U0-G4	401
	3		46646	115	B4-U0-G5	47598	118	B4-U0-G5	47598	118	B4-U0-G5	
	5W		45243	112	B5-U0-G4	46166	114	B5-U0-G4	46166	114	B5-U0-G4	
	FT		46235	114	B4-U0-G5	47178	116	B4-U0-G5	47178	116	B4-U0-G5	
	FTA		46559	115	B5-U0-G4	47509	117	B5-U0-G4	47509	117	B5-U0-G4	
	AM		47134	116	B4-U0-G3	48096	119	B4-U0-G3	48096	119	B4-U0-G3	





Type: \_\_\_\_\_

## Slice Medium Outdoor LED Area Light

### PERFORMANCE (CONT.)

ELECTRICAL DATA (AMPS)*						
Lumens	120V	208V	240V	277V	347V	480V
9L	0.53	0.30	0.26	0.23	0.18	0.13
12L	0.71	0.41	0.35	0.31	0.24	0.18
18L	1.13	0.65	0.56	0.49	0.39	0.28
24L	1.47	0.85	0.73	0.64	0.51	0.37
30L	1.93	1.12	0.97	0.84	0.67	0.48
36L	2.38	1.38	1.19	1.03	0.82	0.60
42L	2.93	1.69	1.47	1.27	1.01	0.73
48L	3.4	1.9	1.7	1.5	1.2	.8

\*Electrical data at 25°C (77°F). Actual wattage may differ by +/-10%

**FOOTNOTES:**

- Lumen maintenance values at 25C are calculated per TM-21 based on LM-80 data and in-situ testing.
- In accordance with IESNA TM-21-11, Projected Values represent interpolated value based on time durations that are within six times the IESNA LM-80-08 total test duration for the device under testing.
- In accordance with IESNA TM-21-11, Calculated Values represent time durations that exceed six times the IESNA LM-80-08 total test duration for the device under testing.

RECOMMENDED LUMEN MAINTENANCE <sup>1</sup> (9-18L)					
Ambient	Initial <sup>2</sup>	25h <sup>2</sup>	50hr <sup>2</sup>	75hr <sup>2</sup>	100hr <sup>2</sup>
0 C	100%	97%	94%	90%	87%
10 C	100%	97%	94%	90%	87%
20 C	100%	97%	94%	90%	87%
25 C	100%	97%	93%	90%	86%
30 C	100%	97%	93%	89%	86%
40 C	100%	97%	92%	88%	84%
50 C	100%	96%	91%	87%	83%

RECOMMENDED LUMEN MAINTENANCE <sup>1</sup> (24-48L)					
C	0 hrs. <sup>2</sup>	25 hrs. <sup>2</sup>	50 hrs. <sup>2</sup>	75 hrs. <sup>2</sup>	100 hrs. <sup>2</sup>
0 C - 25 C	100%	95%	89%	94%	79%
40 C	100%	94%	87%	80%	74%

### PHOTOMETRICS

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Luminaire photometry has been conducted by a NVLAP accredited testing laboratory in accordance with IESNA LM-79-08. As specified by IESNA LM-79-08 the entire luminaire is tested as the source resulting in a luminaire efficiency of 100%.

See <http://www.lsicorp.com/products/led-lighting-solutions.aspx> for detailed photometric data.

### SLM-LED-30L-SIL-2-40-70CRI

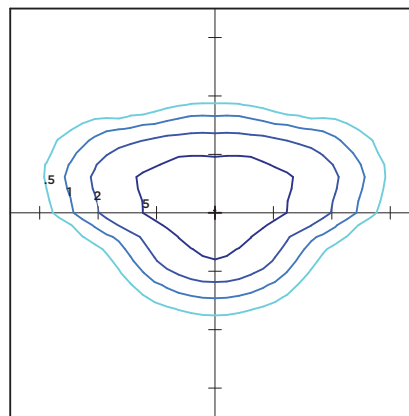
#### LUMINAIRE DATA

Type 2 Distribution	
Description	4000 Kelvin, 70 CRI
Delivered Lumens	31,743
Watts	232
Efficacy	137
IES Type	Type II - Short
BUG Rating	B4-U0-G3

#### Zonal Lumen Summary

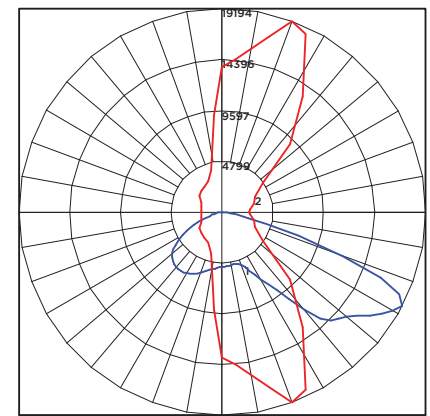
Zone	Lumens	%Luminaire
Low (0-30)°	4953	16%
Medium (30-60)°	19157	60%
High (60-80)°	7350	23%
Very High (80-90)°	284	1%
Uplight (90-180)°	0	0%
Total Flux	31743	100%

#### ISO FOOTCANDLE


**25' Mounting Height/ 25' Grid Spacing**

■ 5 FC ■ 2 FC ■ 1 FC ■ 0.5 FC

#### POLAR CURVE





Type: \_\_\_\_\_

## Slice Medium Outdoor LED Area Light

### PHOTOMETRICS (CONT.)

#### SLM-LED-30L-SIL-3-40-70CRI

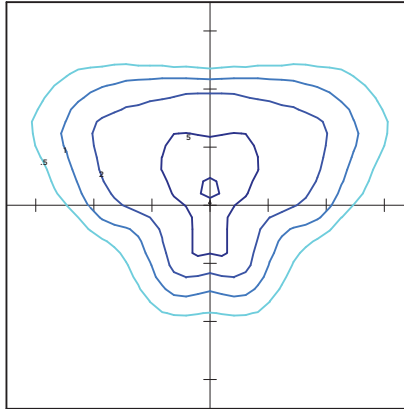
##### LUMINAIRE DATA

Type 3 Distribution	
Description	4000 Kelvin, 70 CRI
Delivered Lumens	32,206
Watts	232
Efficacy	139
IES Type	Type III - Short
BUG Rating	B4-U0-G4

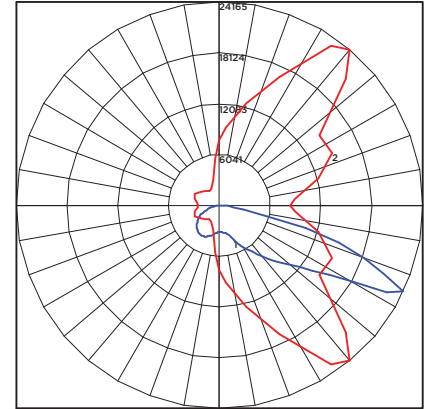
##### Zonal Lumen Summary

Zone	Lumens	%Luminaire
Low (0-30)°	3408	11%
Medium (30-60)°	16397	51%
High (60-80)°	11868	37%
Very High (80-90)°	533	2%
Uplight (90-180)°	0	0%
Total Flux	32206	100%

##### ISO FOOTCANDLE



##### POLAR CURVE



##### 25' Mounting Height/ 25' Grid Spacing

■ 5 FC ■ 2 FC ■ 1 FC ■ 0.5 FC

#### SLM-LED-30L-SIL-FT-40-70CRI

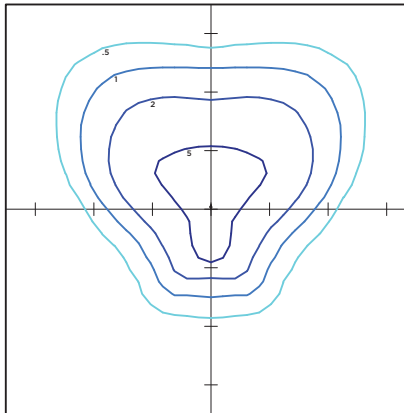
##### LUMINAIRE DATA

Type FT Distribution	
Description	4000 Kelvin, 70 CRI
Delivered Lumens	31,921
Watts	232
Efficacy	138
IES Type	Type IV - Short
BUG Rating	B4-U0-G4

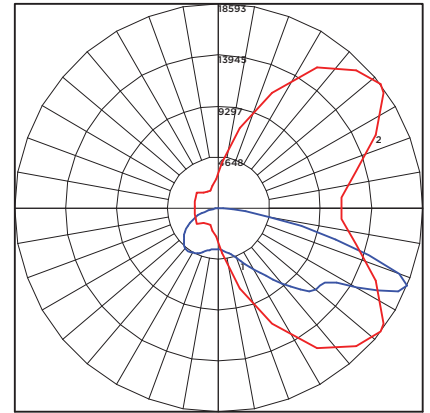
##### Zonal Lumen Summary

Zone	Lumens	%Luminaire
Low (0-30)°	3874	12%
Medium (30-60)°	15694	49%
High (60-80)°	11696	37%
Very High (80-90)°	657	2%
Uplight (90-180)°	0	0%
Total Flux	31921	100%

##### ISO FOOTCANDLE



##### POLAR CURVE



##### 25' Mounting Height/ 25' Grid Spacing

■ 5 FC ■ 2 FC ■ 1 FC ■ 0.5 FC





Type: \_\_\_\_\_

## Slice Medium Outdoor LED Area Light

### PHOTOMETRICS (CONT.)

#### SLM-LED-30L-SIL-5W-40-70CRI

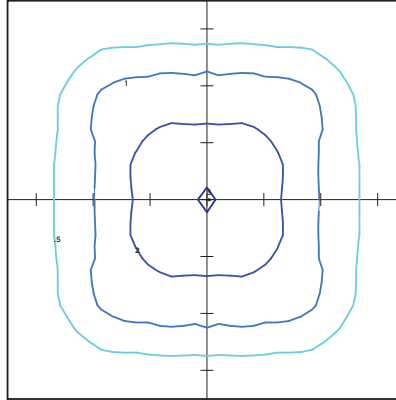
##### LUMINAIRE DATA

Type 5W Distribution	
Description	4000 Kelvin, 70 CRI
Delivered Lumens	31,237
Watts	232
Efficacy	135
IES Type	Type IV - Short
BUG Rating	B5-U0-G3

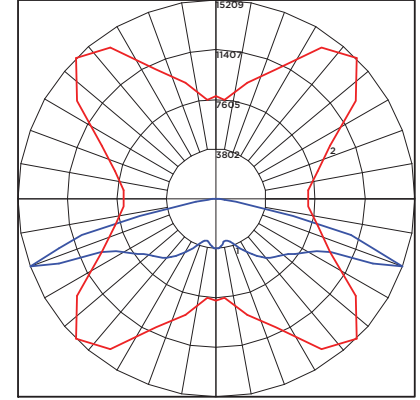
##### Zonal Lumen Summary

Zone	Lumens	%Luminaire
Low (0-30)°	3186	10%
Medium (30-60)°	13594	44%
High (60-80)°	14195	45%
Very High (80-90)°	261	1%
Uplight (90-180)°	0	0%
Total Flux	31237	100%

##### ISO FOOTCANDLE



##### POLAR CURVE



25' Mounting Height/ 25' Grid Spacing

■ 5 FC ■ 2 FC ■ 1 FC ■ 0.5 FC

#### SLM-LED-30L-SIL-FTA-40-70CRI

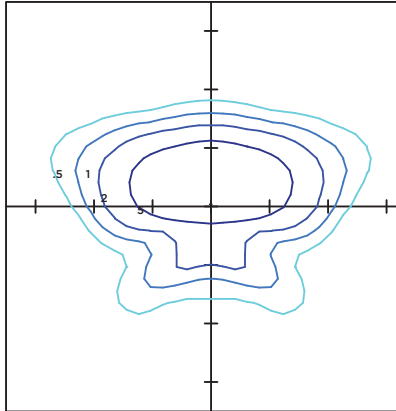
##### LUMINAIRE DATA

Type FTA Distribution	
Description	4000 Kelvin, 70 CRI
Delivered Lumens	32,146
Watts	232
Efficacy	139
IES Type	Type I - Very Short
BUG Rating	B4-U0-G3

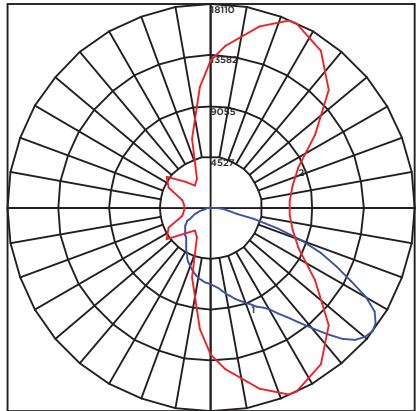
##### Zonal Lumen Summary

Zone	Lumens	%Luminaire
Low (0-30)°	7371	23%
Medium (30-60)°	18710	58%
High (60-80)°	5624	17%
Very High (80-90)°	441	1%
Uplight (90-180)°	0	0%
Total Flux	32146	100%

##### ISO FOOTCANDLE



##### POLAR CURVE



25' Mounting Height/ 25' Grid Spacing

■ 5 FC ■ 2 FC ■ 1 FC ■ 0.5 FC







Type: \_\_\_\_\_

## Slice Medium Outdoor LED Area Light

### PHOTOMETRICS (CONT.)

SLM-LED-30L-SIL-AM-40-70CRI

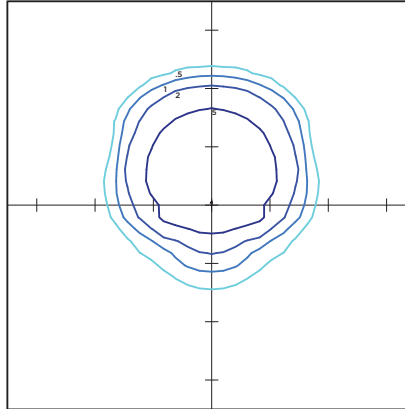
#### LUMINAIRE DATA

Type AM Distribution	
Description	4000 Kelvin, 70 CRI
Delivered Lumens	32,543
Watts	232
Efficacy	140
IES Type	Type III - Very Short
BUG Rating	B4-U0-G3

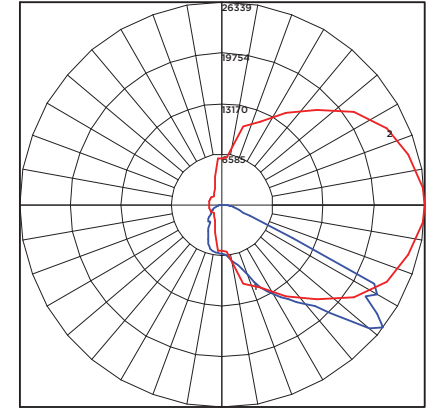
#### Zonal Lumen Summary

Zone	Lumens	%Luminaire
Low (0-30)°	6390	9%
Medium (30-60)°	20951	43%
High (60-80)°	4838	48%
Very High (80-90)°	365	1%
Uplight (90-180)°	0	0%
Total Flux	32543	100%

#### ISO FOOTCANDLE



#### POLAR CURVE

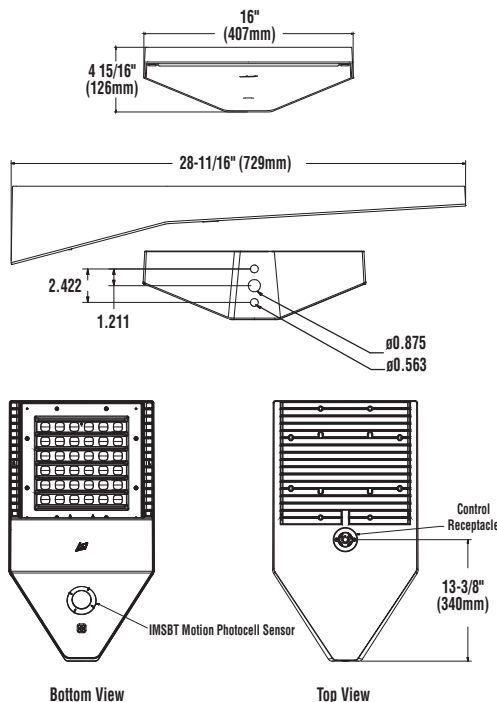


25' Mounting Height/ 25' Grid Spacing

■ 5 FC ■ 2 FC ■ 1 FC ■ 0.5 FC

### PRODUCT DIMENSIONS


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#### LUMINAIRE EPA CHART - SLM

Tilt Degree		0°	30°	45°	Tilt Degree	0°	30°	45°
Single	0.5	2.1	2.6	T90°	1.2	2.9	3.6	
D180°	1.1	2.1	2.6	TN120°	1.3	4.4	5.4	
D90°	0.9	2.5	3.1	Q90°	1.2	2.9	3.6	



Submitted by FISHER LIGHTING AND CONTROLS 	<b>Job Name:</b> Providence Energy LTD - Well Pad - Lighting	<b>Catalog Number:</b> SLM LED 42L SIL FT UNV DIM 40 70CRI PCI(VOLTAGE)BRZ IL Notes:	<b>Type:</b> <b>SITE</b> FLC21-10453
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Type: \_\_\_\_\_

## Slice Medium Outdoor LED Area Light

### CONTROLS

#### AirLink Wireless Lighting Controller

The AirLink integrated controller is a California Title 24 compliant lighting controller that provides real-time light monitoring and control with utility-grade power monitoring. It includes a 24V sensor input and power supply to connect a sensor into the outdoor AirLink wireless lighting system.

The wireless integrated controller is compatible with this fixture.

Click the link below to learn more details about AirLink.

<https://www.isicorp.com/documents/datasheets/airlink-outdoor-specsheet.pdf>

#### Integral Bluetooth™ Motion and Photocell Sensor (IMSBT)

Slim low profile sensor provides multi-level control based on motion and/or daylight. Sensor controls 0-10 VDC LED drivers and is rated for cold and wet locations (-30° C to 70° C). Two unique PIR lenses are available and used based on fixture mounting height. All control parameters are adjustable via an iOS or Android App capable of storing and transmitting sensor profiles.

Click the link below to learn more details about IMSBT.

<https://www.isicorp.com/documents/datasheets/imsbt-specsheet.pdf>

#### AirLink Blue

Wireless Bluetooth Mesh Outdoor Lighting Control System that provides energy savings, code compliance and enhanced safety/security for parking lots and parking garages. Three key components; Bluetooth wireless radio/sensor controller, Time Keeper and an iOS App. Capable of grouping multiple fixtures and sensors as well as scheduling time-based events by zone. Radio/Sensor Controller is factory integrated into Area/Site, Wall Mounted, Parking Garage and Canopy luminaires.

Click the link below to learn more details about AirLink Blue.

<https://www.lsi-airlink.com/airlink-blue/>

### POLES & BRACKETS

LSI offers a full line of poles and mounting accessories to complete your lighting assembly. Aluminum and steel in both square and round shafts. In addition, LSI offers round tapered, fluted and hinge based poles. Designed and engineered for durability and protected with our oven baked DuraGrip Protection System. Also available with our DuraGrip+ Protection system for unmatched corrosion resistance and an extended warranty. American made in our Ohio facility with industry leading lead times.

Click the link below to learn more details about poles & brackets.

<https://www.isicorp.com/products/poles-and-brackets-area-street.aspx>



#### BKA UMB CLR

The 3G rated UMB allows for seamless integration of LSI luminaires onto existing/ retrofit or new construction poles. The UMB was designed for square or round (tapered or straight) poles with two mounting hole spacings between 3.5" - 5".



#### BKS PQM15 CLR

The Pole Quick Mount Bracket allows for preset 15° up tilt of LSI luminaires for greater throw of light and increased vertical illumination as well as fast installation onto poles with LSI's 3" or 5" bolt pattern.



#### BKA ASF CLR

The adjustable Slip Fitter is a 3G rated rugged die cast aluminum adapter to mount LSI luminaires onto a 2" iron pipe, 2 3/8 OD tenon. The Adjustable Slip Fitter can be rotated 180° allowing for tilting LSI luminaires up to 45° and 90° when using a vertical tenon.



#### BKS PQMH CLR

The Pole Quick Mount Bracket allows for lightning fast installation of LSI luminaires onto existing and new construction poles with LSI's B3 or B5 standard pole bolt patterns.



Square Pole  
14'-39'



Round Pole  
10'-30'



Tapered Pole  
20'-39'



**Job Name:**

Providence Energy LTD - Well Pad - Lighting

**Catalog Number:**4SQ B3 S11G25 S BRZ / ABKIT 4SQ STL  
PL 3/4X30 11BC / KIT BCVR 4BC BRZ

Notes:

**Type:****SITE**

FLC21-10453



Catalog # : \_\_\_\_\_ Project : \_\_\_\_\_

Prepared By : \_\_\_\_\_ Date : \_\_\_\_\_

# Steel Poles

## Square Straight

**QUICK LINKS**[Ordering Guide](#)[Configurations](#)[Dimensions](#)[EPA](#)**FEATURES & SPECIFICATIONS****Pole Shaft**

- Straight poles are 4", 5", or 6" square.
- Pole shaft is electro-welded ASTM-A500 Grade C steel tubing with a minimum yield strength of 50,000 psi.
- On Tenon Mount steel poles, tenon is 2-3/8" O.D. high-strength pipe. Tenon is 4-3/4" in length.

**Hand-Hole**

- Standard hand-hole location is 12" above pole base.
- Poles 22' and above have a 3" x 6" reinforced hand-hole. Shorter poles have a 2" x 4" non-reinforced hand-hole.

**Base**

- Pole base is ASTM-A36 hot-rolled steel plate with a minimum yield strength of 36,000 psi.
- Two-piece square base cover is optional.

**Anchor Bolts**

- Poles are furnished with anchor bolts featuring zinc-plated double nuts and washers. Galvanized anchor bolts are optional.
- Anchor bolts conform to ASTM F 1554-07a Grade 55 with a minimum yield strength of 55,000 psi.

**Ground Lug**

- Ground lug is standard.

**Duplex Receptacle**

- Weatherproof duplex receptacle is optional.

**Ground Fault Circuit Interrupter**

- Self-testing Ground fault circuit interrupter is optional.

**Finishes**

- Every pole is provided with the DuraGrip® Protection System and a 5-year limited warranty:
- When the top-of-the line DuraGrip® Plus Protection System is selected, in addition to the DuraGrip® Protection System, a non-porous, automotive-grade corrosion coating is applied to the lower portion of the pole interior, sealing and further protecting it from corrosion. This option extends the limited warranty to 7 years.

**Determining The Luminaire/Pole Combination For Your Application:**

- Select luminaire from luminaire ordering information
- Select bracket configuration if required
- Determine EPA value from luminaire/bracket EPA chart
- Select pole height
- Select MPH to match wind speed in the application area (See windspeed maps).
- Confirm pole EPA equal to or exceeding value of luminaire/bracket EPA
- Consult factory for special wind load requirements and banner brackets

**Pole Vibration Damper**

- A pole vibration damper is recommended in open terrain areas of the country where low steady state winds are common.
- Non-tapered poles and lightly loaded poles are more susceptible to destructive vibration if a damper is not installed.

**Listings**

- UL Listed
- BAA/TAA Compliant



**Job Name:**

Providence Energy LTD - Well Pad - Lighting

**Catalog Number:**4SQ B3 S11G25 S BRZ / ABKIT 4SQ STL  
PL 3/4X30 11BC / KIT BCVR 4BC BRZ

Notes:

**Type:****SITE**

FLC21-10453

**Steel Poles - Square Straight****ORDERING GUIDE**[Back to Quick Links](#)TYPICAL ORDER EXAMPLE: **4SQ B3 S11G 24 S PLP DGP**

Pole Series	Mounting Method	Material	Height <sup>2</sup>	Mounting Configuration	Pole Finish	Options
4SQ - 4" x 4" Square Straight Pole	<b>Bolt-On Mount<sup>1</sup></b> - See pole selection guide for patterns and fixture matches. <b>B5</b> - 5" Traditional Drilling Pattern <b>B3</b> - 3" Reduced Drilling Pattern <b>B2</b> - 2" Reduced Drilling Pattern	S11G - 11 Ga. Steel	8'	S - Single/Parallel D180 - Double D90 - Double DN90 - Double T90 - Triple TN120 - Triple Q90 - Quad QN90 - Quad	BRZ - Bronze BLK - Black PLP - Platinum Plus WHT - White SVG - Satin Verde Green GPT - Graphite MSV - Metallic Silver BZA - Alternate Bronze	GA - Galvanized Anchor Bolts SF - Single Flood <sup>3</sup> DF - Double Flood <sup>3</sup> DGP - DuraGrip <sup>®</sup> Plus LAB - Less Anchor Bolts CRXX - Conduit Raceway <sup>4</sup>
5SQ - 5" x 5" Square Straight Pole		(4SQ and 5SQ only)	10'			
6SQ - 6" x 6" Square Straight Pole		S07G - 07 Ga. Steel	12'			
	<b>T</b> - Tenon Mount - See pole selection guide for tenon and fixture/bracket matches.		13'	<b>N</b> - Tenon Mount (Standard tenon size is 2-3/8" O.D.)		
			14'			
	<b>I</b> - No Mounting Holes <sup>1</sup> - Use with: • BKA 4ISF & BKA 5ISF • BKA X4ISF & BKA X5ISF		15'			
			16'			
			17'			
			17' 6"			
			18'			
			20'			
			22'			
			22' 6"			
			23'			
			24'			
			25'			
			26'			
		27'				
		28'				
		30'				
		32'				
		35'				
		39'				

Height Restriction,  
Consult Pole  
Selection Chart on  
opposite page

Standard SF and DF pole preparations are located 3/4 of the height of the pole from the base, except on 20' poles. Maximum height for SF and DF pole preparations on 20' poles is 13' from the base.

**Accessory Ordering Information**

Description	Order Number	Description	Order Number
4BC - 4" Square Base Cover	122559CLR	Vibration Damper - 4" Square Pole (bolt-on mount only)	172539
5BC - 5" Square Base Cover	122561CLR	Vibration Damper - 5" Square Pole (bolt-on mount only)	172538
6BC - 6" Square Base Cover	122563CLR	Vibration Damper - 6" Square Pole (bolt-on mount only)	178361
ER2 - Weatherproof Duplex Receptacle	122566CLR		
GFI - Ground Fault Circuit Interrupter	122567CLR		
MH5 - mounting Hole Plugs for use with 5" traditional drill pattern (3 set of 3 plugs)	132336		
MH3 - mounting Hole Plugs for use with 3" reduced drill pattern (3 set of 3 plugs)	681126		
MH2 - Mounting Hole Plugs for use with 2" reduced drill pattern (3 sets of 3 plugs)	725841		

**FOOTNOTES:**

- 1 - See Area Light Brackets - 3" Reduced Drill Pattern and Area Light Brackets - 5" Traditional Drill Pattern spec sheets.
- 2 - Pole heights will have +/- 1/2" tolerance.
- 3 - See Flood Lighting Brackets section for choice of FBO brackets.
- 4 - CR selection must indicate required height and side of pole mounting location. Mounting template required at time of order.



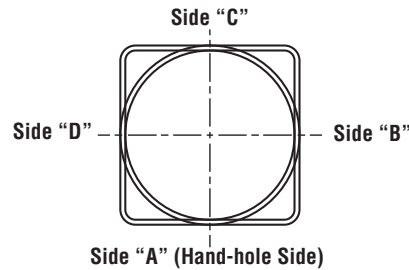


## Steel Poles - Square Straight

### DRILLING LOCATIONS

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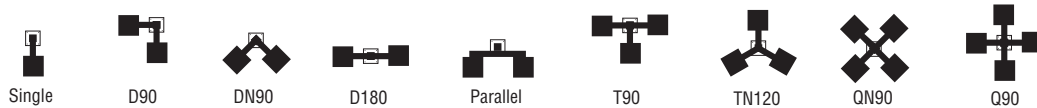
Sides	A	B	C	D
Hand-hole	X			
Single	X			
D180		X		X
D90	X			X
DN90 <sup>1</sup>				
T90	X	X		X
TN120 <sup>2</sup>				
Q90	X	X	X	X
QN90 <sup>3</sup>				
Single FBO	X			
Double FBO		X		X

**NOTES:**

- Two locations will be 45° to the left and right of Side A.
- Other two locations will be 120° to the left and right of Side A.
- Two locations will be 45° to the left and right of Side A and two locations will be 135° to the left and right of Side A.

Consult factory for custom variations. Standard SF and DF pole preparations are located 3/4 of the height of the pole from the base, except on 20' poles. Maximum height for SF and DF pole preparations on 20' poles is 13' from the base.

### FIXTURE CONFIGURATIONS



### BOLT CIRCLE

4" (102mm) square  
10-1/8" (257mm) sq.



11" (279mm) Dia. Bolt Circle

5" (127mm) square  
10-1/8" (257mm) sq.



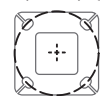
11" (279mm) Dia. Bolt Circle

5" (127mm) square  
10-1/8" (257mm) sq.



11" (279mm) Dia. Bolt Circle

6" (152mm) square  
12" (305mm) sq.



12" (305mm) Dia. Bolt Circle

Bolt Circle Designator	B	C	D	J
Bolt Circle	Slotted 8"-11" (203mm-279mm)	Slotted 9"-11" (229mm-279mm)	Slotted 9"-11" (229mm-279mm)	Slotted 12" (305mm)
Anchor Bolt Size	3/4" x 30" (19mm x 762mm)	3/4" x 30" (19mm x 762mm)	1" x 36" (25mm x 914mm)	1" x 36" (25mm x 914mm)
Anchor Bolt Projection	3-1/4" (83mm)	3-1/4" (83mm)	4" (102mm)	4" (102mm)
Base Plate Opening for Wireway Entry	3-5/8" (92mm)	4-3/4" (121mm)	4-5/8" (117mm)	5-5/8" (143mm)
Base Plate Dimensions	10-1/8" sq. x 3/4" thk. (257mm x 19mm)	10-1/8" sq. x 3/4" thk. (257mm x 19mm)	10-1/8" sq. x 1" thk. (257mm x 25mm)	12" sq. x 1-1/8" thk. (305mm x 29mm)
Pole Gauge	11	11	7	7

Note: Base plate illustrations may change without notice. Do not use for setting anchor bolts. Consult factory for the appropriate anchor bolt template.



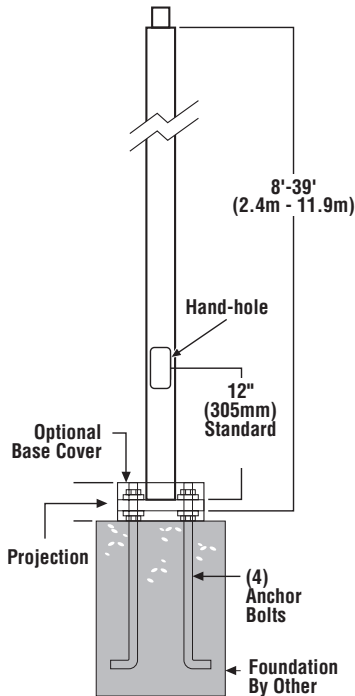


# Steel Poles - Square Straight

## PRODUCT DIMENSIONS

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**SQT -**  
N= 2-3/8" (60mm) O.D. x 4-3/4" (121mm) Tenon



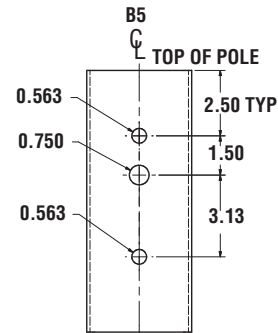
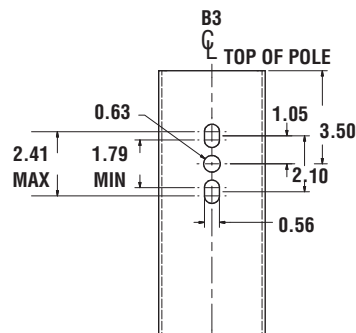
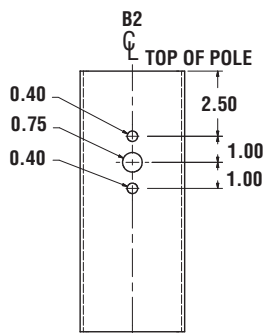
**SF -**  
Single Flood  
Pole Preparation



### SHIPPING WEIGHTS

4"(102mm) sq. 11 Ga. is approximately	7.50 lbs./ft.
4"(102mm) sq. 07 Ga. is approximately	10.00 lbs./ft.
5"(127mm) sq. 11 Ga. is approximately	9.00 lbs./ft.
5"(127mm) sq. 07 Ga. is approximately	12.50 lbs./ft.
6"(152mm) sq. 07 Ga. is approximately	15.40 lbs./ft.
Anchor Bolts (3/4" x 30")(19mm x 762mm)	15 lbs. (7kg)/set
Anchor Bolts (1" x 36")(25mm x 914mm)	30 lbs. (14kg)/set

### Bolt-On Mount 2-Bolt Pattern







# Steel Poles - Square Straight

## WIND SPEED

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### EPA Information

All LSI Industries' poles are guaranteed to meet the EPA requirements listed. LSI Industries is not responsible if a pole order has a lower EPA rating than the indicated wind-loading zone where the pole will be located.

CAUTION: This guarantee does not apply if the pole/bracket/fixture combination is used to support any other items such as flags, pennants, or signs, which would add stress to the pole. LSI Industries cannot accept responsibility for harm or damage caused in these situations.

**NOTE:** Pole calculations include a 1.3 gust factor over steady wind velocity. Example: poles designed to withstand 80 MPH steady wind will withstand gusts to 104 MPH. EPAs are for locations 100 miles away from hurricane ocean lines. Consult LSI for other areas. Note: Hurricane ocean lines are the Atlantic and Gulf of Mexico coastal areas. For applications in Florida or Canada, consult factory.

### Use ONLY with "Wind Speed Map for ASCE 7-10

POLE <sup>1</sup>	Mtg. Height Length (ft)	Wall Thick (ga)	BOLT CIRCLE			EPA									
			Designator	Dia. (in)	Anchor bolt Dia (in)	110 MPH	115 MPH	120 MPH	130 MPH	140 MPH	150 MPH	160 MPH	170 MPH	180 MPH	
4" x 11-ga x 12'	12	11	B	8" - 11"	0.75	13.9	12.5	11.3	9.2	7.6	6.3	5.2	4.3	3.6	
4" x 11-ga x 14'	14	11	B	8" - 11"	0.75	10.7	9.5	8.5	6.8	5.4	4.4	3.5	2.7	2.1	
4" x 11-ga x 16'	16	11	B	8" - 11"	0.75	8.2	7.2	6.4	4.9	3.8	2.9	2.1	1.5	1.0	
4" x 11-ga x 18'	18	11	B	8" - 11"	0.75	6.3	5.4	4.7	3.4	2.4	1.6	1.0	0.4	n/a	
4" x 11-ga x 20'	20	11	B	8" - 11"	0.75	4.6	3.9	3.2	2.1	1.2	0.6	n/a	n/a	n/a	
4" x 11-ga x 22'	22	11	B	8" - 11"	0.75	7.6	6.6	5.7	4.2	3.0	2.0	1.2	0.5	n/a	
4" x 11-ga x 24'	24	11	B	8" - 11"	0.75	6.0	5.1	4.3	2.9	1.8	0.9	n/a	n/a	n/a	
4" x 11-ga x 26'	26	11	B	8" - 11"	0.75	4.6	3.7	3.0	1.7	0.7	n/a	n/a	n/a	n/a	
4" x 7-ga x 14'	14	7	B	8" - 11"	0.75	18.3	16.4	14.9	12.2	10.2	8.5	7.1	5.9	5.0	
4" x 7-ga x 16'	16	7	B	8" - 11"	0.75	14.7	13.2	11.8	9.6	7.8	6.3	5.2	4.2	3.4	
4" x 7-ga x 18'	18	7	B	8" - 11"	0.75	11.9	10.5	9.3	7.4	5.9	4.6	3.6	2.8	2.1	
4" x 7-ga x 20'	20	7	B	8" - 11"	0.75	9.6	8.4	7.4	5.7	4.3	3.2	2.3	1.6	0.9	
4" x 7-ga x 22'	22	7	B	8" - 11"	0.75	7.7	6.6	5.7	4.2	3.0	2.0	1.2	0.5	n/a	
4" x 7-ga x 24'	24	7	B	8" - 11"	0.75	6.0	5.1	4.3	2.9	1.8	0.9	n/a	n/a	n/a	
4" x 7-ga x 26'	26	7	B	8" - 11"	0.75	4.6	3.7	3.0	1.7	0.7	n/a	n/a	n/a	n/a	
4" x 7-ga x 28'	28	7	B	8" - 11"	0.75	3.3	2.5	1.8	0.7	n/a	n/a	n/a	n/a	n/a	
4" x 7-ga x 30'	30	7	B	8" - 11"	0.75	2.2	1.4	0.8	n/a	n/a	n/a	n/a	n/a	n/a	
5" x 11-ga x 14'	14	11	C	9" - 11"	0.75	17.4	15.7	14.1	11.5	9.3	7.7	6.3	5.2	4.2	
5" x 11-ga x 16'	16	11	C	9" - 11"	0.75	13.8	12.3	10.9	8.7	6.9	5.5	4.3	3.3	2.5	
5" x 11-ga x 18'	18	11	C	9" - 11"	0.75	10.8	9.6	8.4	6.5	4.9	3.7	2.6	1.8	1.1	
5" x 11-ga x 20'	20	11	C	9" - 11"	0.75	8.5	7.3	6.3	4.6	3.2	2.1	1.2	0.5	n/a	
5" x 11-ga x 22'	22	11	C	9" - 11"	0.75	10.9	9.5	8.3	6.2	4.5	3.2	2.1	1.2	0.5	
5" x 11-ga x 24'	24	11	C	9" - 11"	0.75	8.8	7.5	6.4	4.5	3.0	1.8	0.8	n/a	n/a	
5" x 11-ga x 26'	26	11	C	9" - 11"	0.75	6.8	5.7	4.6	3.0	1.6	0.6	n/a	n/a	n/a	
5" x 11-ga x 28'	28	11	C	9" - 11"	0.75	5.2	4.1	3.2	1.6	0.4	n/a	n/a	n/a	n/a	
5" x 11-ga x 30'	30	11	C	9" - 11"	0.75	3.6	2.7	1.8	0.4	n/a	n/a	n/a	n/a	n/a	
5" x 7-ga x 20'	20	7	D	9" - 11"	1.00	21.6	19.3	17.3	14.0	11.3	9.2	7.4	6.0	4.8	
5" x 7-ga x 22'	22	7	D	9" - 11"	1.00	20.7	18.6	16.6	13.3	10.7	8.5	6.8	5.4	4.2	
5" x 7-ga x 24'	24	7	D	9" - 11"	1.00	17.7	15.6	13.8	10.8	8.5	6.6	5.0	3.7	2.6	
5" x 7-ga x 26'	26	7	D	9" - 11"	1.00	14.9	13.1	11.4	8.8	6.6	4.9	3.5	2.3	1.3	
5" x 7-ga x 28'	28	7	D	9" - 11"	1.00	12.5	10.9	9.4	6.9	4.9	3.4	2.1	1.0	n/a	
5" x 7-ga x 30'	30	7	D	9" - 11"	1.00	10.3	8.9	7.5	5.2	3.4	2.0	0.8	n/a	n/a	
5" x 7-ga x 35'	35	7	D	9" - 11"	1.00	6.0	4.8	3.6	1.8	n/a	n/a	n/a	n/a	n/a	
6" x 7-ga x 24'	24	7	J	12"	1.00	18.6	16.4	14.3	11.2	8.6	6.5	4.8	3.4	2.2	
6" x 7-ga x 26'	26	7	J	12"	1.00	15.6	13.4	11.7	8.8	6.5	4.6	3.0	1.8	0.7	
6" x 7-ga x 28'	28	7	J	12"	1.00	12.9	10.9	9.3	6.7	4.6	2.8	1.5	n/a	n/a	
6" x 7-ga x 30'	30	7	J	12"	1.00	10.4	8.8	7.3	4.8	2.9	1.3	n/a	n/a	n/a	
6" x 7-ga x 32'	32	7	J	12"	1.00	8.3	6.8	5.5	3.1	1.3	n/a	n/a	n/a	n/a	
6" x 7-ga x 34'	34	7	J	12"	1.00	6.5	5.0	3.7	1.6	n/a	n/a	n/a	n/a	n/a	
6" x 7-ga x 35'	35	7	J	12"	1.00	5.5	4.2	2.9	0.9	n/a	n/a	n/a	n/a	n/a	
6" x 7-ga x 39'	39	7	J	12"	1.00	2.3	1.0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	

All LSI Industries' poles are guaranteed to meet the EPA requirements listed. LSI Industries is not responsible if a pole order has a lower EPA rating than the indicated wind-loading zone where the pole will be located.

CAUTION: This guarantee does not apply if the pole/bracket/fixture combination is used to support any other items such as flags, pennants, or signs, which would add stress to the pole. LSI Industries cannot accept responsibility for harm or damage caused in these situations.

**Note:**

- 1- Poles shorter than these listed here in for each gauge have EPA rating equal to or greater than what is provided in this table. To Confirm EPA ratings on shorter poles, contact LSI Industries.
- 2- LSI Industries recommends a vibration damper be ordered with this length.



# CONSTRUCTION STORMWATER MANAGEMENT PLAN



PROVIDENCE

9635 Maroon Circle, Suite 230  
Englewood, CO 80112

**Providence Operating LLC DBA POCO Operating  
Conner 19-18 Pad  
Brighton, Colorado**

**November 2022**

**Prepared By:**

**Aquionix**  
EHS Services

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Arvada, CO 80002  
(303) 289-7520  
[www.aquionix.com](http://www.aquionix.com)

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## **INTRODUCTION**

This Construction Stormwater Management Plan (SWMP) for Construction Activities at the Conner 19-18 well pad by Providence Operating LLC DBA POCO Operating's (POCO) in Adams County, Colorado has been prepared to comply with the Colorado Oil and Gas Conservation Commission (COGCC) rules and regulations. Specifically, the 1000 series Reclamation Regulations which require that operators implement Stormwater Management under Rule 1002.f. This rule requires operators to implement and maintain control measures at locations to control stormwater runoff in a manner that minimizes erosion, transport of sediment off site, and site degradation. This requirement is in effect for the life of the facility (construction to abandonment). This SWMP satisfies the requirements of COGCC Rule 1002.f for the Conner 19-18 well pad.

This SWMP is intended to be revised as necessary to address planned developments, new disturbances, and other changes required to manage stormwater and protect surface water quality. Significant changes to the SWMP will be documented in the Revision History table in this Plan.

In addition to satisfying the requirements of COGCC Rule 1002.f, this SWMP has been prepared to comply with the Colorado Department of Public Health and Environment's (CDPHE) General Permit (COR400000) for *Stormwater Discharges Associated with Construction Activities*. The General Permit can be found in Appendix A and, upon receipt, a copy of the Certification to Discharge will similarly be incorporated into Appendix A. Once the location achieves final stabilization and is removed from permit coverage under the CDPHE General Permit, the COGCC rules require that a Post-Construction Stormwater Program be implemented.

**CERTIFICATION**

*I certify under penalty of law, that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.*

Signature: Devin Brown

Name: Devin Brown

Title: VP of Operations

Date: November 16, 2022



## SWMP MANAGERS

The SWMP Manager(s) is responsible for making sure the SWMP is implemented in its entirety and must be knowledgeable in the principles and practices of erosion and sediment control and pollution prevention, and with the skills to assess conditions at construction sites that could impact stormwater quality and to assess the effectiveness of stormwater controls implemented to meet permit requirements.

<b>SWMP MANAGER TABLE</b>			
<b>Name</b>	<b>Title</b>	<b>Phone</b>	<b>Email</b>
Devin Brown	VP of Operations (POCO Operating)	303-349-0302	dbrown@providence-energy.com
Meghan Grimes	Sr. Manager of ESG (POCO Operating)	720-256-8774	mgrimes@providence-energy.com
Josh Berger	Lease Operator	970-373-8048	josh@cadenceenergyservices.com
Jim Berger	Lease Operator	970-481-6372	jamesberger2@aol.com

Additionally, the SWMP Manager(s) may delegate responsibility for the coordination of the following to specific personnel:

- Implementation of upset condition/clean-up procedures;
- Notification to regulatory agencies, local authorities and local residents in the event of a significant release of stormwater and/or sediment from a construction area;
- Coordination/implementation of control measures (formerly known as Best Management Practices (BMPs));
- Conducting inspections (as long as the person conducting inspections is also a qualified SWMP Manager);
- Maintenance of stormwater-related records; and
- Coordination of a preventative maintenance program and housekeeping measures.

## REVISION HISTORY

When this SWMP is amended or updated, the following table should be updated with date of revision, author(s), a description of the revision(s) and an approval signature. A copy of the current SWMP shall be maintained at the construction site and be made available to the Water Quality Control Division (WQCD) of the Colorado Oil and Gas Conservation Commission (COGCC), or another Federal, State, or local agency having stormwater program authority upon request.

<b>REVISION HISTORY TABLE</b>		
<b>Revision Date</b>	<b>Revised By</b>	<b>Description of Revisions</b> (Include control measure information (control measure(s) removed, modified; the location of these control measures; and any changes to the control measure(s))
11/2022	Aquionix, Inc.	Initial release.

## **1.0 SITE DESCRIPTION**

POCO currently owns or leases mineral rights within Adams County, Colorado. The project area is located in the SESW quadrant of Section 19 Township 1 South, Range 65 West in Adams County, Colorado, as depicted on the site-specific vicinity waters map in Appendix D. The total area of disturbance will be approximately 8.05-acres. After interim reclamation, the disturbed area will be approximately 5.75 acres and the working pad surface will be approximately 4 acres. The City of Brighton, Colorado is the nearest population center to the Conner 19-18 development activities.

Current drilling and development construction activities include pad construction, access road construction, well drilling, well testing, well completion, installation of the associated facility, and flow line construction. The pad will tie-in to Williams mid-stream pipelines.

### **1.1 Nature of Construction Activity**

The nature of construction activities associated with POCO's Conner 19-18 facility will involve the construction of access roads, a multi-well pad, and various production equipment. The location of the Conner 19-18 facility will require engineered cut and fill for the construction of the well pad. Following construction of the well pad, drilling, and completion operations will occur to bring the well into production.

In areas that are disturbed by construction, topsoil will be stripped and stockpiled near the site. Deleterious organic materials will be stockpiled separately from the topsoil. Soil materials will be managed so that erosion and sediment transport are minimized. Nearby drainages will be protected by appropriate measures.

Once the well is in production, portions of the disturbed area will be reclaimed.

### **1.2 Sequence of Major Activities**

The development of the Conner 19-18 production facility will be accomplished in the following work phases. They include:

- Pad Construction
- Production Equipment Installation
- Well Drilling
- Well Completion
- Interim Reclamation
- Final Reclamation

Each work phase is briefly discussed below, and the control measures are discussed in Section 3.0.

### 1.2.1 Access Road and Pad Construction

Pad and access road construction will be performed using conventional cut and fill construction. The proposed access road for the Conner 19-18 well pad will tee off East 136<sup>th</sup> Avenue. The pad will be located on the north side of East 136<sup>th</sup> Avenue. Cut and fill is anticipated for the access road using road base or aggregate.

The overall disturbed area of the well pad and the access road is anticipated to be approximately 8.05-acres. The pad construction will involve clearing and grubbing, the removal of topsoil to a stockpile along the western boundary of the disturbed area, grading, compaction, contouring, and installation of road base as a surfacing material. To the extent possible, permanent control measures such as berms, diversion ditches, and sediment traps will be utilized to control stormwater throughout the life of the facility during this phase.

Sediment discharge and small amounts of mobile equipment lubricant and fuel are the main potential pollutants of concern during access road and pad construction.

### 1.2.2 Well Drilling

Well drilling for the Conner 19-18 well will include the following activities:

- Mobilization of the drilling rig and associated equipment including generators and drilling-mud handling equipment;
- Storage of chemicals, fuels, and lubricants;
- Installation of potable water tanks and sewage-handling equipment (e.g., portable toilets or sewage vaults);
- Well drilling activities, including the installation and cementing of well casing; and
- Demobilization of the drilling rig and all other equipment at the completion of this phase.

Sediment discharge, releases of unused and used chemicals, petroleum products, drilling water/mud, and drill cuttings are potential pollutants of concern during this phase of construction. Drilling mud and water will be used to maintain appropriate downhole pressures and lubrication. Fresh water and drilling mud (including chemical additives) will be stored on the pad, typically in large tanks or skid-mounted vertical tanks. Drilling mud and associated materials are captured in tanks for reuse during closed-loop drilling processes. Products used in the drilling process to fuel, lubricate, and/or maintain equipment include diesel fuel, unleaded gasoline, gear oil, hydraulic oil, brake fluid, antifreeze, and grease. Materials to be used for cementing casing may also be stored and prepared on location or may be transported to the site.

### 1.2.3 Well Completion

Well completion may last up to 190 days, will include cementing and other processes that stimulate the well and prepare it for production. The basic activities that are conducted during this phase include:

- Mobilization of equipment required for well completion activities;
- Installation of potable water tanks and sewage-handling equipment (e.g., portable toilets) or continued maintenance of such equipment installed during the drilling phase; and
- Demobilization of equipment when this phase has been completed.

Sediment discharge, releases of unused and used chemicals, and flowback water are potential pollutants of concern during this phase of construction. As equipment is demobilized at the completion of this phase, the well pad and surrounding areas will be inspected to identify spills or leaks that may have occurred and may impact surface water so that those areas can be remediated.

### 1.2.4 Production Equipment Installation

The Production Equipment Installation phase includes the construction of the final production equipment for the Conner 19-18 well pad. This phase will take place prior to the drilling phase. See list of final production equipment in sections 1.2.6.

Sediment discharge, releases of produced fluids, and small amounts of equipment lubricant or fuel, corrosion inhibitors or other chemicals are potential pollutants of concern during this phase.

### 1.2.5 Disturbance Reduction and Final Stabilization

Following construction, drilling, and completion, the disturbed area of the well pad will be reduced for the production life of the well to approximately 4 acres. Enough working area will remain to allow a safe working environment for pumpers, haulers and/or periodic workover operations, and vehicle traffic is expected to be minimal. The pad will be recontoured, topsoil reapplied, and the reduced area stabilized with seed, hydro-seed, bonded fiber matrix, or mulch. as deemed appropriate.

### 1.2.6 Production

While the lifespan of the Conner 19-18 facility covered in this SWMP may last up to 50 years, the actual productive life of the well will be dependent on the producing formation, location in the field, and proximity to other wells. The equipment found onsite during this phase will include:

- 16 Oil Wells;
- 3 Separators;

- 2 Oil Tanks;
- 1 Oil Surge Tank;
- 2 Water Tanks;
- 1 VRU Compressor; and
- 2 Line Heaters.

Final stabilization of the disturbed area outside the production area is generally achieved during this phase.

#### 1.2.7 Abandonment

Once the Conner 19-18 wells are deemed ready to abandon, the location will be recontoured and reclaimed to pre-disturbance conditions and/or in accordance with the surface owner's wishes.

When the well is plugged and abandoned, the wellhead assembly will be removed and the well permanently plugged down hole. The equipment associated with the well will be removed from the location unless being used by other wells in the vicinity, and the flow lines and pipelines may be re-routed or abandoned as required.

Following the removal of equipment from the well pad, the location and access roads will be recontoured and reclaimed to pre-disturbance conditions in accordance with COGCC final reclamation standards and/or in accordance with the surface owner's wishes. Once it is recontoured, topsoil will be reapplied across the location in preparation for seeding and an appropriate seed mixture will be applied.

### **1.3 Estimate of Total Area of Site and Disturbed Area**

The total area of disturbance will be approximately 8.05-acres. After interim reclamation, the disturbed area will be approximately 5.75 acres and the working pad surface will be approximately 4 acres, which includes access roads.

### **1.4 Soil Description**

Erosion potential is based primarily onsite topography, soil type, and vegetative cover. Per the United State Department of Agriculture's (USDA) Web Soils Survey, the major soil types that will be disturbed are well-drained soils with a moderately high to high water holding capacity and are classified as:

- 25% Truckton Loamy Sand, 0 to 3 percent slopes
- 75% Ascalon Sandy Loam, 0 to 3 percent slopes

The soils typically are situated on little to no sloping (<3 percent) land. Topsoil is typically shallow with a high percentage of loam composition. The average annual precipitation for the area is approximately 12 - 16 inches.



## 1.5 Vegetation Description

Vegetation in the vicinity of the facility is predominately seasonal crop rotation. Season crop rotation accounts for over 80% of the existing ground cover at the Conner 19-18 facility.

## 1.6 Potential Pollution Sources and Locations

POCO has identified activities, equipment, and materials associated with the construction of the Conner 19-18 well pad that may potentially be sources of pollutants that contribute, or have the potential to contribute, pollutants to stormwater. The following sections provide an overview of the identified potential pollutant sources. The site-specific map contained within Appendix D shows the locations of these potential pollutant sources at the Conner 19-18 facility.

### 1.6.1 Erosion of Disturbed and Stockpiled Soils

The construction activities for the well pad and access road will involve soil disturbances and stockpiling. Clearing, grading, and otherwise altering previously undisturbed land can greatly increase the rate of soil erosion over pre-disturbance rates. The resulting sediment can impact the water quality of receiving streams.

Appendix C contains the figure from the surveying company showing anticipated disturbance area, including cut, fill, and stockpile location. Appendix D contains the figures showing the control measures that will be implemented to manage stormwater during construction and production.

### 1.6.2 Drill Cuttings

During the drilling process, cuttings from down hole will be separated from the drilling mud and will be contained and managed on site. POCO will employ closed-loop drilling techniques. The drill cuttings will be mechanically separated from water-based bentonitic drilling fluids and placed in a 24-mil lined cuttings pit on location and will demonstrate compliance with Table 915-1 through sampling and analysis. The drill cuttings will comply with Table 915-1, will not be considered oily waste, and will be generated using water-based bentonitic drilling fluids.

### 1.6.3 Vehicle Tracking of Sediment

Offsite sediment tracking by vehicles is a potential pollutant source to stormwater and waters of the State. To address offsite sediment tracking, the access road may have a track pad at the intersection with the nearby county road and the well pad will be surfaced with rock, as needed, to minimize offsite vehicle tracking. Furthermore, staff and contractor awareness will reduce the likelihood of offsite sediment tracking by limiting the areas of operations during muddy conditions.

#### 1.6.5 Loading and Unloading Operations

The sites may have tanks for the storage of fuels or other materials used in drilling and completion activities. The presence of such tanks would require loading and unloading of the tanks and releases of materials during these activities could potentially impact stormwater.

#### 1.6.6 Outdoor Storage and Material Handling Activities

During the drilling and completion phases of the project, quantities of well construction and completion materials such as cement, drilling mud, cuttings, sawdust, sand, and other materials will be staged on location and moved around the location as the well is drilled and completed. Releases of these materials from storage areas or during material handling activities could potentially impact stormwater.

#### 1.6.7 Vehicle and Equipment Maintenance and Fueling

It is possible that equipment will be maintained or fueled on site. On-site maintenance and fueling could potentially result in leaks or spills of fuel, gear oil, hydraulic oil, brake fluid, antifreeze, or grease which could potentially impact stormwater.

#### 1.6.8 Significant Dust or Particulate Generating Processes

Construction activities and vehicle traffic to and from the sites could potentially generate dust. Strong winds, frequently encountered in the vicinity of the proposed well pad, have the potential to discharge windblown sediment from disturbed areas.

#### 1.6.9 Routine Maintenance Activities

The use of fertilizers or weed killers is possible at the sites in order to achieve successful revegetation of disturbed areas. See also “vehicle and equipment maintenance and fueling” above.

#### 1.6.10 On-site Waste Management Practices

Trash receptacles will be located on site to contain construction-related or other trash or debris. Used drilling mud and water will be captured in tanks during closed-loop drilling processes and portable toilets will also be utilized on site.

#### 1.6.11 Concrete Truck/Equipment Washing

Concrete truck or equipment washing is not expected. Highly specialized concrete trucks will be on site during well casing operations. The concrete could be prepared on site and truck cleaning will be done off site by third party contractors.

#### 1.6.12 Dedicated Asphalt and Concrete Batch Plants

Dedicated asphalt and concrete batch plants are not expected.

#### 1.6.13 Non-Industrial Waste Sources

All project phases involve people working on site. This can generate personal and work-related trash and debris and may necessitate the use of portable toilets. Clearing operations may generate waste in the form of slash (trees, brush, etc.).

### **1.7 Non-Stormwater Discharges**

Stormwater discharges from the Conner 19-18 facility will consist entirely of runoff from precipitation events and allowable non-stormwater discharges identified below. This condition is verified on a regular basis through site inspections.

Other allowable non-stormwater discharges, provided that appropriate control measures are implemented, may include:

- Discharges resulting from emergency firefighting activities during active emergency response;
- Discharges from uncontaminated spring water that do not originate from an area of land disturbance;
- Discharges of landscape irrigation return flow;
- Discharges to the ground of concrete washout water (see below); and
- Discharges from diversions of state waters within the permitted site.

Concrete washout is not anticipated at the Conner 19-18 facility.

COR400000 does not authorize discharges currently covered by a Division Low Risk Discharge Guidance Document, including uncontaminated groundwater discharge to the ground. In the event that uncontaminated groundwater must be discharged to the ground, the Division's Low Risk Discharge Guidance shall be followed.

COR400000 also does not authorize discharges associated with construction dewatering, which may include groundwater, surface water, and stormwater that has mixed with groundwater and/or surface water (i.e., commingled stormwater runoff). In the event that discharges associated with dewatering activities are deemed necessary, authorization under the CDPS General Permit, *Construction Dewatering Discharges*. (COG070000) shall be obtained.

### **1.8 Receiving Waters**

The planned disturbances for the POCO Conner 19-18 pad operations lie within the South Platte River Basin. For more detail on receiving waters, see the site-specific vicinity waters map in Appendix D.

## **2.0 SITE MAPS/DIAGRAMS**

The control measures anticipated for the Conner 19-18 facility are depicted on the site-specific maps in Appendix D of this Plan. The maps will be regularly updated to reflect changes to the facility.

### **2.1 Construction Site Boundaries**

The disturbed area for the Conner 19-18 well pad is approximately 8.05-acres; however, the actual well pad footprint is smaller, as shown in the plat maps in Appendix C.

### **2.2 Areas of Ground Disturbance**

An approximate 4 acre well pad footprint is anticipated within the 8.05-acres of planned disturbance.

### **2.3 Areas of Cut and Fill**

The eastern half of the well pad footprint is anticipated to be cut with the western half receiving some fill to construction a level surface area for operation.

### **2.4 Storage Areas**

POCO anticipates stockpiling topsoil to the exterior of the well pad footprint but within the disturbed area. Fuel, construction materials, and other chemical storage areas are shown on the individual site map in Appendix D.

### **2.5 Location of Asphalt and Concrete Batch Plants**

Asphalt or concrete batch plants are not planned for the Conner 19-18 facility.

### **2.6 Locations of Structural Control Measures**

The locations of structural control measures, where applicable, are shown on the figures in Appendix D.

### **2.7 Locations of Non-Structural Control Measures**

The locations of non-structural control measures, where applicable, are shown on the figures in Appendix D.

### **2.8 Locations of Springs, Streams, Wetlands and Other Surface Waters**

The locations of springs, streams, wetlands, and other surface waters in proximity to the Conner 19-18 facility are shown on the site-specific vicinity waters map in Appendix D.

The first priority immediate receiving water is an unnamed ditch that transect the northeast portion of the well pad flowing to the northwest. The second priority receiving waters are the Denver Hudson Canal located approximately 4,600 feet northwest, and Barr Lake located approximately 2 miles west of the Conner 19-18 facility.

## **2.9 Implementation of Control Measures Outside of the Permitted Area**

In accordance with the general permit, control measures located outside of the permitted area that are utilized by the construction site for permit compliance but are not owned or operated by POCO, must be documented and include a documented use agreement between POCO and the owner/operator of the control measure(s). Such control measures would be included on site-specific maps and any associated usage agreement documentation appended to this Plan.

### **3.0 STORMWATER MANAGEMENT CONTROLS**

The following sections present POCO's stormwater management controls to be implemented at the Conner 19-18 location prior to and during construction activities to prevent erosion, control sediment, and prevent impacts to stormwater leaving the site.

#### **3.1 Control Measures for Stormwater Pollution Prevention**

This section describes the control measures that will be used for stormwater pollution prevention. Appendix C contains the control measure installation and implementation guidance. Control measures may be added or removed from Appendix C to accommodate changes in site conditions and activities.

##### 3.1.1 Structural Practices for Erosion and Sediment Control

POCO intends to utilize the following structural control measures to control sediment migration from the facility during construction:

- Earthen Berm: An earthen berm will be constructed along the southern boundary of the pad. Smaller berms will be constructed along portions of the northern and eastern pad boundaries.
- Drainage Ditch: A drainage ditch shall be constructed along the northeast boundary of the well-pad and run in a northerly and westerly direction to direct water from an "Unnamed Ditch" around the well-pad perimeter. A second drainage ditch shall be constructed along the southern boundary of the pad in a westerly and northerly direction to direct water around the well-pad perimeter.
- Sediment Control Log: A sediment control log will be placed on the southern boundary of the topsoil stockpile.
- Mulch/Seed: Topsoil stockpiles that will be exposed for more than six months will be mulched and/or seeded as a stabilization technique to control sediment loss.
- Sediment Control Trap: Pads with rip-pad protected outfalls designed to allow sediment to precipitate out of water and allow the water without sediment out off the property will be constructed on the northwest corner of the pad.
- Vehicle Tracking Pad: Vehicle tracking pads are a type of vehicle tracking control which minimize tracking of sediments from the well pad to paved road surfaces. A vehicle tracking pad will be constructed along the access road.
- Rock Check Dams: Rock check dams are temporary grade control structures placed in drainage channels to limit the erosivity of stormwater by reducing flow velocity. Rock check dams shall be constructed within the drainage ditches at the well-pad.

There are various considerations to assess during construction activities to determine the appropriate BMPs including the consistency of the soil, the grade of the pad and natural drainage in the area. As construction progresses, BMPs will be assessed, installed, and/or replaced as needed. Descriptions, design, installation practices, and maintenance and



removal considerations for the structural control measures available for use at this location can be found in Appendix F.

### 3.1.2 Non-Structural Practices for Erosion and Sediment Control

POCO intends to utilize the following non-structural control measures to control sediment migration from the facility during construction:

- Training: Those persons responsible for inspections and monitoring will be trained on the contents of the Plan and the requirements herein.
- Minimize Compaction: POCO will limit traffic outside of the well pad footprint but within the disturbed area, to the extent possible, to reduce compaction in areas where infiltration control measures will occur or where final stabilization will be achieved through vegetative cover.
- Stockpile Tracking: To prevent erosion, stockpiles will be tracked perpendicular to runoff direction.
- Stockpile Location: Whenever possible, stockpiles will be located away from drainage system components and outfalls, and, where practical, stockpiles will be placed in areas that will remain undisturbed for the longest period of time as the phases of construction progress.

### 3.1.3 Phased Control Measure Installation

Control measure implementation will be coordinated with the various stages of construction. Run-on protection and runoff controls will be installed prior to earth disturbing activities where necessary, with consideration given to worker safety, access, and prevailing drainage patterns. As the well pad construction comes to a close, and control measures are no longer needed, they will be removed.

Permanent or temporary stabilization measures for slopes, channels, ditches, disturbed land areas, and soil stockpiles will be implemented as soon as practicable after final grading or the final ground disturbance has been completed. When it is not possible to permanently stabilize a disturbed area, temporary erosion control measures will be implemented as soon as practicable.

### 3.1.4 Materials Handling and Spill Prevention

POCO personnel and contractors will handle and store materials in a manner that prevents stormwater impacts and spills to the extent practicable. Where feasible, significant material storage areas will be kept covered to prevent contact with stormwater.

The following guidelines for storing and managing petroleum products will be implemented:

- Product containers will be clearly labeled.
- Drums (if present) will be kept within secondary containment or general site

containment (i.e. perimeter berm), and may also need to be kept off the ground. Lids for drummed materials will be securely fastened.

- Fuel tanks will be stored within secondary containment, general site containment, or stored to minimize impacts to stormwater.
- Persons trained in handling spills will be on call at all times; POCO field personnel are trained on spill management procedures annually.
- Storage areas and containers will be regularly monitored for leaks and repaired or replaced as necessary.

Oily wastes such as used oil filters, empty containers, rags, and sorbent pads and socks containing oils will be placed in proper receptacles and disposed of or recycled. Routine inspections will be conducted to identify leaks from equipment and vehicles and if needed corrective actions will be implemented.

### 3.1.5 Stockpile Stabilization

During facility construction, topsoil should be piled no higher than three to five feet high and slopes of the stockpiles should not exceed a 2:1 width to height ratio to minimize erosion potential and facilitate interim stabilization.

Whenever possible, topsoil will not be stockpiled for longer than six months. Topsoil stockpiled for more than six months will be seeded and mulched with a temporary grass cover or will be stabilized using structural and/or non-structural control measures.

Topsoil stockpiles should be fenced and uniquely identified on facility drawings in accordance with COGCC 1000 series rules. Perimeter control measures such as sediment control logs, rock socks, straw bales, ditch and/or berm with sediment trap(s) or sandbags should be used around the base of unstabilized stockpiles or where there is potential for sediment to come in contact with runoff and leave the site.

### 3.1.6 Other Material/Chemical Product Management

Chemicals and other materials such as cement, sand, and sawdust that are utilized during facility construction, drilling, or completions activities will be stored in accordance with manufacturer's recommendations; generally, in original packaging and/or otherwise covered to ensure that the raw material does not come into contact with stormwater. Storage or laydown areas employed during construction activities will be regularly inspected for spills, leaks, and the potential of materials commingling with stormwater.

### 3.1.7 Spill Response

Spills are to be reported to the SWMP manager(s) immediately. Spills of produced fluids and exploration and production (E&P) waste that are greater than one barrel (25 gallons) outside of secondary containment or greater than five barrels (125 gallons) that are inside of secondary containment, will be reported to the COGCC by POCO or their designated agent. Spills of refined petroleum products, unused chemicals, and other non-E&P waste

will be evaluated on a case-by-case basis and any spills that exceed a reportable quantity will be reported to the appropriate state or federal agency by POCO or their designated agent. As needed, POCO personnel will review Safety Data Sheets (SDS) for information on spills of chemicals or other materials.

POCO will coordinate the appropriate personnel to handle spills in accordance with POCO's Emergency Response Plan. Spills will be controlled and contained as soon as practicable upon discovery and cleaned up as soon as practicable. Spilled material and/or contaminated soil will be disposed of in accordance with all applicable regulations, generally at a commercial landfill or disposal facility. De minimis spills of inert construction materials such as bentonite, concrete, and sawdust used in drilling and completion will be cleaned up as soon as practicable after drilling and completion activities are completed

### **3.2 Dedicated Asphalt or Concrete Batch Plants**

Dedicated asphalt or concrete batch plants are not expected at the Conner 19-18 well pad location.

### **3.3 Vehicle Tracking**

In order to limit vehicle tracking of sediment, vehicles will use designated entry points into construction areas. Stabilization methods, such as road base, chemical stabilizers, and/or a Vehicle Tracking Control (VTC) (See VTC detail in Appendix F) will be used where necessary. The locations of vehicle tracking control measures will be shown on the site maps.

### **3.4 Waste Management**

#### 3.4.1 Waste Management and Disposal

Exploration and production wastes will be managed in accordance with the COGCC 900 Series rules. Construction-related and other trash will be collected in dumpsters and containers and hauled off-site for disposal in commercial landfills as soon as practicable. Dumpsters will be covered during times when construction activities are not occurring. POCO expects that contractors will pick up loose trash and debris.

Portable toilets may be used to contain sanitary waste, with waste materials regularly pumped and transported off-site for disposal at approved facilities. Portable toilets will be secured when a risk of tippage is present.

#### 3.4.2 Concrete Washout

Concrete washout is not expected within the project site. However, if the need for concrete washout arises, an appropriate containment structure will be utilized. See Section 1.7 above for more information. The locations of any waste containments or concrete washout areas on site will be shown on the site maps.

### **3.5 Ground Water and Stormwater Dewatering**

#### **3.5.1 Groundwater Dewatering**

No groundwater dewatering is expected at this time. If groundwater is encountered, refer to Section 1.7 above for information.

#### **3.5.2 Stormwater Dewatering**

If the need for stormwater dewatering is encountered, control measures will be utilized to prevent erosion and trap sediment. See Dewatering Operations (DWO) in the Control Measures Design Manual for control measures descriptions for dewatering operations. The control measures to be utilized will be shown on the site map. See Section 1.7 above for more information.

### **3.6 Control Measure Maintenance**

Erosion and sediment control measures implemented under this Plan will be maintained in effective operational condition, in accordance with the manufacturer's specifications and good engineering, hydrologic and pollution control practices. Routine inspections include a provision to evaluate the effectiveness of each implemented control measures and identify when maintenance is required.

When control measures maintenance or replacement is required, POCO will correct the issue as soon as possible to minimize the discharge of pollutants. When new control measures are installed or replaced, this Plan will be updated accordingly.

## **4.0 FINAL STABILIZATION AND LONG-TERM STORMWATER MANAGEMENT**

Final stabilization must be implemented for all construction sites covered under General Permit COR400000. A site is considered to be in final stabilization when a location meets interim reclamation in accordance with COGCC Rule 1003 has been achieved and (1), (2), and (3) below are complete:

- (1) All construction activities are complete;
- (2) Permanent stabilization methods are complete. Permanent stabilization methods include, but are not limited to, permanent pavement or concrete, hardscape, xeriscape, stabilized driving surfaces, vegetative cover, or equivalent permanent alternative stabilization methods (alternative methods may be approved by the Division). Vegetative cover must meet the following criteria:
  - a. Evenly distributed perennial vegetation; and
  - b. Coverage, at a minimum, equal to 70 percent of what would have been provided by native vegetation in a local, undisturbed area or adequate reference site.
- (3) The permittee must ensure that all temporary control measures are removed from the construction site once final stabilization is achieved, except when the control measure specifications allow the control measure to be left in place (i.e., biodegradable control measures).

Specific control measures for soil preparation and amendment, soil stabilization, and sediment control during final stabilization will be selected and applied, as needed.

## 5.0 INSPECTIONS AND MAINTENANCE PROCEDURES

Site inspections will be conducted in accordance with the requirements and minimum schedule outlined in Part I.D.2 of the CDPS General Permit (COR400000). The requirements are as follows:

- The first site inspection must be completed within seven (7) calendar days of the commencement of construction activities.
- Active construction sites will be inspected at one of the two following frequencies:
  - At least one inspection every 7 calendar days; or
  - At least one inspection every 14 calendar days, if post-storm event inspections are conducted within 24 hours after the end of any precipitation or snowmelt event that causes surface erosion. Note that post-storm inspections may be used to fulfill the 14 day routine inspection requirement.

POCO has elected to inspect at least once every 7 days at the Conner 19-18 facility during active construction.

- If a site is considered temporarily idle, that is, no construction activities will occur following a storm event, then a post-storm inspection will be conducted prior to re-commencing constructing activities, no later than 72 hours following the storm event. Routine inspections must still be conducted at least every 14 calendar days.
- For sites or portions of sites in which all construction activities that will result in ground disturbance are completed, all activities for final stabilization, as outlined above in Section 4, with the exception of vegetative coverage are completed, and this SWMP has been amended to locate the areas to be inspected, inspections will be conducted at least once every 30 days, and post-storm inspections are not required.
- Inspections are not required at sites where snow cover exists over the entire site for an extended period of time and construction activities are halted, as long as melting conditions do not exist. The following information must be documented in the inspection record for the use of this exclusion: dates when snow cover occurred, date when construction activities ceased, and date melting conditions began. This only applies when all construction activities cease and typically only at high elevations.
- For sites that discharge to a water body designated as an Outstanding Water by the Water Quality Control Division, inspections will be performed at least once every 7 calendar days.

A person identified as a SWMP Manager (see beginning of this Plan) will conduct inspections. The scope of the inspection will cover the construction site perimeter, disturbed areas, designated haul routes, material and/or waste storage areas that are exposed to precipitation, discharge locations, and locations where vehicles access the site. These areas will be inspected for evidence of, or the potential for, pollutants leaving the construction site boundaries entering the stormwater drainage system or discharging to waters of the state. Erosion and sediment control practices identified in this SWMP will be evaluated to ensure that they are maintained and operating correctly.

Personnel performing site inspections will record the information as outlined below on the inspection report. This inspection report will identify any incidents of non-compliance with the terms and conditions of the general permit and this SWMP. The inspection report will include:

1. The inspection date;
2. Name(s) and title(s) of personnel making the inspection;
3. Weather conditions at the time of inspection;
4. Phase of construction at the time of inspection;
5. Estimated acreage of disturbance at time of inspection;
6. Location(s) of discharges of sediment or other pollutants from the site;
7. Location(s) of control measures that need to be maintained;
8. Location(s) of control measures that failed to operate as designed or proved inadequate for a particular location;
9. Location(s) where additional control measures are needed that were not in place at the time of inspection;
10. Description of the minimum inspection frequency utilized when conducting inspection;
11. Deviations and reason for deviation from the minimum inspection schedule as outlined above;
12. Description of corrective action for items 3, 4, 5, and 6, above, dates corrective action(s) taken, and measures taken to prevent future violations, including requisite changes to the SWMP, as necessary; and
13. After adequate corrective actions have been taken, or where a report does not identify any incidents requiring corrective actions, the report shall contain a signed statement indicating the site is in compliance with the permit to the best of the signer's knowledge and belief.

A sample Routine Inspection Form can be found in Appendix E of this Plan.

Where site inspections note the need for control measure maintenance activities, control measures must be maintained in accordance with the SWMP and the General Permit. Repair, replacement, or installation of new control measures determined necessary during site inspections to address ineffective or inadequate control measures must be conducted in accordance with the permit. SWMP updates required as a result of deficiencies in the SWMP noted during site inspections shall be made in accordance with the General Permit.



## **6.0 SWMP REVISION, RECORDS AND RETENTION**

Pursuant to the General Permit, this SWMP has been prepared prior to commencement of any construction activity. A complete, accurate, and signed permit application shall be submitted electronically at least 10 days prior to the commencement of construction activities, except in the event of construction activities in response to a public emergency (in which an application shall be submitted no later than 14 days *after* the commencement of construction activities).

### **6.1 SWMP Retention Requirements**

A copy of the SWMP must be retained on site unless another location, specified by the permittee, is approved by the Division.

### **6.2 SWMP Review and Changes**

The SWMP shall be amended if the following occurs:

- When there is a change in design, construction, operation, or maintenance of the site, which would require the implementation of new or revised control measures; or
- If the SWMP proves to be ineffective in achieving the general objectives of controlling pollutants in stormwater discharges associated with construction activity; or
- When control measures are no longer necessary or removed; or
- When control measures identified in the SWMP are taken on site that result in a change to the SWMP.

SWMP revisions may include, but are not limited to, potential pollutant source identification, selection of appropriate control measures for site conditions, control measures maintenance procedures, and interim and final stabilization practices. The SWMP changes may include a schedule for further control measures design and implementation, provided that, if any interim control measures are needed to comply with the permit, they are also included in the SWMP and implemented during the interim period.

For SWMP revisions made prior to or following a change(s) onsite, including revisions to sections addressing site conditions and control measures, a notation must be included in the Revision History table at the beginning of this Plan that identifies the date of the site change, the control measures removed or modified, the locations of the control measures, and any changes to the control measures.

POCO shall ensure the site changes are reflected in the SWMP or pursuant to Part I.C.3 of COR400000. POCO understands that it shall be considered non-compliant with the general permit until SWMP revisions have been made.

**APPENDIX A**

CDPS CERTIFICATION AND  
GENERAL PERMIT COR400000

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**COLORADO**

**Department of Public  
Health & Environment**

CERTIFICATION TO DISCHARGE  
UNDER  
CDPS GENERAL PERMIT COR400000  
STORMWATER ASSOCIATED WITH CONSTRUCTION ACTIVITIES

Certification Number: COR403522

This Certification to Discharge specifically authorizes:

Owner POCO Holdco, LLC  
Operator POCO Holdco, LLC  
to discharge stormwater from the facility identified as

POCO - DJ Basin Operations

To the waters of the State of Colorado, including, but not limited to:

Todd Creek, South Platte River

Facility Activity : Oil and Gas Exploration and Well Pad Development

Disturbed Acres: 500 acres

Facility Located at: Yosemite St and 162 Ave Brighton CO 80602  
Adams County  
Latitude 39.99222 Longitude -104.87349

Specific Information  
(if applicable):

Certification is issued and effective: 12/9/2020  
Expiration date of general permit: 3/31/2024

This certification under the permit requires that specific actions be performed at designated times. The certification holder is legally obligated to comply with all terms and conditions of the permit.

This certification was approved by:  
Meg Parish, Section Manager  
Permits Section  
Water Quality Control Division





# STATE OF COLORADO

## COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT

### Water Quality Control Division

CDPS GENERAL PERMIT STORMWATER DISCHARGES ASSOCIATED WITH  
CONSTRUCTION ACTIVITY AUTHORIZATION TO DISCHARGE UNDER THE COLORADO DISCHARGE PERMIT SYSTEM (CDPS)  
COR400000

In compliance with the provisions of the Colorado Water Quality Control Act, (25-8-101 et seq., CRS, 1973 as amended) and the Federal Water Pollution Control Act, as amended (33 U.S.C. 1251 et seq.; the "Act"), this permit authorizes the discharge of stormwater associated with construction activities (and specific allowable non-stormwater discharges in accordance with Part I.A.1. of the permit) certified under this permit, from those locations specified throughout the State of Colorado to specified waters of the State.

Such discharges shall be in accordance with the conditions of this permit. This permit specifically authorizes the facility listed on the certification to discharge in accordance with permit requirements and conditions set forth in Parts I and II hereof. All discharges authorized herein shall be consistent with the terms and conditions of this permit.

This permit becomes effective on April 1, 2019, and shall expire at midnight March 31, 2024.

Issued and signed this 28th day of January, 2021.

*Meg Parish*

Meg Parish, Permits Section Manager Water Quality Control Division

COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT

#### Permit History

Minor Modification Issued January 28, 2021 Effective February 1, 2021

Modification Issued December 31, 2020 Effective February 1, 2021

Originally signed and issued October 31, 2018; effective April 1, 2019

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## Part I

Note: At the first mention of terminology that has a specific connotation for the purposes of this permit, the terminology is electronically linked to the definitions section of the permit in Part I.E.

### A. COVERAGE UNDER THIS PERMIT

#### 1. Authorized Discharges

This general permit authorizes permittee(s) to discharge the following to state waters: stormwater associated with construction activity and specified non-stormwater associated with construction activity. The following types of stormwater and non-stormwater discharges are authorized under this permit:

##### a. Allowable Stormwater Discharges

- i. Stormwater discharges associated with construction activity.
- ii. Stormwater discharges associated with producing earthen materials, such as soils, sand, and gravel dedicated to providing material to a single contiguous site, or within ¼ mile of a construction site (e.g. borrow or fill areas).
- iii. Stormwater discharges associated with [dedicated asphalt](#), [concrete batch plants](#) and [masonry mixing stations](#) (Coverage under this permit is not required if alternative coverage has been obtained.)

##### b. Allowable Non-Stormwater Discharges

The following non-stormwater discharges are allowable under this permit if the discharges are identified in the stormwater management plan in accordance with [Part I.C](#) and if they have appropriate [control measures](#) in accordance with [Part I.B.1](#).

- i. Discharges from uncontaminated springs that do not originate from an area of land disturbance.
- ii. Discharges to the ground of concrete washout water associated with the washing of concrete tools and concrete mixer chutes. Discharges of concrete washout water must not leave the site as surface runoff or reach [receiving waters](#) as defined by this permit. Concrete on-site waste disposal is not authorized by this permit except in accordance with [Part I.B.1.a.ii\(b\)](#).
- iii. Discharges of landscape irrigation return flow.
- iv. Discharges from [diversions](#) of state waters within the permitted site.

##### c. Emergency Fire Fighting

Discharges resulting from emergency firefighting activities during the active emergency response are authorized by this permit.

#### 2. Limitations on Coverage

Discharges not authorized by this permit include, but are not limited to, the discharges and activities listed below. Permittees may seek individual or alternate general permit coverage for the discharges, as appropriate and available.

##### a. Discharges of Non-Stormwater

Discharges of non-stormwater, except the authorized non-stormwater discharges listed in Part



I.A.1.b., are not eligible for coverage under this permit.

- b. Discharges Currently Covered by another Individual or General Permit
- c. Discharges Currently Covered by a Water Quality Control Division (division) Low Risk Guidance Document

### 3. Permit Certification and Submittal Procedures

#### a. Duty to Apply

The following activities shall apply for coverage under this permit:

- i. Construction activity that will disturb one acre or more; or
- ii. Construction activity that is part of a [common plan of development or sale](#); or
- iii. Stormwater discharges that are designated by the division as needing a stormwater permit because the discharge:

**(a)** Contributes to a violation of a water quality standard; or

**(b)** Is a significant contributor of [pollutants](#) to state waters.

#### b. Application Requirements

To obtain authorization to discharge under this permit, applicants applying for coverage following the effective date of the renewal permit shall meet the following requirements:

- i. Owners and operators submitting an application for permit coverage will be co-permittees subject to the same benefits, duties, and obligations under this permit.
- ii. Signature requirements: Both the [owner](#) and [operator](#) (permittee) of the construction site, as defined in Part I.E., must agree to the terms and conditions of the permit and submit a completed application that includes the signature of both the owner and the operator. In cases where the duties of the owner and operator are managed by the owner, both application signatures may be completed by the owner. Both the owner and operator are responsible for ensuring compliance with all terms and conditions of the permit, including implementation of the stormwater management plan.
- iii. The applicant(s) must develop a stormwater management plan (SWMP) in accordance with the requirements of Part I.C. The applicant(s) must also certify that the SWMP is complete, or will be complete, prior to commencement of any construction activity.
- iv. In order to apply for certification under this general permit, the applicant(s) must submit a complete, accurate, and signed permit application form as provided by the division by electronic delivery at least 10 days prior to the commencement of construction activity, except those construction activities that are in response to a [public emergency related site](#); [public emergency related sites](#) shall apply for coverage no later than 14 days after the commencement of construction activities. The provisions of this part in no way remove a violation of the Colorado Water Quality Control Act if a [point source](#) discharge occurs prior to the issuance of a CDPS permit.
- v. **The application in its entirety must be submitted via the division's online permitting system** unless a waiver is granted by the division. If a waiver is granted, the application in its entirety, including signatures by both the owner and operator, must be submitted to:

Colorado Department of Public Health and Environment  
Water Quality Control Division  
Permits Section, WOCD-PS-B2  
4300 Cherry Creek Drive South  
Denver, CO 80246

- vi. The applicant(s) must receive written notification that the division granted permit coverage prior to conducting construction activities except for construction activities that are in response to a public emergency related site.

- c. Division Review of Permit Application

Within 10 days of receipt of the application, and following review of the application, the division may:

- i. Issue a certification of coverage;
- ii. Request additional information necessary to evaluate the discharge;
- iii. Delay the authorization to discharge pending further review;
- iv. Notify the applicant that additional terms and conditions are necessary; or
- v. Deny the authorization to discharge under this general permit.

- d. Alternative Permit Coverage

- i. Division Required Alternative Permit Coverage:

The division may require an applicant or permittee to apply for an individual permit or an alternative general permit if it determines the discharge does not fall under the scope of this general permit, including if any additional terms and conditions are necessary in order to ensure that discharges authorized by this permit shall not cause, have the reasonable potential to cause, or measurably contribute to an exceedance of any applicable water quality standard, including narrative standards for water quality. In this case, the division will notify the applicant or permittee that an individual permit application is required.

- ii. Permittee Request for Alternative Permit Coverage:

A permittee authorized to discharge stormwater under this permit may request to be excluded from coverage under this general permit by applying for an individual permit. In this case, the permittee must submit an individual application, with reasons supporting the request, to the division at least **180 days prior to any discharge. When an individual permit is issued, the permittee's authorization to discharge under this permit is terminated on the effective date of the individual permit.**

- e. Submittal Signature Requirements

Documents required for submittal to the division in accordance with this permit, including applications for permit coverage and other documents as requested by the division, must include signatures by both the owner and the operator, except for instances where the duties of the owner and operator are managed by the owner.

Signatures on all documents submitted to the division as required by this permit must meet the Standard Signatory Requirements in [Part II.K](#) of this permit in accordance with 40 C.F.R. 122.41(k).

- i. Signature Certification

Any person(s) signing documents required for submittal to the division must make the following

certification:

**“I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.”**

f. Compliance Document Signature Requirements

Documents which are required for compliance with the permit, but for which submittal to the division is not required unless specifically requested by the division, must be signed by the individual(s) designated as the [Qualified Stormwater Manager](#), as defined in Part I.E.

- i. Any person(s) signing inspection documents required for compliance with the permit per [Part I.D.5.c.xiii](#) must make the following statement and provide the date of the statement:

**“I verify that, to the best of my knowledge and belief, that if any corrective action items were identified during the inspection, those corrective actions are complete, and the site is currently in compliance with the permit.”**

g. Field Wide Permit Coverage for Oil and Gas Construction

At the discretion of the division, a single permit certification may be issued to a single oil and gas permittee to cover construction activity related discharges from an oil and gas field at multiple locations that are not necessarily contiguous.

h. Permit Coverage without Application

**Qualifying Local Program:** When a small construction site is within the jurisdiction of a qualifying local program, the owner and operator of the construction activity are authorized to discharge stormwater associated with **small construction activity** under this general permit without the submittal of an application to the division. Sites covered by a qualifying local program are exempt from the following sections of this general permit: Part I.A.3.a.; Part I.A.3.b.; Part I.A.3.c.; Part I.A.3.d.; Part I.A.3.g.; Part I.A.3.i.; Part I.A.3.j.; Part I.A.3.k.

Sites covered by a qualifying local program are subject to the following requirements:

- i. **Local Agency Authority:** This permit does not pre-empt or supersede the authority of local agencies to prohibit, restrict, or control discharges of stormwater to storm drain systems or other water courses within their jurisdiction.
- ii. **Permit Coverage Termination:** When a site under a Qualifying Local Program is finally stabilized, coverage under this permit is automatically terminated.
- iii. **Compliance with Qualifying Local Program:** Qualifying Local Program requirements that are equivalent to the requirements of this permit are incorporated by reference. Permittees authorized to discharge under this permit, must comply with the equivalent requirements of the Qualifying Local Program that has jurisdiction over the site as a condition of this permit.
- iv. **Compliance with Remaining Permit Conditions.** Requirements of this permit that are in addition to or more stringent than the requirements of the Qualifying Local Program apply in addition to the requirements of the Qualifying Local Program.
- v. **Written Authorization of Coverage:** The division or local municipality may require any permittee within the jurisdiction of a Qualifying Local Program covered under this permit to

apply for, and obtain written authorization of coverage under this permit. The permittee must be notified in writing that an application for written authorization of coverage is required.

i. Permittee Initiated Permit Actions

Permittee initiated permit actions, including but not limited to modifications, contact changes, transfers, and terminations, shall be conducted following [Part II.L](#), division guidance and using appropriate division-provided forms.

j. Sale of Residence to Homeowner

Residential construction sites only: The permittee may remove residential lots from permit coverage once the lot meets the following criteria:

- i. The residential lot has been sold to the homeowner(s) for private residential use;
- ii. A certificate of occupancy, or equivalent, is maintained on-site and is available during division inspections;
- iii. The lot is less than one acre of disturbance;
- iv. All construction activity conducted on the lot by the permittee is complete;
- v. The permittee is not responsible for final stabilization of the lot; and
- vi. The SWMP was modified to indicate the lot is no longer part of the construction activity.

If the residential lot meets the criteria listed above then activities occurring on the lot are no longer considered to be construction activities with a duty to apply and maintain permit coverage. Therefore, the permittee is not required to meet the final stabilization requirements and may terminate permit coverage for the lot.

k. Permit Expiration and Continuation of Permit Coverage

Authorization to discharge under this general permit shall expire at midnight on March 31, 2024. While Regulation 61.4 requires a permittee to submit an application for continuing permit coverage 180 days before the permit expires, the division is requiring that permittees desiring continued coverage under this general permit must reapply at least 90 days in advance of this permit expiration. The division will determine if the permittee may continue to discharge stormwater under the terms of the general permit. An individual permit may be required for any facility not reauthorized to discharge under the reissued general permit.

If this permit is not reissued or replaced prior to the expiration date, it will be administratively continued and remain in force and effect. For permittees that have applied for continued permit coverage, discharges authorized under this permit prior to the expiration date will automatically remain covered by this permit until the earliest of:

- i. An authorization to discharge under a reissued permit, or a replacement of this permit, following the timely and appropriate submittal of a complete application requesting authorization to discharge under the new permit and compliance with the requirements of the new permit; or
- ii. The issuance and effect of a termination issued by the division; or
- iii. **The issuance or denial of an individual permit for the facility's discharges;** or
- iv. A formal permit decision by the division not to reissue this general permit, at which time the division will identify a reasonable time period for covered dischargers to seek coverage under

an alternative general permit or an individual permit. Coverage under this permit will cease when coverage under another permit is granted/authorized; or

- v. The division has informed the permittee that discharges previously authorized under this permit are no longer covered under this permit.

## B. EFFLUENT LIMITATIONS

### 1. Requirements for Control Measures Used to Meet Effluent Limitations

The permittee must implement control measures to [minimize](#) the discharge of pollutants from all potential pollutant sources at the site. Control measures must be installed prior to commencement of construction activities. Control measures must be selected, designed, installed and maintained in accordance with [good engineering, hydrologic and pollution control practices](#). Control measures implemented at the site must be designed to prevent pollution or degradation of state waters.

#### a. Stormwater Pollution Prevention

The permittee must implement structural and/or nonstructural control measures that effectively minimize erosion, sediment transport, and the release of other pollutants related to construction activity.

##### i. Control Measures for Erosion and Sediment Control

Control measures for erosion and sediment control may include, but are not limited to, wattles/sediment control logs, silt fences, earthen dikes, drainage swales, sediment traps, subsurface drains, pipe slope drains, inlet protection, outlet protection, gabions, sediment basins, temporary vegetation, permanent vegetation, mulching, geotextiles, sod stabilization, slope roughening, maintaining existing vegetation, protection of trees, and preservation of mature vegetation.

Specific control measures must meet the requirements listed below.

- (a) Structural and nonstructural vehicle tracking controls shall be implemented to minimize vehicle tracking of sediment from disturbed areas and may include tracking pads, minimizing site access, wash racks, graveled parking areas, maintaining vehicle traffic to paved areas, street sweeping and sediment control measures.
- (b) Stormwater runoff from all disturbed areas and soil storage areas must utilize or flow to one or more control measures to minimize erosion or sediment in the discharge. The control measure(s) must be selected, designed, installed and adequately sized in accordance with good engineering, hydrologic and pollution control practices for the intended application. The control measure(s) must contain or filter flows in order to prevent the [bypass](#) of flows without treatment and must be appropriate for stormwater runoff from disturbed areas and for the expected flow rate, duration, and flow conditions (e.g. sheet or concentrated flow).
- (c) Selection of control measures should prioritize the use of structural and nonstructural control measures that minimize the potential for erosion (i.e. covering materials). Selection should also prioritize phasing construction activities to minimize the amount of soil disturbance at any point in time throughout the duration of construction.
- (d) Outlets that withdraw water from or near the surface shall be installed when discharging from basins and impoundments, unless [infeasible](#).
- (e) Maintain pre-existing vegetation or equivalent control measures for areas within 50 horizontal feet of receiving waters as defined by this permit, unless infeasible.

- (f) Soil compaction must be minimized for areas where infiltration control measures will occur or where [final stabilization](#) will be achieved through vegetative cover.
  - (g) Unless infeasible, topsoil shall be preserved for those areas of a site that will utilize vegetative final stabilization.
  - (h) Minimize the amount of soil exposed during construction activity, including the disturbance of [steep slopes](#).
  - (i) Diversion control measures must minimize soil transport and erosion within the entire diversion, minimize erosion during discharge, and minimize run-on into the diversion. The permittee must minimize the discharge of pollutants throughout the installation, implementation and removal of the diversion. Diversions must meet one or more of the following conditions:
    - (1) Lined or piped structures that result in no erosion in all flow conditions.
    - (2) Diversion channels, berms, and coffer dams must be lined or composed of a material that minimizes potential for soil loss in the entire wetted perimeter during anticipated flow conditions (e.g. vegetated swale, non-erosive soil substrate). The entire length of the diversion channel must be designed with all of the following considerations: maximum flow velocity for the type of material(s) exposed to the anticipated flows to ensure that the calculated maximum shear stress of flows in the channel is not expected to result in physical damage to the channel or liner and result in discharge of pollutants. Additionally, the conditions relied on to minimize soil loss must be maintained for the projected life of the diversion (i.e. a vegetated swale must be limited to a period of time that ensures vegetative growth, minimizes erosion and maintains stable conditions).
    - (3) An alternative diversion criteria, approved by the division prior to implementation. The diversion method must be designed to minimize the discharge of pollutants and to prevent the potential for pollution or degradation to state waters as a result of the diverted flow through the diversion structure. In addition, the alternative diversion method must minimize the discharge of pollutants throughout the installation, implementation and removal of the diversion.
- ii. Practices for Other Common Pollutants
- (a) Bulk storage, individual containers of 55 gallons or greater, for petroleum products and other liquid chemicals must have secondary containment, or equivalent protection, in order to contain [spills](#) and to prevent spilled material from entering state waters.
  - (b) Control measures designed for concrete washout waste must be implemented. This includes washout waste discharged to the ground as authorized under this permit and washout waste from concrete trucks and masonry operations contained on site. The permittee must ensure the washing activities do not contribute pollutants to stormwater runoff, or receiving waters in accordance [Part I.A.1.b.ii](#). Discharges that may reach groundwater must flow through soil that has buffering capacity prior to reaching groundwater, as necessary to meet the effluent limits in this permit, including [Part I.B.3.a](#). The concrete washout location must not be located in an area where shallow groundwater may be present and would result in buffering capacity not being adequate, such as near natural drainages, springs, or wetlands. This permit authorizes discharges to the ground of concrete washout waste, but does not authorize on-site waste disposal per [Part I.B.3.d](#).
  - (c) In the event that water remains onsite and contains pollutants either from the

firefighting activities or picked up from the site (i.e. in a gutter, sediment basin, etc.) after active emergency response is complete, the permittee must ensure the remaining water containing pollutants is properly removed and disposed of in order to minimize pollutants from discharging from the site, unless infeasible.

iii. Stabilization Requirements

The following requirements must be implemented for each site.

- (a) Temporary stabilization must be implemented for earth disturbing activities on any portion of the site where ground disturbing construction activity has permanently ceased, or temporarily ceased for more than 14 calendar days. Temporary stabilization methods may include, but are not limited to, tarps, soil tackifier, and hydroseed. The permittee may exceed the 14-day schedule when either the function of the specific area of the site requires it to remain disturbed or physical characteristics of the terrain and climate prevent stabilization. The SWMP must document the constraints necessitating the alternative schedule, provide the alternate stabilization schedule, and identify all locations where the alternative schedule is applicable on the site map. Minimum inspection frequency and scope, as directed in Part I.D., must be followed for temporarily stabilized areas.
- (b) Final stabilization must be implemented for all construction sites covered under this permit. Final stabilization is reached when (1), (2), and (3) below are complete:
  - (1) All construction activities are complete.
  - (2) Permanent stabilization methods are complete. Permanent stabilization methods include, but are not limited to, permanent pavement or concrete, hardscape, xeriscape, stabilized driving surfaces, vegetative cover, or equivalent permanent alternative stabilization methods. The division may approve alternative final stabilization criteria for specific operations. Vegetative cover must meet the following criteria:
    - a. Evenly distributed perennial vegetation, and
    - b. Coverage, at a minimum, equal to 70 percent of what would have been provided by native vegetation in a local, undisturbed area or adequate reference site, and
  - (3) The permittee must ensure all temporary control measures are removed from the construction site once final stabilization is achieved, except when the control measure specifications allow the control measure to be left in place (i.e. bio-degradable control measures).
- (c) Final stabilization must be designed and installed as a permanent feature. Final stabilization measures for obtaining a vegetative cover or alternative stabilization methods include, but are not limited to, the following as appropriate:
  - (1) Seed mix selection and application methods;
  - (2) Soil preparation and amendments;
  - (3) Soil stabilization methods to provide adequate protection to minimize erosion (e.g. crimped straw, hydro mulch or rolled erosion control products);
  - (4) Appropriate sediment control measures as needed until final stabilization is achieved;



(5) Permanent pavement, hardscape, xeriscape, stabilized driving surfaces;

(d) Other alternative stabilization practices as applicable.

b. Maintenance

The permittee must ensure that all control measures remain in effective operating condition and are protected from activities that would reduce their effectiveness. Control measures must be maintained in accordance with good engineering, hydrologic and pollution control practices. Observations leading to the required maintenance of control measures can be made during a site inspection, or during general observations of site conditions. The necessary repairs or modifications to a [control measure requiring routine maintenance](#), as defined in Part I.E., must be conducted to maintain an effective operating condition. This section is not subject to the requirements in [Part I.B.1.c](#) below.

c. Corrective Actions

The permittee must assess the adequacy of control measures at the site, and the need for changes to those control measures, to ensure continued effective performance.

When an [inadequate control measure](#), as defined in Part I.E., is identified (i.e., new or replacement control measures become necessary), the following corrective action requirements apply. The permittee is in noncompliance with the permit until the inadequate control measure is replaced or corrected and returned to effective operating condition in compliance with [Part I.B.1](#) and the general requirements in [Part I.B.3](#). If the inadequate control measure results in noncompliance that meets the conditions of Part II.L., the permittee must also meet the requirements of that section.

i. The permittee must take all necessary steps to minimize or prevent the discharge of pollutants from the permitted area and manage any stormwater run-on onto the site until a control measure is implemented and made operational and/or an inadequate control measure is replaced or corrected and returned to effective operating condition. If it is infeasible to install or repair the control measure immediately after discovering the deficiency, the following must be documented in the SWMP in [Part I.D.5.c](#) and kept on record in accordance with the recordkeeping requirements in Part II.

(a) Describe why it is infeasible to initiate the installation or repair immediately; and

(b) Provide a schedule for installing or repairing the control measure and returning it to an effective operating condition as soon as possible.

ii. If applicable, the permittee must remove and properly dispose of any unauthorized release or discharge within and from the permitted area (e.g., discharge of non-stormwater, untreated stormwater containing pollutants, spill, or leak not authorized by this permit.) The permittee must also clean up any contaminated surfaces, if feasible, to minimize discharges of the material in subsequent storm events, including water remaining from the response that contains pollutants after active emergency firefighting response is complete.

2. Discharges to an Impaired Waterbody

a. [Total Maximum Daily Load](#) (TMDL)

If the discharge from the site of permit coverage flows to or could reasonably be expected to flow to any water body for which a TMDL has been approved, and stormwater discharges associated with construction activity were assigned a pollutant-specific Wasteload Allocation (WLA) under the TMDL, the division may:

i. Ensure the WLA is implemented properly through alternative local requirements, such as by a

municipal stormwater permit; or

- ii. Notify the permittee of the WLA and amend **the permittee's certification to add specific** effluent limits and other requirements, as appropriate. The permittee may be required to do the following:
  - (a) **Under the permittee's SWMP, implement specific control measures based on** requirements of the WLA, and evaluate whether the requirements are met through implementation of existing stormwater control measures or if additional control measures are necessary. Document the calculations or other evidence demonstrating that the requirements are expected to be met; and
  - (b) If the evaluation shows that additional or modified control measures are necessary, describe the type and schedule for the control measure additions or modifications.
- iii. Discharge monitoring may also be required. The permittee may maintain coverage under the general permit provided they comply with the applicable requirements outlined above. The division reserves the right to require individual or alternate general permit coverage.

### 3. General Requirements

- a. Discharges authorized by this permit shall not cause, have the reasonable potential to cause, or measurably contribute to an exceedance of any applicable water quality standard, including narrative standards for water quality.
- b. The division may require sampling and testing, on a case-by-case basis, in the event that there is reason to suspect that the SWMP is not adequately minimizing pollutants in stormwater or in order to measure the effectiveness of the control measures in removing pollutants in the effluent. Such monitoring may include Whole Effluent Toxicity testing.
- c. The permittee must comply with the lawful requirements of federal agencies, municipalities, counties, drainage districts and other local agencies including applicable requirements in [Municipal Stormwater Management Programs](#) developed to comply with CDPS permits. The permittee must comply with local stormwater management requirements, policies and guidelines including those for erosion and sediment control.
- d. All construction site wastes must be properly managed to prevent potential pollution of state waters. This permit does not authorize on-site waste disposal.
- e. This permit does not relieve the permittee of the reporting requirements in 40 CFR 110, 40 CFR 117 or 40 CFR 302. Any discharge of hazardous material must be handled in accordance with the division's Noncompliance Notification Requirements (see [Part II.L](#) of the permit).

## C. STORMWATER MANAGEMENT PLAN (SWMP) REQUIREMENTS

### 1. SWMP General Requirements

- a. A SWMP shall be developed for each construction site listed under [Part I.A.3.a](#), including but not limited to, construction activity that will disturb one acre or more and/or are part of a common plan of development or sale covered by this permit. The SWMP must be prepared in accordance with good engineering, hydrologic and pollution control practices.
  - i. For public emergency related sites, a SWMP shall be created no later than 14 days after the commencement of construction activities.
- b. The permittee must implement the provisions of the SWMP as written and updated, from commencement of construction activity until final stabilization is complete. The division may review the SWMP.

- c. A copy of the SWMP must be retained onsite or be onsite when construction activities are occurring at the site unless the permittee specifies another location and obtains approval from the division.

## 2. SWMP Content

- a. The SWMP, at a minimum, must include the following elements.
  - i. Qualified Stormwater Manager. The SWMP must list individual(s) by title and name who are designated as responsible for implementing the SWMP in its entirety and meet the definition of a Qualified Stormwater Manager. This role may be filled by more than one individual.
  - ii. Spill Prevention and Response Plan. The SWMP must have a spill prevention and response plan. The plan may incorporate by reference any part of a Spill Prevention Control and Countermeasure (SPCC) plan under section 311 of the Clean Water Act (CWA) or a Spill Prevention Plan required by a separate CDPS permit. The relevant sections of any referenced plans must be available as part of the SWMP consistent with Part I.C.4.
  - iii. Other CDPS Permits. The SWMP must list the applicable CDPS permits associated with the permitted site and the activities occurring on the permitted site (e.g. a CDPS Dewatering Permit).
  - iv. Materials Handling. The SWMP must describe handling procedures of all control measures implemented at the site to minimize impacts from handling significant materials that could contribute pollutants to runoff. These handling procedures can include control measures for pollutants and activities such as, exposed storage of building materials, paints and solvents, landscape materials, fertilizers or chemicals, sanitary waste material, trash and equipment maintenance or fueling procedures.
  - v. Potential Sources of Pollution. The SWMP must list all potential sources of pollution which may reasonably be expected to affect the quality of stormwater discharges associated with construction activity from the site. This may include, but is not limited to, the following pollutant sources:
    - (a) Disturbed and stored soils;
    - (b) Vehicle tracking of sediments;
    - (c) Management of contaminated soils, if known to be present, or if contaminated soils are found during construction;
    - (d) Loading and unloading operations;
    - (e) Outdoor storage activities (erodible building materials, fertilizers, chemicals, etc.);
    - (f) Vehicle and equipment maintenance and fueling;
    - (g) Significant dust or particulate generating processes (e.g., saw cutting material, including dust);
    - (h) Routine maintenance activities involving fertilizers, pesticides, herbicides, detergents, fuels, solvents, oils, etc.;
    - (i) On-site waste management practices (waste piles, liquid wastes, dumpsters);
    - (j) Concrete truck/equipment washing, including washing of the concrete truck chute and associated fixtures and equipment;
    - (k) Dedicated asphalt, concrete batch plants and masonry mixing stations;

(L) Non-industrial waste sources such as worker trash and portable toilets.

- vi. Implementation of Control Measures. The SWMP must include design specifications that contain information on the implementation of all the structural and nonstructural control measures in use on the site in accordance with good engineering, hydrologic and pollution control practices; including, as applicable, drawings, dimensions, installation information, materials, implementation processes, control measure-specific inspection expectations, and maintenance requirements.

The SWMP must include a documented use agreement between the permittee and the owner or operator of any control measures located outside of the permitted area, that are utilized by the **permittee's construction site for compliance with this permit, but not under the direct control of the permittee.** The permittee is responsible for ensuring that all control measures located outside of their permitted area, that are being utilized by the **permittee's construction site,** are properly maintained and in compliance with all terms and conditions of the permit. The SWMP must include all information required of and relevant to any such control measures located outside the permitted area, including location, installation specifications, design specifications and maintenance requirements.

- vii. Site Description. The SWMP must include a site description which includes, at a minimum, the following:
- (a) The nature of the construction activity at the site;
  - (b) The proposed schedule for the sequence for major construction activities and the planned implementation of control measures for each phase. (e.g. clearing, grading, utilities, vertical, etc.);
  - (c) Estimates of the total acreage of the site, and the acreage expected to be disturbed by clearing, excavation, grading, or any other construction activities;
  - (d) A summary of any existing data and sources used in the development of the construction site plans or SWMP that describe the soil types found in the permitted area and the erodibility of the identified soil types;
  - (e) A description of the percent cover of native vegetation on the site if the site is undisturbed, or the percent cover of native vegetation in a similar, local undisturbed area or adequate reference area if the site is disturbed. Include the source or methodology for determining the percentage. If a percent cover is not appropriate for the site location (i.e. arid), describe the technique and justification for the identified cover of native vegetation;
  - (f) A description of any allowable non-stormwater discharges at the site, including those being discharged under a separate CDPS permit or a division low risk discharge guidance policy, and applicable control measures installed;
  - (g) A description of the drainage patterns from the site, including a description of the immediate source receiving the discharge and the receiving water(s) of the discharge, if different than the immediate source. If the stormwater discharge is to a [municipal separate storm sewer system](#), include the name of the entity owning that system, the location(s) of the stormwater discharge, and the receiving water(s);
  - (h) A description of all stream crossings located within the construction site boundary; and
  - (i) A description of the alternate temporary stabilization schedule, if applicable ([Part I.B.1.a.iii\(a\)](#)).

- (j) A description of the alternative diversion criteria as approved by the division, if applicable ([Part I.B.1.a.i\(3\)](#)).

viii. Site Map. The SWMP must include a site map which includes, at a minimum, the following:

- (a) Construction site boundaries;
- (b) Flow arrows that depict stormwater flow directions on-site and runoff direction;
- (c) All areas of ground disturbance including areas of borrow and fill;
- (d) Areas used for storage of soil;
- (e) Locations of all waste accumulation areas, including areas for liquid, concrete, masonry, and asphalt;
- (f) Locations of dedicated asphalt, concrete batch plants and masonry mixing stations;
- (g) Locations of all structural control measures;
- (h) Locations of all non-structural control measures (e.g. temporary stabilization);
- (i) Locations of springs, streams, wetlands, diversions and other state waters, including areas that require pre-existing vegetation be maintained within 50 feet of a receiving water, where determined feasible in accordance with [Part I.B.1.a.i\(e\)](#);
- (j) Locations of all stream crossings located within the construction site boundary; and
- (k) Locations where alternative temporary stabilization schedules apply.

ix. Temporary Stabilization, Final Stabilization and Long Term Stormwater Management.

- (a) The SWMP must document the constraints necessitating an alternative temporary stabilization schedule, as referenced in [Part I.B.1.a.iii\(a\)](#), provide the alternate stabilization schedule, and identify all locations where the alternative schedule is applicable on the site map.
- (b) The SWMP must describe and locate the methods used to achieve final stabilization of all disturbed areas at the site, as listed in [Part I.B.1.a.iii\(b\)](#).
- (c) The SWMP must describe the measures used to establish final stabilization through vegetative cover or alternative stabilization method, as referenced in [Part I.B.1.a.iii\(c\)](#), and describe and locate any temporary control measures in place during the process of final stabilization.
- (d) The SWMP must describe and locate any planned permanent control measures to control pollutants in stormwater discharges that will occur after construction operations are completed, including but not limited to, detention/retention ponds, rain gardens, stormwater vaults, etc.

x. Inspection Reports. The SWMP must include documented inspection reports in accordance with [Part I.D.5.c](#).

### 3. SWMP Review and Revisions

Permittees must keep a record of SWMP changes made that includes the date and identification of the changes. The SWMP must be amended when the following occurs:

- a. A change in design, construction, operation, or maintenance of the site requiring implementation

of new or revised control measures;

- b. The SWMP proves ineffective in controlling pollutants in stormwater runoff in compliance with the permit conditions;
- c. Control measures identified in the SWMP are no longer necessary and are removed; and
- d. Corrective actions are taken onsite that result in a change to the SWMP.
- e. The site or areas of the site qualifying for reduced frequency inspections under [Part I.D.4](#).

For SWMP revisions made prior to or following a change(s) onsite, including revisions to sections addressing site conditions and control measures, a notation must be included in the SWMP that identifies the date of the site change, the control measure removed, or modified, the location(s) of those control measures, and any changes to the control measure(s). The permittee must ensure the site changes are reflected in the SWMP. The permittee is noncompliant with the permit until the SWMP revisions have been made.

#### 4. SWMP Availability

A copy of the SWMP must be provided upon request to the division, EPA, and any local agency with authority for approving sediment and erosion plans, grading plans or stormwater management plans within the time frame specified in the request. If the SWMP is required to be submitted to any of these entities, the submission must include a signed certification in accordance with [Part I.A.3.e](#), certifying that the SWMP is complete and compliant with all terms and conditions of the permit.

All SWMPs required under this permit are considered reports that must be available to the public under Section 308(b) of the CWA and Section 61.5(4) of the CDPS regulations. The permittee must make plans available to members of the public upon request. However, the permittee may claim any portion of a SWMP as confidential in accordance with 40 CFR Part 2.

#### D. SITE INSPECTIONS

Site inspections must be conducted in accordance with the following requirements. The required inspection **schedules are a minimum frequency and do not affect the permittee's responsibility to implement control** measures in effective operating condition as prescribed in the SWMP, [Part I.C.2.a.vi](#), as proper maintenance of control measures may require more frequent inspections. Site inspections shall start within 7 calendar days of the commencement of construction activities on site.

##### 1. Person Responsible for Conducting Inspections

**The person(s) inspecting the site may be on the permittee's staff or a third party hired to conduct** stormwater inspections under the direction of the permittee(s). The permittee is responsible for ensuring that the inspector meets the definition of a Qualified Stormwater Manager. The inspector may be different than the individual(s) listed in [Part I.C.2.a.i](#).

##### 2. Inspection Frequency

Permittees must conduct site inspections in accordance with on the following minimum frequencies, unless the site meets the requirements of [Part I.D.3](#). All inspections must be recorded per [Part I.D.5.c](#).

- a. At least one inspection every 7 calendar days; or
- b. At least one inspection every 14 calendar days, if post-storm event inspections are conducted within 24 hours after the end of any precipitation or snowmelt event that causes surface erosion. Post-storm inspections may be used to fulfill the 14-day routine inspection requirement.
- c. When site conditions make the schedule required in this section impractical, the permittee may

petition the division to grant an alternate inspection schedule. The alternative inspection schedule must not be implemented prior to written approval by the division and incorporation into the SWMP.

### 3. Inspection Frequency for Discharges to Outstanding Waters

Permittees must conduct site inspections at least once every 7 calendar days for sites that discharge to a water body designated as an Outstanding Water by the Water Quality Control Commission.

### 4. Reduced Inspection Frequency

The permittee may perform site inspections at the following reduced frequencies when one of the following conditions exists:

#### a. Post-Storm Inspections at Temporarily Idle Sites

For permittees choosing an inspection frequency pursuant to [Part I.D.2.b](#) and if no construction activities will occur following a storm event, post-storm event inspections must be conducted prior to re-commencing construction activities, and no later than 72 hours following the storm event. If the post-storm event inspection qualifies under this section, the inspection delay must be documented in the inspection record per [Part I.D.5.c](#). Routine inspections must still be conducted at least every 14 calendar days.

#### b. Inspections at Completed Sites/Areas

When the site, or portions of a site, are awaiting establishment of a vegetative ground cover and final stabilization, the permittee must conduct a thorough inspection of the stormwater management system at least once every 30 days. Post-storm event inspections are not required under this schedule. This reduced inspection schedule is allowed if all of the following criteria are met:

- i. All construction activities resulting in ground disturbance are complete;
- ii. All activities required for final stabilization, in accordance with [Part I.B.1.a.iii\(b\) & \(c\)](#) and with the SWMP, have been completed, with the exception of the application of seed that has not occurred due to seasonal conditions or the necessity for additional seed application to augment previous efforts; and
- iii. The SWMP has been amended to locate those areas to be inspected in accordance with the reduced schedule allowed for in this paragraph.

#### c. Winter Conditions Inspections Exclusion

Inspections are not required for sites that meet all of the following conditions: construction activities are temporarily halted, snow cover exists over the entire site for an extended period, and melting conditions posing a risk of surface erosion do not exist. This inspection exception is applicable only during the period where melting conditions do not exist, and applies to the routine 7-day, 14-day and monthly inspections, as well as the post-storm-event inspections. When this inspection exclusion is implemented, the following information must be documented in accordance with the requirements in [Part I.C.3](#) and [Part I.D.5.c](#):

- i. Dates when snow cover existed;
- ii. Date when construction activities ceased; and
- iii. Date melting conditions began.

### 5. Inspection Scope



a. Areas to Be Inspected

When conducting a site inspection the following areas, if applicable, must be inspected for evidence of, or the potential for, pollutants leaving the construction site boundaries, entering the stormwater drainage system or discharging to state waters:

- i. Construction site perimeter;
- ii. All disturbed areas;
- iii. Locations of installed control measures;
- iv. Designated haul routes;
- v. Material and waste storage areas exposed to precipitation;
- vi. Locations where stormwater has the potential to discharge offsite; and
- vii. Locations where vehicles exit the site.

b. Inspection Requirements

- i. Visually verify whether all implemented control measures are in effective operational condition and are working as designed in their specifications to minimize pollutant discharges.
- ii. Determine if there are new potential sources of pollutants.
- iii. Assess the adequacy of control measures at the site to identify areas requiring new or modified control measures to minimize pollutant discharges.
- iv. Identify all areas of non-compliance with the permit requirements and, if necessary, implement corrective action(s) in accordance with [Part I.B.1.c.](#)

c. Inspection Reports

The permittee must keep a record of all inspections conducted for each permitted site. Inspection reports must identify any incidents of noncompliance with the terms and conditions of this permit. All inspection reports must be signed and dated in accordance with [Part I.A.3.f.](#) Inspection records must be retained in accordance with [Part II.O.](#) At a minimum, the inspection report must include:

- i. The inspection date;
- ii. Name(s) and title(s) of personnel conducting the inspection;
- iii. Weather conditions at the time of inspection;
- iv. Phase of construction at the time of inspection;
- v. Estimated acreage of disturbance at the time of inspection;
- vi. Location(s) and identification of control measures requiring routine maintenance;
- vii. Location(s) and identification of discharges of sediment or other pollutants from the site;
- viii. Location(s) and identification of inadequate control measures;
- ix. Location(s) and identification of additional control measures needed that were not in place at the time of inspection;

- x. Description of corrective action(s) for items vii, viii, ix, above, dates corrective action(s) were completed, including requisite changes to the SWMP, as necessary;
- xi. Description of the minimum inspection frequency (either in accordance with [Part I.D.2](#), [Part I.D.3](#) or [Part I.D.4](#).) utilized when conducting each inspection.
- xii. Deviations from the minimum inspection schedule as required in [Part I.D.2](#). This would include documentation of division approval for an alternate inspection schedule outlined in [Part I.D.2.c](#);
- xiii. After adequate corrective action(s) have been taken, or where a report does not identify any incidents requiring corrective action, the report shall contain a statement as required in [Part I.A.3.f](#).

## E. DEFINITIONS

For the purposes of this permit:

- (1) Bypass the intentional diversion of waste streams from any portion of a treatment facility in accordance with 40 CFR 122.41(m)(1)(i) and Regulation 61.2(12).
- (2) Common Plan of Development or Sale - A contiguous area where multiple separate and distinct construction activities may be taking place at different times on different schedules, but remain related. The **division has determined that “contiguous” means construction activities located in close proximity to each other (within ¼ mile). Construction activities are considered to be “related” if they share the same development plan, builder or contractor, equipment, storage areas, etc. “Common plan of development or sale” includes construction activities that are associated with the construction of field wide oil and gas permits for facilities that are related.**
- (3) Construction Activity - Ground surface disturbing and associated activities (land disturbance), which include, but are not limited to, clearing, grading, excavation, demolition, installation of new or improved haul roads and access roads, staging areas, stockpiling of fill materials, and borrow areas. Construction does not include routine maintenance to maintain the original line and grade, hydraulic capacity, or original purpose of the facility. Activities to conduct repairs that are not part of routine maintenance or for replacement are construction activities and are not routine maintenance. Repaving activities where underlying and/or surrounding soil is exposed as part of the repaving operation are considered construction activities. Construction activity is from initial ground breaking to final stabilization regardless of ownership of the construction activities.
- (4) Control Measure - Any best management practice or other method used to prevent or reduce the discharge of pollutants to state waters. Control measures include, but are not limited to, best management practices. Control measures can include other methods such as the installation, operation, and maintenance of structural controls and treatment devices.
- (5) Control Measure Requiring Routine Maintenance - Any control measure that is still operating in accordance with its design and the requirements of this permit, but requires maintenance to prevent a breach of the control measure. See also inadequate control measure.
- (6) Dedicated Asphalt, Concrete Batch Plants and Masonry Mixing Stations - Are batch plants or mixing stations located on, or within ¼ mile of, a construction site and that provide materials only to that specific construction site.
- (7) Diversion - Discharges of state waters that are temporarily routed through channels or structures (e.g. in-stream, uncontaminated springs, non-pumped groundwater, temporary rerouting of surface waters).
- (8) Final Stabilization - The condition reached when construction activities at the site have been

- completed, permanent stabilization methods are complete, and temporary control measures are removed. Areas being stabilized with a vegetative cover must have evenly distributed perennial vegetation. The vegetation coverage must be, at a minimum, equal to 70 percent of what would have been provided by native vegetation in a local, undisturbed area or adequate reference site.
- (9) Good Engineering, Hydrologic and Pollution Control Practices: are methods, procedures, and practices that:
- a. Are based on basic scientific fact(s).
  - b. Reflect best industry practices and standards.
  - c. Are appropriate for the conditions and pollutant sources.
  - d. Provide appropriate solutions to meet the associated permit requirements, including practice based effluent limits.
- (10) Inadequate Control Measure - Any control measure that is not designed or implemented in accordance with the requirements of the permit and/or any control measure that is not implemented to operate in accordance with its design. See also Control Measure Requiring Routine Maintenance.
- (11) Infeasible - Not technologically possible, or not economically practicable and achievable in light of best industry practices.
- (12) Minimize - reduce or eliminate to the extent achievable using control measures that are technologically available and economically practicable and achievable in light of best industry practice.
- (13) Municipality - A city, town, county, district, association, or other public body created by, or under, State law and having jurisdiction over disposal of sewage, industrial wastes, or other wastes, or a designated and approved management agency under section 208 of CWA (1987).
- (14) Municipal Separate Storm Sewer System (MS4) - A conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains):
- a. Owned or operated by a State, city, town, county, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, stormwater, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or a designated and approved management agency under section 208 of the CWA that discharges to state waters;
    - i. Designed or used for collecting or conveying stormwater;
    - ii. Are not a combined sewer; and
    - iii. Are not part of a Publicly Owned Treatment Works (POTW). See 5 CCR 1002-61.2(62).
- (15) Municipal Stormwater Management Program - A stormwater program operated by a municipality, typically to meet the requirements of the municipalities MS4 discharge certification.
- (16) Operator - The party that has operational control over day-to-day activities at a project site which are necessary to ensure compliance with the permit. This party is authorized to direct individuals at a site to carry out activities required by the permit (i.e. the general contractor).

- (17) Outstanding Waters - Waters designated as outstanding waters pursuant to Regulation 31, Section 31.8(2)(a). The highest level of water quality protection applies to certain waters that constitute an outstanding state or national resource.
- (18) Owner - The party that has overall control of the activities and that has funded the implementation of the construction plans and specifications. This is the party that may have ownership of, a long term lease of, or easements on the property on which the construction activity is occurring (e.g. the developer).
- (19) Permittee(s) - The owner and operator named in the discharge certification issued under this permit for the construction site specified in the certification.
- (20) Point Source - Any discernible, confined, and discrete conveyance, including, but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, or vessel or other floating craft, from which pollutants are or may be discharged. Point source does not include irrigation return flow. See 5 CCR 102-61.2(75).
- (21) Pollutant - Dredged spoil, dirt, slurry, solid waste, incinerator residue, sewage, sewage sludge, garbage, trash, chemical waste, biological nutrient, biological material, radioactive material, heat, wrecked or discarded equipment, rock, sand, or any industrial, municipal or agricultural waste. See 5 CCR 1002-61.2(76).
- (22) Presentation of credentials - a government issued form of identification, if in person; or (ii) providing name, position and purpose of inspection if request to enter is made via telephone, email **or other form of electronic communication. A Permittee's non-response to a request to enter upon presentation of credentials constitutes a denial to such request, and may result in violation of the Permit.**
- (23) Process Water - Any water which, during manufacturing or processing, comes into contact with or results from the production of any raw material, intermediate product, finished product, by product or waste product.
- (24) Public Emergency Related Site - a project initiated in response to an unanticipated emergency (e.g., mud slides, earthquake, extreme flooding conditions, disruption in essential public services), for which the related work requires immediate authorization to avoid imminent endangerment to human health or the environment, or to reestablish essential public services.
- (25) Qualified Stormwater Manager - An individual knowledgeable in the principles and practices of erosion and sediment control and pollution prevention, and with the skills to assess conditions at construction sites that could impact stormwater quality and to assess the effectiveness of stormwater controls implemented to meet the requirements of this permit.
- (26) Qualifying Local Program - A municipal program for stormwater discharges associated with small construction activity that was formally approved by the division as a qualifying local program.
- (27) Receiving Water - Any classified or unclassified surface water segment (including tributaries) in the State of Colorado into which stormwater associated with construction activities discharges. This definition includes all water courses, even if they are usually dry, such as borrow ditches, arroyos, and other unnamed waterways.
- (28) Severe Property Damage - substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production. See 40 CFR 122.41(m)(1)(ii).
- (29) Significant Materials - Include, but not limited to, raw materials; fuels; materials such as solvents, detergents, and plastic pellets; finished materials such as metallic products; raw materials used in

- food processing or production; hazardous substances designated under section 101(14) of CERCLA; any chemical the permittee is required to report under section 313 of Title III of the Superfund Amendments and Reauthorization Act (SARA); fertilizers; pesticides; and waste products such as ashes, slag and sludge that have the potential to be released with stormwater discharges.
- (30) Small Construction Activity - The discharge of stormwater from construction activities that result in land disturbance of equal to, or greater than, one acre and less than five acres. Small construction activity also includes the disturbance of less than one acre of total land area that is part of a larger common plan of development or sale, if the larger common plan ultimately disturbs equal to, or greater than, one acre and less than five acres.
- (31) Spill - An unintentional release of solid or liquid material which may pollute state waters.
- (32) State Waters - means any and all surface and subsurface waters which are contained in or flow in or through this state, but does not include waters in sewage systems, waters in treatment works of disposal systems, waters in potable water distribution systems, and all water withdrawn for use until use and treatment have been completed.
- (33) Steep Slopes: where a local government, or industry technical manual (e.g. stormwater BMP manual) **has defined what is to be considered a “steep slope”, this permit’s definition automatically** adopts that definition. Where no such definition exists, steep slopes are automatically defined as those that are 3:1 or greater.
- (34) Stormwater - Precipitation runoff, snow melt runoff, and surface runoff and drainage. See 5 CCR 1002-61.2(103).
- (35) Total Maximum Daily Loads (TMDLs) -The sum of the individual wasteload allocations (WLA) for point sources and load allocations (LA) for nonpoint sources and natural background. For the purposes of this permit, a TMDL is a calculation of the maximum amount of a pollutant that a waterbody can receive and still meet water quality standards, and an allocation of that amount to the pollutant's sources. A TMDL includes WLAs, LAs, and must include a margin of safety (MOS), and account for seasonal variations. See section 303(d) of the CWA and 40 C.F.R. 130.2 and 130.7.
- (36) Upset - an exceptional incident in which there is unintentional and temporary noncompliance with permit effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventative maintenance, or careless or improper operation in accordance with 40 CFR 122.41(n) and Regulation 61.2(114).

#### F. MONITORING

The division may require sampling and testing, on a case-by-case basis. If the division requires sampling and testing, the division will send a notification to the permittee. Reporting procedures for any monitoring data collected will be included in the notification.

If monitoring is required, the following applies:

1. The thirty (30) day average must be determined by the arithmetic mean of all samples collected during a thirty (30) consecutive-day period; and
2. A **grab sample, for monitoring requirements, is a single “dip and take”** sample.

#### G. OIL AND GAS CONSTRUCTION

Stormwater discharges associated with construction activities directly related to oil and gas exploration, production, processing, and treatment operations or transmission facilities are regulated under the Colorado Discharge Permit System Regulations (5 CCR 1002-61), and require coverage under this permit in accordance with that regulation. However, references in this permit to specific authority under the CWA do not apply to

stormwater discharges associated with these oil and gas related construction activities, to the extent that the references are limited by the federal Energy Policy Act of 2005.

## Part II: Standard Permit Conditions

### A. DUTY TO COMPLY

The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Water Quality Control Act and is grounds for:

1. Enforcement action;
2. Permit termination, revocation and reissuance, or modification; or
3. Denial of a permit renewal application.

### B. DUTY TO REAPPLY

If the permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the permittee must apply for and obtain authorization as required by Part I.A.3.k. of the permit.

### C. NEED TO HALT OR REDUCE ACTIVITY NOT A DEFENSE

It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

### D. DUTY TO MITIGATE

A permittee must take all reasonable steps to minimize or prevent any discharge in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.

### E. PROPER OPERATION AND MAINTENANCE

A permittee must at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) that are installed or used by the permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of backup or auxiliary facilities or similar systems which are installed by the permittee only when the operation is necessary to achieve compliance with the conditions of this permit. This requirement can be met by meeting the requirements for Part I.B., I.C., and I.D. above. See also 40 C.F.R. § 122.41(e).

### F. PERMIT ACTIONS

This permit may be modified, revoked and reissued, or terminated for cause. The permittee request for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition. Any request for modification, revocation, reissuance, or termination under this permit must comply with all terms and conditions of Regulation 61.8(8).

### G. PROPERTY RIGHTS

In accordance with 40 CFR 122.41(g) and 5 CCR 1002-61, 61.8(9):

1. The issuance of a permit does not convey any property or water rights in either real or personal property, or stream flows or any exclusive privilege.
2. The issuance of a permit does not authorize any injury to person or property or any invasion of personal rights, nor does it authorize the infringement of federal, state, or local laws or regulations.
3. Except for any toxic effluent standard or prohibition imposed under Section 307 of the Federal act or any standard for sewage sludge use or disposal under Section 405(d) of the Federal act, compliance with a permit during its term constitutes compliance, for purposes of enforcement, with Sections 301,



302, 306, 318, 403, and 405(a) and (b) of the Federal act. However, a permit may be modified, revoked and reissued, or terminated during its term for cause as set forth in Section 61.8(8) of the Colorado Discharge Permit System Regulations.

#### H. DUTY TO PROVIDE INFORMATION

The permittee shall furnish to the division, within a reasonable time, any information which the division may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit, or to determine compliance with this permit. The permittee shall also furnish to the division, upon request, copies of records required to be kept by this permit in accordance with 40 CFR 122.41(h) and/or Regulation 61.8(3)(q).

#### I. INSPECTION AND ENTRY

The permittee shall allow the division and the authorized representative, upon the [presentation of credentials](#) as required by law, to allow for inspections to be conducted in accordance with 40 CFR 122.41(i), Regulation 61.8(3), and Regulation 61.8(4):

1. To enter upon the permittee's premises where a regulated facility or activity is located or in which any records are required to be kept under the terms and conditions of this permit;
2. At reasonable times to have access to and copy any records required to be kept under the terms and conditions of this permit;
3. At reasonable times, inspect any monitoring equipment or monitoring method required in the permit; and
4. To enter upon the permittee's premises in a reasonable manner and at a reasonable time to inspect or investigate, any actual, suspected, or potential source of water pollution, or any violation of the Colorado Water Quality Control Act. The investigation may include: sampling of any discharges, stormwater or [process water](#), taking of photographs, interviewing site staff on alleged violations and other matters related to the permit, and assessing any and all facilities or areas within the site that may affect discharges, the permit, or an alleged violation.

The permittee shall provide access to the division or other authorized representatives upon **presentation of proper credentials. A permittee's non-response to a request to enter upon presentation of credentials constitutes a denial of such request, and may result in a violation of the permit.**

#### J. MONITORING AND RECORDS

1. Samples and measurements taken for the purpose of monitoring must be representative of the volume and nature of the monitored activity.
2. The permittee must retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least three years from the date the permit expires or the date the **permittee's authorization is terminated. This period may be extended by request of the division at any time.**
3. Records of monitoring information must include:
  - a. The date, exact place, and time of sampling or measurements;
  - b. The individual(s) who performed the sampling or measurements;
  - c. The date(s) analyses were performed

- d. The individual(s) who performed the analyses;
  - e. The analytical techniques or methods used; and
  - f. The results of such analyses.
4. Monitoring must be conducted according to test procedures approved under 40 CFR Part 136, unless other test procedures have been specified in the permit.

#### K. SIGNATORY REQUIREMENTS

##### 1. Authorization to Sign:

All documents required to be submitted to the division by the permit must be signed in accordance with the following criteria:

- a. For a corporation: by a responsible corporate officer. For the purpose of this subsection, a responsible corporate officer means:
  - i. A president, secretary, treasurer, or vice president of the corporation in charge of a principal business function, or any other person who performs similar policy- or decision-making functions for the corporation, or
  - ii. The manager of one or more manufacturing, production, or operating facilities, provided, the manager is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.
- b. For a partnership or sole proprietorship: by a general partner or the proprietor, respectively; or
- c. For a [municipality](#), state, federal, or other public agency: By either a principal executive officer or ranking elected official. For purposes of this subsection, a principal executive officer of a federal agency includes
  - i. The chief executive officer of the agency, or
  - ii. A senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency. (e.g. Regional Administrator of EPA)

##### 2. Electronic Signatures

For persons signing applications for coverage under this permit electronically, in addition to meeting other applicable requirements stated above, such signatures must meet the same signature, authentication, and identity-proofing standards set forth at 40 CFR § 3.2000(b) for electronic reports (including robust second-factor authentication). Compliance with this requirement can be achieved by submitting the application using the Colorado Environmental Online Service (CEOS) system.

##### 3. Change in Authorization to Sign

If an authorization is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization must be submitted to the division, prior to the re-authorization, or together with any reports, information, or applications to be signed by an authorized representative.

## L. REPORTING REQUIREMENTS

### 1. Planned Changes

The permittee shall give advance notice to the division, in writing, of any planned physical alterations or additions to the permitted facility in accordance with 40 CFR 122.41(l) and Regulation 61.8(5)(a). Notice is required only when:

- a. The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in 40 CFR 122.29(b); or
- b. The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which are subject neither to effluent limitations in the permit, nor to notification requirements under 40 CFR 122.41(a)(1).

### 2. Anticipated Non-Compliance

The permittee shall give advance notice to the division, in writing, of any planned changes in the permitted facility or activity that may result in noncompliance with permit requirements. The timing of notification requirements differs based on the type of non-compliance as described in subparagraphs 5, 6, 7, and 8 below.

### 3. Transfer of Ownership or Control

The permittee shall notify the division, in writing, ten (10) calendar days in advance of a proposed transfer of the permit. This permit is not transferable to any person except after notice is given to the division.

- a. Where a facility wants to change the name of the permittee, the original permittee (the first owner or operators) must submit a Notice of Termination.
- b. The new owner or operator must submit an application. See also signature requirements in Part II.K, above.
- c. A permit may be automatically transferred to a new permittee if:
  - i. The current permittee notifies the division in writing 30 calendar days in advance of the proposed transfer date; and
  - ii. The notice includes a written agreement between the existing and new permittee(s) containing a specific date for transfer of permit responsibility, coverage and liability between them; and
  - iii. The division does not notify the existing permittee and the proposed new permittee of its intent to modify, or revoke and reissue the permit.
  - iv. Fee requirements of the Colorado Discharge Permit System Regulations, Section 61.15, have been met.

### 4. Monitoring reports

Monitoring results must be reported at the intervals specified in this permit per the requirements of 40 CFR 122.41(l)(4).

### 5. Compliance Schedules

Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule in the permit, shall be submitted on the date listed

in the compliance schedule section. The fourteen (14) calendar day provision in Regulation 61.8(4)(n)(i) has been incorporated into the due date.

**6. Twenty-four Hour Reporting**

In addition to the reports required elsewhere in this permit, the permittee shall report the following circumstances orally within twenty-four (24) hours from the time the permittee becomes aware of the circumstances, and shall mail to the division a written report containing the information requested within five (5) working days after becoming aware of the following circumstances:

- a. Circumstances leading to any noncompliance which may endanger health or the environment regardless of the cause of the incident;
- b. Circumstances leading to any unanticipated bypass which exceeds any effluent limitations in the permit;
- c. Circumstances leading to any upset which causes an exceedance of any effluent limitation in the permit;
- d. Daily maximum violations for any of the pollutants limited by Part I of this permit. This includes any toxic pollutant or hazardous substance or any pollutant specifically identified as the method to control any toxic pollutant or hazardous substance.
- e. The division may waive the written report required under subparagraph 6 of this section if the oral report has been received within 24 hours.

**7. Other Non-Compliance**

A permittee must report all instances of noncompliance at the time monitoring reports are due. If no monitoring reports are required, these reports are due at least annually in accordance with Regulation 61.8(4)(p). The annual report must contain all instances of non-compliance required under either subparagraph 5 or subparagraph 6 of this subsection.

**8. Other Information**

Where a permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application, or in any report to the Permitting Authority, it has a duty to promptly submit such facts or information.

**M. BYPASS**

**1. Bypass Not Exceeding Limitations**

The permittees may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the provisions of Part II.M.2 of this permit. See 40 CFR 122.41(m)(2).

**2. Notice of Bypass**

- a. Anticipated bypass. If the permittee knows in advance of the need for a bypass, the permittee must submit prior notice, if possible at least ten days before the date of the bypass. See 40 CFR §122.41(m)(3)(i) and/or Regulation 61.9(5)(c).
- b. Unanticipated bypass. The permittee must submit notice of an unanticipated bypass in accordance with Part II.L.6. See 40 CFR §122.41(m)(3)(ii).

**3. Prohibition of Bypass**

Bypasses are prohibited and the division may take enforcement action against the permittee for bypass, unless:

- a. The bypass is unavoidable to prevent loss of life, personal injury, or severe property damage;
- b. There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate backup equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance; and
- c. Proper notices were submitted to the division.

#### N. UPSET

##### 1. Effect of an upset

An upset constitutes an affirmative defense to an action brought for noncompliance with permit effluent limitations if the requirements of Part II.N.2. of this permit are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review in accordance with Regulation 61.8(3)(j).

##### 2. Conditions Necessary for Demonstration of an Upset

A permittee who wishes to establish the affirmative defense of upset shall demonstrate through properly signed contemporaneous operating logs, or other relevant evidence that:

- a. An upset occurred and the permittee can identify the specific cause(s) of the upset;
- b. The permitted facility was at the time being properly operated and maintained; and
- c. The permittee submitted proper notice of the upset as required in Part II.L.6. (24- hour notice); and
- d. The permittee complied with any remedial measure necessary to minimize or prevent any discharge or sludge use or disposal in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment. In addition to the demonstration required above, a permittee who wishes to establish the affirmative defense of upset for a violation of effluent limitations based upon water quality standards shall also demonstrate through monitoring, modeling or other methods that the relevant standards were achieved in the receiving water.

##### 3. Burden of Proof

In any enforcement proceeding, the permittee seeking to establish the occurrence of an upset has the burden of proof.

#### O. RETENTION OF RECORDS

##### 1. Post-Expiration or Termination Retention

Copies of documentation required by this permit, including records of all data used to complete the application for permit coverage to be covered by this permit, must be retained for at least three years from the date that permit coverage expires or is terminated. This period may be extended by request of EPA at any time.

##### 2. On-site Retention

The permittee must retain an electronic version or hardcopy of the SWMP at the construction site from

the date of the initiation of construction activities to the date of expiration or inactivation of permit coverage; unless another location, specified by the permittee, is approved by the division.

P. REOPENER CLAUSE

**1.** Procedures for Modification or Revocation

Permit modification or revocation of this permit or coverage under this permit will be conducted according to Regulation 61.8(8).

**2.** Water Quality Protection

If there is evidence indicating that the stormwater discharges authorized by this permit cause, have the reasonable potential to cause or contribute to an excursion above any applicable water quality standard, the permittee may be required to obtain an individual permit, or the permit may be modified to include different limitations and/or requirements.

Q. SEVERABILITY

The provisions of this permit are severable. If any provisions or the application of any provision of this permit to any circumstances, is held invalid, the application of such provision to other circumstances and the application of the remainder of this permit shall not be affected.

R. NOTIFICATION REQUIREMENTS

**1.** Notification to Parties

All notification requirements, excluding information submitted using the CEOS portal, shall be directed as follows:

- a. Oral Notifications, during normal business hours shall be to:  
Clean Water Compliance Section  
Water Quality Control Division  
Telephone: (303) 692-3500
- b. Written notification shall be to:  
Clean Water Compliance Section  
Water Quality Control Division  
Colorado Department of Public Health and Environment  
WQCD-WQP-B2  
4300 Cherry Creek Drive South  
Denver, CO 80246-1530

S. RESPONSIBILITIES

**1.** Reduction, Loss, or Failure of Treatment Facility

The permittee has the duty to halt or reduce any activity if necessary to maintain compliance with the effluent limitations of the permit. It shall not be a defense for a permittee in an enforcement action that it would be necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

T. OIL AND HAZARDOUS SUBSTANCE LIABILITY

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties to which the permittee is or may be subject to under Section 311 (Oil and Hazardous Substance Liability) of the CWA.

#### U. EMERGENCY POWERS

Nothing in this permit shall be construed to prevent or limit application of any emergency power of the division.

#### V. CONFIDENTIALITY

Any information relating to any secret process, method of manufacture or production, or sales or marketing data which has been declared confidential by the permittee, and which may be acquired, ascertained, or discovered, whether in any sampling investigation, emergency investigation, or otherwise, shall not be publicly disclosed by any member, officer, or employee of the Water Quality Control Commission or the division, but shall be kept confidential. Any person seeking to invoke the protection of this section shall bear the burden of proving its applicability. This section shall never be interpreted as preventing full disclosure of effluent data.

#### W. FEES

The permittee is required to submit payment of an annual fee as set forth in the 2016 amendments to the Water Quality Control Act, Section 25-8-502 (1.1) (b), and the Colorado Discharge Permit System Regulations 5 CCR 1002-61, Section 61.15 as amended. Failure to submit the required fee when due and payable is a violation of the permit and will result in enforcement action pursuant to Section 25-8-601 et. seq., C.R.S.1973 as amended.

#### X. DURATION OF PERMIT

The duration of a permit shall be for a fixed term and shall not exceed five (5) years. If the permittee desires to continue to discharge, a permit renewal application shall be submitted at least ninety (90) calendar days before this permit expires. Filing of a timely and complete application shall cause the expired permit to continue in force to the effective date of the new permit. The permit's duration may be extended only through administrative extensions and not through interim modifications. If the permittee anticipates there will be no discharge after the expiration date of this permit, the division should be promptly notified so that it can terminate the permit in accordance with Part I.A.3.i.

#### Y. SECTION 307 TOXICS

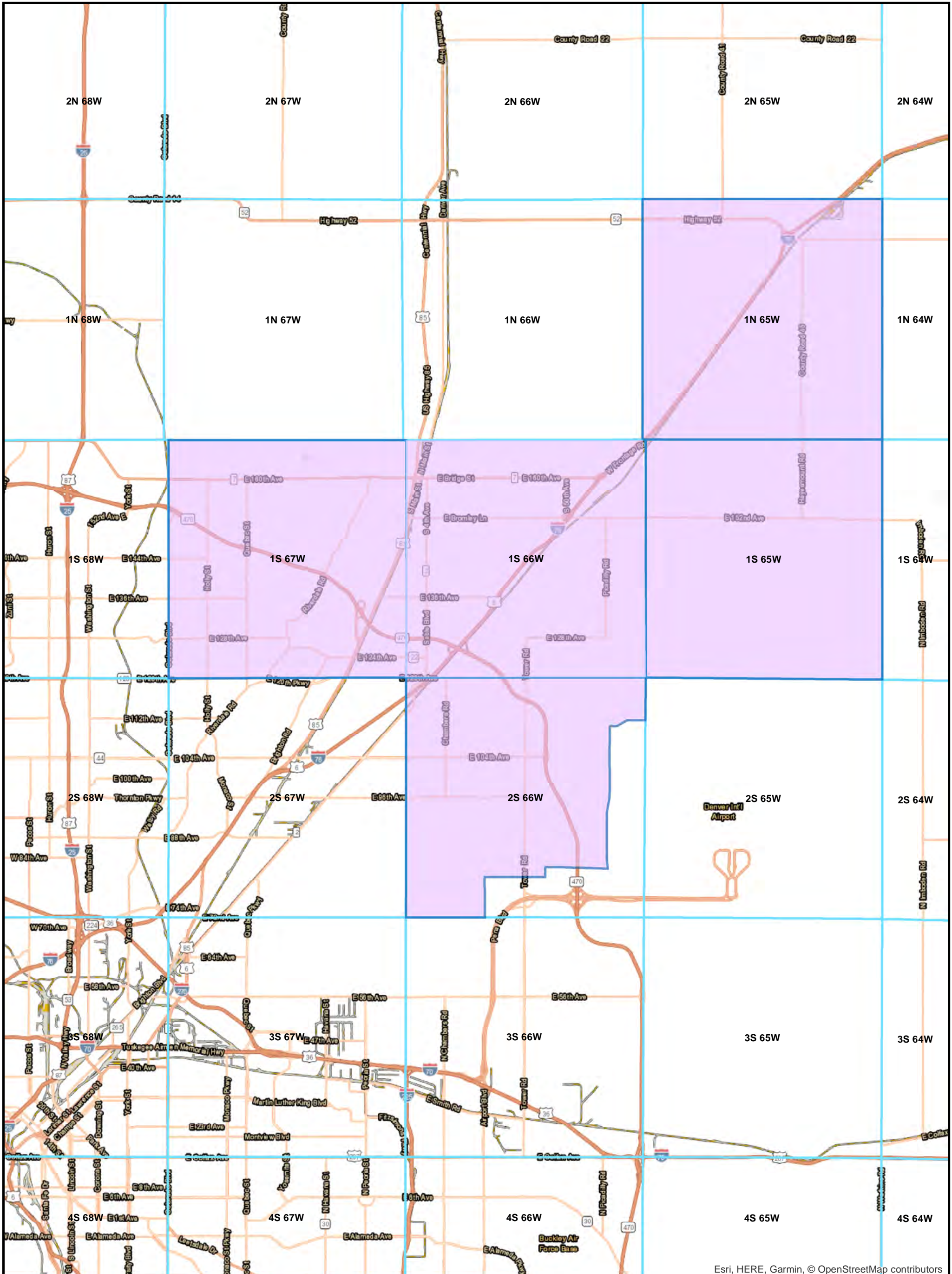
If a toxic effluent standard or prohibition, including any applicable schedule of compliance specified, is established by regulation pursuant to Section 307 of the Federal Act for a toxic pollutant which is present in the permittee's discharge and such standard or prohibition is more stringent than any limitation upon such pollutant in the discharge permit, the division shall institute proceedings to modify or revoke and reissue the permit to conform to the toxic effluent standard or prohibition



**APPENDIX B**




CONSTRUCTION STORMWATER PERMIT OVERVIEW MAP

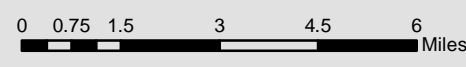
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Esri, HERE, Garmin, © OpenStreetMap contributors

MAP FEATURES

-  Field Area Boundary:  
Approx. 146,404 acres
-  COR403522
-  Permit Area to Add



POCO Holdco, LLC

Figure 1: Construction Stormwater Permit  
Overview Map

Permit No. COR403522



DRAWN BY: SL (Aquionix)  
DATE DRAWN: 09/01/2020  
MAP SCALE: 1:185,000  
COORD. SYSTEM: WGS\_1984\_Web\_Mercator\_Auxiliary\_Sphere

**APPENDIX C**  
CONNER 19-18 PLAT

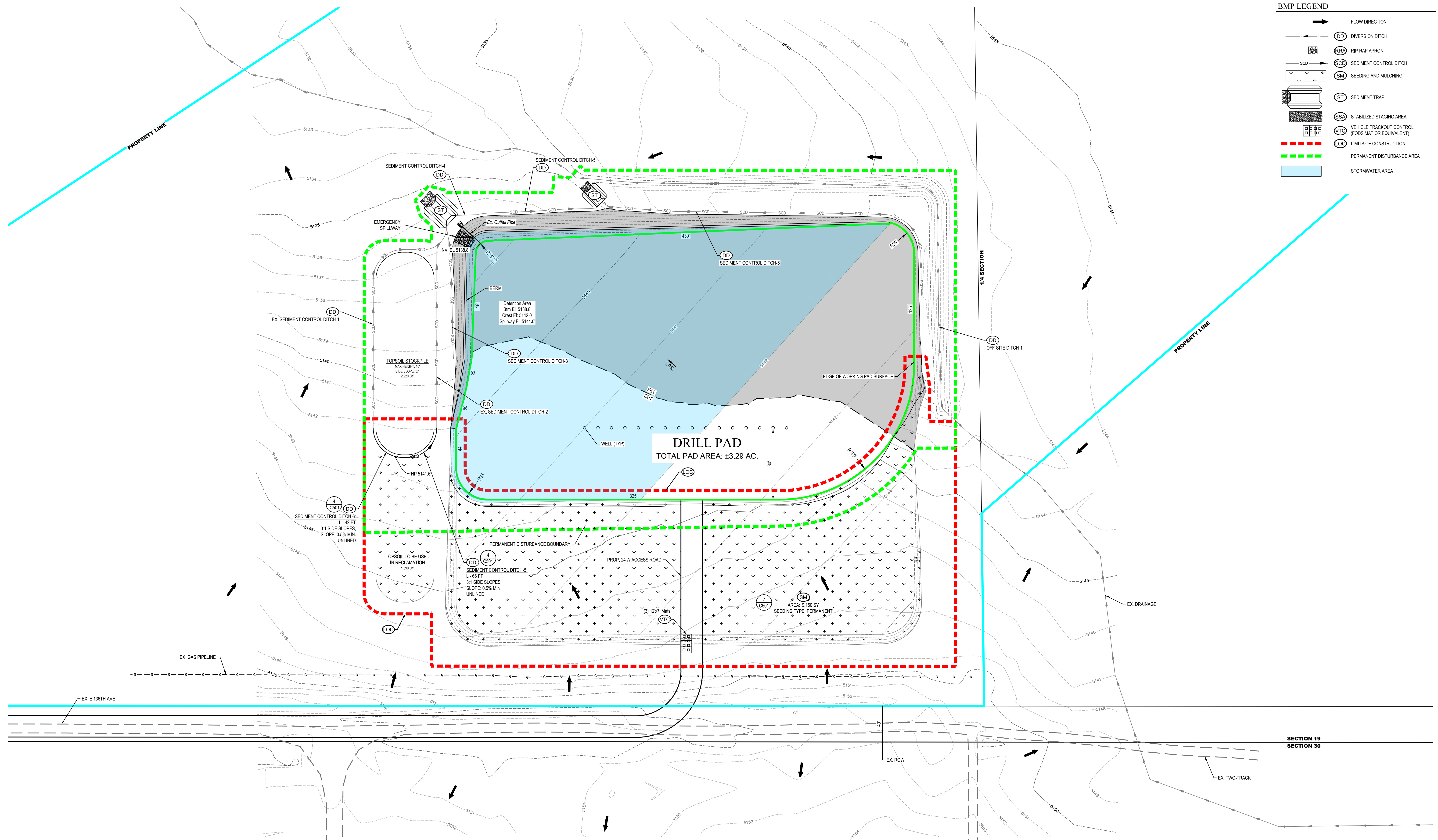
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**POCO OPERATING**  
**CONNER 19-18 PAD**  
**GESC PLAN**  
**SEC. 19, T1S, R65W, 6th P.M.**  
**ADAMS COUNTY, COLORADO**

**BMP LEGEND**

	FLOW DIRECTION
	DIVERSION DITCH
	RIP-RAP APRON
	SEDIMENT CONTROL DITCH
	SEEDING AND MULCHING
	SEDIMENT TRAP
	STABILIZED STAGING AREA
	VEHICLE TRACKOUT CONTROL (FOSS MAT OR EQUIVALENT)
	LIMITS OF CONSTRUCTION
	PERMANENT DISTURBANCE AREA
	STORMWATER AREA



**LEGEND:**

--- 0000 ---	EXISTING MAJOR CONTOUR (5)
--- 000 ---	EXISTING MINOR CONTOUR (1)
--- 000 ---	PROPOSED MAJOR CONTOUR (5)
--- 000 ---	PROPOSED MINOR CONTOUR (1)
--- OHP ---	EXISTING OVERHEAD POWER
--- BWF ---	BARBED WIRE FENCE (FIELD FENCE)
--- P ---	EXISTING PIPELINE
--- TW ---	EXISTING TWO-TRACK
---	PROPOSED PAD EDGE
---	PROPOSED EDGE OF ROAD
---	PROPERTY LINE

- NOTES:**
- THE SIZE, TYPE AND LOCATION OF ALL KNOWN UNDERGROUND UTILITIES ARE APPROXIMATE WHEN SHOWN ON THESE DRAWINGS. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THE EXISTENCE OF ALL UNDERGROUND UTILITIES IN THE AREA OF THE WORK BEFORE COMMENCING NEW CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING ALL UNDERGROUND UTILITIES.
  - CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING DEMOLITION, REMOVAL, REPLACEMENT, AND DISPOSAL OF ALL FACILITIES AND MATERIAL.
  - ALL SYMBOLS ARE ONLY GRAPHICALLY REPRESENTED AND ARE NOT TO SCALE.
  - CONTACT THE PROJECT SURVEYOR FOR ANY INQUIRIES RELATED TO THE EXISTING SITE SURVEY.
  - PROPOSED GRADING PLAN IS BASED ON EXISTING SITE CONTOURS.
  - THE PROPERTY OWNER SHALL CONTROL NOXIOUS WEEDS ON THE SITE.
  - THE HISTORICAL FLOW PATTERNS AND RUNOFF AMOUNTS ON THE SITE WILL BE MAINTAINED.
  - REFER TO DETAIL SHEETS FOR EROSION CONTROL BMP DETAILS.
  - EXISTING FENCE TO BE REMOVED FROM AND RE-ROUTED AROUND LOCATION.
  - INSTALL VTC TO MANUFACTURER'S STANDARDS & RECOMMENDATIONS.

**GRADING DETAILS:**

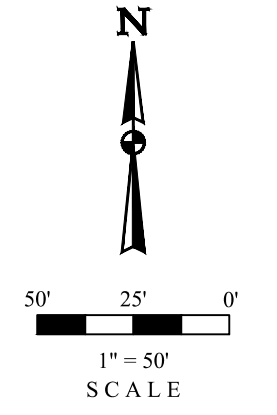
APPROXIMATE EARTHWORK QUANTITIES	
TOTAL CUT	30 Cu. Yds.
FILL	10,250 Cu. Yds.
MATERIAL BALANCE	≈10,220 Cu. Yds.
TOPSOIL ("L" LAYER OVER RECLAIM)	1,690 Cu. Yds.
**ESTIMATE ONLY**	

**NOTES:**

- Fill quantity includes 10% for compaction.
- Pad Cut/Fill slopes are 3H:1V
- Actual site conditions may vary. Field adjust grades as necessary to balance earthwork.

**APPROXIMATE SURFACE DISTURBANCE AREAS**

PERMANENT DISTURBANCE AREA	DISTANCE	ACRES
	NA	±5.66
<b>TOTAL SURFACE USE AREA</b>		±5.66



REV	DATE	BY	REASON FOR REVISION



PRODUCTION PHASE  
FINAL GRADING PLAN

SCALE: AS NOTED  
DRAWN BY: CC  
DATE DRAWN: 04-23-2024  
UELS FILE NO.: P - 2 0 3 1  
PROJ. NO.: PR006-21-0001  
FILE: P - 2 0 3 1

SHEET  
**C103**

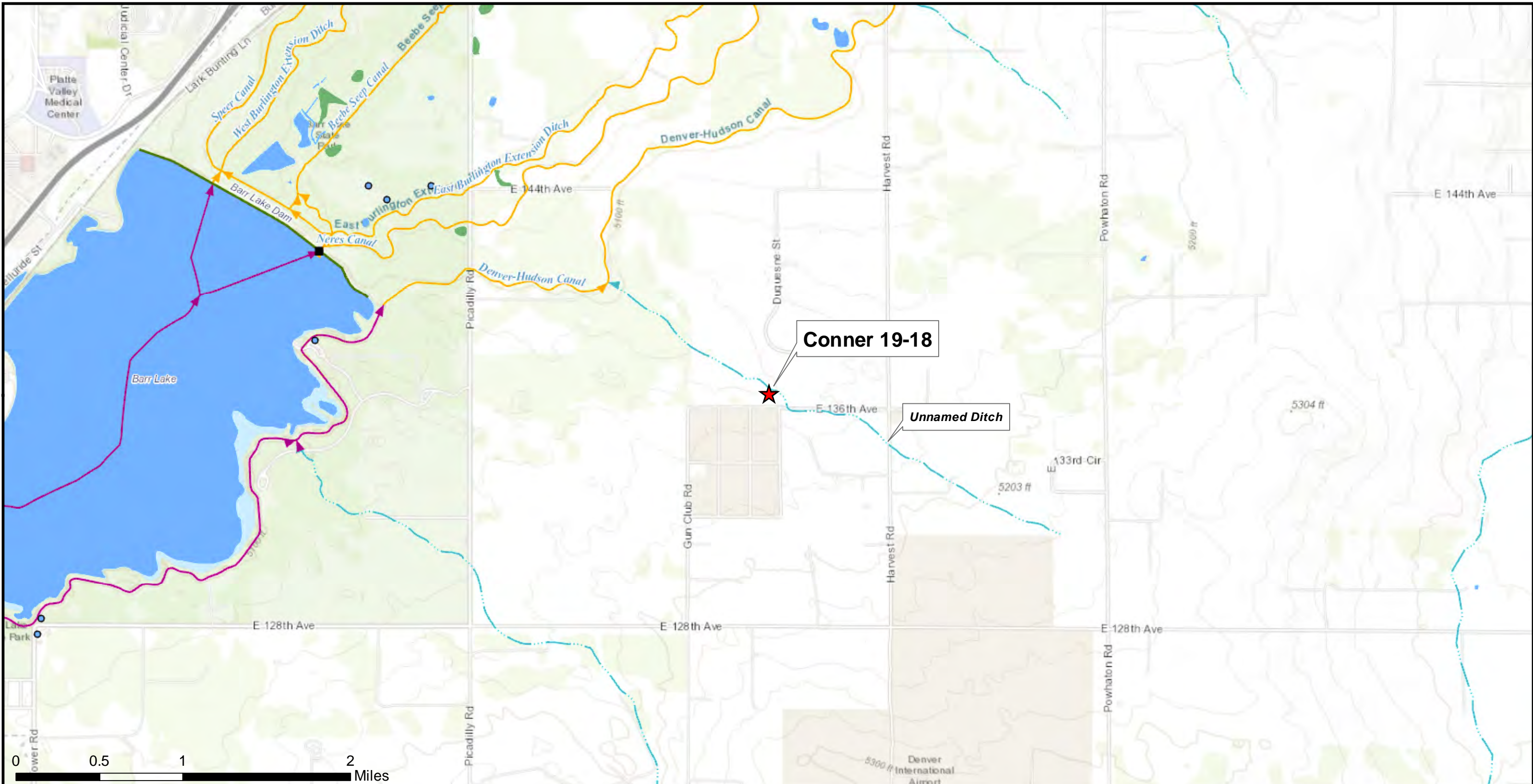
C:\FILES\1\BARRIED\2024\19-28 PAD P-2031\UW\CONNER - GESC-14.dwg 6/7/2024 2:14 PM ARSHI FULL BLEED 0 (56.00 x 24.00 INCHES) CALDER

**APPENDIX D**

CONNER 18-19 CONTROL MEASURE MAP

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**Conner 19-18**

**Unnamed Ditch**

**MAP FEATURES**

- ★ Pad Location
- Perennial Stream
- - - Intermittent Stream
- Ephemeral Stream
- Artificial Path
- Canal / Ditch
- Lake / Pond

**MAP NOTES**

Conner 19-18 Well Pad Coordinates (WGS 1984)  
 39.944320 / -104.708180

REVISION	DATE
Initial Release	10/21/22

**POCO Operating, LLC.**

**Conner 19-18  
 Surrounding Waters  
 Stormwater Management Plan**

*Section 19, Township 1S, Range 65W  
 Adams County*

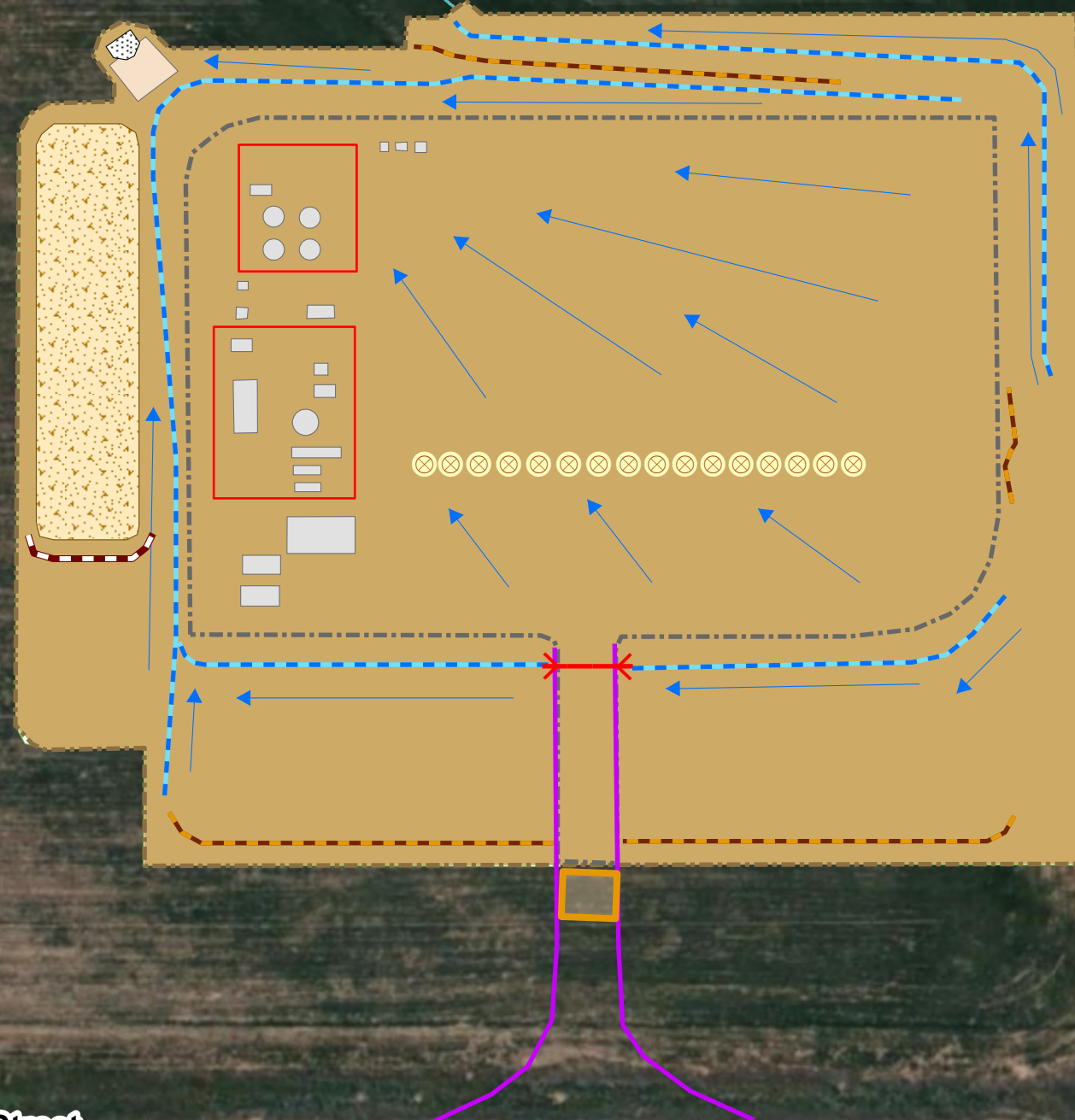
**Aquionix**  
GIS Services

5545 W. 56th Ave Unit E  
 Arvada, CO 80002  
 (303) 289-7520  
 www.aquionix.com

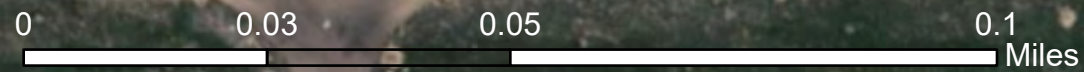
DESIGNED BY: Aquionix  
 DATE DRAWN: 10/21/2022  
 DRAWN BY: KT

SCALE: 1:35,000  
 COORD. SYSTEM: WGS\_1984  
 \_Web\_Mercator\_Auxiliary\_Sphere





E. 136th Street



MAP FEATURES

- |  |                               |  |                                   |  |                             |
|--|-------------------------------|--|-----------------------------------|--|-----------------------------|
|  | Production Pad Surface        |  | Secondary Containment             |  | Sediment Control Log        |
|  | Disturbed Area                |  | Rip Rap/Effluent of Sediment Trap |  | Culvert                     |
|  | Proposed Production Equipment |  | Access Road                       |  | Intermittent Stream / Ditch |
|  | Sediment Trap                 |  | Earthen Berm                      |  | Surface Flow Direction      |
|  | Topsoil Stockpile             |  | Drainage Ditch                    |  | Well Head Surface Location  |
|  |                               |  | Track Pad                         |  |                             |

MAP NOTES

Conner 19-18 Well Pad Coordinates (WGS 1984)  
39.944320 / -104.708180

REVISION	DATE
Initial Release	10/21/22
Track Pad Addition	11/14/22

**POCO Operating, LLC.**

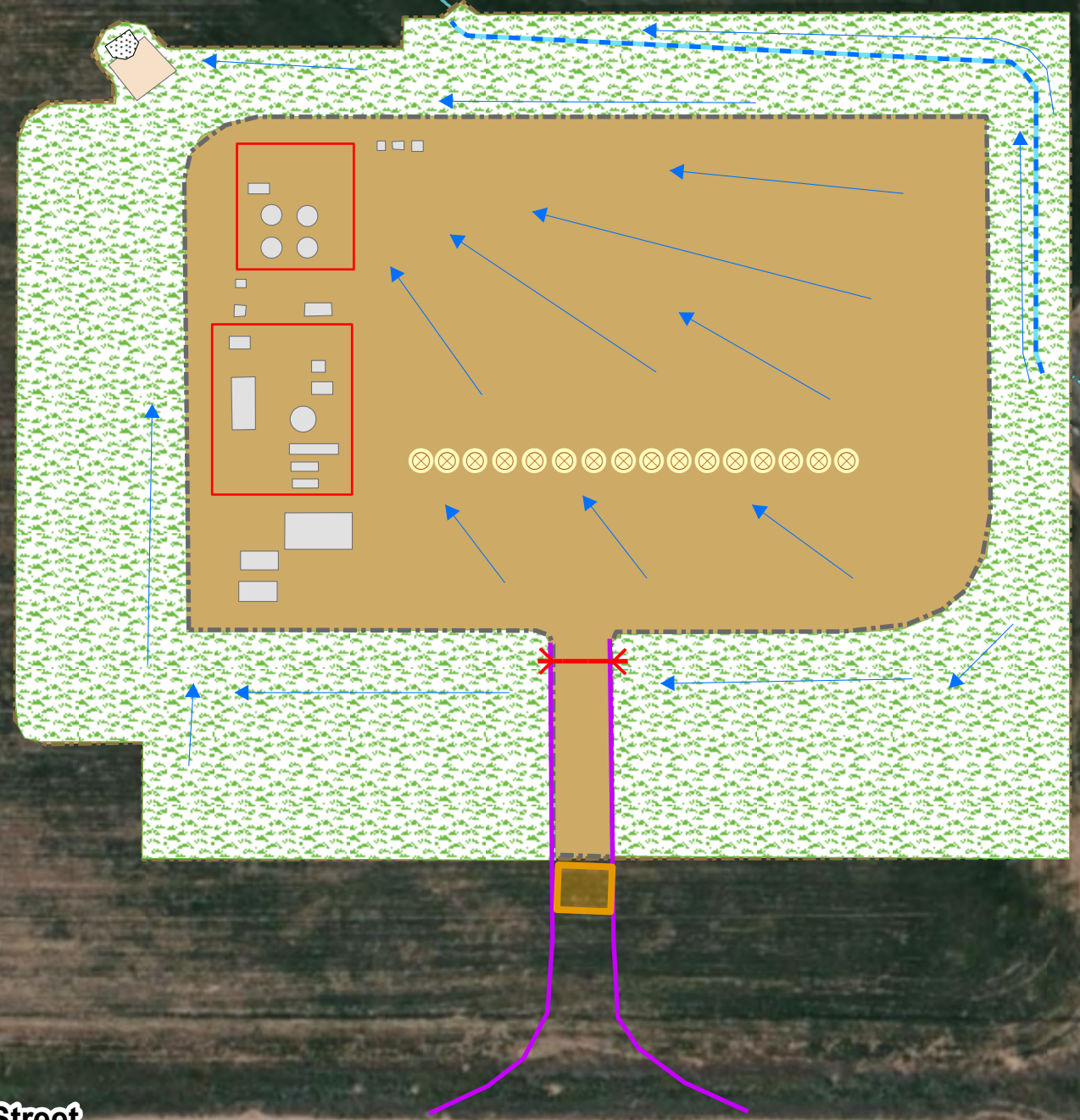
**Conner 19-18  
Initial Construction  
Stormwater Management Plan**  
Section 19, Township 1S, Range 65W  
Adams County

**Aquionix**  
EHS Services  
5545 W. 56th Ave Unit E  
Arvada, CO 80002  
(303) 289-7520  
www.aquionix.com

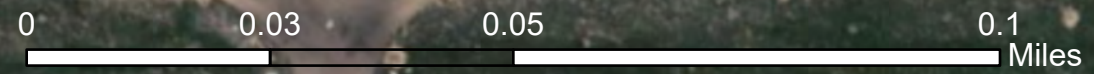
DESIGNED BY: Aquionix  
DATE DRAWN: 10/21/2022  
DRAWN BY: KT

SCALE: 1:1,250  
COORD. SYSTEM: WGS\_1984  
\_Web\_Mercator\_Auxiliary\_Sphere





E. 136th Street



MAP FEATURES

	Production Pad Surface		Secondary Containment		Culvert
	Disturbed Area		Rip Rap/Effluent of Sediment Trap		Intermittent Stream / Ditch
	Proposed Production Equipment		Access Road		Well Head Surface Location
	Sediment Trap		Drainage Ditch		Track Pad
	Hydroseed		Surface Flow Direction		

MAP NOTES

Conner 19-18 Well Pad Coordinates (WGS 1984)  
39.944320 / -104.708180

REVISION	DATE
Initial Release	10/21/22
Track Pad Addition	11/14/22

**POCO Operating, LLC.**

**Conner 19-18**  
**Interim Reclamation**  
**Stormwater Management Plan**

Section 19, Township 1S, Range 65W  
Adams County

**Aquionix**  
EHS Services

5545 W. 56th Ave Unit E  
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DESIGNED BY: Aquionix	SCALE: 1:1,250
DATE DRAWN: 10/21/2022	COORD. SYSTEM: WGS_1984 _Web_Mercator_Auxiliary_Sphere
DRAWN BY: KT	

Y:\POCO Operating-3710\mxd\Conner 19-18

**APPENDIX E**

ROUTINE STORMWATER INSPECTION FORM

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Items			
Item	Result	Action Item	Comments
Inspector Name:			
Inspector Title:			
Qualified Stormwater Manager?			
Weather:			
Inspection Frequency:			
Phase of Construction:			
Estimated acreage of disturbance:			
Are there any new potential pollutant sources?			
Are there any location(s) of discharges of sediment or other pollutants from the site?			
Is there evidence of, or potential for, pollutants to leave the site boundaries, entering the drainage system or discharging to state waters at the following locations:  <ul style="list-style-type: none"> <li>Construction Site Perimeter</li> <li>All disturbed areas</li> <li>Design haul roads</li> <li>Material and waste storage areas exposed to precipitation</li> <li>Locations where stormwater has the potential to discharge offsite</li> <li>Locations where vehicles exit the site</li> </ul>			
Are there any BMPs that need to be maintained to remain in effective operational condition or modified to minimize pollutant discharges?			
Are there any BMPs that failed to operate as designed or proved inadequate for a particular location?			
Are any BMPs needed that were not in place at the time of inspection?			
Are there any deviations from the minimum inspection schedule? *Assumed minimum inspection frequency of once every 7 days.			
<b>Stormwater Reporting Requirements</b>			
The permittee shall report the following circumstances orally within twenty-four (24) hours from the time the permittee becomes aware of the circumstances, and shall mail to the division a written report containing the information requested within five (5) working days after becoming aware of the following circumstances. The division may waive the written report required if the oral report has been received within 24 hours.			
Has there been an incident of noncompliance requiring 24-hour notification?			

General Questions/Comments	
Completion Time:	

Deficiencies and Action Items						
Item (Car #)	Comment / Deficiency	Inspection Report - Follow-up Action Needed?	Date Closed	Verification (Date/Initials)	Date and Time of 24 Hour Oral Notification	Date of 5 Day Written Notification
None						

Notes/Comments

**Certification**

I certify, under penalty of law, that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment for known violations.

Authorized Signature	Date

**APPENDIX F**  
CONTROL MEASURES MANUAL

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## 5.4 Selection of Controls

Implementation of BMPs will be successful if used appropriately, taking into account a number of factors. The following are guidelines recommended in determining the appropriate BMPs for the site:

1. Determine the limits of clearing and grubbing. If the entire site will not undergo excavation and grading, the boundaries of cut-and-fill operations should be defined. Buffer strips of natural vegetation may be utilized as a control measure.
2. Define the layout of buildings and roads. - This will have been decided previously as part of the general development plan. If building layout is not final, the road areas stabilized with pavement and the drainage features related to roads should be defined as they relate to the plan.
3. Determine permanent drainage features. - The location of permanent channels, storm sewers, roadside swales, and stormwater quality controls such as ponds, wetlands, grassed-lined swales, buffer strips, and areas of porous pavement, if known, should be defined.
4. Determine extent of temporary channel diversions. - If permanent channel improvements are a part of the plan, the route, sizing, and lining needed for temporary channel diversions should be determined. Location and type of temporary channel crossings can be assessed.
5. Determine the boundaries of watersheds. - The size of drainage basins will determine the types of sediment controls to be used. Areas located offsite that contribute overland flow runoff must be assessed. Measures to limit the size of upland overland flow areas, such as diversion dikes, may be initially considered at this stage.
6. Select erosion controls. - All areas exposed will require a control measure be defined dependent on the duration of exposure. These can be selected based on the schedule of construction.
7. Select sediment controls. - Areas greater than 5 acres will require the installation of sediment basins. Consideration can be given to dividing large drainage basins into subareas, each served by a sediment basin.
8. Determine staging areas. - The schedule of construction will determine what areas must be disturbed at various stages throughout the development plan. The opportunity for staging cut-and-fill operations to minimize the period of exposure of soils can be assessed. The sequence for installing sediment controls and erosion controls can also be determined at this time.
9. Identify locations of topsoil and other stockpiles.
10. Identify location of construction roads, access points, and material storage areas.

## 5.5 Erosion Control



### Erosion Control BMPs

- Seeding
- Mulching
- Mulch tackifier
- Soil Binder
- Erosion Control Blankets
- Turf Reinforcement Mats
- Embankment Protector
- Berm/Diversion
- Check Dams
- Outlet Protection
- Temporary Drainage Swale
- Grading Techniques

Erosion and sedimentation processes during and after construction or maintenance activities (including highway construction and maintenance) can result in adverse impacts to the environment. These adverse impacts can be minimized through proper application of BMPs.

The first line of defense is to prevent erosion, which is accomplished by protecting the soil surface from raindrop impact and overland flow of runoff. Soil stabilization is a common and effective practice used to minimize erosion. Common practices include establishing new vegetation, maintaining and protecting existing vegetative cover over soils, and techniques to minimize erosion over disturbed soils where establishing a cover is not practical or possible.

Soil stabilization practices reduce the potential for erosion by:

- Absorbing the kinetic energy of raindrops
- Intercepting water so it can infiltrate into the ground
- Slowing the velocity of runoff
- Binding the sediments in the root layer

Soil stabilization practices are key practices, since the most cost-effective measure for erosion and sediment control is the prevention of erosion. This section discusses the most common erosion control BMPs.



# EC 1: Seeding

---

## Description

Grass and forb species planted for temporary or permanent cover on disturbed surfaces.



## Applications

- Used for temporary cover when a disturbed area (i.e., detour slopes) will be left in place for more than 3 months.
- Used as permanent cover on disturbed soils.
- Used to improve wildlife habitat and aesthetics.

## Limitations

- Seeding should not be applied when the ground is frozen or during the summer when moisture is not available to the seed.

## Design Guidelines

- Appropriate native seed mix must be selected by determining soil type, precipitation, elevation, and aspect of site. If possible, identify native plant material that currently exists on site. CDOT landscape architect should be consulted for seed mix or for seed mix approvals.
- Provide a mix with a minimum of 6 native cool and warm season, bunch and sod forming grasses. Provide 80 to 100 pure live seed per square foot when evenly applied by a drill seeder.

- Jobs with landscaping and federal financial participation shall include wildflowers in the mix.
- Non-native species (i.e., oats, millet, winter wheat) may be used for a temporary nurse crop. Non-native species may be used for irrigated lawn areas.
- Provide for multiple mobilizations for seeding.

### Installation

- Weights, seed species, and percentage of purity and germination must be checked prior to seeding.

TABLE EC 1.1  
Seeding Season

Zone	Spring Seeding	Fall Seeding
Below 6000'	Spring thaw to June 1 <sup>st</sup>	September 1 <sup>st</sup> until consistent ground freeze
6000' to 7000'	Spring thaw to June 15 <sup>th</sup>	August 15 <sup>th</sup> until consistent ground freeze
7000' to 8000'	Spring thaw to July 1 <sup>st</sup>	August 1 <sup>st</sup> until consistent ground freeze
Above 8000'	Spring thaw to consistent ground freeze	Spring thaw to consistent ground freeze

- Seeding in areas that are not irrigated should be restricted to the seasons described in Table EC 1.1. If seeding cannot be accomplished due to seasonal constraints, apply mulch and mulch tackifier to the slopes for temporary erosion control. Maintain temporary mulch until permanent seeding is allowed.
- Prior to permanent seeding prepare soil and, if required, incorporate topsoil, amendments and fertilizer.
- Drill seed disturbed areas flatter than 2:1.
- Broadcast seed and rake into the soil on slopes 2:1 or steeper, double to triple drill seeding rates.
- Hydroseed only where 20 inches per year or more of precipitation occur and when slopes are 2:1 or steeper. Double to triple the hydroseeding rates.
- Permanent and temporary seeding shall occur throughout construction.

### Maintenance and Inspection

- Inspect seeded areas frequently. If the seeded areas fail to establish, provide adequate ground coverage or is disturbed, the area should be re-seeded.

## EC 2: Mulching

### Description

Application of plant residues to the soil surface. Typically mulching material includes certified weed free hay or straw, certified under the Colorado Department of Agriculture Weed Free Forage Certification Program and inspected as regulated by the Weed Free Forage Act, Title 35, Article 27.5, CRS and wood cellulose fiber.



### Applications

- Used in combination with mulch tackifier for temporary erosion control (i.e., incomplete slopes, detour slopes, stockpiles).
- Used in combination with mulch tackifier for temporary erosion control on slopes when seeding is not allowed due to seasonal constraints.
- Used to cover permanent or temporary seed areas.

## Limitations

- Hay may have limited availability in the spring. When approved, straw may be substituted at 2 tons per acre.
- Hydromulch with wood cellulose fibers shall be limited to operations where precipitation is over 20 inches.
- Over spraying of hydromulch may result in erosion.
- Hydromulch shall not be done in the presence of free surface water.

## Installation

- Mulch shall be applied at a rate of 1 ½ to 2 tons per acre.
- At a minimum, 50% of the mulch, by weight, should be 10 inches or more in length.
- Depth of the applied mulch should not be less than 1 inch and not more than 2 inches.
- Applied mulch should be uniformly distributed so that no more than 10% of the soil surface is exposed.
- Applied mulch should be anchored to the soil surface by using tackifier and mechanically crimping immediately after mulching or at least within 4 hours.
- Apply hydromulch immediately after seeding. Hydromulch mixture shall be applied at 2000 pounds per acre wood cellulose fiber mulch; 100 pounds per acre tackifier.



## Maintenance and Inspection

- Inspect frequently and reapply mulching in areas where the mulching has been loosened or removed. Mulch tackifier must be applied with additional applications of mulching.



## Description

Effective construction site management to minimize erosion and sediment transport includes attention to construction phasing, scheduling, and sequencing of land disturbing activities. On most construction projects, erosion and sediment controls will need to be adjusted as the project progresses and should be documented in the SWMP.

Construction phasing refers to disturbing only part of a site at a time to limit the potential for erosion from dormant parts of a site. Grading activities and construction are completed and soils are effectively stabilized on one part of a site before grading and construction begins on another portion of the site.



**Photograph CP-1.** Construction phasing to avoid disturbing the entire area at one time. Photo courtesy of WWE.

Construction sequencing or scheduling refers to a specified work schedule that coordinates the timing of land disturbing activities and the installation of erosion and sediment control practices.

## Appropriate Uses

All construction projects can benefit from upfront planning to phase and sequence construction activities to minimize the extent and duration of disturbance. Larger projects and linear construction projects may benefit most from construction sequencing or phasing, but even small projects can benefit from construction sequencing that minimizes the duration of disturbance.

Typically, erosion and sediment controls needed at a site will change as a site progresses through the major phases of construction. Erosion and sediment control practices corresponding to each phase of construction must be documented in the SWMP.

## Design and Installation

BMPs appropriate to the major phases of development should be identified on construction drawings. In some cases, it will be necessary to provide several drawings showing construction-phase BMPs placed according to stages of development (e.g., clearing and grading, utility installation, active construction, final stabilization). Some municipalities in the Denver area set maximum sizes for disturbed area associated with phases of a construction project. Additionally, requirements for phased construction drawings vary among local governments within the UDFCD boundary. Some local governments require separate erosion and sediment control drawings for initial BMPs, interim conditions (in active construction), and final stabilization.

Construction Scheduling	
<b>Functions</b>	
Erosion Control	Moderate
Sediment Control	Moderate
Site/Material Management	Yes

Typical construction phasing BMPs include:

- Limit the amount of disturbed area at any given time on a site to the extent practical. For example, a 100-acre subdivision might be constructed in five phases of 20 acres each.
- If there is carryover of stockpiled material from one phase to the next, position carryover material in a location easily accessible for the pending phase that will not require disturbance of stabilized areas to access the stockpile. Particularly with regard to efforts to balance cut and fill at a site, careful planning for location of stockpiles is important.

Typical construction sequencing BMPs include:

- Sequence construction activities to minimize duration of soil disturbance and exposure. For example, when multiple utilities will occupy the same trench, schedule installation so that the trench does not have to be closed and opened multiple times.
- Schedule site stabilization activities (e.g., landscaping, seeding and mulching, installation of erosion control blankets) as soon as feasible following grading.
- Install initial erosion and sediment control practices before construction begins. Promptly install additional BMPs for inlet protection, stabilization, etc., as construction activities are completed.

Table CP-1 provides typical sequencing of construction activities and associated BMPs.

## **Maintenance and Removal**

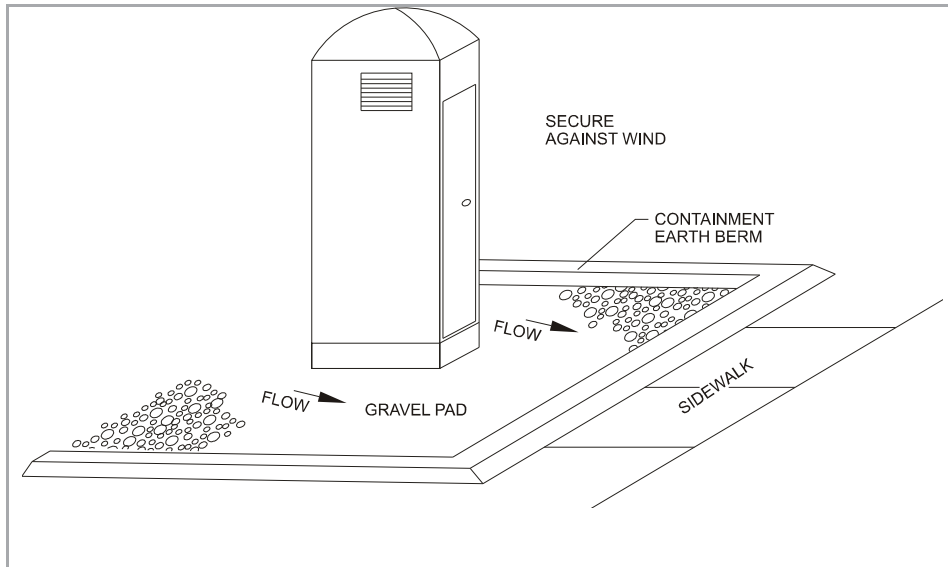
When the construction schedule is altered, erosion and sediment control measures in the SWMP and construction drawings should be appropriately adjusted to reflect actual "on the ground" conditions at the construction site. Be aware that changes in construction schedules can have significant implications for site stabilization, particularly with regard to establishment of vegetative cover.

**Table CP-1. Typical Phased BMP Installation for Construction Projects**

Project Phase	BMPs
Pre-disturbance, Site Access	<ul style="list-style-type: none"> <li>▪ Install sediment controls downgradient of access point (on paved streets this may consist of inlet protection).</li> <li>▪ Establish vehicle tracking control at entrances to paved streets. Fence as needed.</li> <li>▪ Use construction fencing to define the boundaries of the project and limit access to areas of the site that are not to be disturbed.</li> </ul> <p><b>Note: it may be necessary to protect inlets in the general vicinity of the site, even if not downgradient, if there is a possibility that sediment tracked from the site could contribute to the inlets.</b></p>
Site Clearing and Grubbing	<ul style="list-style-type: none"> <li>▪ Install perimeter controls as needed on downgradient perimeter of site (silt fence, wattles, etc).</li> <li>▪ Limit disturbance to those areas planned for disturbance and protect undisturbed areas within the site (construction fence, flagging, etc).</li> <li>▪ Preserve vegetative buffer at site perimeter.</li> <li>▪ Create stabilized staging area.</li> <li>▪ Locate portable toilets on flat surfaces away from drainage paths. Stake in areas susceptible to high winds.</li> <li>▪ Construct concrete washout area and provide signage.</li> <li>▪ Establish waste disposal areas.</li> <li>▪ Install sediment basins.</li> <li>▪ Create dirt perimeter berms and/or brush barriers during grubbing and clearing.</li> <li>▪ Separate and stockpile topsoil, leave roughened and/or cover.</li> <li>▪ Protect stockpiles with perimeter control BMPs. Stockpiles should be located away from drainage paths and should be accessed from the upgradient side so that perimeter controls can remain in place on the downgradient side. Use erosion control blankets, temporary seeding, and/or mulch for stockpiles that will be inactive for an extended period.</li> <li>▪ Leave disturbed area of site in a roughened condition to limit erosion. Consider temporary revegetation for areas of the site that have been disturbed but that will be inactive for an extended period.</li> <li>▪ Water to minimize dust but not to the point that watering creates runoff.</li> </ul>



Project Phase	BMPs
Utility And Infrastructure Installation	<p><b>In Addition to the Above BMPs:</b></p> <ul style="list-style-type: none"> <li>▪ Close trench as soon as possible (generally at the end of the day).</li> <li>▪ Use rough-cut street control or apply road base for streets that will not be promptly paved.</li> <li>▪ Provide inlet protection as streets are paved and inlets are constructed.</li> <li>▪ Protect and repair BMPs, as necessary.</li> <li>▪ Perform street sweeping as needed.</li> </ul>
Building Construction	<p><b>In Addition to the Above BMPs:</b></p> <ul style="list-style-type: none"> <li>▪ Implement materials management and good housekeeping practices for home building activities.</li> <li>▪ Use perimeter controls for temporary stockpiles from foundation excavations.</li> <li>▪ For lots adjacent to streets, lot-line perimeter controls may be necessary at the back of curb.</li> </ul>
Final Grading	<p><b>In Addition to the Above BMPs:</b></p> <ul style="list-style-type: none"> <li>▪ Remove excess or waste materials.</li> <li>▪ Remove stored materials.</li> </ul>
Final Stabilization	<p><b>In Addition to the Above BMPs:</b></p> <ul style="list-style-type: none"> <li>▪ Seed and mulch/tackify.</li> <li>▪ Seed and install blankets on steep slopes.</li> <li>▪ Remove all temporary BMPs when site has reached final stabilization.</li> </ul>

**DESCRIPTION:**

Temporary on-site sanitary facilities for construction personnel.

**APPLICATION:**

All sites with no permanent sanitary facilities or where permanent facility is too far from activities.

**INSTALLATION/APPLICATION CRITERIA:**

- ◆ Locate portable toilets in convenient locations throughout the site.
- ◆ Prepare level, gravel surface and provide clear access to the toilets for servicing and for on-site personnel.
- ◆ Construct earth berm perimeter (6" tall by 6" wide), control for spill/protection leak.

**LIMITATIONS:**

- ◆ No limitations.

**MAINTENANCE:**

- ◆ Portable toilets should be maintained in good working order by licensed service with daily observation for leak detection.
- ◆ Regular waste collection should be arranged with licensed service.
- ◆ All waste should be deposited in sanitary sewer system for treatment with appropriate agency approval.

## Description

Stockpile management includes measures to minimize erosion and sediment transport from soil stockpiles.

## Appropriate Uses

Stockpile management should be used when soils or other erodible materials are stored at the construction site. Special attention should be given to stockpiles in close proximity to natural or manmade storm systems.



**Photograph SP-1.** A topsoil stockpile that has been partially revegetated and is protected by silt fence perimeter control.

## Design and Installation

Locate stockpiles away from all drainage system components including storm sewer inlets. Where practical, choose stockpile locations that that will remain undisturbed for the longest period of time as the phases of construction progress. Place sediment control BMPs around the perimeter of the stockpile, such as sediment control logs, rock socks, silt fence, straw bales and sand bags. See Detail SP-1 for guidance on proper establishment of perimeter controls around a stockpile. For stockpiles in active use, provide a stabilized designated access point on the upgradient side of the stockpile.

Stabilize the stockpile surface with surface roughening, temporary seeding and mulching, erosion control blankets, or soil binders. Soils stockpiled for an extended period (typically for more than 60 days) should be seeded and mulched with a temporary grass cover once the stockpile is placed (typically within 14 days). Use of mulch only or a soil binder is acceptable if the stockpile will be in place for a more limited time period (typically 30-60 days). Timeframes for stabilization of stockpiles noted in this fact sheet are "typical" guidelines. Check permit requirements for specific federal, state, and/or local requirements that may be more prescriptive.

Stockpiles should not be placed in streets or paved areas unless no other practical alternative exists. See the Stabilized Staging Area Fact Sheet for guidance when staging in roadways is unavoidable due to space or right-of-way constraints. For paved areas, rock socks must be used for perimeter control and all inlets with the potential to receive sediment from the stockpile (even from vehicle tracking) must be protected.

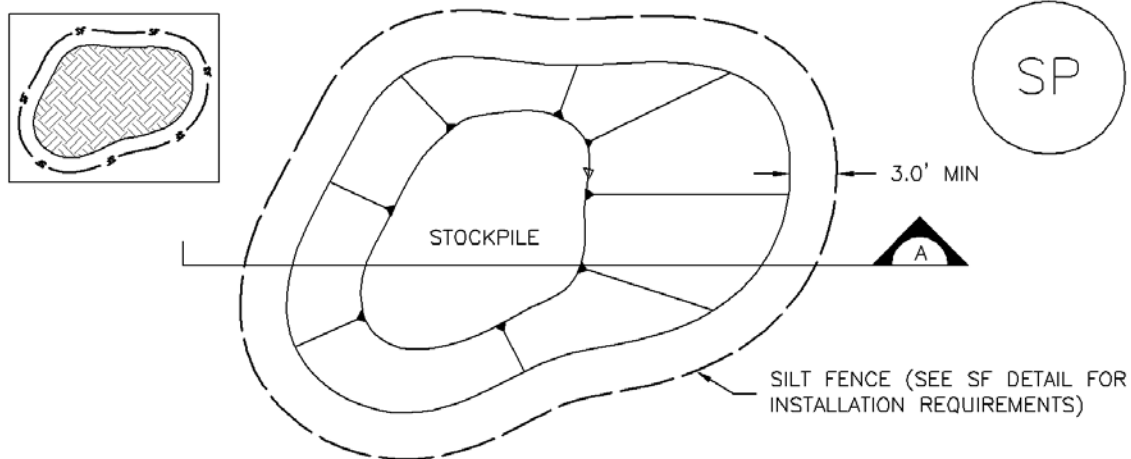
## Maintenance and Removal

Inspect perimeter controls and inlet protection in accordance with their respective BMP Fact Sheets. Where seeding, mulch and/or soil binders are used, reseeding or reapplication of soil binder may be necessary.

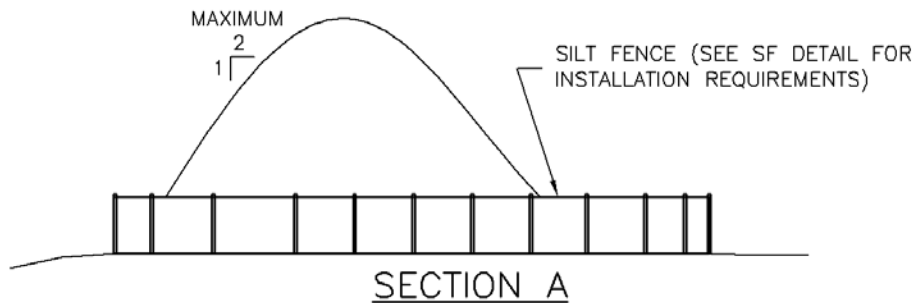
When temporary removal of a perimeter BMP is necessary to access a stockpile, ensure BMPs are reinstalled in accordance with their respective design detail section.

Stockpile Management	
Functions	
Erosion Control	Yes
Sediment Control	Yes
Site/Material Management	Yes

When the stockpile is no longer needed, properly dispose of excess materials and revegetate or otherwise stabilize the ground surface where the stockpile was located.



## STOCKPILE PROTECTION PLAN



## SP-1. STOCKPILE PROTECTION

### STOCKPILE PROTECTION INSTALLATION NOTES

1. SEE PLAN VIEW FOR:
  - LOCATION OF STOCKPILES.
  - TYPE OF STOCKPILE PROTECTION.
2. INSTALL PERIMETER CONTROLS IN ACCORDANCE WITH THEIR RESPECTIVE DESIGN DETAILS. SILT FENCE IS SHOWN IN THE STOCKPILE PROTECTION DETAILS; HOWEVER, OTHER TYPES OF PERIMETER CONTROLS INCLUDING SEDIMENT CONTROL LOGS OR ROCK SOCKS MAY BE SUITABLE IN SOME CIRCUMSTANCES. CONSIDERATIONS FOR DETERMINING THE APPROPRIATE TYPE OF PERIMETER CONTROL FOR A STOCKPILE INCLUDE WHETHER THE STOCKPILE IS LOCATED ON A PERVIOUS OR IMPERVIOUS SURFACE, THE RELATIVE HEIGHTS OF THE PERIMETER CONTROL AND STOCKPILE, THE ABILITY OF THE PERIMETER CONTROL TO CONTAIN THE STOCKPILE WITHOUT FAILING IN THE EVENT THAT MATERIAL FROM THE STOCKPILE SHIFTS OR SLUMPS AGAINST THE PERIMETER, AND OTHER FACTORS.
3. STABILIZE THE STOCKPILE SURFACE WITH SURFACE ROUGHENING, TEMPORARY SEEDING AND MULCHING, EROSION CONTROL BLANKETS, OR SOIL BINDERS. SOILS STOCKPILED FOR AN EXTENDED PERIOD (TYPICALLY FOR MORE THAN 60 DAYS) SHOULD BE SEEDING AND MULCHED WITH A TEMPORARY GRASS COVER ONCE THE STOCKPILE IS PLACED (TYPICALLY WITHIN 14 DAYS). USE OF MULCH ONLY OR A SOIL BINDER IS ACCEPTABLE IF THE STOCKPILE WILL BE IN PLACE FOR A MORE LIMITED TIME PERIOD (TYPICALLY 30-60 DAYS).
4. FOR TEMPORARY STOCKPILES ON THE INTERIOR PORTION OF A CONSTRUCTION SITE, WHERE OTHER DOWNGRADIENT CONTROLS, INCLUDING PERIMETER CONTROL, ARE IN PLACE, STOCKPILE PERIMETER CONTROLS MAY NOT BE REQUIRED.

STOCKPILE PROTECTION MAINTENANCE NOTES

1. INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.

2. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.

3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.

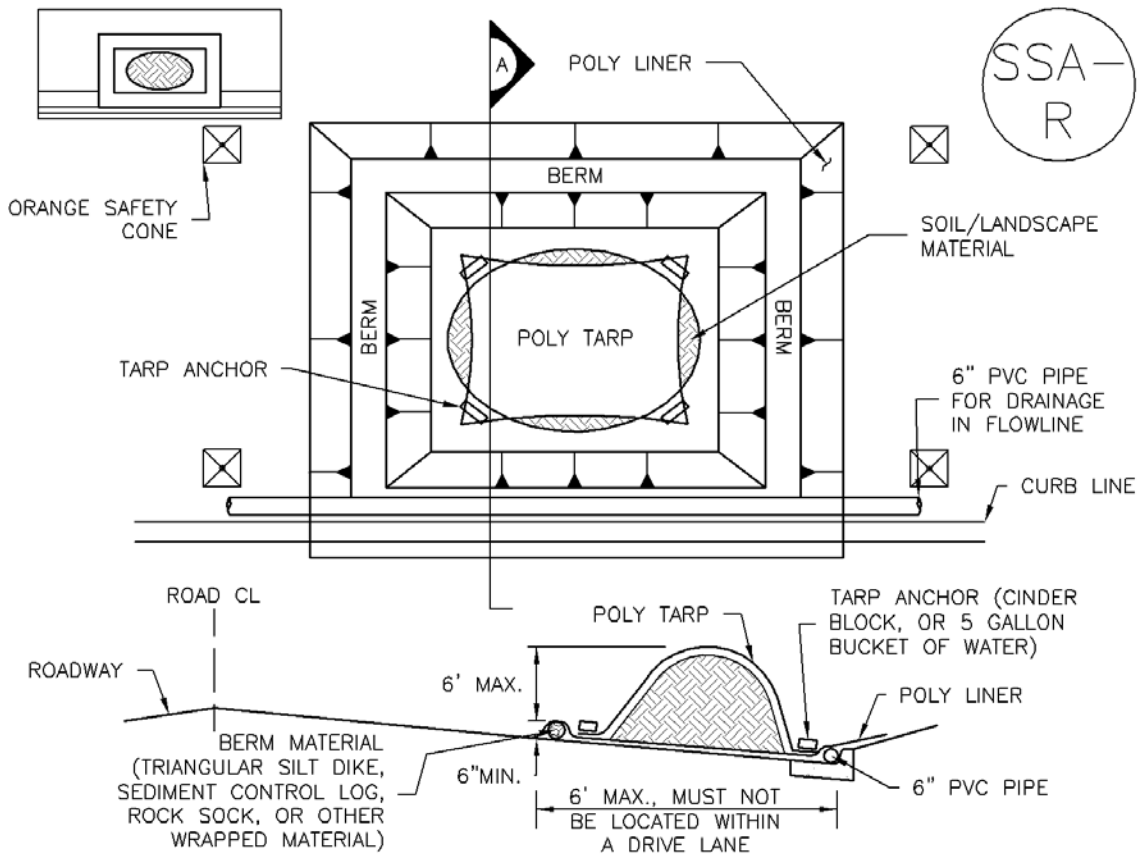
STOCKPILE PROTECTION MAINTENANCE NOTES

4. IF PERIMETER PROTECTION MUST BE MOVED TO ACCESS SOIL STOCKPILE, REPLACE PERIMETER CONTROLS BY THE END OF THE WORKDAY.

5. STOCKPILE PERIMETER CONTROLS CAN BE REMOVED ONCE ALL THE MATERIAL FROM THE STOCKPILE HAS BEEN USED.

(DETAILS ADAPTED FROM PARKER, COLORADO, NOT AVAILABLE IN AUTOCAD)

NOTE: MANY JURISDICTIONS HAVE BMP DETAILS THAT VARY FROM UDFCD STANDARD DETAILS. CONSULT WITH LOCAL JURISDICTIONS AS TO WHICH DETAIL SHOULD BE USED WHEN DIFFERENCES ARE NOTED.



## SP-2. MATERIALS STAGING IN ROADWAY

### MATERIALS STAGING IN ROADWAYS INSTALLATION NOTES

1. SEE PLAN VIEW FOR
  - LOCATION OF MATERIAL STAGING AREA(S).
  - CONTRACTOR MAY ADJUST LOCATION AND SIZE OF STAGING AREA WITH APPROVAL FROM THE LOCAL JURISDICTION.
2. FEATURE MUST BE INSTALLED PRIOR TO EXCAVATION, EARTHWORK OR DELIVERY OF MATERIALS.
3. MATERIALS MUST BE STATIONED ON THE POLY LINER. ANY INCIDENTAL MATERIALS DEPOSITED ON PAVED SECTION OR ALONG CURB LINE MUST BE CLEANED UP PROMPTLY.
4. POLY LINER AND TARP COVER SHOULD BE OF SIGNIFICANT THICKNESS TO PREVENT DAMAGE OR LOSS OF INTEGRITY.
5. SAND BAGS MAY BE SUBSTITUTED TO ANCHOR THE COVER TARP OR PROVIDE BERMING UNDER THE BASE LINER.
6. FEATURE IS NOT INTENDED FOR USE WITH WET MATERIAL THAT WILL BE DRAINING AND/OR SPREADING OUT ON THE POLY LINER OR FOR DEMOLITION MATERIALS.
7. THIS FEATURE CAN BE USED FOR:
  - UTILITY REPAIRS.
  - WHEN OTHER STAGING LOCATIONS AND OPTIONS ARE LIMITED.
  - OTHER LIMITED APPLICATION AND SHORT DURATION STAGING.



MATERIALS STAGING IN ROADWAY MAINTENANCE NOTES

1. INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.
2. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.
3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.
4. INSPECT PVC PIPE ALONG CURB LINE FOR CLOGGING AND DEBRIS. REMOVE OBSTRUCTIONS PROMPTLY.
5. CLEAN MATERIAL FROM PAVED SURFACES BY SWEEPING OR VACUUMING.

NOTE: MANY JURISDICTIONS HAVE BMP DETAILS THAT VARY FROM UDFCD STANDARD DETAILS. CONSULT WITH LOCAL JURISDICTIONS AS TO WHICH DETAIL SHOULD BE USED WHEN DIFFERENCES ARE NOTED.

(DETAILS ADAPTED FROM AURORA, COLORADO)

# SC 1: Erosion Bale

**Description** A temporary sediment barrier consisting of a row of entrenched and anchored straw, or hay bales.

**Applications**

- Used as temporary sediment barriers and filters along the toe of fills or around inlets.

**Limitations**

- Do not use along toe of fills where the size of the drainage area is greater than one-quarter acre per 100 feet of barrier length; maximum slope length and gradient behind the barrier is 100 feet and 50 percent (2:1), respectively.
- Do not use where effectiveness is required for more than 3 months. Useful life of erosion bale is approximately 1 year; the bales may have to be replaced one or more times during construction.
- Under no circumstances should erosion bale be constructed in flowing streams or in swales where flows are likely to exceed 1 cfs, and where the contributing drainage area is greater than 1 acre.
- Not to be used where the control of sediment is critical; in high-risk areas; in areas where they cannot be entrenched as required and firmly anchored; and areas where ponded water could flow onto the roadway.



**Installation**

- The erosion bale must be entrenched and backfilled. A trench should be excavated the width of a bale and the length of the proposed barrier to a minimum depth of 4 inches. After the bales are staked, the excavated soil must be backfilled against the barrier. Backfill soil should conform to the ground level on the downhill side and should be built up to 4 inches against the uphill side of the barrier.
- Each bale must be securely anchored by at least two wooden stakes driven toward the previously laid bale to force the bales together. Stakes should be driven into the ground a minimum of 1 foot to securely anchor

the bales. Stakes should have a minimum diameter or cross section of 2 inches. Reinforcing bars shall not be used in place of the wooden stake.

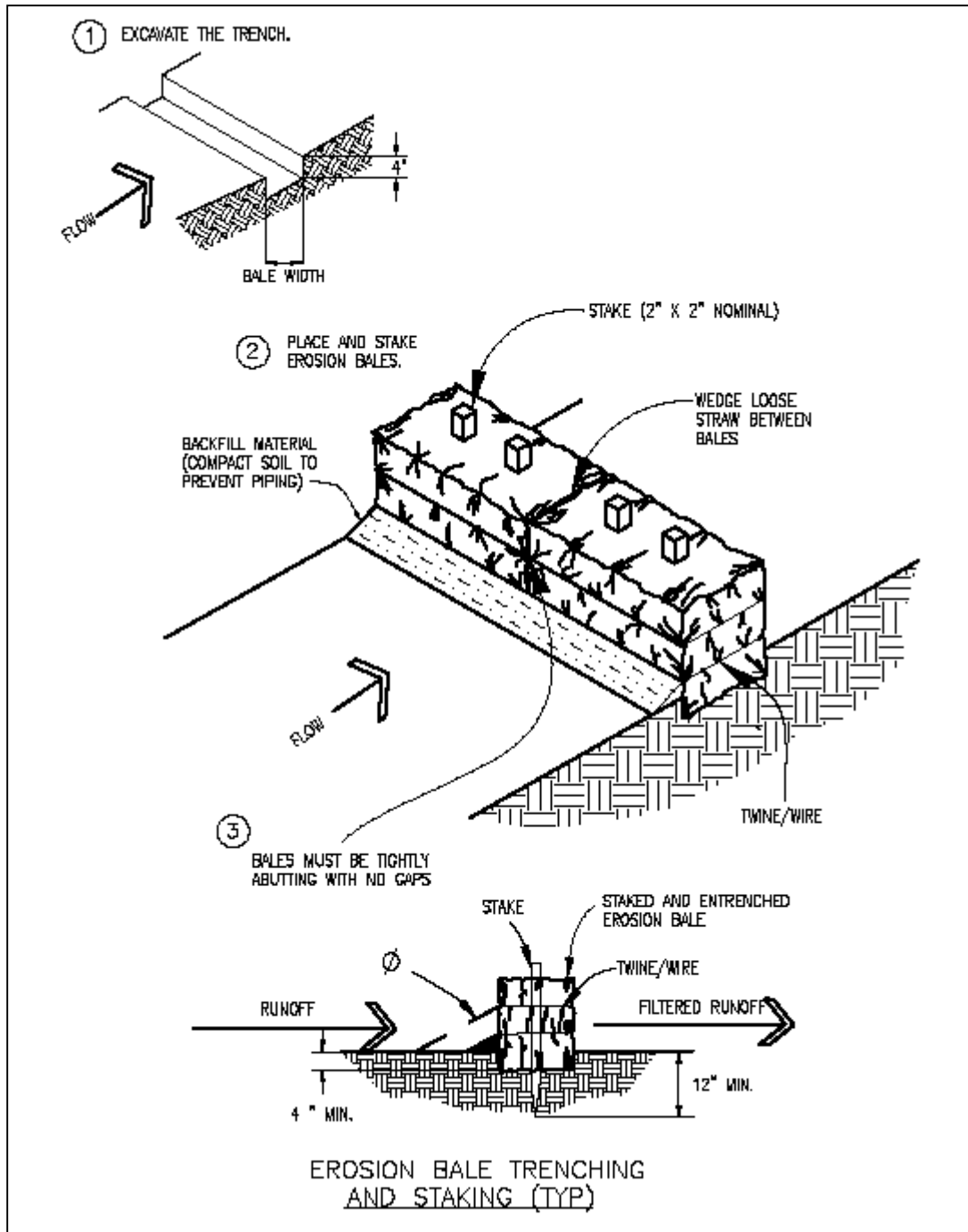


FIGURE SC 1.1  
Erosion Bale Installation (CDOT<sup>®</sup>)

- All bales must be either wire-bound or string-tied, and they should be installed so that bindings are oriented around the sides rather than along

the tops and bottoms of the bales (in order to prevent deterioration of bindings).

- The gaps between bales should be filled by wedging with straw to prevent water from escaping between the bales. The main consideration is to obtain tight joints. Erosion bales will not filter sediment or pond water if the water is allowed to flow between, around, or under the bales. Loose straw or hay scattered over the area immediately uphill from an erosion bale barrier tends to increase barrier efficiency.
- Along toe of fills, install the erosion bales along a level contour and leave enough area behind the barrier for runoff to pond and sediment to settle. A minimum distance of 5 feet from toe of the fill is recommended.

### Maintenance and Inspection

- Erosion bales deteriorate quickly and, therefore, inspections during construction should be frequent. Repair or replacement should be made promptly as needed.
- Erosion bales must be removed when they have served their usefulness.
- Trenches where erosion bales were located should be graded and stabilized.
- Sediment accumulation against the erosion bale barrier shall be removed when it reaches half the exposed bale height. Sediments removed must be properly disposed.
- Replace erosion bales as necessary but at a minimum of once each year.

## EC 12: Grading Techniques

**Description** Soil surface roughening, terracing and rounding at tops of cuts, transitions, and roadway ditches to facilitate plant establishment and minimize soil erosion.

**Applications**

- Used to temporarily stabilize disturbed areas and protect from wind and water erosion.
- Used as a temporary practice during construction.



**Installation**

- Round channel bottoms to avoid V-shaped ditches and top of cut of cut slopes.
- Avoid angles in cut-and-fill transition areas by rounding transition line.
- Roughen, terrace, scarify or disc parallel to the contours. Scarify or disc to maintain 1- to 3-inch minimum variation in soil surface.

- Grading techniques are BMPs that must be implemented in conjunction with other BMPs such as mulching or soil binders. Use of only grading techniques are not adequate erosion control BMPs.

### Maintenance and Inspection

- Inspection and maintenance must be provided periodically and after each rain or snowfall event that causes runoff to ensure roughed state is maintained.
- Rills developed should be filled and the area re-graded immediately .

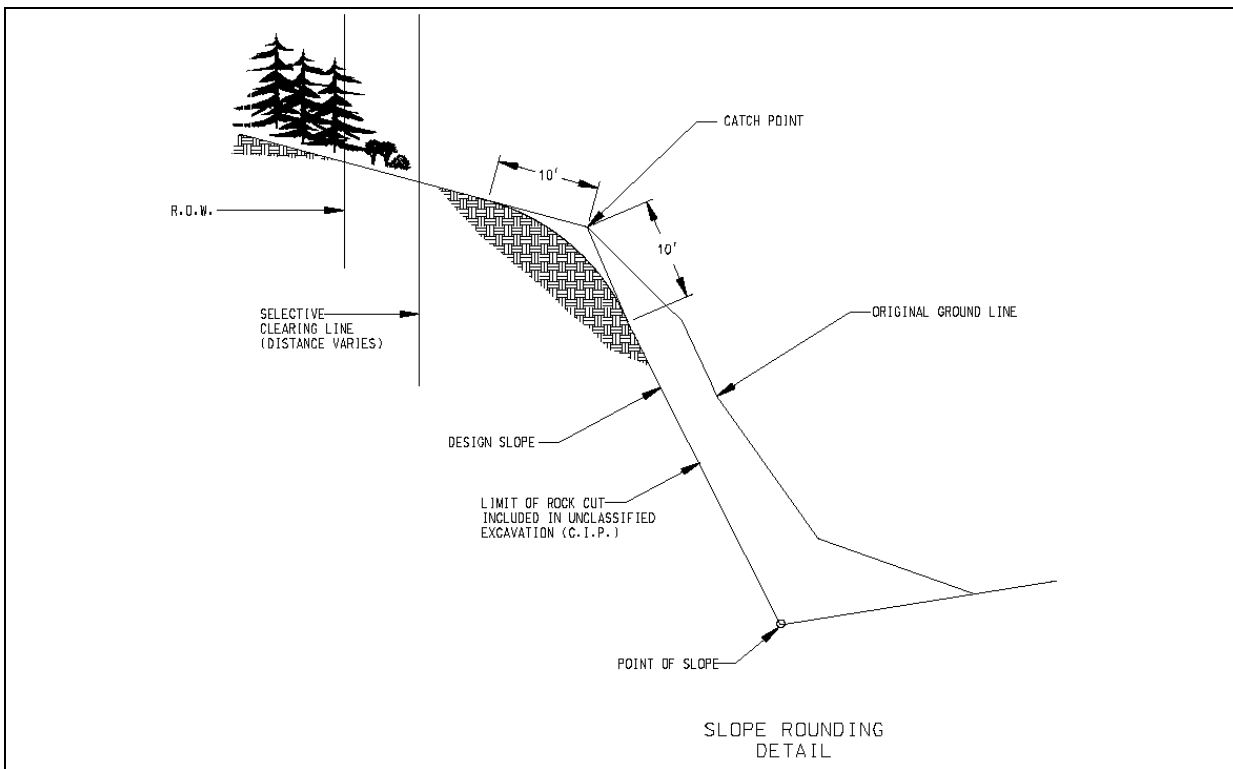


FIGURE EC 12.1  
Slope Rounding Flatter than 2:1(CDOT<sup>18</sup>)

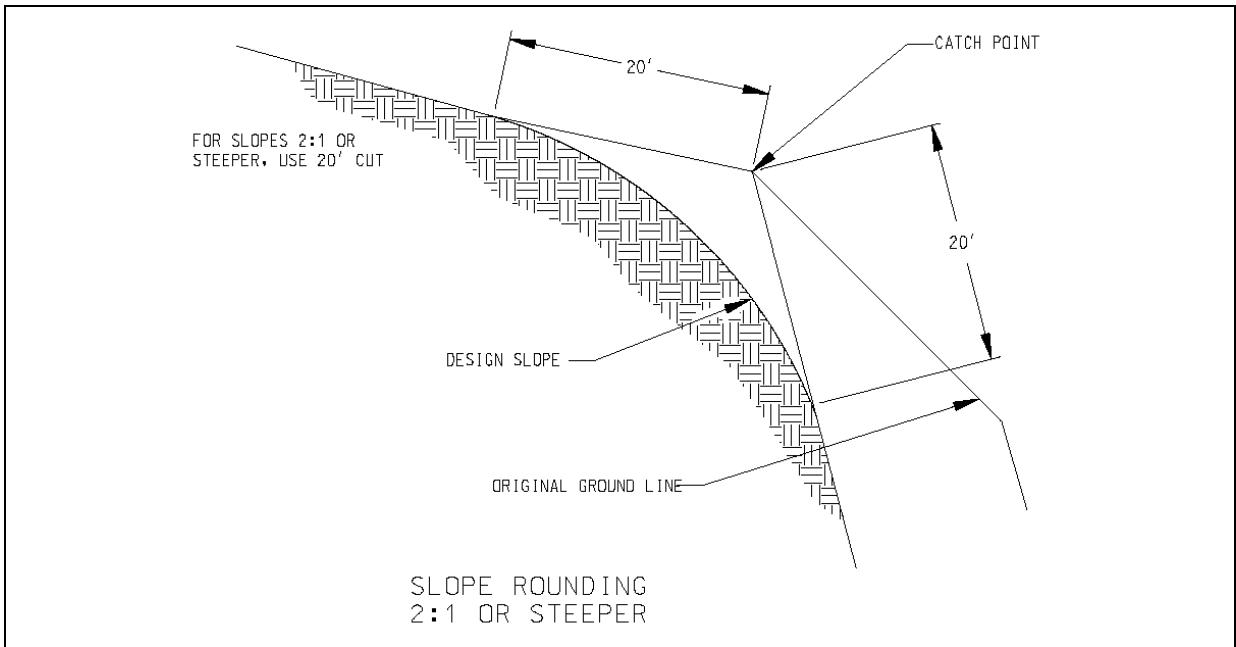


FIGURE EC 12.2  
Slope Rounding 2:1 or Steeper (CDOT<sup>18</sup>)



# EC 8: Berm/Diversion

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**Description** A temporary berm or ridge made of soil (or coarse aggregate), with or without a diversion channel.

## Applications

- Used to intercept and divert runoff to desired location such as towards a sediment trap or a slope drain.
- Used to divert runoff from areas where it might damage property, cause erosion, or interfere with the establishment of vegetation.
- Used along the top edges of cuts and fills to protect the embankment.
- Used as a temporary feature.

## Limitations

- Berms to intercept and divert runoff should not be used where the drainage area exceeds 10 acres.
- Should not be used in areas with slopes steeper than 10 percent.

## Design Guidelines

### *Location*

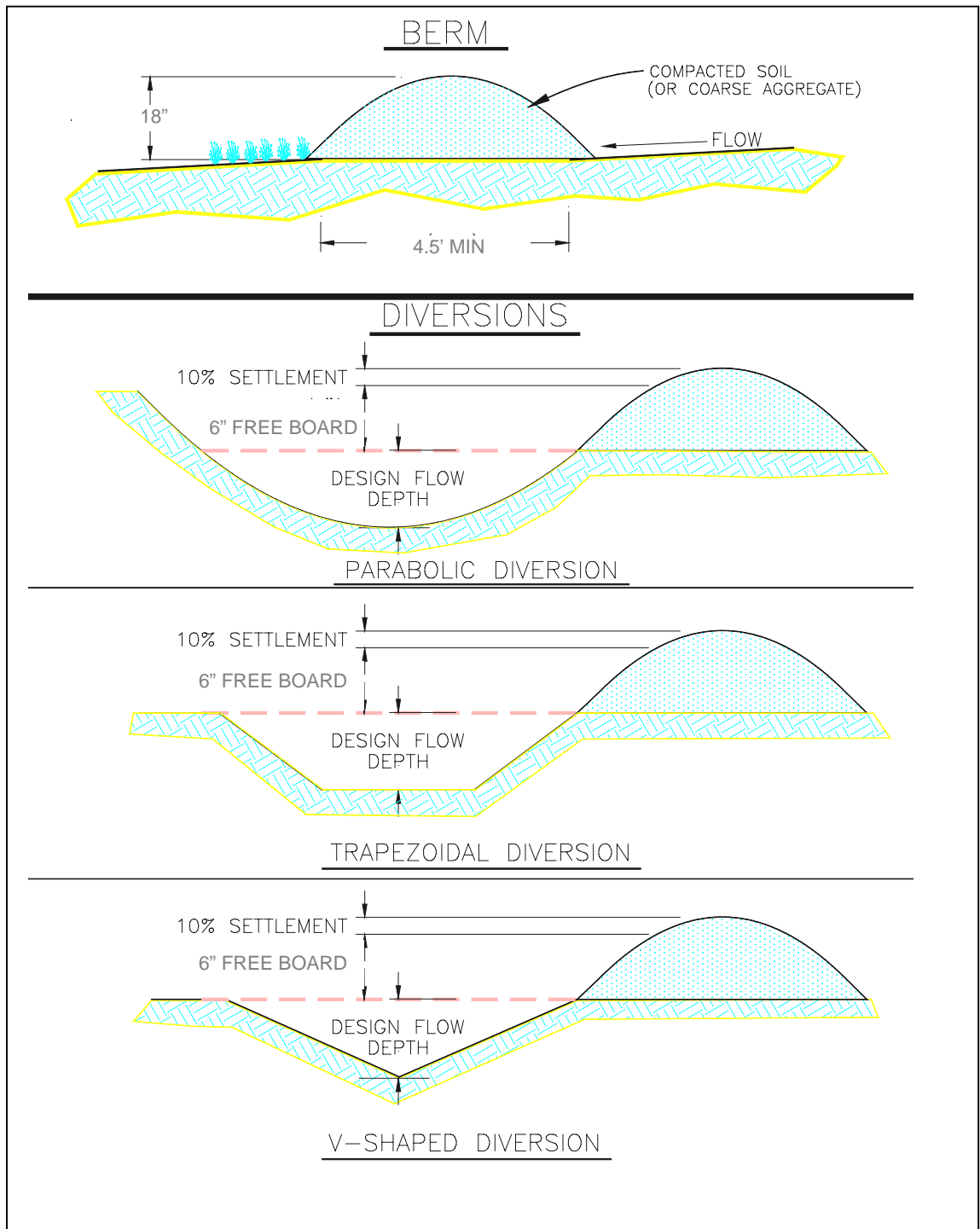
- Appropriate location should be determined by considering outlet conditions, topography, land use, soil type, length of slope, and areas where seepage might be a problem.

### *Berm*

- Berms shall have a minimum height of 18 inches, side slopes of 2:1 or flatter, and a minimum base width of 4.5 feet (see Figure EC 8.1).

### *Diversion channel*

- The diversion channel shall have a minimum capacity to convey the runoff expected from a 2-year frequency storm. Diversions to protect homes, schools, industrial buildings, roads, parking lots, and comparable high risk areas, as well as those intended to function in connection with other structures, shall have sufficient capacity to carry peak runoff expected from a storm frequency consistent with the hazard involved.
- Design channel in accordance with the CDOT *Drainage Design Manual*.
- The minimum freeboard shall be 6 inches.
- The geometry may be parabolic, trapezoidal, or V-shaped (see Figure EC 8.1).



**FIGURE EC 8.1**  
Berm/Diversion Geometry (Adapted from VEaSCH<sup>28</sup>)

### Materials

- Berms and diversions should be constructed of compacted soil or coarse aggregate.

### Installation

- All berms shall have an uninterrupted positive grade to a stabilized outlet. The outlet should be capable of conveying concentrated runoff into an undisturbed, stabilized area at a non-erosive velocity.
- Berms shall be compacted as needed to prevent unequal settlement.
- Diversion channels shall be excavated or shaped to line, grade, and cross-section as indicated in the plans and as required to meet the criteria as specified.
- All trees, brush, stumps, obstructions, and other objectionable material shall be removed and disposed of so as not to interfere with the proper functioning of the diversion.
- Berms and diversion channels should be stabilized with riprap, turf reinforcement or appropriate measure for protection against erosion and failure.

### Maintenance and Inspection

- Inspection and maintenance must be provided periodically and after each rain or snowfall event that causes runoff.
- Sediments accumulated against the berm should be removed periodically and properly disposed of.
- Erosion along the berm should be repaired with the stabilization measure re-established.

# EC 11: Temporary Drainage Swale

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**Description** Temporary drainage swales are implemented to intercept, divert, collect surface runoff, and convey the accumulated runoff to acceptable outlet points in order to prevent sediment from entering the storm drainage system.

## Applications

- Along the bottom or mid-slope of steep grades to intercept sheet flow and direct the concentrated runoff towards an acceptable outlet point.
- At the top of slopes to divert and direct offsite runoff from adjacent slopes.
- Along roads to intercept and convey runoff.
- Can be used as an alternative to silt fences.

## Limitations

- May be necessary to implement other sediment control measures along with swales to control erosion.
- Swales are not effective sediment trapping measures.

## Standards and Specifications

- Drainage swales shall be sized according to design procedures outlined in the CDOT *Design Drainage Manual*.
- At a minimum, the swale should conform to predevelopment drainage patterns.
- Provide stabilized drainage channels and outlets.
- Permanent dikes and swales should be installed where possible.
- Do not use to divert runoff from highway right-of-way onto adjacent properties.

## Maintenance and Inspection

- Inspect temporary swales weekly and after rainfall and snowfall events for washouts, lost riprap, damaged lining, erosion, and accumulation of debris and sediment in the swale. Repair damaged sediment control measures and remove accumulated sediment as soon as possible.
- Remove temporary sediment control measures once the project areas has been stabilized.

## Description

Temporary seeding can be used to stabilize disturbed areas that will be inactive for an extended period. Permanent seeding should be used to stabilize areas at final grade that will not be otherwise stabilized. Effective seeding includes preparation of a seedbed, selection of an appropriate seed mixture, proper planting techniques, and protection of the seeded area with mulch, geotextiles, or other appropriate measures.



**Photograph TS/PS -1.** Equipment used to drill seed. Photo courtesy of Douglas County.

## Appropriate Uses

When the soil surface is disturbed and will remain inactive for an extended period (typically 30 days or longer), proactive stabilization measures should be implemented. If the inactive period is short-lived (on the order of two weeks), techniques such as surface roughening may be appropriate. For longer periods of inactivity, temporary seeding and mulching can provide effective erosion control. Permanent seeding should be used on finished areas that have not been otherwise stabilized.

Typically, local governments have their own seed mixes and timelines for seeding. Check jurisdictional requirements for seeding and temporary stabilization.

## Design and Installation

Effective seeding requires proper seedbed preparation, selection of an appropriate seed mixture, use of appropriate seeding equipment to ensure proper coverage and density, and protection with mulch or fabric until plants are established.

The USDCM Volume 2 *Revegetation* Chapter contains detailed seed mix, soil preparations, and seeding and mulching recommendations that may be referenced to supplement this Fact Sheet.

Drill seeding is the preferred seeding method. Hydroseeding is not recommended except in areas where steep slopes prevent use of drill seeding equipment, and even in these instances it is preferable to hand seed and mulch. Some jurisdictions do not allow hydroseeding or hydromulching.

## Seedbed Preparation

Prior to seeding, ensure that areas to be revegetated have soil conditions capable of supporting vegetation. Overlot grading can result in loss of topsoil, resulting in poor quality subsoils at the ground surface that have low nutrient value, little organic matter content, few soil microorganisms, rooting restrictions, and conditions less conducive to infiltration of precipitation. As a result, it is typically necessary to provide stockpiled topsoil, compost, or other

Temporary and Permanent Seeding	
Functions	
Erosion Control	Yes
Sediment Control	No
Site/Material Management	No

## **EC-2      Temporary and Permanent Seeding (TS/PS)**

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soil amendments and rototill them into the soil to a depth of 6 inches or more.

Topsoil should be salvaged during grading operations for use and spread on areas to be revegetated later. Topsoil should be viewed as an important resource to be utilized for vegetation establishment, due to its water-holding capacity, structure, texture, organic matter content, biological activity, and nutrient content. The rooting depth of most native grasses in the semi-arid Denver metropolitan area is 6 to 18 inches. At a minimum, the upper 6 inches of topsoil should be stripped, stockpiled, and ultimately respread across areas that will be revegetated.

Where topsoil is not available, subsoils should be amended to provide an appropriate plant-growth medium. Organic matter, such as well digested compost, can be added to improve soil characteristics conducive to plant growth. Other treatments can be used to adjust soil pH conditions when needed. Soil testing, which is typically inexpensive, should be completed to determine and optimize the types and amounts of amendments that are required.

If the disturbed ground surface is compacted, rip or rototill the surface prior to placing topsoil. If adding compost to the existing soil surface, rototilling is necessary. Surface roughening will assist in placement of a stable topsoil layer on steeper slopes, and allow infiltration and root penetration to greater depth.

Prior to seeding, the soil surface should be rough and the seedbed should be firm, but neither too loose nor compacted. The upper layer of soil should be in a condition suitable for seeding at the proper depth and conducive to plant growth. Seed-to-soil contact is the key to good germination.

### **Seed Mix for Temporary Vegetation**

To provide temporary vegetative cover on disturbed areas which will not be paved, built upon, or fully landscaped or worked for an extended period (typically 30 days or more), plant an annual grass appropriate for the time of planting and mulch the planted areas. Annual grasses suitable for the Denver metropolitan area are listed in Table TS/PS-1. These are to be considered only as general recommendations when specific design guidance for a particular site is not available. Local governments typically specify seed mixes appropriate for their jurisdiction.

### **Seed Mix for Permanent Revegetation**

To provide vegetative cover on disturbed areas that have reached final grade, a perennial grass mix should be established. Permanent seeding should be performed promptly (typically within 14 days) after reaching final grade. Each site will have different characteristics and a landscape professional or the local jurisdiction should be contacted to determine the most suitable seed mix for a specific site. In lieu of a specific recommendation, one of the perennial grass mixes appropriate for site conditions and growth season listed in Table TS/PS-2 can be used. The pure live seed (PLS) rates of application recommended in these tables are considered to be absolute minimum rates for seed applied using proper drill-seeding equipment.

If desired for wildlife habitat or landscape diversity, shrubs such as rubber rabbitbrush (*Chrysothamnus nauseosus*), fourwing saltbush (*Atriplex canescens*) and skunkbrush sumac (*Rhus trilobata*) could be added to the upland seedmixes at 0.25, 0.5 and 1 pound PLS/acre, respectively. In riparian zones, planting root stock of such species as American plum (*Prunus americana*), woods rose (*Rosa woodsii*), plains cottonwood (*Populus sargentii*), and willow (*Populus spp.*) may be considered. On non-topsoiled upland sites, a legume such as Ladak alfalfa at 1 pound PLS/acre can be included as a source of nitrogen for perennial grasses.

Seeding dates for the highest success probability of perennial species along the Front Range are generally in the spring from April through early May and in the fall after the first of September until the ground freezes. If the area is irrigated, seeding may occur in summer months, as well. See Table TS/PS-3 for appropriate seeding dates.

**Table TS/PS-1. Minimum Drill Seeding Rates for Various Temporary Annual Grasses**

Species <sup>a</sup> (Common name)	Growth Season <sup>b</sup>	Pounds of Pure Live Seed (PLS)/acre <sup>c</sup>	Planting Depth (inches)
1. Oats	Cool	35 - 50	1 - 2
2. Spring wheat	Cool	25 - 35	1 - 2
3. Spring barley	Cool	25 - 35	1 - 2
4. Annual ryegrass	Cool	10 - 15	½
5. Millet	Warm	3 - 15	½ - ¾
6. Sudangrass	Warm	5-10	½ - ¾
7. Sorghum	Warm	5-10	½ - ¾
8. Winter wheat	Cool	20-35	1 - 2
9. Winter barley	Cool	20-35	1 - 2
10. Winter rye	Cool	20-35	1 - 2
11. Triticale	Cool	25-40	1 - 2

<sup>a</sup> Successful seeding of annual grass resulting in adequate plant growth will usually produce enough dead-plant residue to provide protection from wind and water erosion for an additional year. This assumes that the cover is not disturbed or mowed closer than 8 inches.

Hydraulic seeding may be substituted for drilling only where slopes are steeper than 3:1 or where access limitations exist. When hydraulic seeding is used, hydraulic mulching should be applied as a separate operation, when practical, to prevent the seeds from being encapsulated in the mulch.

<sup>b</sup> See Table TS/PS-3 for seeding dates. Irrigation, if consistently applied, may extend the use of cool season species during the summer months.

<sup>c</sup> Seeding rates should be doubled if seed is broadcast, or increased by 50 percent if done using a Brillion Drill or by hydraulic seeding.



# EC-2 Temporary and Permanent Seeding (TS/PS)

**Table TS/PS-2. Minimum Drill Seeding Rates for Perennial Grasses**

Common <sup>a</sup> Name	Botanical Name	Growth Season <sup>b</sup>	Growth Form	Seeds/ Pound	Pounds of PLS/acre
<b>Alakali Soil Seed Mix</b>					
Alkali sacaton	<i>Sporobolus airoides</i>	Cool	Bunch	1,750,000	0.25
Basin wildrye	<i>Elymus cinereus</i>	Cool	Bunch	165,000	2.5
Sodar streambank wheatgrass	<i>Agropyron riparium 'Sodar'</i>	Cool	Sod	170,000	2.5
Jose tall wheatgrass	<i>Agropyron elongatum 'Jose'</i>	Cool	Bunch	79,000	7.0
Arriba western wheatgrass	<i>Agropyron smithii 'Arriba'</i>	Cool	Sod	110,000	5.5
<b>Total</b>					<b>17.75</b>
<b>Fertile Loamy Soil Seed Mix</b>					
Ephriam crested wheatgrass	<i>Agropyron cristatum 'Ephriam'</i>	Cool	Sod	175,000	2.0
Dural hard fescue	<i>Festuca ovina 'duriuscula'</i>	Cool	Bunch	565,000	1.0
Lincoln smooth brome	<i>Bromus inermis leys 'Lincoln'</i>	Cool	Sod	130,000	3.0
Sodar streambank wheatgrass	<i>Agropyron riparium 'Sodar'</i>	Cool	Sod	170,000	2.5
Arriba western wheatgrass	<i>Agropyron smithii 'Arriba'</i>	Cool	Sod	110,000	7.0
<b>Total</b>					<b>15.5</b>
<b>High Water Table Soil Seed Mix</b>					
Meadow foxtail	<i>Alopecurus pratensis</i>	Cool	Sod	900,000	0.5
Redtop	<i>Agrostis alba</i>	Warm	Open sod	5,000,000	0.25
Reed canarygrass	<i>Phalaris arundinacea</i>	Cool	Sod	68,000	0.5
Lincoln smooth brome	<i>Bromus inermis leys 'Lincoln'</i>	Cool	Sod	130,000	3.0
Pathfinder switchgrass	<i>Panicum virgatum 'Pathfinder'</i>	Warm	Sod	389,000	1.0
Alkar tall wheatgrass	<i>Agropyron elongatum 'Alkar'</i>	Cool	Bunch	79,000	5.5
<b>Total</b>					<b>10.75</b>
<b>Transition Turf Seed Mix<sup>c</sup></b>					
Ruebens Canadian bluegrass	<i>Poa compressa 'Ruebens'</i>	Cool	Sod	2,500,000	0.5
Dural hard fescue	<i>Festuca ovina 'duriuscula'</i>	Cool	Bunch	565,000	1.0
Citation perennial ryegrass	<i>Lolium perenne 'Citation'</i>	Cool	Sod	247,000	3.0
Lincoln smooth brome	<i>Bromus inermis leys 'Lincoln'</i>	Cool	Sod	130,000	3.0
<b>Total</b>					<b>7.5</b>

**Table TS/PS-2. Minimum Drill Seeding Rates for Perennial Grasses (cont.)**

Common Name	Botanical Name	Growth Season <sup>b</sup>	Growth Form	Seeds/Pound	Pounds of PLS/acre
<b>Sandy Soil Seed Mix</b>					
Blue grama	<i>Bouteloua gracilis</i>	Warm	Sod-forming bunchgrass	825,000	0.5
Camper little bluestem	<i>Schizachyrium scoparium</i> 'Camper'	Warm	Bunch	240,000	1.0
Prairie sandreed	<i>Calamovilfa longifolia</i>	Warm	Open sod	274,000	1.0
Sand dropseed	<i>Sporobolus cryptandrus</i>	Cool	Bunch	5,298,000	0.25
Vaughn sideoats grama	<i>Bouteloua curtipendula</i> 'Vaughn'	Warm	Sod	191,000	2.0
Arriba western wheatgrass	<i>Agropyron smithii</i> 'Arriba'	Cool	Sod	110,000	5.5
<b>Total</b>					<b>10.25</b>
<b>Heavy Clay, Rocky Foothill Seed Mix</b>					
Ephriam crested wheatgrass <sup>d</sup>	<i>Agropyron cristatum</i> 'Ephriam'	Cool	Sod	175,000	1.5
Oahe Intermediate wheatgrass	<i>Agropyron intermedium</i> 'Oahe'	Cool	Sod	115,000	5.5
Vaughn sideoats grama <sup>e</sup>	<i>Bouteloua curtipendula</i> 'Vaughn'	Warm	Sod	191,000	2.0
Lincoln smooth brome	<i>Bromus inermis</i> leys 'Lincoln'	Cool	Sod	130,000	3.0
Arriba western wheatgrass	<i>Agropyron smithii</i> 'Arriba'	Cool	Sod	110,000	5.5
<b>Total</b>					<b>17.5</b>
<p><sup>a</sup> All of the above seeding mixes and rates are based on drill seeding followed by crimped straw mulch. These rates should be doubled if seed is broadcast and should be increased by 50 percent if the seeding is done using a Brillion Drill or is applied through hydraulic seeding. Hydraulic seeding may be substituted for drilling only where slopes are steeper than 3:1. If hydraulic seeding is used, hydraulic mulching should be done as a separate operation.</p> <p><sup>b</sup> See Table TS/PS-3 for seeding dates.</p> <p><sup>c</sup> If site is to be irrigated, the transition turf seed rates should be doubled.</p> <p><sup>d</sup> Crested wheatgrass should not be used on slopes steeper than 6H to 1V.</p> <p><sup>e</sup> Can substitute 0.5 lbs PLS of blue grama for the 2.0 lbs PLS of Vaughn sideoats grama.</p>					

# EC-2 Temporary and Permanent Seeding (TS/PS)

**Table TS/PS-3. Seeding Dates for Annual and Perennial Grasses**

Seeding Dates	Annual Grasses (Numbers in table reference species in Table TS/PS-1)		Perennial Grasses	
	Warm	Cool	Warm	Cool
January 1–March 15			✓	✓
March 16–April 30	4	1,2,3	✓	✓
May 1–May 15	4		✓	
May 16–June 30	4,5,6,7			
July 1–July 15	5,6,7			
July 16–August 31				
September 1–September 30		8,9,10,11		
October 1–December 31			✓	✓

## Mulch

Cover seeded areas with mulch or an appropriate rolled erosion control product to promote establishment of vegetation. Anchor mulch by crimping, netting or use of a non-toxic tackifier. See the Mulching BMP Fact Sheet for additional guidance.

## Maintenance and Removal

Monitor and observe seeded areas to identify areas of poor growth or areas that fail to germinate. Reseed and mulch these areas, as needed.

An area that has been permanently seeded should have a good stand of vegetation within one growing season if irrigated and within three growing seasons without irrigation in Colorado. Reseed portions of the site that fail to germinate or remain bare after the first growing season.

Seeded areas may require irrigation, particularly during extended dry periods. Targeted weed control may also be necessary.

Protect seeded areas from construction equipment and vehicle access.

## Description

The BMPs selected for construction dewatering vary depending on site-specific features such as soils, topography, anticipated discharge quantities, and discharge location. Dewatering typically involves pumping water from an inundated area to a BMP, and then downstream to a receiving waterway, sediment basin, or well-vegetated area. Dewatering typically involves use of several BMPs in sequence.



**Photograph DW-1.** A relatively small dewatering operation using straw bales and a dewatering bag.

## Appropriate Uses

Dewatering operations are used when an area of the construction site needs to be dewatered as the result of a large storm event, groundwater, or existing ponding conditions. This can occur during deep excavation, utility trenching, and wetland or pond excavation.



**Photograph DW-2.** Dewatering bags used for a relatively large dewatering operation.

## Design and Installation

Dewatering techniques will vary depending on site conditions. However, all dewatering discharges must be treated to remove sediment before discharging from the construction site. Discharging water into a sediment trap or basin is an acceptable treatment option. Water may also be treated using a dewatering filter bag, and a series of straw bales or sediment logs. If these previous options are not feasible due to space or the ability to passively treat the discharge to remove sediment, then a settling tank or an active treatment system may need to be utilized. Settling tanks are manufactured tanks with a series of baffles to promote settling. Flocculants can also be added to the tank to induce more rapid settling. This is an approach sometimes used on highly urbanized construction sites. Contact the state agency for special requirements prior to using flocculents and land application techniques.

Some commonly used methods to handle the pumped water without surface discharge include land application to vegetated areas through a perforated discharge hose (i.e., the "sprinkler method") or dispersal from a water truck for dust control.

Dewatering Operations	
Functions	
Erosion Control	Moderate
Sediment Control	Yes
Site/Material Management	Yes

Dewatering discharges to non-paved areas must minimize the potential for scour at the discharge point either using a velocity dissipation device or dewatering filter bag.

Design Details are provided for these types of dewatering situations:

DW-1. Dewatering for Pond Already Filled with Water

DW-2 Dewatering Sump for Submersed Pump

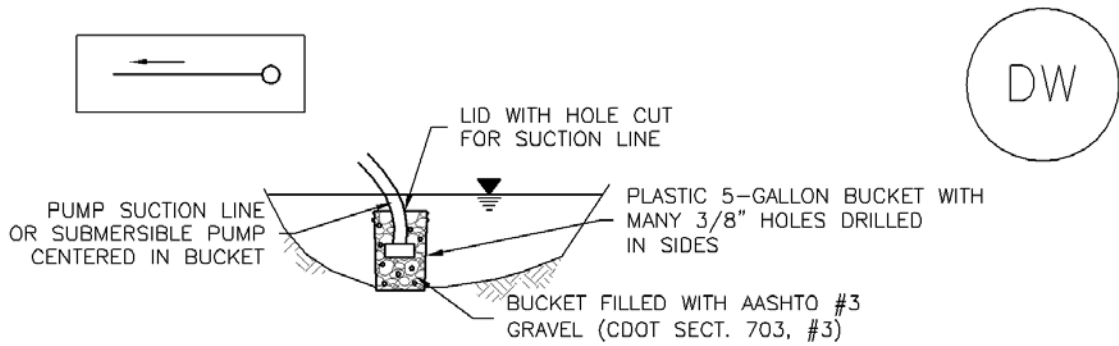
DW-3 Sump Discharge Settling Basin

DW-4 Dewatering Filter Bag

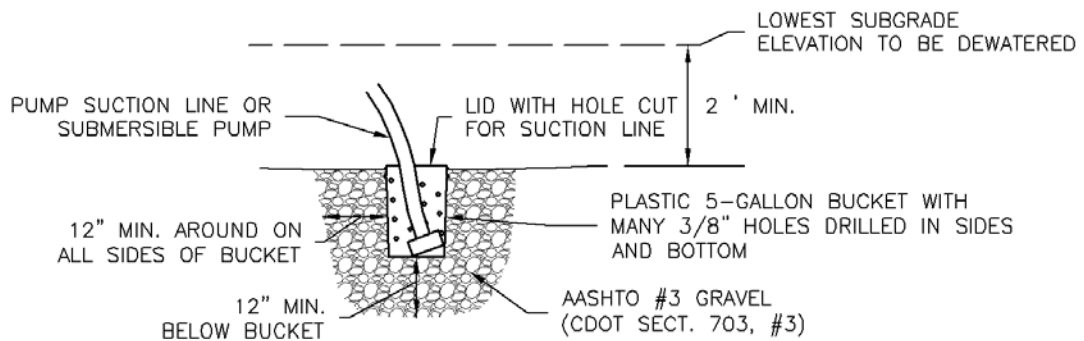
## **Maintenance and Removal**

When a sediment basin or trap is used to enable settling of sediment from construction dewatering discharges, inspect the basin for sediment accumulation. Remove sediment prior to the basin or trap reaching half full. Inspect treatment facilities prior to any dewatering activity. If using a sediment control practice such as a sediment trap or basin, complete all maintenance requirements as described in the fact sheets prior to dewatering.

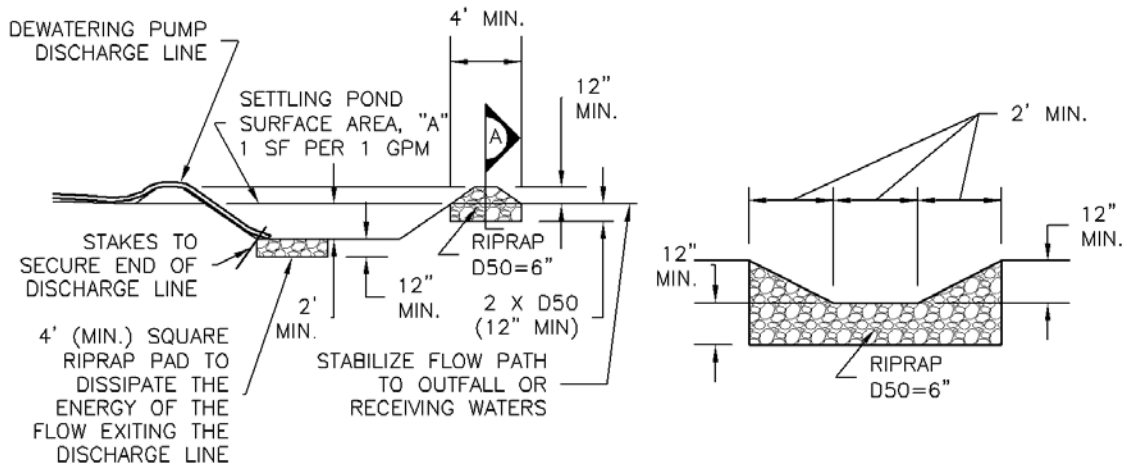
Properly dispose of used dewatering bags, as well as sediment removed from the dewatering BMPs. Depending on the size of the dewatering operation, it may also be necessary to revegetate or otherwise stabilize the area where the dewatering operation was occurring.



DW-1. DEWATERING POND ALREADY FILLED WITH WATER

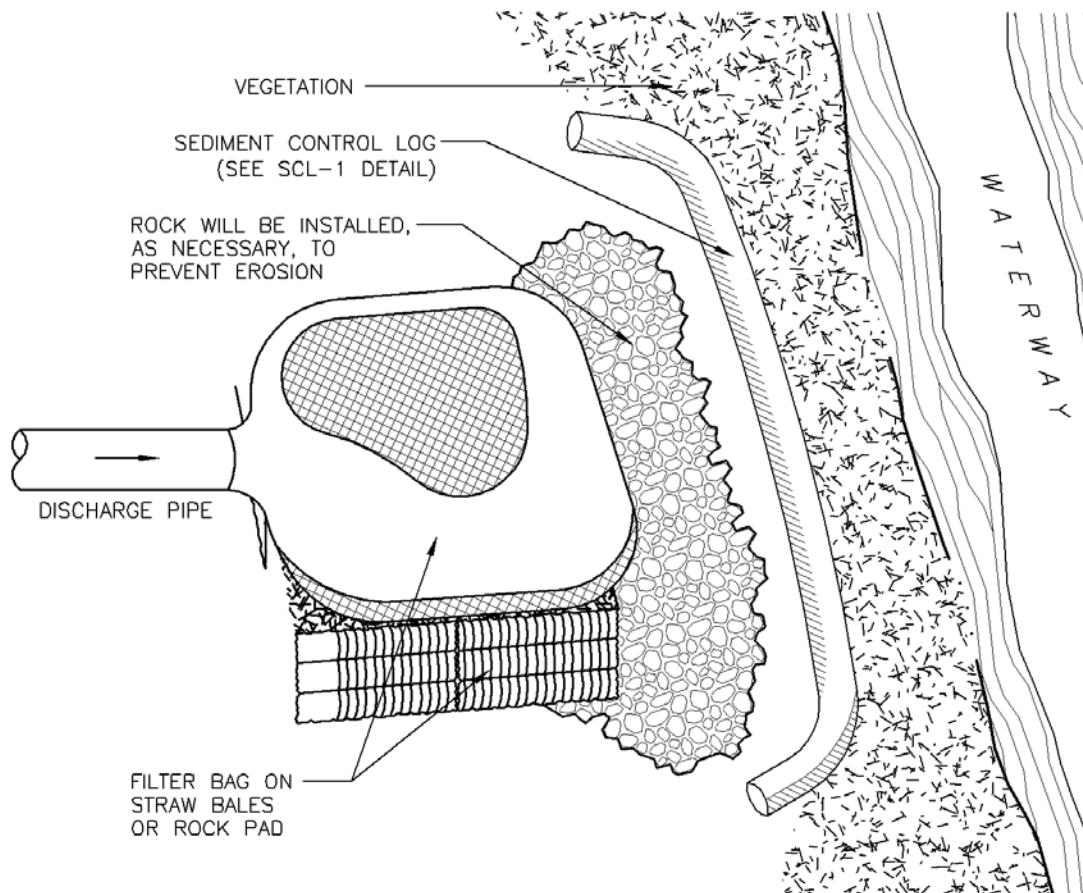


DW-2. DEWATERING SUMP FOR SUBMERSED PUMP



DW-3. SUMP DISCHARGE  
SETTLING BASIN

SETTLING BASIN  
SECTION A



### DW-4. DEWATERING FILTER BAG

#### DEWATERING INSTALLATION NOTES

1. SEE PLAN VIEW FOR;
  - LOCATION OF DEWATERING EQUIPMENT.
  - TYPE OF DEWATERING OPERATION (DW-1 TO DW-4).
2. THE OWNER OR CONTRACTOR SHALL OBTAIN A CONSTRUCTION DISCHARGE (DEWATERING) PERMIT FROM THE STATE PRIOR TO ANY DEWATERING OPERATIONS DISCHARGING FROM THE SITE. ALL DEWATERING SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE PERMIT.
3. THE OWNER OR OPERATOR SHALL PROVIDE, OPERATE, AND MAINTAIN DEWATERING SYSTEMS OF SUFFICIENT SIZE AND CAPACITY TO PERMIT EXCAVATION AND SUBSEQUENT CONSTRUCTION IN DRY CONDITIONS AND TO LOWER AND MAINTAIN THE GROUNDWATER LEVEL A MINIMUM OF 2- FEET BELOW THE LOWEST POINT OF EXCAVATION AND CONTINUOUSLY MAINTAIN EXCAVATIONS FREE OF WATER UNTIL BACK-FILLED TO FINAL GRADE.



## DEWATERING INSTALLATION NOTES

4. DEWATERING OPERATIONS SHALL USE ONE OR MORE OF THE DEWATERING SUMPS SHOWN ABOVE, WELL POINTS, OR OTHER MEANS APPROVED BY THE LOCAL JURISDICTION TO REDUCE THE PUMPING OF SEDIMENT, AND SHALL PROVIDE A TEMPORARY SEDIMENT BASIN OR FILTRATION BMP TO REDUCE SEDIMENT TO ALLOWABLE LEVELS PRIOR TO RELEASE OFF SITE OR TO A RECEIVING WATER. A SEDIMENT BASIN MAY BE USED IN LIEU OF SUMP DISCHARGE SETTLING BASIN SHOWN ABOVE IF A 4-FOOT-SQUARE RIPRAP PAD IS PLACED AT THE DISCHARGE POINT AND THE DISCHARGE END OF THE LINE IS STAKED IN PLACE TO PREVENT MOVEMENT OF THE LINE.

## DEWATERING MAINTENANCE NOTES

1. INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.

2. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.

3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.

4. DEWATERING BMPs ARE REQUIRED IN ADDITION TO ALL OTHER PERMIT REQUIREMENTS.

5. TEMPORARY SETTLING BASINS SHALL BE REMOVED WHEN NO LONGER NEEDED FOR DEWATERING OPERATIONS. ANY DISTURBED AREA SHALL BE COVERED WITH TOPSOIL, SEEDED AND MULCHED OR OTHERWISE STABILIZED IN A MANNER APPROVED BY THE LOCAL JURISDICTION.

NOTE: MANY JURISDICTIONS HAVE BMP DETAILS THAT VARY FROM UDFCD STANDARD DETAILS. CONSULT WITH LOCAL JURISDICTIONS AS TO WHICH DETAIL SHOULD BE USED WHEN DIFFERENCES ARE NOTED.

(DETAILS ADAPTED FROM DOUGLAS COUNTY, COLORADO, NOT AVAILABLE IN AUTOCAD)

## Description

Vehicle tracking controls provide stabilized construction site access where vehicles exit the site onto paved public roads. An effective vehicle tracking control helps remove sediment (mud or dirt) from vehicles, reducing tracking onto the paved surface.



**Photograph VTC-1.** A vehicle tracking control pad constructed with properly sized rock reduces off-site sediment tracking.

## Appropriate Uses

Implement a stabilized construction entrance or vehicle tracking control where frequent heavy vehicle traffic exits the construction site onto a paved roadway. An effective vehicle tracking control is particularly important during the following conditions:

- Wet weather periods when mud is easily tracked off site.
- During dry weather periods where dust is a concern.
- When poorly drained, clayey soils are present on site.

Although wheel washes are not required in designs of vehicle tracking controls, they may be needed at particularly muddy sites.

## Design and Installation

Construct the vehicle tracking control on a level surface. Where feasible, grade the tracking control towards the construction site to reduce off-site runoff. Place signage, as needed, to direct construction vehicles to the designated exit through the vehicle tracking control. There are several different types of stabilized construction entrances including:

**VTC-1. Aggregate Vehicle Tracking Control.** This is a coarse-aggregate surfaced pad underlain by a geotextile. This is the most common vehicle tracking control, and when properly maintained can be effective at removing sediment from vehicle tires.

**VTC-2. Vehicle Tracking Control with Construction Mat or Turf Reinforcement Mat.** This type of control may be appropriate for site access at very small construction sites with low traffic volume over vegetated areas. Although this application does not typically remove sediment from vehicles, it helps protect existing vegetation and provides a stabilized entrance.

Vehicle Tracking Control	
<b>Functions</b>	
Erosion Control	Moderate
Sediment Control	Yes
Site/Material Management	Yes

**VTC-3. Stabilized Construction Entrance/Exit with Wheel Wash.** This is an aggregate pad, similar to VTC-1, but includes equipment for tire washing. The wheel wash equipment may be as simple as hand-held power washing equipment to more advance proprietary systems. When a wheel wash is provided, it is important to direct wash water to a sediment trap prior to discharge from the site.

Vehicle tracking controls are sometimes installed in combination with a sediment trap to treat runoff.

## Maintenance and Removal

Inspect the area for degradation and replace aggregate or material used for a stabilized entrance/exit as needed. If the area becomes clogged and ponds water, remove and dispose of excess sediment or replace material with a fresh layer of aggregate as necessary.

With aggregate vehicle tracking controls, ensure rock and debris from this area do not enter the public right-of-way.

Remove sediment that is tracked onto the public right of way daily or more frequently as needed. Excess sediment in the roadway indicates that the stabilized construction entrance needs maintenance.

Ensure that drainage ditches at the entrance/exit area remain clear.

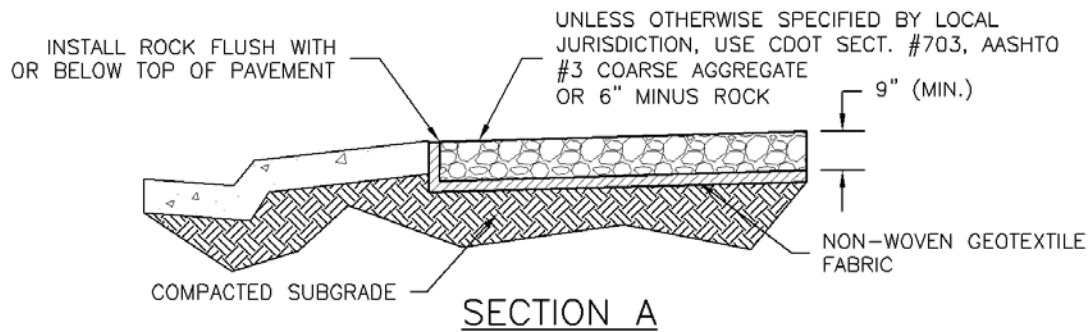
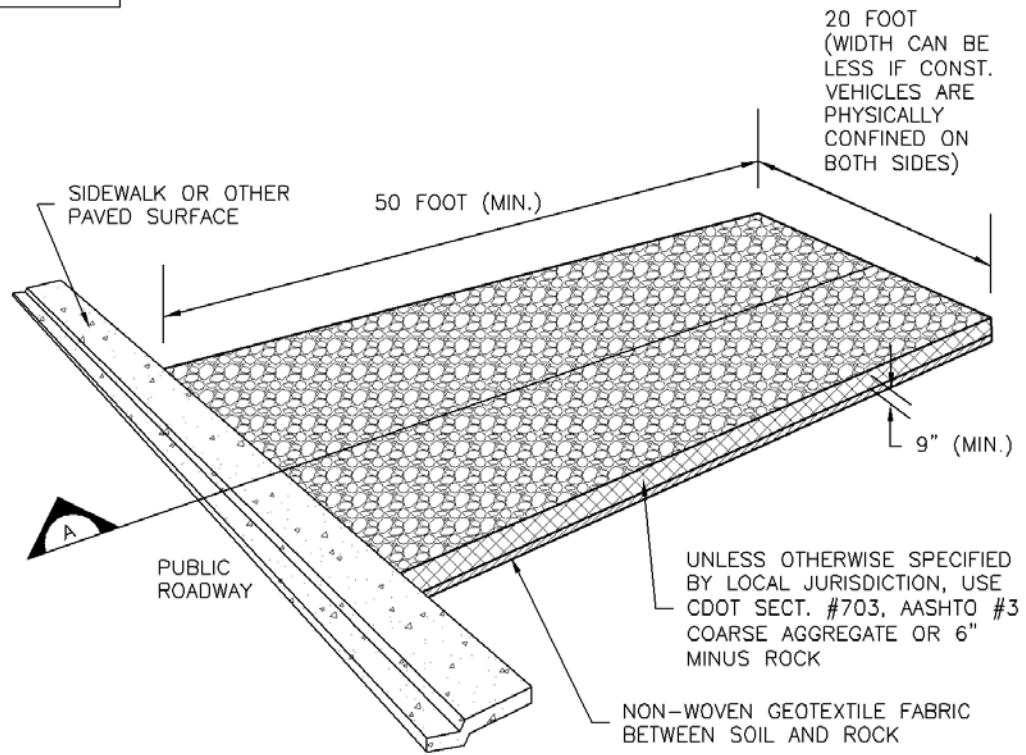
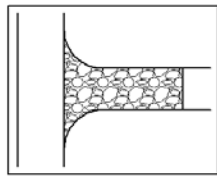
A stabilized entrance should be removed only when there is no longer the potential for vehicle tracking to occur. This is typically after the site has been stabilized.

When wheel wash equipment is used, be sure that the wash water is discharged to a sediment trap prior to discharge. Also inspect channels conveying the water from the wash area to the sediment trap and stabilize areas that may be eroding.

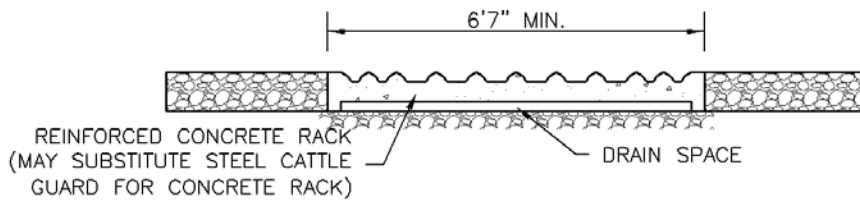
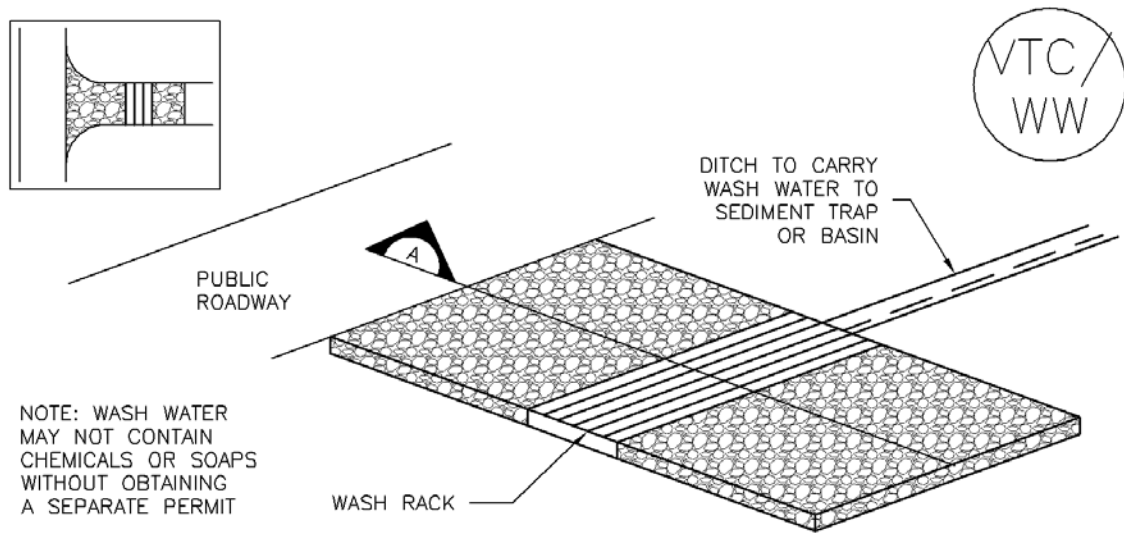
When a construction entrance/exit is removed, excess sediment from the aggregate should be removed and disposed of appropriately. The entrance should be promptly stabilized with a permanent surface following removal, typically by paving.



**Photograph VTC-2.** A vehicle tracking control pad with wheel wash facility. Photo courtesy of Tom Gore.

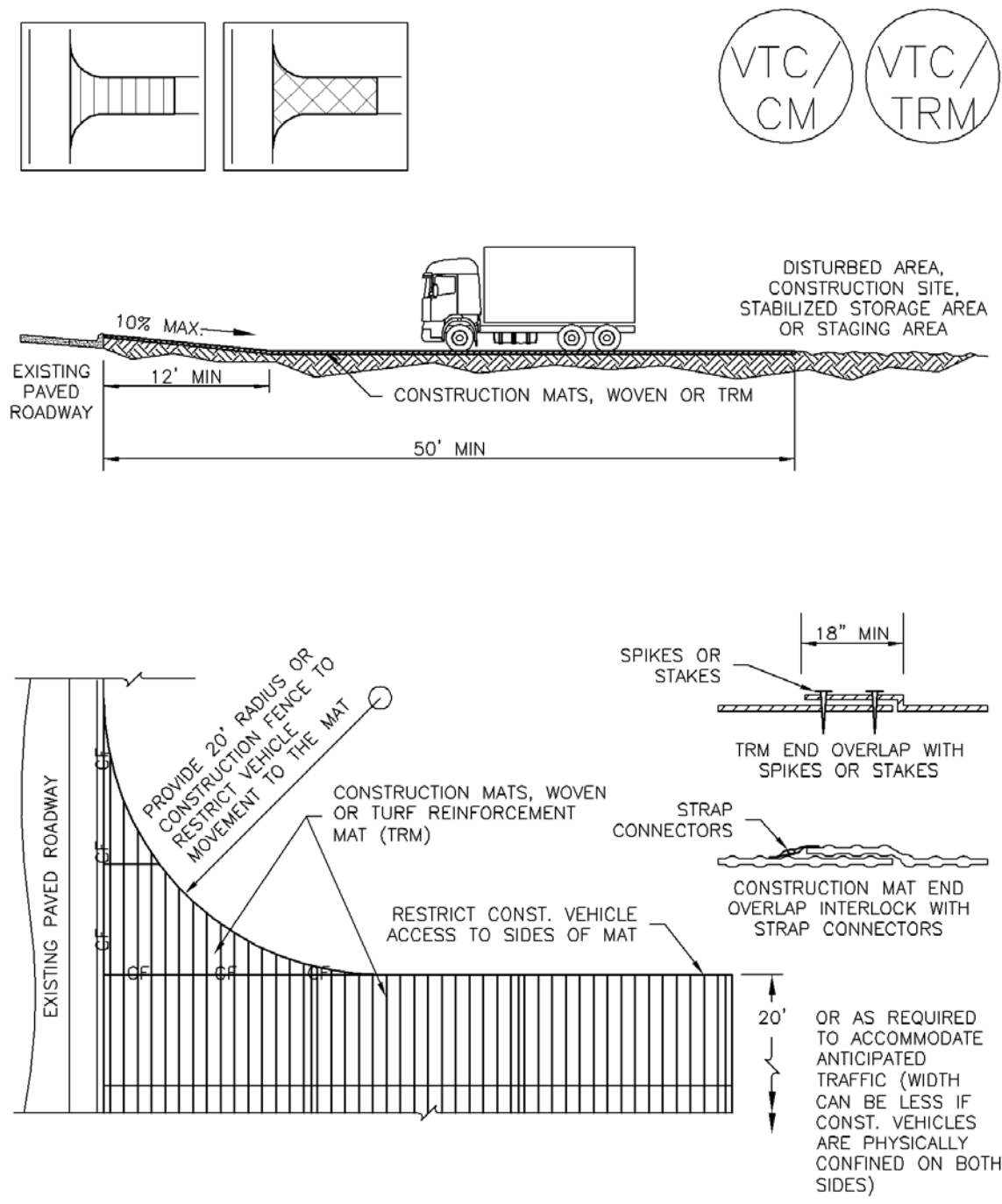


## VTC-1. AGGREGATE VEHICLE TRACKING CONTROL



SECTION A

VTC-2. AGGREGATE VEHICLE TRACKING CONTROL WITH WASH RACK



VTC-3. VEHICLE TRACKING CONTROL W/ CONSTRUCTION MAT OR TURF REINFORCEMENT MAT (TRM)

STABILIZED CONSTRUCTION ENTRANCE/EXIT INSTALLATION NOTES

1. SEE PLAN VIEW FOR
  - LOCATION OF CONSTRUCTION ENTRANCE(S)/EXIT(S).
  - TYPE OF CONSTRUCTION ENTRANCE(S)/EXITS(S) (WITH/WITHOUT WHEEL WASH, CONSTRUCTION MAT OR TRM).
2. CONSTRUCTION MAT OR TRM STABILIZED CONSTRUCTION ENTRANCES ARE ONLY TO BE USED ON SHORT DURATION PROJECTS (TYPICALLY RANGING FROM A WEEK TO A MONTH) WHERE THERE WILL BE LIMITED VEHICULAR ACCESS.
3. A STABILIZED CONSTRUCTION ENTRANCE/EXIT SHALL BE LOCATED AT ALL ACCESS POINTS WHERE VEHICLES ACCESS THE CONSTRUCTION SITE FROM PAVED RIGHT-OF-WAYS.
4. STABILIZED CONSTRUCTION ENTRANCE/EXIT SHALL BE INSTALLED PRIOR TO ANY LAND DISTURBING ACTIVITIES.
5. A NON-WOVEN GEOTEXTILE FABRIC SHALL BE PLACED UNDER THE STABILIZED CONSTRUCTION ENTRANCE/EXIT PRIOR TO THE PLACEMENT OF ROCK.
6. UNLESS OTHERWISE SPECIFIED BY LOCAL JURISDICTION, ROCK SHALL CONSIST OF DOT SECT. #703, AASHTO #3 COARSE AGGREGATE OR 6" (MINUS) ROCK.

STABILIZED CONSTRUCTION ENTRANCE/EXIT MAINTENANCE NOTES

1. INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.
2. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.
3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.
4. ROCK SHALL BE REAPPLIED OR REGRADED AS NECESSARY TO THE STABILIZED ENTRANCE/EXIT TO MAINTAIN A CONSISTENT DEPTH.
5. SEDIMENT TRACKED ONTO PAVED ROADS IS TO BE REMOVED THROUGHOUT THE DAY AND AT THE END OF THE DAY BY SHOVELING OR SWEEPING. SEDIMENT MAY NOT BE WASHED DOWN STORM SEWER DRAINS.

NOTE: MANY JURISDICTIONS HAVE BMP DETAILS THAT VARY FROM UDFCD STANDARD DETAILS. CONSULT WITH LOCAL JURISDICTIONS AS TO WHICH DETAIL SHOULD BE USED WHEN DIFFERENCES ARE NOTED.

(DETAILS ADAPTED FROM CITY OF BROOMFIELD, COLORADO, NOT AVAILABLE IN AUTOCAD)



## Description

Sediment traps are formed by excavating an area or by placing an earthen embankment across a low area or drainage swale. Sediment traps are designed to capture drainage from disturbed areas less than one acre and allow settling of sediment.



**Photograph ST-1.** Sediment traps are used to collect sediment-laden runoff from disturbed area. Photo courtesy of EPA Menu of BMPs.

## Appropriate Uses

Sediment traps can be used in combination with other layers of erosion and sediment controls to trap sediment from small drainage areas (less than one acre) or areas with localized high sediment loading. For example, sediment traps are often provided in conjunction with vehicle tracking controls and wheel wash facilities.

## Design and Installation

A sediment trap consists of a small excavated basin with an earthen berm and a riprap outlet. The berm of the sediment trap may be constructed from the excavated material and must be compacted to 95 percent of the maximum density in accordance with ASTM D698. An overflow outlet must be provided at an elevation at least 6 inches below the top of the berm. See Detail ST-1 for additional design and installation information.

## Maintenance and Removal

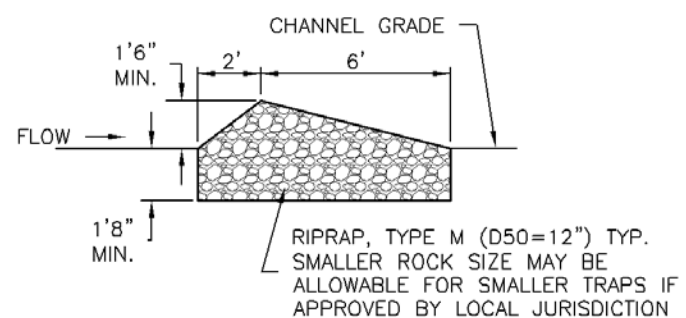
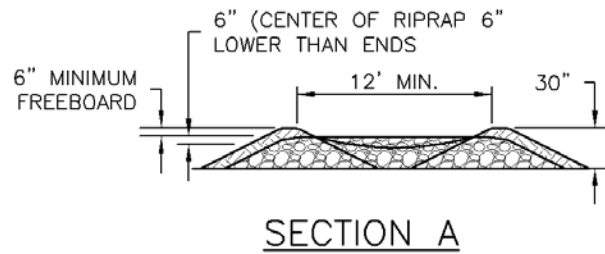
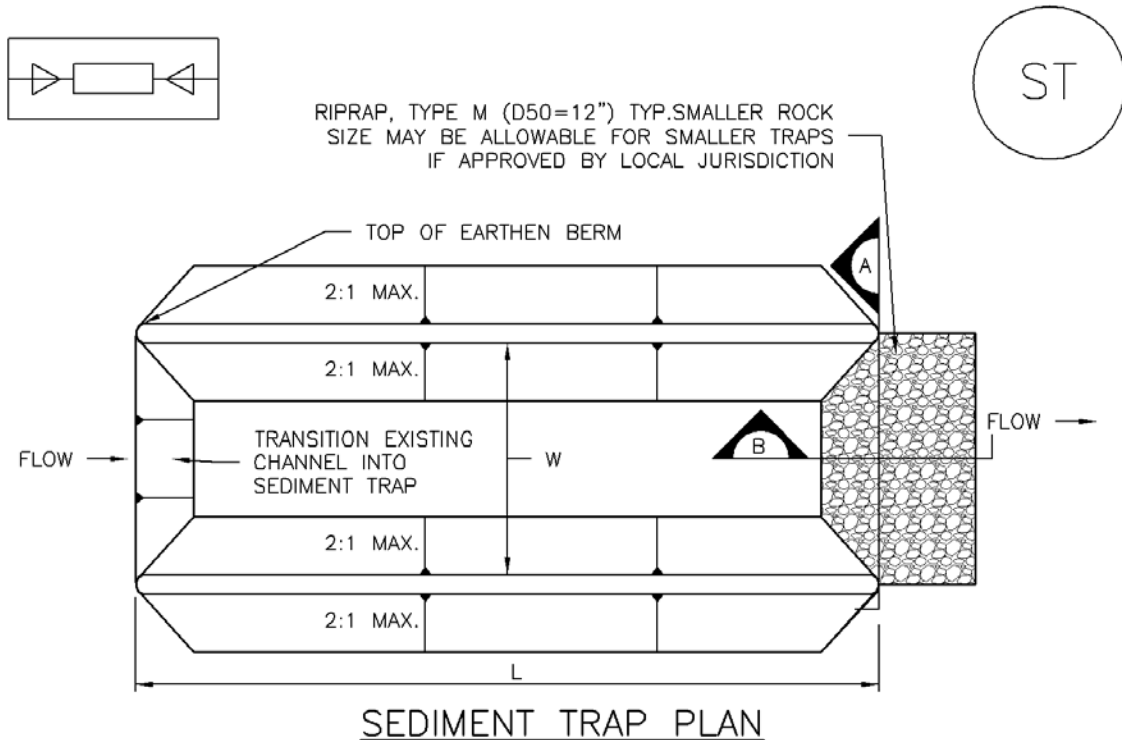
Inspect the sediment trap embankments for stability and seepage.

Remove accumulated sediment as needed to maintain the effectiveness of the sediment trap, typically when the sediment depth is approximately one-half the height of the outflow embankment.

Inspect the outlet for debris and damage. Repair damage to the outlet, and remove all obstructions.

A sediment trap should not be removed until the upstream area is sufficiently stabilized. Upon removal of the trap, the disturbed area should be covered with topsoil and stabilized.

Sediment Trap	
Functions	
Erosion Control	No
Sediment Control	Yes
Site/Material Management	No



SECTION B  
ST-1. SEDIMENT TRAP

## SEDIMENT TRAP INSTALLATION NOTES

1. SEE PLAN VIEW FOR:  
-LOCATION, LENGTH AND WIDTH OF SEDIMENT TRAP.
2. ONLY USE FOR DRAINAGE AREAS LESS THAN 1 ACRE.
3. SEDIMENT TRAPS SHALL BE INSTALLED PRIOR TO ANY UPGRADIENT LAND-DISTURBING ACTIVITIES.
4. SEDIMENT TRAP BERM SHALL BE CONSTRUCTED FROM MATERIAL FROM EXCAVATION. THE BERM SHALL BE COMPACTED TO 95% OF THE MAXIMUM DENSITY IN ACCORDANCE WITH ASTM D698.
5. SEDIMENT TRAP OUTLET TO BE CONSTRUCTED OF RIPRAP, TYPE M (D50=12") TYP. SMALLER ROCK SIZE MAY BE ALLOWABLE FOR SMALLER TRAPS IF APPROVED BY LOCAL JURISDICTION.
6. THE TOP OF THE EARTHEN BERM SHALL BE A MINIMUM OF 6" HIGHER THAN THE TOP OF THE RIPRAP OUTLET STRUCTURE.
7. THE ENDS OF THE RIPRAP OUTLET STRUCTURE SHALL BE A MINIMUM OF 6" HIGHER THAN THE CENTER OF THE OUTLET STRUCTURE.

## SEDIMENT TRAP MAINTENANCE NOTES

1. INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.
2. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.
3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.
4. REMOVE SEDIMENT ACCUMULATED IN TRAP AS NEEDED TO MAINTAIN THE FUNCTIONALITY OF THE BMP, TYPICALLY WHEN THE SEDIMENT DEPTH REACHES  $\frac{1}{2}$  THE HEIGHT OF THE RIPRAP OUTLET.
5. SEDIMENT TRAPS SHALL REMAIN IN PLACE UNTIL THE UPSTREAM DISTURBED AREA IS STABILIZED AND APPROVED BY THE LOCAL JURISDICTION.
6. WHEN SEDIMENT TRAPS ARE REMOVED, THE DISTURBED AREA SHALL BE COVERED WITH TOPSOIL, SEEDED AND MULCHED OR OTHERWISE STABILIZED IN A MANNER APPROVED BY THE LOCAL JURISDICTION.

(DETAILS ADAPTED FROM DOUGLAS COUNTY, COLORADO, NOT AVAILABLE IN AUTOCAD)

NOTE: MANY JURISDICTIONS HAVE BMP DETAILS THAT VARY FROM UDFCD STANDARD DETAILS. CONSULT WITH LOCAL JURISDICTIONS AS TO WHICH DETAIL SHOULD BE USED WHEN DIFFERENCES ARE NOTED.

## Description

Check dams are temporary grade control structures placed in drainage channels to limit the erosivity of stormwater by reducing flow velocity. Check dams are typically constructed from rock, gravel bags, sand bags, or sometimes, proprietary devices. Reinforced check dams are typically constructed from rock and wire gabion. Although the primary function of check dams is to reduce the velocity of concentrated flows, a secondary benefit is sediment trapping upstream of the structure.



**Photograph CD-1.** Rock check dams in a roadside ditch. Photo courtesy of WWE.

## Appropriate Uses

Use as a grade control for temporary drainage ditches or swales until final soil stabilization measures are established upstream and downstream. Check dams can be used on mild or moderately steep slopes. Check dams may be used under the following conditions:

- As temporary grade control facilities along waterways until final stabilization is established.
- Along permanent swales that need protection prior to installation of a non-erodible lining.
- Along temporary channels, ditches or swales that need protection where construction of a non-erodible lining is not practicable.
- Reinforced check dams should be used in areas subject to high flow velocities.

## Design and Installation

Place check dams at regularly spaced intervals along the drainage swale or ditch. Check dams heights should allow for pools to develop upstream of each check dam, extending to the downstream toe of the check dam immediately upstream.

When rock is used for the check dam, place rock mechanically or by hand. Do not dump rocks into the drainage channel. Where multiple check dams are used, the top of the lower dam should be at the same elevation as the toe of the upper dam.

When reinforced check dams are used, install erosion control fabric under and around the check dam to prevent erosion on the upstream and downstream sides. Each section of the dam should be keyed in to reduce the potential for washout or undermining. A rock apron upstream and downstream of the dam may be necessary to further control erosion.

<b>Check Dams</b>	
<b>Functions</b>	
Erosion Control	Yes
Sediment Control	Moderate
Site/Material Management	No

Design details with notes are provided for the following types of check dams:

- Rock Check Dams (CD-1)
- Reinforced Check Dams (CD-2)

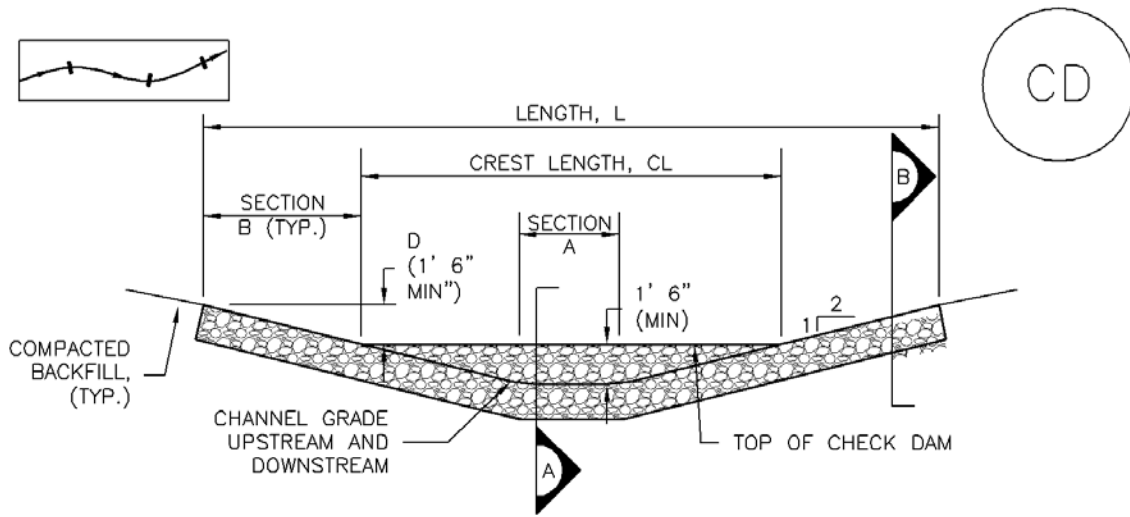
Sediment control logs may also be used as check dams; however, silt fence is not appropriate for use as a check dam. Many jurisdictions also prohibit or discourage use of straw bales for this purpose.

## Maintenance and Removal

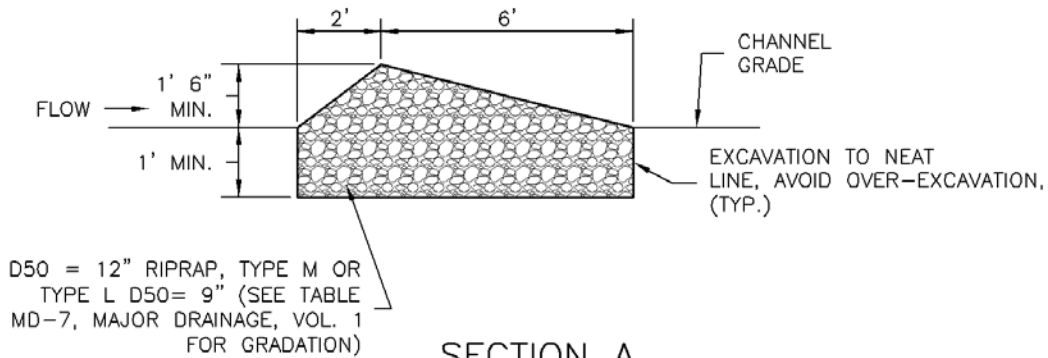
Replace missing rocks causing voids in the check dam. If gravel bags or sandbags are used, replace or repair torn or displaced bags.

Remove accumulated sediment, as needed to maintain BMP effectiveness, typically before the sediment depth upstream of the check dam is within ½ of the crest height. Remove accumulated sediment prior to mulching, seeding, or chemical soil stabilization. Removed sediment can be incorporated into the earthwork with approval from the Project Engineer, or disposed of at an alternate location in accordance with the standard specifications.

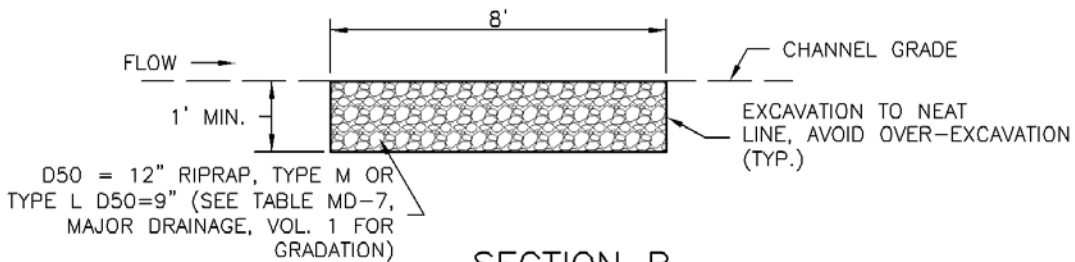
Check dams constructed in permanent swales should be removed when perennial grasses have become established, or immediately prior to installation of a non-erodible lining. All of the rock and accumulated sediment should be removed, and the area seeded and mulched, or otherwise stabilized.



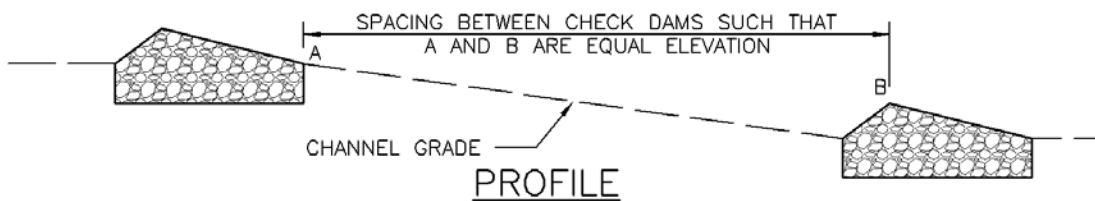
**CHECK DAM ELEVATION VIEW**



**SECTION A**



**SECTION B**



**PROFILE**

**CD-1. CHECK DAM**

CHECK DAM INSTALLATION NOTES

1. SEE PLAN VIEW FOR:
  - LOCATION OF CHECK DAMS.
  - CHECK DAM TYPE (CHECK DAM OR REINFORCED CHECK DAM).
  - LENGTH (L), CREST LENGTH (CL), AND DEPTH (D).
2. CHECK DAMS INDICATED ON INITIAL SWMP SHALL BE INSTALLED AFTER CONSTRUCTION FENCE, BUT PRIOR TO ANY UPSTREAM LAND DISTURBING ACTIVITIES.
3. RIPRAP UTILIZED FOR CHECK DAMS SHOULD BE OF APPROPRIATE SIZE FOR THE APPLICATION. TYPICAL TYPES OF RIPRAP USED FOR CHECK DAMS ARE TYPE M (D50 12") OR TYPE L (D50 9").
4. RIPRAP PAD SHALL BE TRENCHED INTO THE GROUND A MINIMUM OF 1'.
5. THE ENDS OF THE CHECK DAM SHALL BE A MINIMUM OF 1' 6" HIGHER THAN THE CENTER OF THE CHECK DAM.

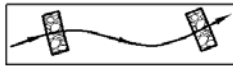
CHECK DAM MAINTENANCE NOTES

1. INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.
2. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.
3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.
4. SEDIMENT ACCUMULATED UPSTREAM OF THE CHECK DAMS SHALL BE REMOVED WHEN THE SEDIMENT DEPTH IS WITHIN ½ OF THE HEIGHT OF THE CREST.
5. CHECK DAMS ARE TO REMAIN IN PLACE UNTIL THE UPSTREAM DISTURBED AREA IS STABILIZED AND APPROVED BY THE LOCAL JURISDICTION.
6. WHEN CHECK DAMS ARE REMOVED, EXCAVATIONS SHALL BE FILLED WITH SUITABLE COMPACTED BACKFILL. DISTURBED AREA SHALL BE SEEDED AND MULCHED AND COVERED WITH GEOTEXTILE OR OTHERWISE STABILIZED IN A MANNER APPROVED BY THE LOCAL JURISDICTION.

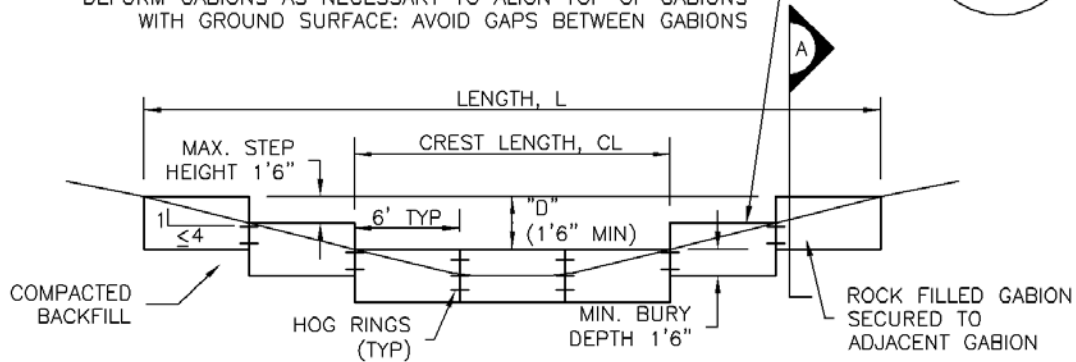
(DETAILS ADAPTED FROM DOUGLAS COUNTY, COLORADO, NOT AVAILABLE IN AUTOCAD)

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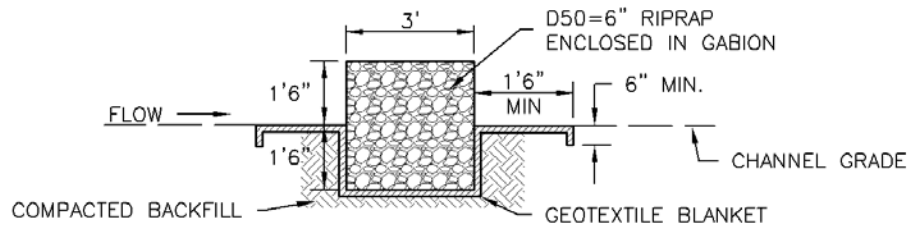




ALTERNATIVE TO STEPS ON BANKS ABOVE CREST:  
DEFORM GABIONS AS NECESSARY TO ALIGN TOP OF GABIONS  
WITH GROUND SURFACE: AVOID GAPS BETWEEN GABIONS



## REINFORCED CHECK DAM ELEVATION VIEW



## SECTION A

### REINFORCED CHECK DAM INSTALLATION NOTES

1. SEE PLAN VIEW FOR:
  - LOCATIONS OF CHECK DAMS.
  - CHECK DAM TYPE (CHECK DAM OR REINFORCED CHECK DAM).
  - LENGTH (L), CREST LENGTH (CL), AND DEPTH (D).
2. CHECK DAMS INDICATED ON THE SWMP SHALL BE INSTALLED PRIOR TO AN UPSTREAM LAND-DISTURBING ACTIVITIES.
3. REINFORCED CHECK DAMS, GABIONS SHALL HAVE GALVANIZED TWISTED WIRE NETTING WITH A MAXIMUM OPENING DIMENSION OF  $4\frac{1}{2}$ " AND A MINIMUM WIRE THICKNESS OF 0.10". WIRE "HOG RINGS" AT 4" SPACING OR OTHER APPROVED MEANS SHALL BE USED AT ALL GABION SEAMS AND TO SECURE THE GABION TO THE ADJACENT SECTION.
4. THE CHECK DAM SHALL BE TRENCHED INTO THE GROUND A MINIMUM OF 1' 6".
5. GEOTEXTILE BLANKET SHALL BE PLACED IN THE REINFORCED CHECK DAM TRENCH EXTENDING A MINIMUM OF 1' 6" ON BOTH THE UPSTREAM AND DOWNSTREAM SIDES OF THE REINFORCED CHECK DAM.

## CD-2. REINFORCED CHECK DAM

REINFORCED CHECK DAM MAINTENANCE NOTES

1. INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.
2. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.
3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.
4. SEDIMENT ACCUMULATED UPSTREAM OF REINFORCED CHECK DAMS SHALL BE REMOVED AS NEEDED TO MAINTAIN THE EFFECTIVENESS OF BMP, TYPICALLY WHEN THE UPSTREAM SEDIMENT DEPTH IS WITHIN ½ THE HEIGHT OF THE CREST.
5. REPAIR OR REPLACE REINFORCED CHECK DAMS WHEN THERE ARE SIGNS OF DAMAGE SUCH AS HOLES IN THE GABION OR UNDERCUTTING.
6. REINFORCED CHECK DAMS ARE TO REMAIN IN PLACE UNTIL THE UPSTREAM DISTURBED AREA IS STABILIZED AND APPROVED BY THE LOCAL JURISDICTION.
7. WHEN REINFORCED CHECK DAMS ARE REMOVED, ALL DISTURBED AREAS SHALL BE COVERED WITH TOPSOIL, SEEDED AND MULCHED, AND COVERED WITH A GEOTEXTILE BLANKET, OR OTHERWISE STABILIZED AS APPROVED BY LOCAL JURISDICTION.

(DETAIL ADAPTED FROM DOUGLAS COUNTY, COLORADO AND CITY OF AURORA, COLORADO, NOT AVAILABLE IN AUTOCAD)

NOTE: MANY JURISDICTIONS HAVE BMP DETAILS THAT VARY FROM UDFCD STANDARD DETAILS. CONSULT WITH LOCAL JURISDICTIONS AS TO WHICH DETAIL SHOULD BE USED WHEN DIFFERENCES ARE NOTED.

## Description

A sediment control log is a linear roll made of natural materials such as straw, coconut fiber, or compost. The most common type of sediment control log has straw filling and is often referred to as a "straw wattle." All sediment control logs are used as a sediment barrier to intercept sheet flow runoff from disturbed areas.



## Appropriate Uses

Sediment control logs can be used in the following applications to trap sediment:

- As perimeter control for stockpiles and the site.
- As part of inlet protection designs.
- As check dams in small drainage ditches. (Sediment control logs are not intended for use in channels with high flow velocities.)
- On disturbed slopes to shorten flow lengths (as an erosion control).
- As part of multi-layered perimeter control along a receiving water such as a stream, pond or wetland.



**Photographs SCL-1 and SCL-2.** Sediment control logs used as 1) a perimeter control around a soil stockpile; and, 2) as a "J-hook" perimeter control at the corner of a construction site.

Sediment control logs work well in combination with other layers of erosion and sediment controls.

## Design and Installation

Sediment control logs should be installed along the contour to avoid concentrating flows. The maximum allowable tributary drainage area per 100 lineal feet of sediment control log, installed along the contour, is approximately 0.25 acres with a disturbed slope length of up to 150 feet and a tributary slope gradient no steeper than 3:1. Longer and steeper slopes require additional measures. This recommendation only applies to sediment control logs installed along the contour. When installed for other uses, such as perimeter control, it should be installed in a way that will not produce concentrated flows. For example, a "J-hook" installation may be appropriate to force runoff to pond and evaporate or infiltrate in multiple areas rather than concentrate and cause erosive conditions parallel to the BMP.

Sediment Control Log	
Functions	
Erosion Control	Moderate
Sediment Control	Yes
Site/Material Management	No

Although sediment control logs initially allow runoff to flow through the BMP, they can quickly become a barrier and should be installed as if they are impermeable.

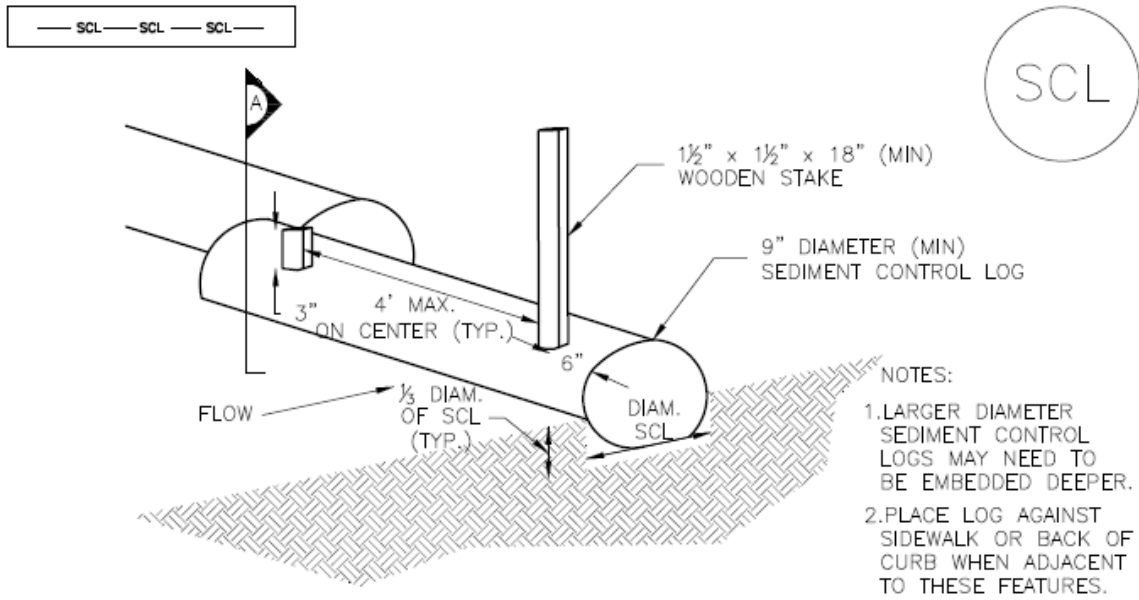
Design details and notes for sediment control logs are provided in the following details. Sediment logs must be properly installed per the detail to prevent undercutting, bypassing and displacement. When installed on slopes, sediment control logs should be installed along the contours (i.e., perpendicular to flow).

Improper installation can lead to poor performance. Be sure that sediment control logs are properly trenched (if lighter than 8 lb/foot), anchored and tightly jointed.

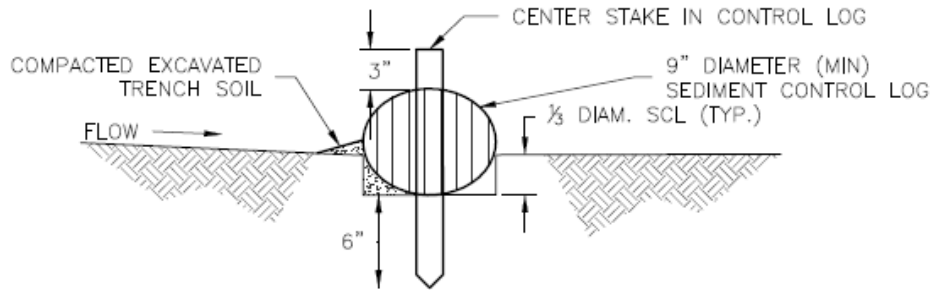
## **Maintenance and Removal**

Be aware that sediment control logs will eventually degrade. Remove accumulated sediment before the depth is one-half the height of the sediment log and repair damage to the sediment log, typically by replacing the damaged section.

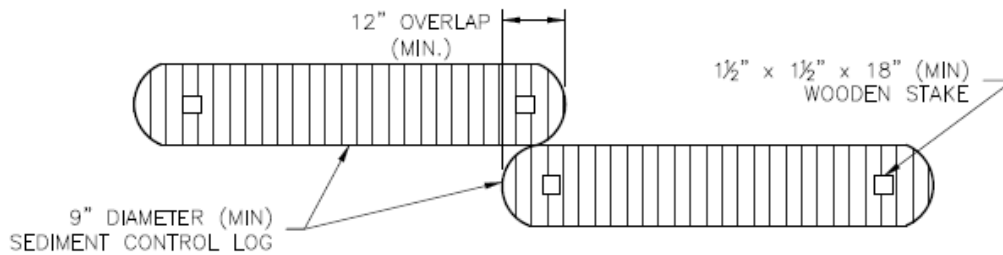
Once the upstream area is stabilized, remove and properly dispose of the logs. Areas disturbed beneath the logs may need to be seeded and mulched. Sediment control logs that are biodegradable may occasionally be left in place (e.g., when logs are used in conjunction with erosion control blankets as permanent slope breaks). However, removal of sediment control logs after final stabilization is typically appropriate when used in perimeter control, inlet protection and check dam applications. Compost from compost sediment control logs may be spread over the area and seeded as long as this does not cover newly established vegetation.



## TRENCHED SEDIMENT CONTROL LOG

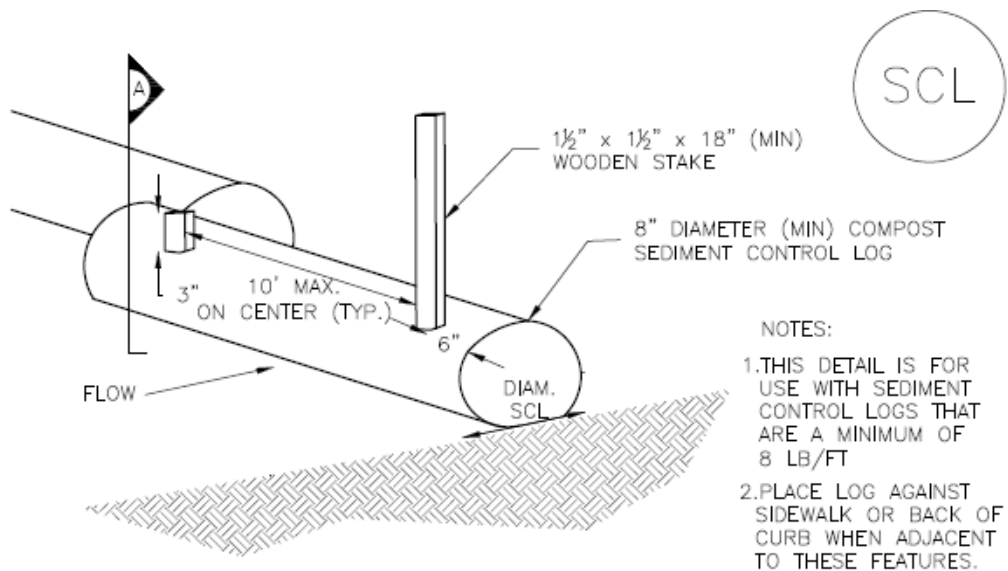


## SECTION A TRENCHED SEDIMENT CONTROL LOG

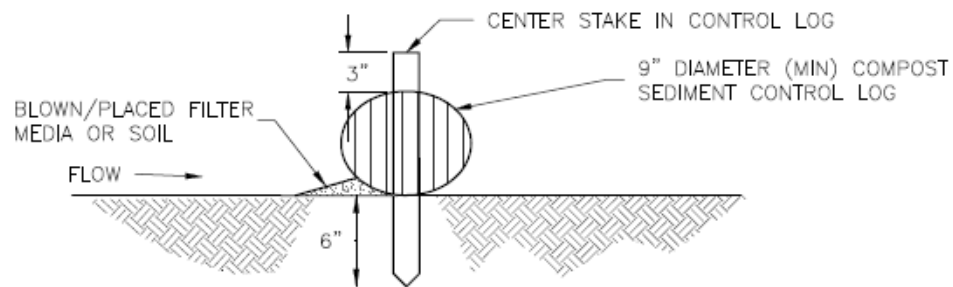


## LOG JOINTS

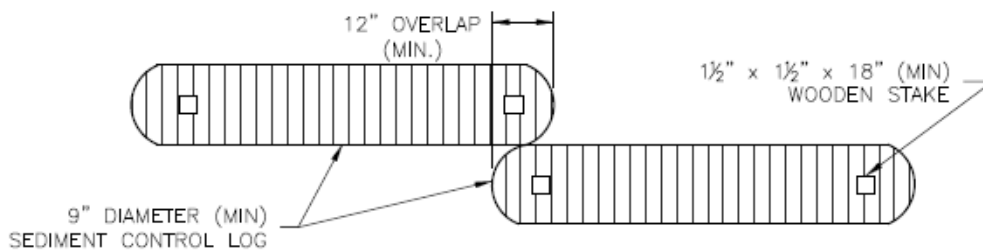
## SCL-1. TRENCHED SEDIMENT CONTROL LOG



COMPOST SEDIMENT CONTROL LOG (WEIGHTED)

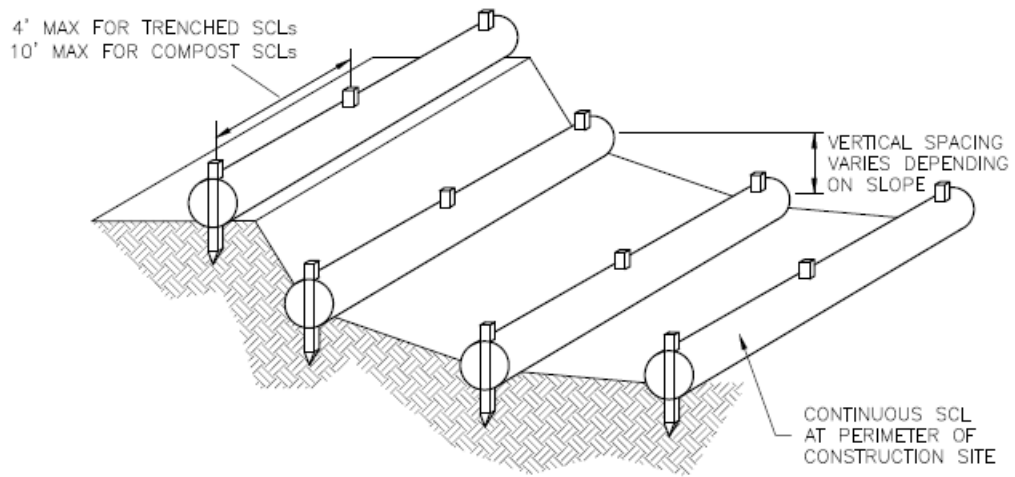


SECTION A  
COMPOST SEDIMENT CONTROL LOG (A)



LOG JOINTS

SCL-2. COMPOST SEDIMENT CONTROL LOG (WEIGHTED)



SCL-3. SEDIMENT CONTROL LOGS TO CONTROL SLOPE LENGTH



SEDIMENT CONTROL LOG INSTALLATION NOTES

1. SEE PLAN VIEW FOR LOCATION AND LENGTH OF SEDIMENT CONTROL LOGS.
2. SEDIMENT CONTROL LOGS THAT ACT AS A PERIMETER CONTROL SHALL BE INSTALLED PRIOR TO ANY UPGRADIENT LAND-DISTURBING ACTIVITIES.
3. SEDIMENT CONTROL LOGS SHALL CONSIST OF STRAW, COMPOST, EXCELSIOR OR COCONUT FIBER, AND SHALL BE FREE OF ANY NOXIOUS WEED SEEDS OR DEFECTS INCLUDING RIPS, HOLES AND OBVIOUS WEAR.
4. SEDIMENT CONTROL LOGS MAY BE USED AS SMALL CHECK DAMS IN DITCHES AND SWALES. HOWEVER, THEY SHOULD NOT BE USED IN PERENNIAL STREAMS.
5. IT IS RECOMMENDED THAT SEDIMENT CONTROL LOGS BE TRENCHED INTO THE GROUND TO A DEPTH OF APPROXIMATELY  $\frac{1}{3}$  OF THE DIAMETER OF THE LOG. IF TRENCHING TO THIS DEPTH IS NOT FEASIBLE AND/OR DESIRABLE (SHORT TERM INSTALLATION WITH DESIRE NOT TO DAMAGE LANDSCAPE) A LESSER TRENCHING DEPTH MAY BE ACCEPTABLE WITH MORE ROBUST STAKING. COMPOST LOGS THAT ARE 8 LB/FT DO NOT NEED TO BE TRENCHED.
6. THE UPHILL SIDE OF THE SEDIMENT CONTROL LOG SHALL BE BACKFILLED WITH SOIL OR FILTER MATERIAL THAT IS FREE OF ROCKS AND DEBRIS. THE SOIL SHALL BE TIGHTLY COMPACTED INTO THE SHAPE OF A RIGHT TRIANGLE USING A SHOVEL OR WEIGHTED LAWN ROLLER OR BLOWN IN PLACE.
7. FOLLOW MANUFACTURERS' GUIDANCE FOR STAKING. IF MANUFACTURERS' INSTRUCTIONS DO NOT SPECIFY SPACING, STAKES SHALL BE PLACED ON 4' CENTERS AND EMBEDDED A MINIMUM OF 6" INTO THE GROUND. 3" OF THE STAKE SHALL PROTRUDE FROM THE TOP OF THE LOG. STAKES THAT ARE BROKEN PRIOR TO INSTALLATION SHALL BE REPLACED. COMPOST LOGS SHOULD BE STAKED 10' ON CENTER.

SEDIMENT CONTROL LOG MAINTENANCE NOTES

1. INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.
2. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.
3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.
4. SEDIMENT ACCUMULATED UPSTREAM OF SEDIMENT CONTROL LOG SHALL BE REMOVED AS NEEDED TO MAINTAIN FUNCTIONALITY OF THE BMP, TYPICALLY WHEN DEPTH OF ACCUMULATED SEDIMENTS IS APPROXIMATELY  $\frac{1}{2}$  OF THE HEIGHT OF THE SEDIMENT CONTROL LOG.
5. SEDIMENT CONTROL LOG SHALL BE REMOVED AT THE END OF CONSTRUCTION. COMPOST FROM COMPOST LOGS MAY BE LEFT IN PLACE AS LONG AS BAGS ARE REMOVED AND THE AREA SEEDED. IF DISTURBED AREAS EXIST AFTER REMOVAL, THEY SHALL BE COVERED WITH TOP SOIL, SEEDED AND MULCHED OR OTHERWISE STABILIZED IN A MANNER APPROVED BY THE LOCAL JURISDICTION.

(DETAILS ADAPTED FROM TOWN OF PARKER, COLORADO, JEFFERSON COUNTY, COLORADO, DOUGLAS COUNTY, COLORADO, AND CITY OF AURORA, COLORADO, NOT AVAILABLE IN AUTOCAD)

NOTE: MANY JURISDICTIONS HAVE BMP DETAILS THAT VARY FROM UDFCD STANDARD DETAILS. CONSULT WITH LOCAL JURISDICTIONS AS TO WHICH DETAIL SHOULD BE USED WHEN DIFFERENCES ARE NOTED.

## SURFACE DAMAGE AND RELEASE AGREEMENT

This Surface Damage and Release Agreement ("**Agreement**") is made and entered into this 1st day of July, 2017, by and between **DS, LLC**, 2 Osprey Circle, Thornton CO 80241 ("**Owner**"), and **PetroShare Corp.** 9635 Maroon Circle, Suite 400, Englewood CO 80112 ("**Operator**"); sometimes referred to each as a "**Party**," or collectively as the "**Parties**."

WITNESSETH:

For and in consideration of the covenants and agreements contained herein, and for other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the Parties agree as follows:

1. **OWNERSHIP.** Owner is the surface owner of certain lands located in Adams County, Colorado as more specifically described as follows ("**Lands**");

Township 1 South, Range 65 West, 6<sup>th</sup> P.M.  
Section 19: A portion of Parcel 7 situated in the SE/4SW/4  
(Conner 19-18-1XYH)

Operator owns a working or operating interest in a valid oil and gas lease or leases covering all or portions of the Lands or lands pooled or included in a spacing unit therewith (each a "**Lease**," collectively, the "**Leases**").

2. **OPERATOR'S OIL AND GAS OPERATIONS ON THE LANDS.** Operator may drill or cause to be drilled an oil and/or gas well or wells on the Lands ("**Wells**"). In order for Operator to drill, including directional and horizontal drilling to access subsurface locations outside the boundaries of the surface area described herein in the instance of restricted surface access, construct, complete, stimulate, re-stimulate, re-complete, rework, re-entry, deepen, produce, maintain, operate, plug and abandon the Wells and all facilities associated therewith, including, but not limited to, access roads ("**Access Roads**"), pipelines, flow lines, separators, tank batteries, electric lines and any other facilities or property necessary for Operator to conduct operations on the Wells (each a "**Facility**," collectively, the "**Facilities**"), it is necessary that Operator enter and utilize a portion of the surface of the Lands. The Parties enter into this Agreement to evidence their entire agreement regarding the payment of surface damages, entry, surface use, and any other matters relating to Operator's use of the Lands.

3. **LOCATION.** The approximate location of the Wells, the Access Roads to the Well site and certain other Facilities to be constructed on the Lands will be illustrated on a survey plat which will be delivered to Owner prior to or concurrently with Operator's submission to the Colorado Oil and Gas Conservation Commission ("**COGCC**") of applications for drilling permits. Any material changes to such locations may be made by Operator with the consent of Owner, which will not be unreasonably withheld, but will not unduly interfere with Owner's existing use of the surface estate. Operator agrees not to use any more of the surface of the Lands than is reasonably necessary to conduct its operations.

4. **CONDUCT OF OPERATIONS.** Operator's operations on the Lands will be conducted pursuant to the terms of the Leases, this Agreement, and the rules and regulations of the COGCC.

5. **COMPENSATION AMOUNT.**

A. Prior to entry Operator will pay Owner the sum of ██████████ per Well

location and the associated Facilities ("**Amount**"). The Amount is hereby acknowledged by Owner as full and final consideration for Operator's use of the Lands for the purposes enumerated in this Agreement and for any and all damages caused or created by reason of the reasonable and customary ingress, egress, rights-of-way, drilling, completion, recompletion, reworking, re-entry, production and maintenance operations associated with the Wells and Facilities. Such damages will include, without limitation, damage to growing crops, cropland, the removal, transportation and care of livestock, re-seeding, construction and use of Access Roads and the preparation and use of the Well site areas and construction, installation and maintenance of production equipment and facilities such as flowlines, gas pipelines, separators, tank batteries and other equipment or facilities necessary or convenient for the production, transportation and sale of oil and/or gas therefrom.

B. Operator will pay Owner a sum of [REDACTED] per rod for the right to construct new roads on the Lands and [REDACTED] per rod to use existing roads on the Lands. Access by Operator will be limited to this space and the route of such roads will be agreed to by both Operator and Owner.

6. **ADDITIONAL SURFACE USE PROVISIONS,  
ACCESS ROADS, FENCES AND FACILITIES.**

With respect to its operations on the Lands, Operator will comply with the following provisions:

A. Access Roads:

- (i) Access Roads will not exceed 30 feet in traveling road surface width.
- (ii) Operator will take reasonable steps to ensure that all of its vehicles accessing the Lands on its behalf remain on the Access Roads.
- (iii) Operator agrees to back-slope all Access Roads.
- (iv) Operator will provide Owner with a minimum of 10 days prior written notice before restoring the surface of all Access Roads to be permanently abandoned by Operator. No later than 10 days following receipt of such notice, Owner may elect, in writing, not to have such Access Roads abandoned by Operator. In such event, Operator will have no liability under this Agreement, the Lease, or otherwise, to restore the surface of the Lands utilized as Access Roads. Failure to timely respond will be deemed as Owner's election that Operator proceed with the abandonment of the Access Roads and the restoration of the surface thereof.
- (v) Operator will stockpile and save any topsoil removed while constructing Access Roads for rehabilitation or re-seeding as reasonably directed by Owner.
- (vi) Operator will maintain all Access Roads in good repair and condition.

B. Surface Restoration:

Upon permanent cessation of Operator's operations on the Lands, all areas thereof occupied or utilized by Operator will be restored by Operator to their original contour as nearly as is reasonably practicable, and re-seeded if so requested by Owner, all in accordance with the rules and regulations of the Colorado Oil and Gas Conservation Commission (COGCC) unless a variance therefrom is granted by the COGCC upon the request of Owner; provided however, that Operator's intent to

abandon any Access Roads will be subject to the provisions of Paragraph 6(A)(iv) herein.

C. Other.

(i) Operator will install culverts on the Lands that may be necessary to maintain present drainage and irrigation otherwise affected by its operations on the Lands.

(ii) If by reason of the activities of the Operator, including, but not limited to, drilling, completing, equipping, and operating of the Wells, there is unanticipated damage to personal property of the Owner, including, but not limited to, irrigation wells, fences, culverts, bridges, pipelines, ditches, or irrigation systems, Operator will repair or replace such items after consultation with and to the reasonable satisfaction of the Owner. Owner will notify Operator of any items damaged after the Well's construction and Operator will repair or replace such items after consultation with the Owner within 15 days of occurrence.

(iii) Operator agrees that all trash, refuse pipe, equipment, liquids, chemicals, or other materials brought on the Lands that are not necessary for continued operations of the Wells will be removed and disposed away from the Lands no later than 90 days after the completion of the Wells. No such items will be burned or buried on the Lands.

(iv) Operator shall not permit any of its employees or contractors operating hereunder to bring any dog, firearm, explosive device, weapon, alcoholic beverage, or illegal drugs on Owner's property. No employee or contractor of Operator shall hunt, prospect for antlers, fossils or antiquities, recreate, consume alcoholic beverages, or carry on any illegal activities on the Lands. In the event Owner discovers any employee, contractor or representative of Operator failing to abide by the terms of this paragraph, Owner shall provide Operator with as much information as possible regarding any individual violating this provision and Operator agrees to take appropriate action regarding such violation.

(v) Owner has requested that all consultation be conducted directly with Owner. Accordingly, Owner shall have the responsibility of notifying any affected tenant, lessee or other party who may own or have an interest in any crops or surface improvements which could be affected by operations of Operator. Owner agrees that all damages claimed by a surface tenant, lessee or other such party resulting from operations of Operator shall be settled by Owner, and Owner hereby agrees to indemnify and hold Operator harmless from and against any such claims.

(vi) Operator will provide Owner with ten (10) days notice by mail, phone call or personal visit prior to commencing operations on the Lands with heavy equipment. Owner acknowledges that this notice complies with, or hereby waives, all COGCC requirements that it be given advance notice by Operator of its operations. Owner acknowledges receiving from Operator a brochure prepared by the COGCC which describes the rights and responsibilities of Owner as the surface owner of the Lands.

(vii) Owner expressly waives the application of any COGCC setbacks inconsistent with this Agreement, including, but not limited to, setbacks for high density areas and surface lot lines. Owner hereby waives any right to appeal

COGCC issuance of drilling permits, including COGCC conditions of approval of Operator's applications for such permits.

(viii) Owner hereby does not consent to the conduct of wildlife surveys on the Lands, and to the imposition of timing restrictions, buffer zones or other conditions of approval, stipulations, or standard operating practices related to wildlife protection and habitat preservation by the COGCC with respect to the Well(s).

7. **DEFAULT AND RIGHT TO CURE.** In the event that either Operator or Owner defaults under this Agreement, the defaulting party shall be notified in writing of the facts relied upon as constituting a breach thereof, and that party, if in default, shall within sixty (60) days after receipt of such notice, commence the compliance with the obligations imposed by virtue of this agreement. In the event the defaulting party does not commence compliance with the obligations imposed by virtue of this agreement within said sixty (60) day period, the non-defaulting party shall have the right to take such action as will cure the default and invoice the defaulting party for the reasonable costs incurred in curing the default, and/or may require specific performance of the defaulting party's obligations under this agreement. The defaulting party agrees to pay any and all reasonable attorney's fees of the other party incurred as a result of a breach of this agreement.

Except as otherwise agreed in writing, no waiver by Owner or Operator of any breach by the other Party of any of its obligations, agreements, or covenants hereunder will be deemed to be a waiver of any subsequent or continuing breach of the same, nor will any forbearance by Owner or Operator to seek a remedy for any breach by the other Party be deemed to be a waiver by Owner or Operator of its rights or remedies with respect to such breach; however, in no event will Operator be liable for additional payment for reasonably anticipated damages to the Lands caused by Operator's oil and gas operations, and in no event will Operator be liable for consequential damages.

8. **INDEMNITY/RELEASE.**

Operator agrees to indemnify and hold Owner harmless from any and all claims, damages and causes of action arising out of and caused by Operator's operations on the Lands that may be asserted by any of Operator's agents, employees, subcontractors, contractors or persons entering upon the Lands at the request of Operator.

A. Except as provided in paragraph 6.C.(ii) above for cases of unanticipated damage to personal property of the Owner, Owner, for itself and its successors and assigns, does hereby, in consideration of the Amount, release, relinquish and discharge Operator, its affiliates, successors and assigns from all claims, demands, damages and causes of action that Owner may have by reason of the drilling of the Well(s) and all other damage or injury to the Lands caused by the drilling, completion, recompletion, reworking, re-entry, production, operation and maintenance of the Well(s), and Owner accepts the Amount as full compensation therefor.

9. **NOTICE FOR ADDITIONAL OPERATIONS.** Operator will comply with COGCC rules and regulations requiring that advance notice be provided to Owner for subsequent operations on the Wells, including, but not limited to, reworking operations thereto.

10. **NOTICES.** Notice by either Party will be promptly given, orally if possible (with the exception of the default notice described in Paragraph 7), with subsequent written confirmation sent by United States mail, postage prepaid and addressed to either Party at the address as designated below; or to such other place as either Party may from time to time designate by notice to the other:

Owners

Operator

DS, LLC  
David Conner  
2 Osprey Circle  
Thornton CO 80241  
Phone: (303) 549-9303

PetroShare Corp.  
Attention: Bill Givan  
9635 Maroon Circle, Suite 400  
Englewood, CO 80112  
Phone: (303) 500-1160  
Fax: (303) 770-6885

11. **BINDING EFFECT.** The covenants and conditions herein contained and all of the provisions of this Agreement will inure to the benefit of and will be binding upon the Parties hereto, their respective heirs, representatives, successors or assigns. Owner agrees to contact any and all tenants of Lands or any other third parties utilizing the surface of the Lands that may be affected by Operator's activities on the Lands. It will be Owner's sole responsibility to advise such third parties of the existence of this Agreement and Operator's right to utilize the surface of the Lands pursuant to this Agreement for the payment of any consideration, if any, due such third party from Owner.

12. **CONFIDENTIALITY.** The Parties agree to keep the terms and conditions of this Agreement confidential and will not disclose such matters to any third party without the advance written consent of the other, or if ordered to do so in a legal proceeding. While the specific terms hereof are to remain confidential between the Parties, the Parties shall execute a Memorandum of Surface Damage and Release Agreement that Operator shall place of record in Adams County, Colorado.

13. **ENTIRE AGREEMENT.** This instrument contains the entire agreement between the Parties and may not be modified orally or in any other manner other than by agreement in writing signed by all Parties or their respective successors or assigns.

14. **TERM.** This Agreement will remain in full force and effect for so long as Operator has the right to conduct oil and gas operations on the Lands pursuant to the Leases; provided, however, that the termination of this Agreement will not relieve the Parties from their respective obligations or liabilities arising herein prior to such termination.

15. **COUNTERPARTS.** This Agreement may be executed by facsimile, in counterparts, each of which will be considered an original and enforceable against either Party.

16. **GOVERNING LAW AND VENUE.** This Agreement will be governed by, construed and enforced in accordance with the laws of the State of Colorado. In construing this Agreement, no consideration shall be given to the fact or presumption that one party has had a greater or lesser hand in drafting this Agreement than the other party.

17. **SUCCESSORS.** This Agreement constitutes a covenant running with the Lands and will be binding upon and inure to the benefit of, and be enforceable by, the Parties and their respective successors, administrators, trustees, executors and assigns.

18. **AUTHORITY OF SIGNATORIES.** The signatories below declare, warrant and represent that they have the authority to enter into this Agreement on behalf of their respective principals, if any.

19. **ATTORNEY'S FEES AND COSTS.** The Parties agree that the prevailing Party in any action resulting from a substantial breach of this Agreement will be entitled to its reasonable attorney's fees and costs incurred therein.

IN WITNESS WHEREOF, the Parties hereby execute as herein dated, but effective, the day and year first written above.

PETROSHARE CORP.

By: William R. Givan  
William R. Givan  
Vice President Land  
Dated: 8-3-17

Owner

By: David Conner  
Name: David Conner, Dated: 7/25/17

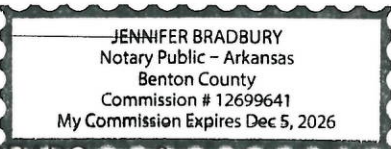
ACKNOWLEDGEMENT

STATE OF ~~COLORADO~~ <sup>ARKANSAS</sup> §  
                  ~~ADAMS~~ <sup>BENTON</sup> §  
COUNTY OF ~~ADAMS~~ §

The foregoing instrument was acknowledged before me this 25 day of July, 2017, by **David Conner**, known to me, and who acknowledged that he/she/they executed the foregoing instrument as his /her/their free and voluntary act and deed, as Owner / Manager of DS, LLC, for the uses and purposes therein set forth.

Witness my hand and official seal.

My Commission Expires:

(seal) 

Notary Public: JFB

STATE OF COLORADO §  
                  §  
COUNTY OF DOUGLAS §

The foregoing instrument was acknowledged before me this 3<sup>rd</sup> day of August, 2017, by William R. Givan, as Vice President Land of **PETROSHARE CORP.**, a Colorado corporation, on behalf of such corporation.

Witness my hand and official seal.

My Commission Expires:

[seal] 

Notary Public: Brian Wert



Adams County Oil and Gas Facility  
Permit

**Visual Aesthetics Plan**



## Visual Aesthetics Plan

Pursuant to Colorado Energy and Carbon Management Rule 425, all permanent equipment at new and existing Oil and Gas Facilities, regardless of construction date, which are observable from any public highway, road, or publicly-maintained trail, will be painted with uniform, non-contrasting, non-reflective color tones (similar to the Munsell Soil Color Coding System), and with colors matched to but slightly darker than the surrounding landscape.

Sound walls will be used to shield sensitive areas during drilling operations and will be considered and implemented according to third-party recommendations. The sound walls will comply with a color scheme approved by the county, blending with the natural background.

Each phase of operations will determine what equipment is on location. Except for the production, each stage will have temporary equipment that may be visible to the surrounding area and visible from the public roadways. The following plans depict each phase of operations and the equipment on location.

### Berming

POCO is not using berms as visual mitigation. There will be a 12" berm installed around the perimeter of the disturbed area for stormwater control measures.

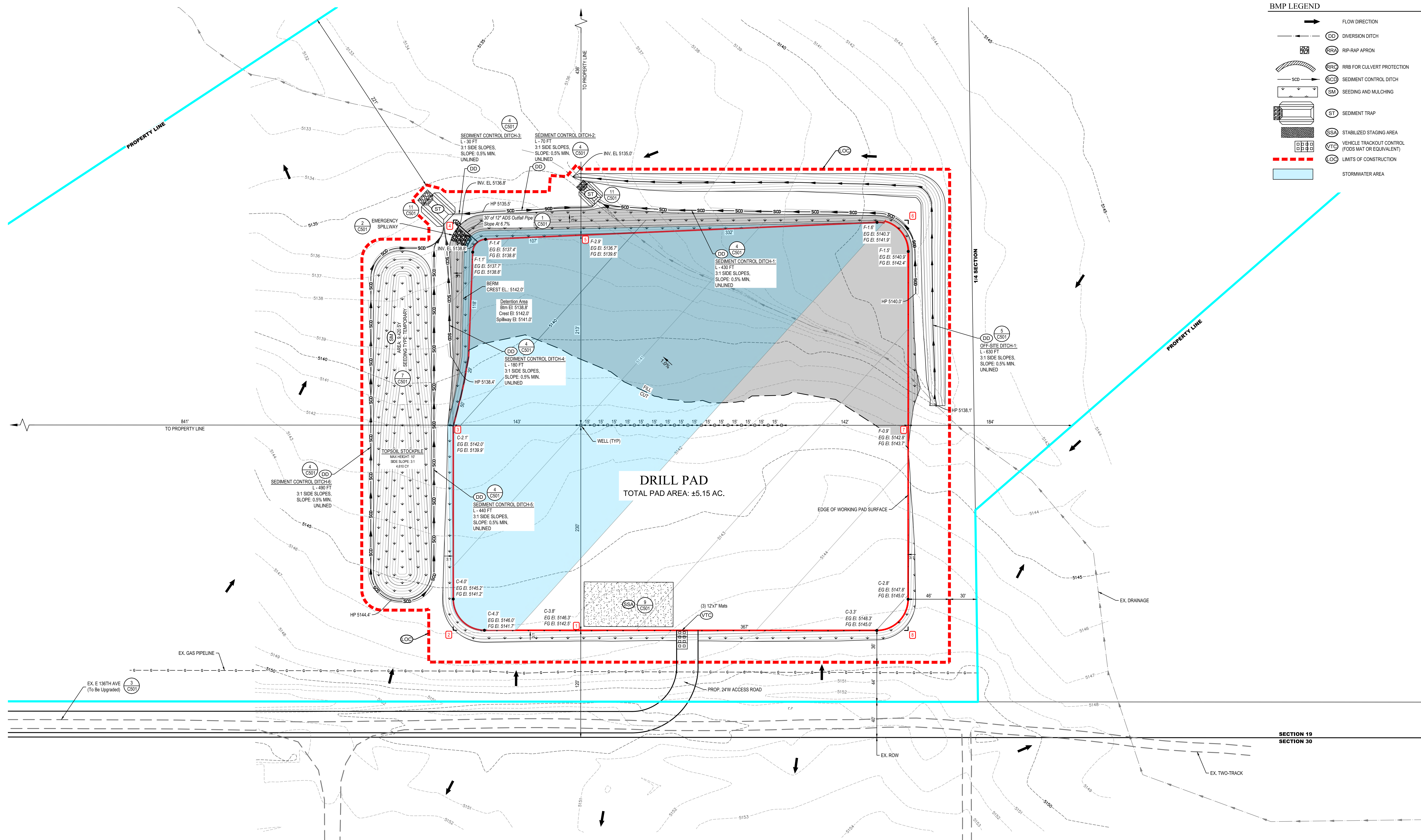
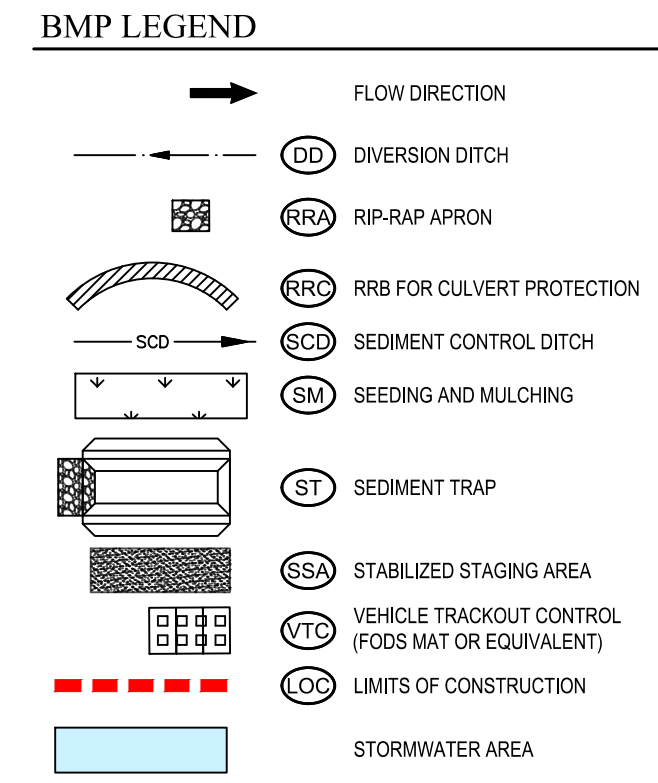
### Site Security

Pre-Production Phases:

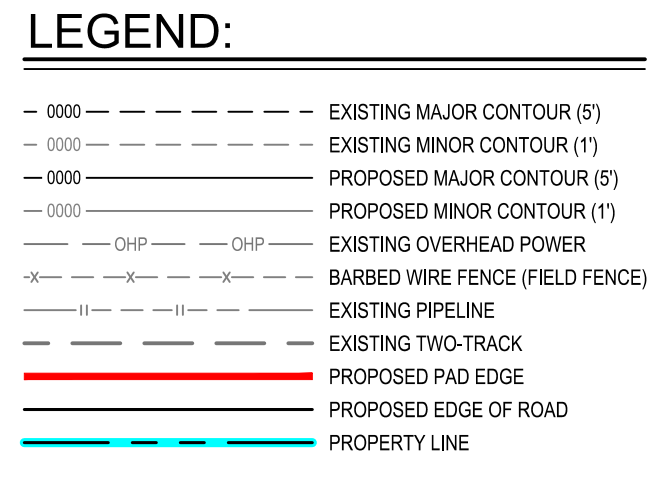
Pre-production phases include construction, drilling and completions. POCO implements gate guards 24/7 during pre-production phases. Name, contacts and reason for visit will be collected by the guard. The guard will check each person in and out of the location. During drilling and completions, sound walls will be installed around the perimeter of the location requiring every vehicle to enter and exit through the guarded main access.

During Production Phase, the Location will have Clean Connect technology which notifies POCO of all traffic entering and existing the location. Clean Connect sends the license plate number to POCO contacts for record keeping.

**POCO OPERATING**  
**CONNER 19-18 PAD**  
**GESC PLAN**  
**SEC. 19, T1S, R65W, 6th P.M.**  
**ADAMS COUNTY, COLORADO**



**DRILL PAD**  
TOTAL PAD AREA: ±5.15 AC.



- NOTES:**
- THE SIZE, TYPE AND LOCATION OF ALL KNOWN UNDERGROUND UTILITIES ARE APPROXIMATE WHEN SHOWN ON THESE DRAWINGS. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THE EXISTENCE OF ALL UNDERGROUND UTILITIES IN THE AREA OF THE WORK BEFORE COMMENCING NEW CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING ALL UNDERGROUND UTILITIES.
  - CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING DEMOLITION, REMOVAL, REPLACEMENT, AND DISPOSAL OF ALL FACILITIES AND MATERIAL.
  - ALL SYMBOLS ARE ONLY GRAPHICALLY REPRESENTED AND ARE NOT TO SCALE.
  - CONTACT THE PROJECT SURVEYOR FOR ANY INQUIRIES RELATED TO THE EXISTING SITE SURVEY.
  - PROPOSED GRADING PLAN IS BASED ON EXISTING SITE CONTOURS.
  - THE PROPERTY OWNER SHALL CONTROL NOXIOUS WEEDS ON THE SITE.
  - THE HISTORICAL FLOW PATTERNS AND RUNOFF AMOUNTS ON THE SITE WILL BE MAINTAINED.
  - REFER TO DETAIL SHEETS FOR EROSION CONTROL BMP DETAILS.
  - INSTALL VTC TO MANUFACTURER'S STANDARDS & RECOMMENDATIONS.

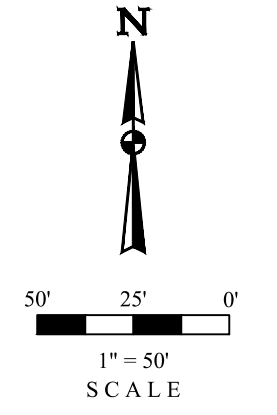
**GRADING DETAILS:**

APPROXIMATE EARTHWORK QUANTITIES	
(6") TOPSOIL STRIPPING	4,610 Cu. Yds.
REMAINING LOCATION	9,920 Cu. Yds.
<b>TOTAL CUT</b>	<b>14,530 Cu. Yds.</b>
<b>FILL</b>	<b>9,920 Cu. Yds.</b>
EXCESS MATERIAL	4,610 Cu. Yds.
TOPSOIL	4,610 Cu. Yds.
<b>EARTHWORK BALANCE</b>	<b>0 Cu. Yds.</b>

**\*\*ESTIMATE ONLY\*\***

APPROXIMATE SURFACE DISTURBANCE AREAS		
LIMITS OF CONSTRUCTION	NA	±8.05
<b>TOTAL SURFACE USE AREA</b>		<b>±8.05</b>

- NOTES:**
- Fill quantity includes 10% for compaction.
  - Pad Cut/Fill slopes are 3H:1V
  - Topsoil quantity is an estimate of 6" deep across the pad grading area. Actual site conditions may vary. Field adjust grades as necessary to balance earthwork.
  - Excess unbalance to be used for berm construction.



REV	DATE	BY	REASON FOR REVISION	APPROVED
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RESPONSIBLE ENGINEER:  
**PHILIP A. HAWK**  
PROFESSIONAL ENGINEER  
NO. 11-24

DRILL PHASE FINAL  
GRADING PLAN

SCALE: AS NOTED  
DRAWN BY: CC  
DATE DRAWN: 04-23-2024  
UELS FILE NO.: P-2031  
PROJ. NO.: P006-21-001  
FILE: P-2031

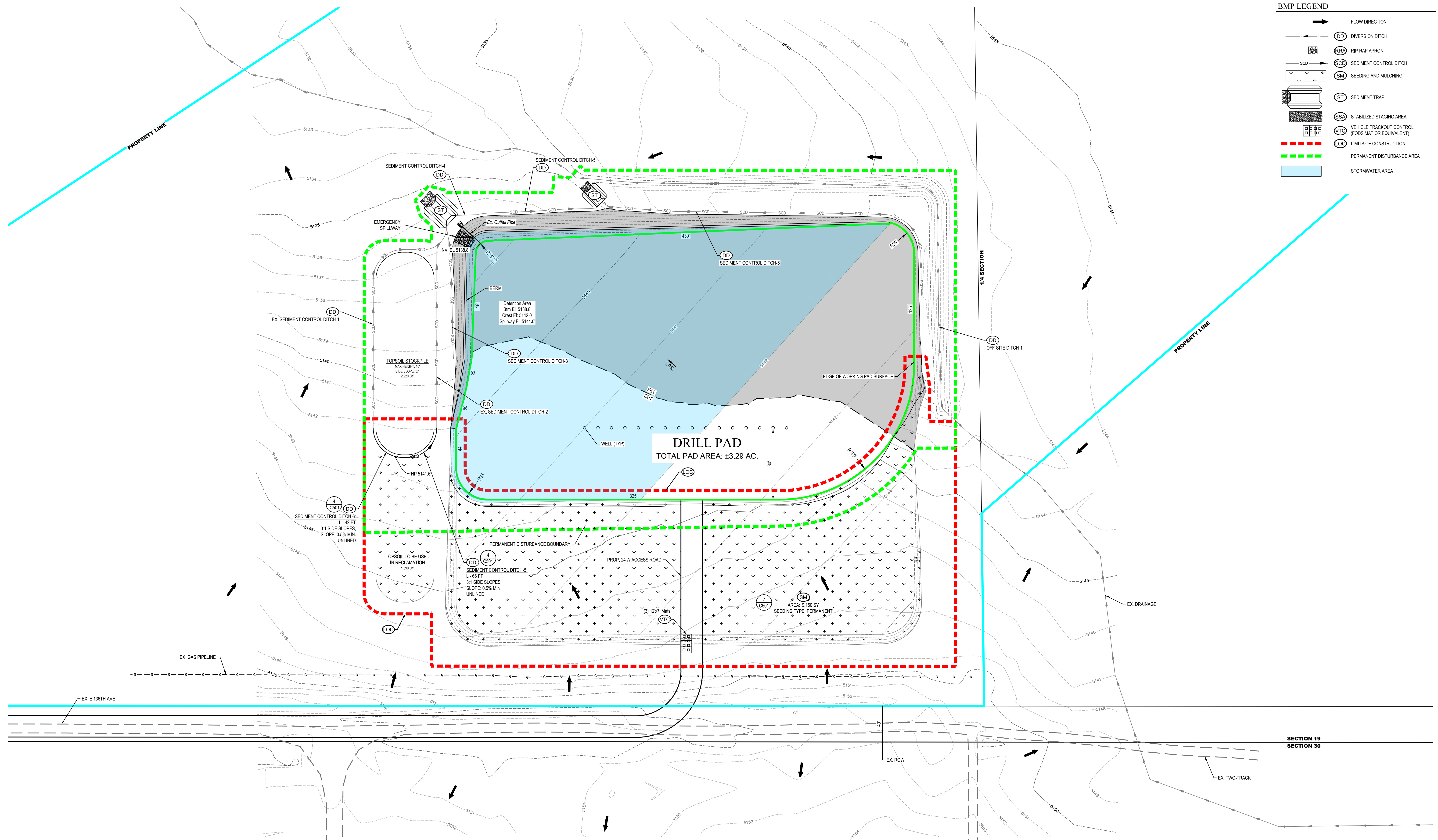
SHEET  
**C102**



**POCO OPERATING**  
**CONNER 19-18 PAD**  
**GESC PLAN**  
**SEC. 19, T1S, R65W, 6th P.M.**  
**ADAMS COUNTY, COLORADO**

**BMP LEGEND**

	FLOW DIRECTION
	DIVERSION DITCH
	RIP-RAP APRON
	SEDIMENT CONTROL DITCH
	SEEDING AND MULCHING
	SEDIMENT TRAP
	STABILIZED STAGING AREA
	VEHICLE TRACKOUT CONTROL (FOSS MAT OR EQUIVALENT)
	LIMITS OF CONSTRUCTION
	PERMANENT DISTURBANCE AREA
	STORMWATER AREA



**LEGEND:**

--- 0000 ---	EXISTING MAJOR CONTOUR (5')
--- 0000 ---	EXISTING MINOR CONTOUR (1')
--- 0000 ---	PROPOSED MAJOR CONTOUR (5')
--- 0000 ---	PROPOSED MINOR CONTOUR (1')
--- OHP ---	EXISTING OVERHEAD POWER
--- BWF ---	BARBED WIRE FENCE (FIELD FENCE)
--- EX ---	EXISTING PIPELINE
--- EX ---	EXISTING TWO-TRACK
---	PROPOSED PAD EDGE
---	PROPOSED EDGE OF ROAD
---	PROPERTY LINE

- NOTES:**
- THE SIZE, TYPE AND LOCATION OF ALL KNOWN UNDERGROUND UTILITIES ARE APPROXIMATE WHEN SHOWN ON THESE DRAWINGS. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THE EXISTENCE OF ALL UNDERGROUND UTILITIES IN THE AREA OF THE WORK BEFORE COMMENCING NEW CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING ALL UNDERGROUND UTILITIES.
  - CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING DEMOLITION, REMOVAL, REPLACEMENT, AND DISPOSAL OF ALL FACILITIES AND MATERIAL.
  - ALL SYMBOLS ARE ONLY GRAPHICALLY REPRESENTED AND ARE NOT TO SCALE.
  - CONTACT THE PROJECT SURVEYOR FOR ANY INQUIRIES RELATED TO THE EXISTING SITE SURVEY.
  - PROPOSED GRADING PLAN IS BASED ON EXISTING SITE CONTOURS.
  - THE PROPERTY OWNER SHALL CONTROL NOXIOUS WEEDS ON THE SITE.
  - THE HISTORICAL FLOW PATTERNS AND RUNOFF AMOUNTS ON THE SITE WILL BE MAINTAINED.
  - REFER TO DETAIL SHEETS FOR EROSION CONTROL BMP DETAILS.
  - EXISTING FENCE TO BE REMOVED FROM AND RE-ROUTED AROUND LOCATION.
  - INSTALL VTC TO MANUFACTURER'S STANDARDS & RECOMMENDATIONS.

**GRADING DETAILS:**

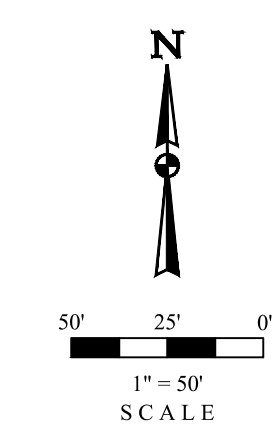
APPROXIMATE EARTHWORK QUANTITIES	
TOTAL CUT	30 Cu. Yds.
FILL	10,250 Cu. Yds.
MATERIAL BALANCE	<10,220 Cu. Yds.
TOPSOIL (6" LAYER OVER RECLAIM)	1,690 Cu. Yds.
**ESTIMATE ONLY**	

**NOTES:**

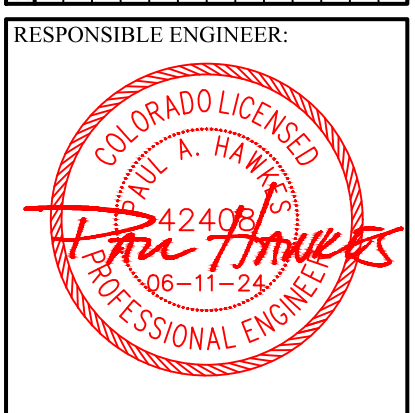
- Fill quantity includes 10% for compaction.
- Pad Cut/Fill slopes are 3H:1V
- Actual site conditions may vary. Field adjust grades as necessary to balance earthwork.

**APPROXIMATE SURFACE DISTURBANCE AREAS**

PERMANENT DISTURBANCE AREA	DISTANCE	ACRES
	NA	±5.66
<b>TOTAL SURFACE USE AREA</b>		±5.66



REV	DATE	BY	REASON FOR REVISION



RESPONSIBLE ENGINEER:

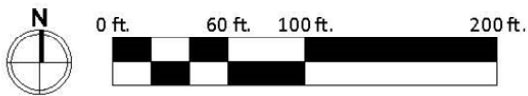
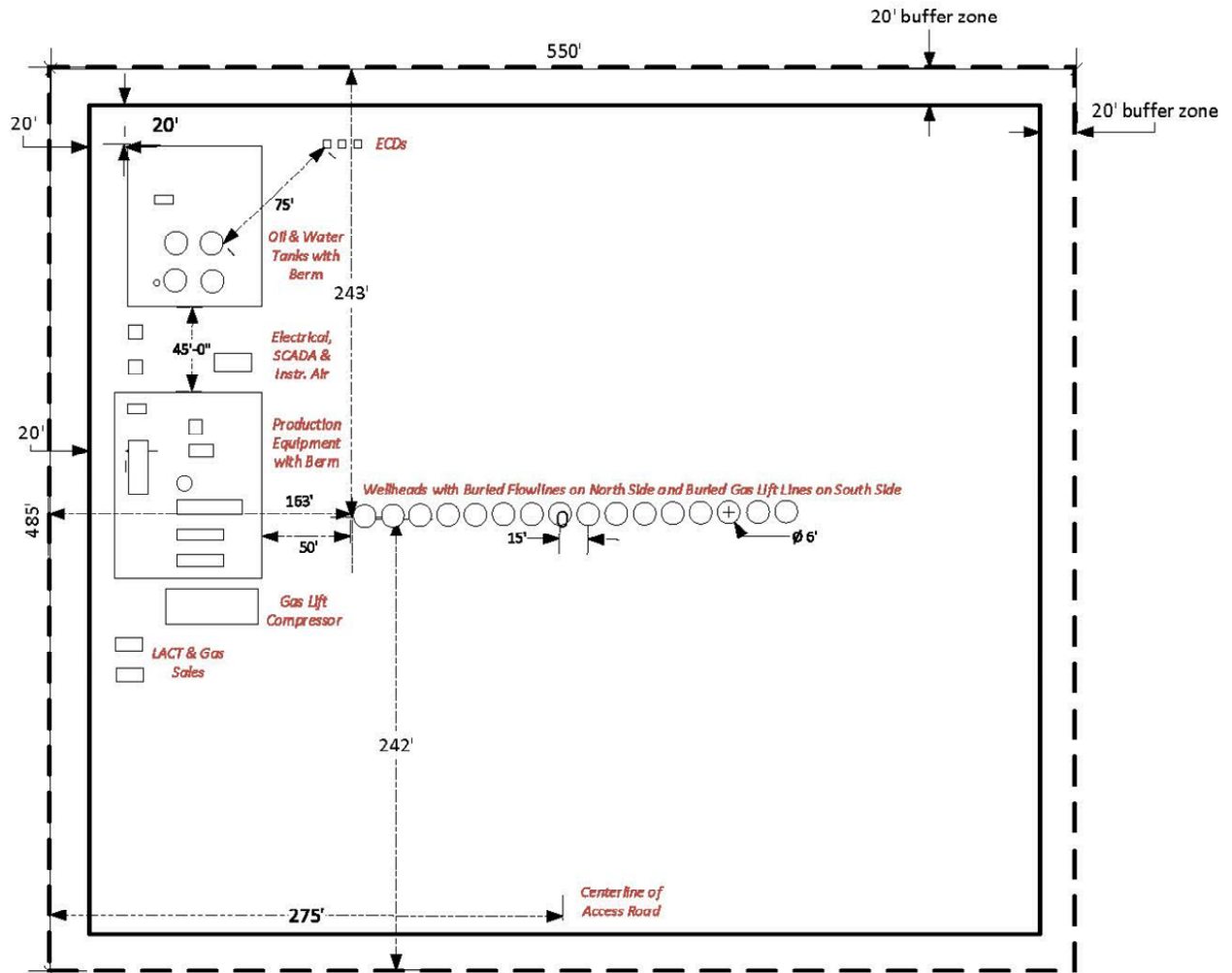
PRODUCTION PHASE  
FINAL GRADING PLAN

SCALE: AS NOTED  
DRAWN BY: CC  
DATE DRAWN: 04-23-2024  
UELS FILE NO.: P - 2 0 3 1  
PROJ. NO.: PR006-21-0001  
FILE: P - 2 0 3 1

SHEET  
**C103**

C:\FILE E:\MARGED\2024\19-18 PAD P-2031\UW\CONNER - GESC-14.dwg 6/12/2024 2:14 PM ARSHI FULL BLEED 0 (36.00 x 24.00 INCHES) CALDER

# POCO Operating: Wakeman Pad



Equipment	Count	Height
Condensate Tanks	2	20'
Water Tanks	2	20'
Instrument Air building	1	9'
Surge Drum	1	20.5'
Separators	3	18.5'
Heater/Treater	1	25'
Emission Control Devices	3	26'
LACT Unit	1	10'
Sales Gas Meter building	1	8'
Gas Lift Compressor	1	9.5'
Wellheads	16	7'

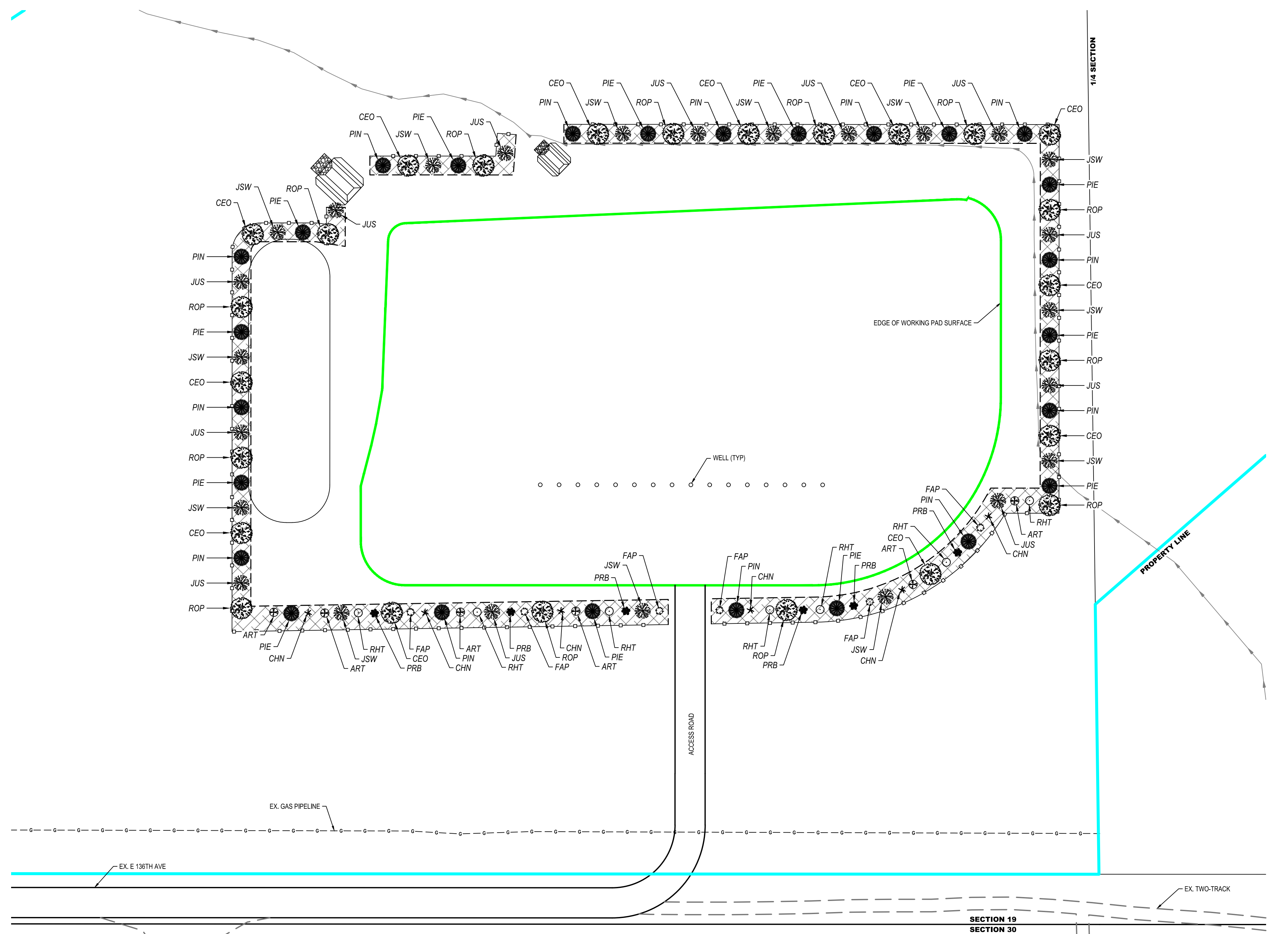


**LANDSCAPE DESIGNER**  
 Uintah Engineering & Land Surveying, LLC  
 Headquarters  
 85 South 200 East  
 Vernal, Utah 84078  
 (435) 789-1017  
 Colorado Branch  
 3313 35th Ave. #1B  
 Evans, CO 80620  
 (970) 506-1544



**LEGEND:**

	TREES
	SHRUBS
	MULCH - 3" DEPTH CASCADE CEDAR
	6" PRIVACY FENCE
	STEEL EDGER



**LANDSCAPE BUFFER REQUIREMENT TABLE**

LINEAR FEET OF BUFFER	TREES REQUIRED	TREES PROVIDED
625 LF OF STREET FRONTAGE	1 TREE PER 40 LF OF BUFFER: 16 TREES	16 TREES
	SHRUBS REQUIRED	SHRUBS PROVIDED
	2 SHRUBS PER 40 LF OF BUFFER: 31 SHRUBS	32 SHRUBS
1,224 LF AT ADJACENT PROPERTY LINES	3 TREES PER 60 LF OF BUFFER: 61 TREES	65 TREES
	SHRUBS REQUIRED	SHRUBS PROVIDED
	2 SHRUBS PER 60 LF OF BUFFER: 15 TREES	15 TREES

- NOTES**
- STREET FRONTAGE LANDSCAPE BUFFER PLANTING REQUIREMENTS SHALL BE CALCULATED AT 1 TREE AND 2 SHRUBS PER EVERY 40 LINEAR FEET OF BUFFER. BUFFER IS REQUIRED TO BE 20' WIDE. DEVELOPMENT STANDARDS AND REGULATIONS SECTION 4-19-07-1.
  - ADJACENT PROPERTY LINES LANDSCAPE BUFFER PLANTING REQUIREMENTS SHALL BE CLASSIFIED AS BUFFER YARD D (NEW INDUSTRIAL USE ADJUTING EXISTING AGRICULTURAL USE), AND SHALL BE CALCULATED AT 3 TREES PER EVERY 60 LINEAR FEET OF BUFFER. BUFFER IS REQUIRED TO BE 15' WIDE. DEVELOPMENT STANDARDS AND REGULATIONS SECTION 4-19-06-1.
  - THIS LANDSCAPING PLAN WAS DEVELOPED TO BE XERISCAPED WITH NATIVE TREES, AND SHRUBS. IT IS ANTICIPATED THAT ONCE THE NATIVE LANDSCAPING IS ESTABLISHED, IRRIGATION WILL NOT BE NEEDED.

**XERISCAPE PLANT LIST**

**TREES**

SYMBOL	KEY	QTY.	COMMON NAME	BOTANICAL NAME	SIZE	COND.
	CEO	12	WESTERN HACKBERRY	CELTIS OCCIDENTALIS	2.5" CALIPER	B&B
	ROP	13	BLACK LOCUST	ROBINIA PSEUDOCACIA	2.5" CALIPER	B&B
	JSW	13	'WICHITA BLUE' JUNIPER	JUNIPERUS SCOPULORUM 'WICHITA BLUE'	6 FT HT	B&B
	JUS	12	'ROCKY MOUNTAIN' JUNIPER	JUNIPERUS SCOPULORUM	6 FT HT	B&B
	PIE	13	PINYON PINE	PINUS EDULIS	6 FT HT	B&B
	PIN	13	AUSTRIAN PINE	PINUS NIGRA	6 FT HT	B&B

QUANTITIES BASED ON PERCENTAGE OF TOTAL TREE REQUIREMENT TOTAL: 81 TREES

**SHRUBS**

SYMBOL	KEY	QTY.	COMMON NAME	BOTANICAL NAME	SIZE	COND.
	ART	6	TALL WESTERN SAGE	ARTEMISIA TRIDENTATA	5 GAL.	B&B
	CHN	6	RABBIT BRUSH	CHRYSOTHAMNUS NAUSEOSUS	5 GAL.	B&B
	FAP	6	APACHE PLUME	FALLUGIA PARADOXA	5 GAL.	B&B
	PRB	6	WESTERN SAND CHERRY	PRUNUS BESSEYI	5 GAL.	B&B
	RHT	7	THREE-LEAF SUMAC	RHUS TRILOBATA	5 GAL.	B&B

QUANTITIES BASED ON PERCENTAGE OF TOTAL SHRUB REQUIREMENT TOTAL: 32 SHRUBS

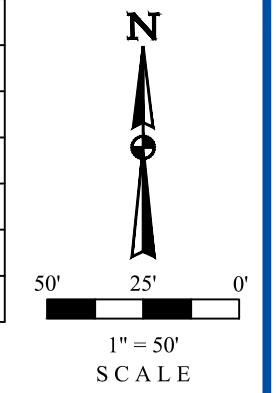


**SURVEY BENCHMARK**  
 COA ID: 456524NE001  
 DESCRIPTION: 3 1/2 INCH DIAMETER ALUMINUM CAP STAMPED (ARAPAHOE COUNTY MAPPING, BENCHMARK, BM 010101, 2000, PLS 11424), ON 3 FOOT SMOOTH ALUMINUM RODS, WITH TWO CARBONITE POSTS, ±33 FEET WEST OF THE CENTERLINE OF WATKINS ROAD, BELOW A NORTH-SOUTH OVERHEAD POWER LINES, ±10 FEET WEST OF THE TOE OF SLOPE, AND ±3.2 MILES SOUTH OF F-70 AND WATKINS ROAD.  
 LATITUDE: 39° 41' 40.08" N  
 LONGITUDE: 104° 36' 12.54" W (NAD 83)  
 ELEV: 5689.89 (NAVD 88)  
 \*DO NOT USE FOR PAD LOCATION.

**DISCLAIMER:**  
 THIS PLOT DOES NOT REPRESENT A MONUMENTED LAND SURVEY AND SHOULD NOT BE RELIED UPON TO DETERMINE BOUNDARY LINES, PROPERTY OWNERSHIP OR OTHER PROPERTY INTERESTS. PARCEL LINES, IF DEPICTED, HAVE NOT BEEN VERIFIED AND MAY BE BASED UPON PUBLICLY AVAILABLE DATA THAT ALSO HAS NOT BEEN INDEPENDENTLY VERIFIED.

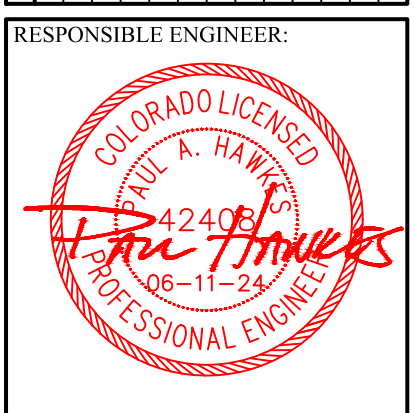
**NOTE:** EXISTING TOPOGRAPHY INFORMATION WAS COLLECTED BY UINTAH ENGINEERING & LAND SURVEYING ON 11-22-2021.

CALL 811  
 TWO WORKING DAYS  
**BEFORE YOU DIG**  
 1-800-922-1987



**POCO OPERATING**  
**CONNER 19-18 PAD**  
**GESC PLAN**  
**SEC. 19, T1S, R65W, 6th P.M.**  
**ADAMS COUNTY, COLORADO**

REV.	DATE	BY	REASON FOR REVISION
1			



RESPONSIBLE ENGINEER:  
**T. A. Hawley**  
 PROFESSIONAL ENGINEER

LANDSCAPING PLAN

SCALE: AS NOTED  
 DRAWN BY: CC  
 DATE DRAWN: 04-23-2024  
 UELS FILE NO.: P - 2 0 3 1  
 PROJ. NO.: PRO06-21-0001  
 FILE: P - 2 0 3 1

SHEET  
**C104**

E:\FILE 01\04002\0204\F-AN\WOOD\OWNER 19-28 PAD P-2021\UML\OWNER - GESC.dwg CALDER 6/7/2024 2:14 PM ARCH FILE, PLOT D, (56.00 X 24.00 INCHES)









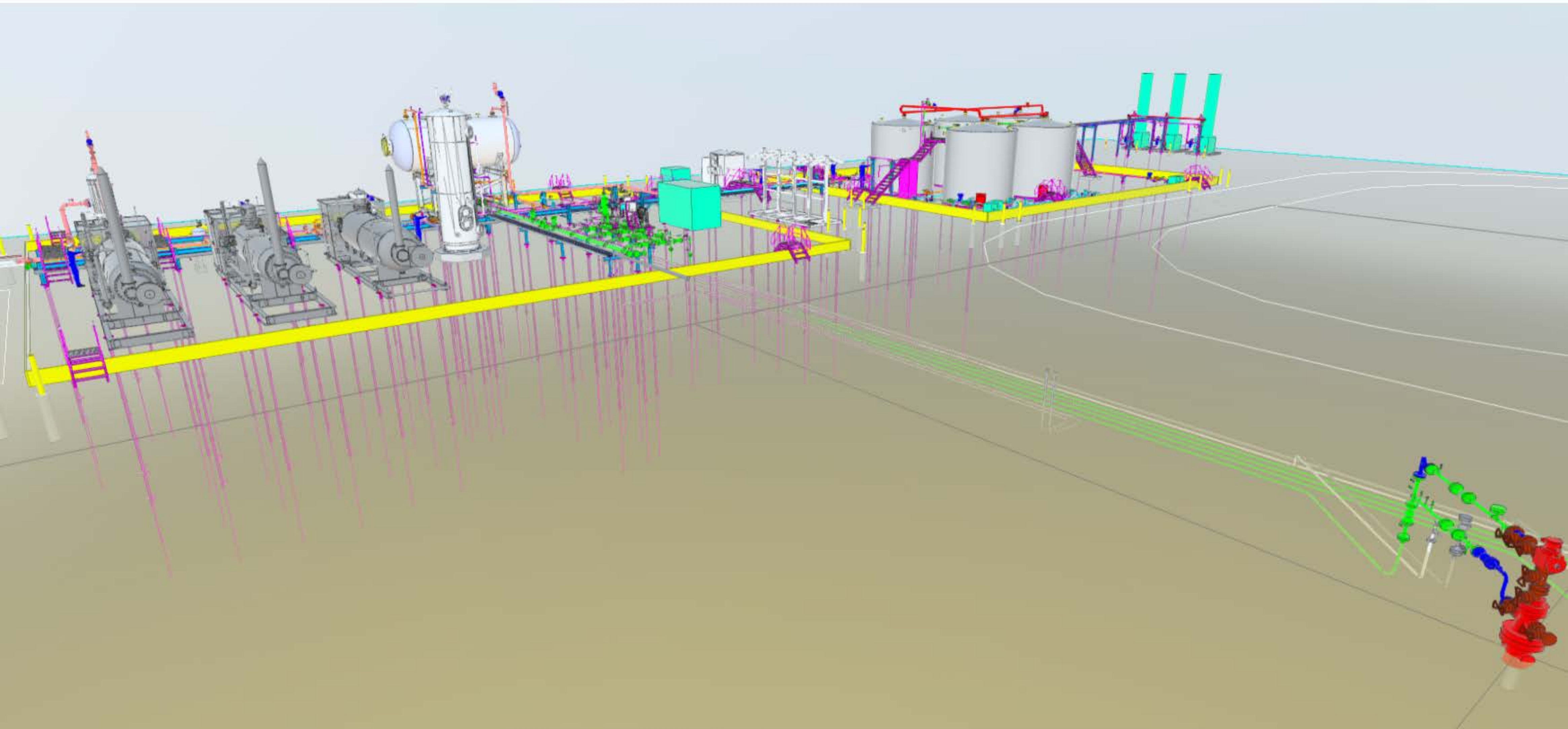




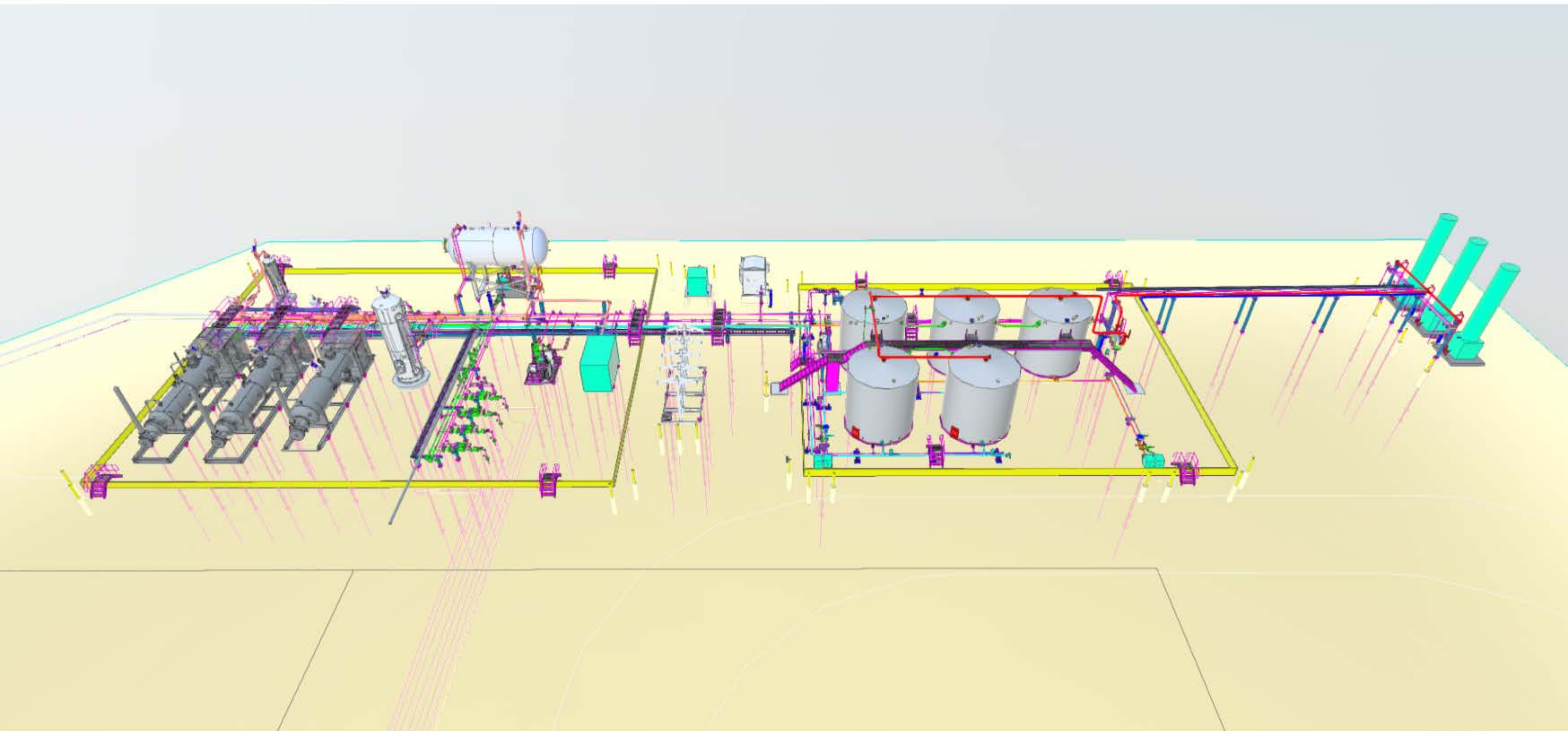




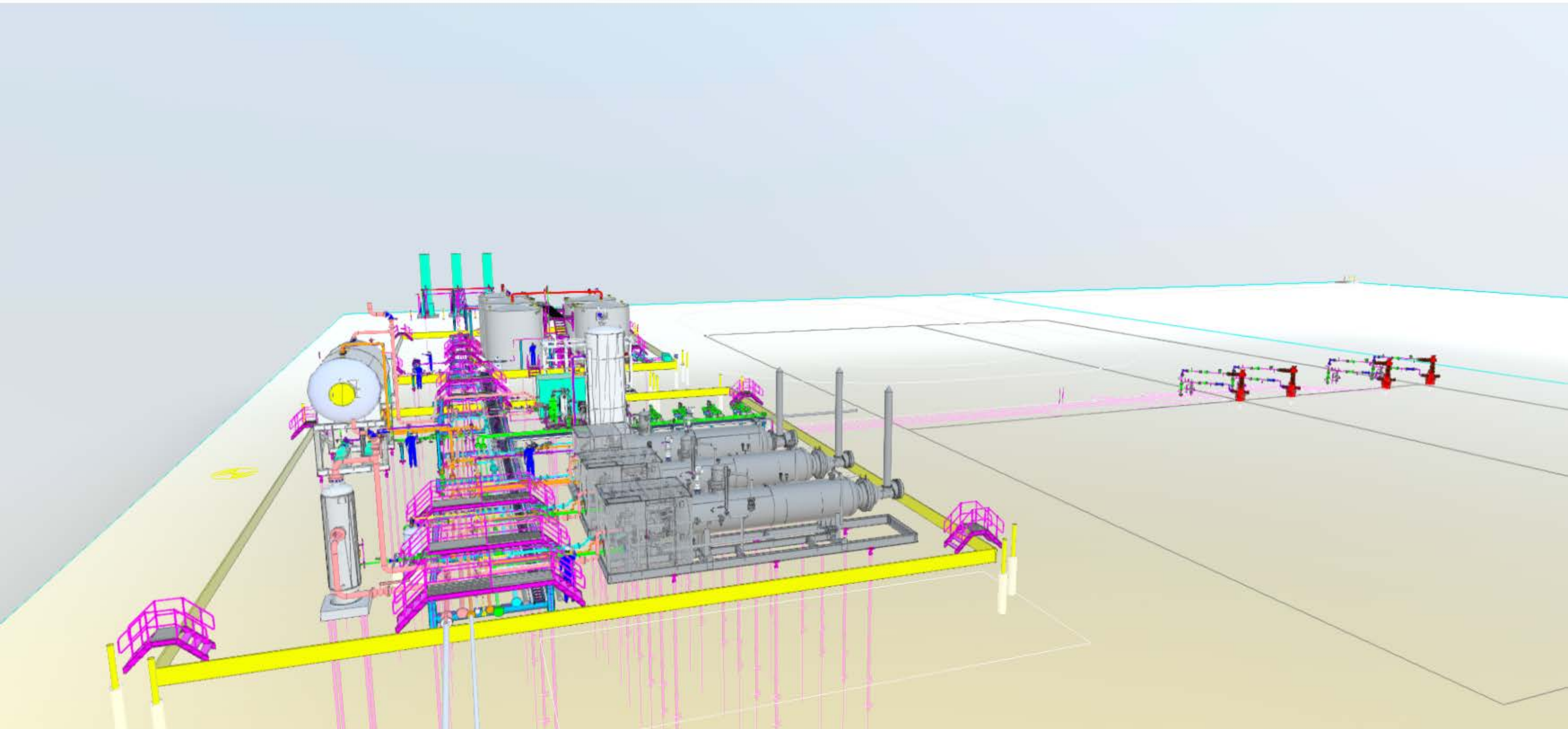




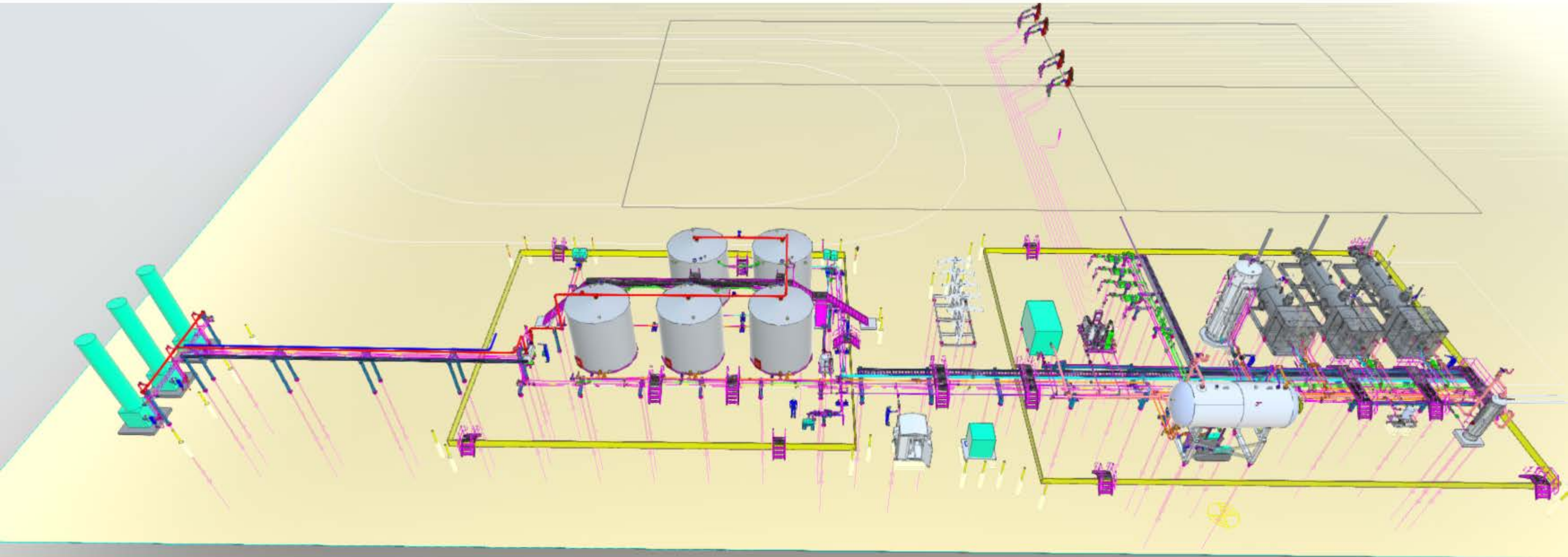




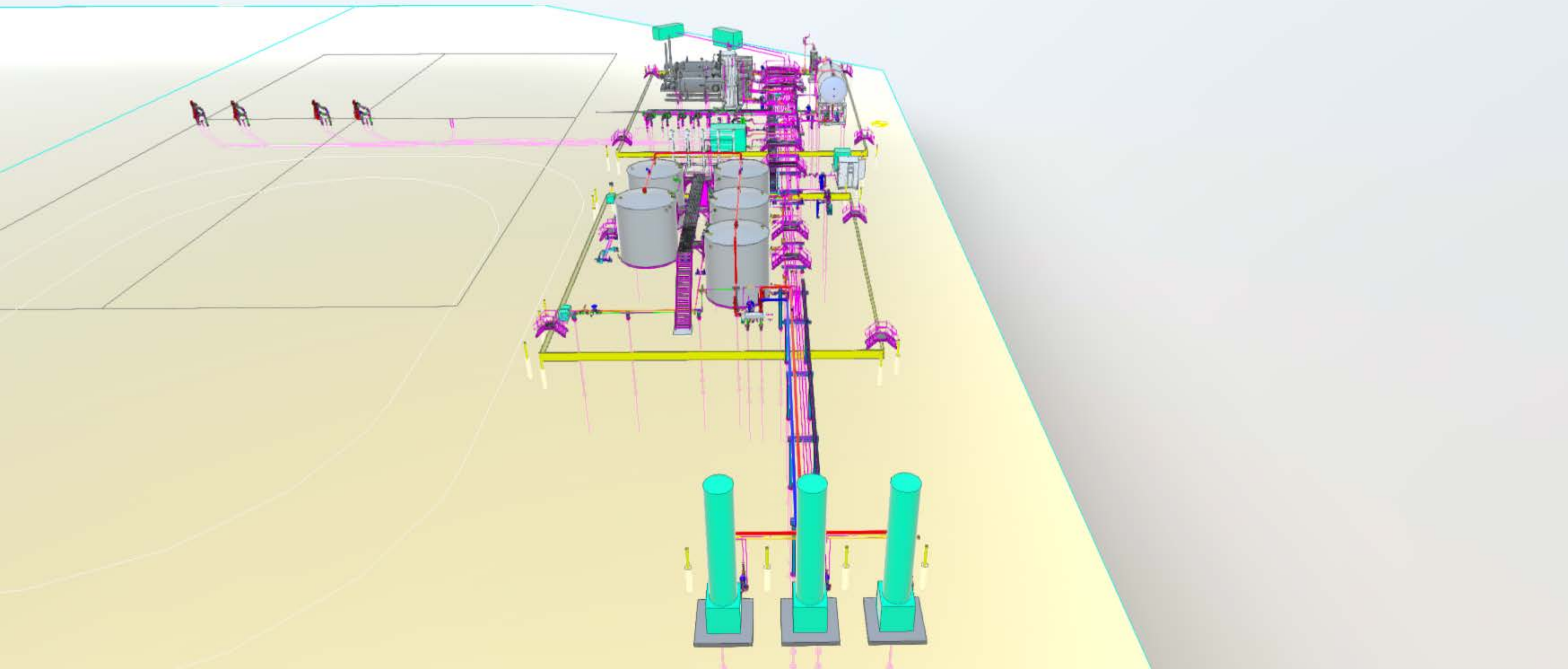














## *Brighton Fire Rescue District*

500 S. 4<sup>th</sup> Ave, 3<sup>rd</sup> Floor • Brighton, Colorado 80601

Telephone: (303) 659-4101 • Fax: (303) 659-4103 • Website: [www.brightonfire.org](http://www.brightonfire.org).

---

May 23, 2024

Meghan Grimes- VP of Regulatory Affairs  
POCO Operating  
9635 Maroon Circle, Suite 450  
Englewood, CO 80112

Subject: Will Serve Letter

Project: Conner Well Pad  
Location: Parcel 0156719300004 North of 136<sup>th</sup> Ave, West of  
Harvest Rd, and East of Gun Club Rd

To Whom It May Concern:

The above named project is within the boundaries of the Brighton Fire Rescue District and will be served by the District. Fire protection and prevention services provided by the district will be according to applicable laws and District rules, regulations, and policies.

Please contact this office if you need further information or have any questions.

Sincerely,

Todd Godek  
Captain, Fire Prevention  
[tgodek@brightonfire.org](mailto:tgodek@brightonfire.org)  
(303)654-8045

**Meghan A. Grimes**  
**Providence Energy**  
**9635 Maroon Circle, Suite 320**  
**Englewood CO 80112-5927**

**Subject: 5-day Ambient Sound Level Survey & Noise Impact Model**  
**Location: Conner Pad Site – Adams County, Colorado**

ATTN: Ms. Grimes

The following Ambient Sound Level Survey and Noise Impact Model was developed for your Conner Pad Site located east of Adams County, Colorado. The noise levels produced by the drilling and fracturing operations at the site should not exceed the noise standards set forth by the Colorado Oil & Gas Conservation Commission, AESTHETIC AND NOISE CONTROL REGULATIONS & Adam County Noise Ordinance section of the ordinance. The following report identifies the noise sources for drilling and fracturing operations and includes noise mitigation models for both scenarios.

**Site Location and Conditions**

The Conner pad site is located off East 136th Ave approximately 0.35 miles east of Gun Club Road The nearest occupied structure is a single-family residential property and is located approximately 2,200 feet west of the well head. Open pastures surround the location and residential properties are located around the pad site. The topography of the location is predominantly flat in all directions surrounding the location. Ambient Location and well head coordinates are below.

**Table 1. Well Pad & Sound Meter Placement**

<u>Ambient Location</u>	<u>Drill Site Coordinate</u>
39.943679	39.944224
-104.714396	-104.708019

**Sound Level Survey Instrumentation**

A Brüel and Kjær 2250 Type 1 Hand-held Analyzer sound level meter was programmed, field calibrated, and deployed at the Conner pad. The meters were programmed to measure the A-weighted as well as C-weighted sound levels. The metering system was installed on a t-post approximately 5 feet above ground level in a locked weatherproof enclosure for security purposes. Figure 1 displays the drill site and the ambient noise measurement locations.

**(Continued on Next Page)**

**Texas Office**  
 3208 FM 920  
 Weatherford, Texas 76088  
 Office: (817) 594-4446 Fax (817) 594-4472

**Colorado Regional Office**  
 623 E 18<sup>th</sup> Street  
 Greeley, Colorado 80631  
 Office: (720) 517-2552

**West Virginia Regional Office**  
 447 Gantzer Ridge Road  
 Triadelphia, West Virginia 26059  
 Office: (304) 231-8088

**Adams County Noise Ordinance**

- a. The goal of this rule is to identify noise sources related to oil and gas operations that impact surrounding landowners and to implement cost-effective and technically feasible mitigation measures to bring oil and gas facilities into compliance with the allowable noise levels identified in subsection c. Operators should be aware that noise control is most effectively addressed at the siting and design phase, especially with respect to centralized compression and other downstream “gas facilities” (see definition in the 100 Series of these rules).
- b. Oil and gas operations at any well site, production facility, or gas facility shall comply with the following maximum permissible noise levels.

<b>ZONE</b>	<b>7:00 am to next 7:00 pm</b>	<b>7:00 pm to next 7:00 am</b>
Residential/Agricultural/Rural	55 db(A)	50 db(A)
Commercial	60 db(A)	55 db(A)
Light industrial	70 db(A)	65 db(A)
Industrial	80 db(A)	75 db(A)
All Areas	60 db(C)	60 db(C)

The type of land use of the surrounding area shall be determined by the Director in consultation with the Local Governmental Designee taking into consideration any applicable zoning or other local land use designation. In the hours between 7:00 a.m. and the next 7:00 the noise levels permitted above may be increased ten (10) dB(A) for a period not to exceed fifteen (15) minutes in any one (1) hour period. The allowable noise level for periodic, impulsive or shrill noises is reduced by five (5) dB(A) from the levels shown.

**Ambient Sound Level Survey**

A 5-day pre-drilling ambient noise survey was taken at the Conner Pad Site from Wednesday, April 17, to Sunday, April 21, 2024, to measure and document the pre-drilling ambient sound levels at the Conner pad.

**Ambient Measurement Results**

The ambient sound level data collected at the site is attached in both a graphed and tabular form, along with the established 5-day ambient sound levels. The measured 5-day average sound level was 53.2 dBA and 67.0 dBC. The 5 day average daytime sound level was 54.8 dBA & 64.4 dBC, the 5 day average nighttime sound level was 50.1 dBA & 68.3 dBC. Please note that the ambient measurement levels recorded during the 5 day ambient is at the 55 dBA daytime allowable, 50 dBA nighttime allowable & above the 60 dBC day and night time allowable.

**(Continued on Next Page)**

**Texas Office**  
 3208 FM 920  
 Weatherford, Texas 76088  
 Office: (817) 594-4446 Fax (817) 594-4472

**Colorado Regional Office**  
 623 E 18<sup>th</sup> Street  
 Greeley, Colorado 80631  
 Office: (720) 517-2552

**West Virginia Regional Office**  
 447 Gantzer Ridge Road  
 Triadelphia, West Virginia 26059  
 Office: (304) 231-8088

**Summary of Findings for Unmitigated Expected Sound Levels**

We can expect the following Hourly LAeq & LCEq averages to be produced by the unmitigated operational equipment during specific operations, which can be measured at the receivers around the pad.

**Table 2. Unmitigated Operations Expected Sound Levels at Receiver, dBA**

Operations Type	Distance From Pad (LF)	Unmitigated Drilling (dBA)	Unmitigated Fracing (dBA)
1	2,250	53	53
2	2,800	50	50
3	2,800	50	51
4	3,300	48	48

**Table 3. Unmitigated Operations Expected Sound Levels at Receiver, dBC**

Operations Type	Distance From Pad (LF)	Unmitigated Drilling (dBC)	Unmitigated Fracing (dBC)
1	2,250	57	58
2	2,800	54	56
3	2,800	55	56
4	3,300	52	55

If at any time during the operations, the noise levels remain above the maximum permissible noise levels, mitigation techniques may be utilized.

**Unmitigated Noise Impact Model Results**

The *unmitigated noise impact models* for drilling operations are included as **Figure 7 & 9**. It displays an estimated sound level of 53 dBA & 57 dBC for unmitigated drilling operations. The *unmitigated noise impact models for fracing* are included as **Figure 11 & 13**. It displays estimated sound levels to be of 53 dBA & 58 dBC for unmitigated fracing operations. The nearest occupied structure (residence) is located approximately 2,250 feet to the west of the pad site. With an allowable sound level of 55dBA during the day, 50 dBA during the night, 60 dBC at all times and a nighttime ambient level of 50.1 dBA & 68.3 dBC we can expect drilling and fracing operations to be above the allowable sound level set by the Adams County at the Conner Pad.

**(Continued on Next Page)**

**Texas Office**

3208 FM 920

Weatherford, Texas 76088

Office: (817) 594-4446 Fax (817) 594-4472

**Colorado Regional Office**

623 E 18<sup>th</sup> Street

Greeley, Colorado 80631

Office: (720) 517-2552

**West Virginia Regional Office**

447 Gantzer Ridge Road

Triadelphia, West Virginia 26059

Office: (304) 231-8088



**Summary of Findings for Mitigated Expected Sound Levels**

We can expect the following Hourly LAeq & LReq averages to be produced by the mitigated operational equipment during specific operations, which can be measured at the receivers around the pad.

**Table 4. Mitigated Operations Expected Sound Levels at Receiver, dBA**

Operations Type	Distance From Pad (LF)	Mitigated Drilling (dBA)	Mitigated Fracing (dBA)
1	2,250	44	44
2	2,800	40	41
3	2,800	41	42
4	3,300	39	40

**Table 5. Mitigated Operations Expected Sound Levels at Receiver, dBC**

Operations Type	Distance From Pad (LF)	Mitigated Drilling (dBC)	Mitigated Fracing (dBC)
1	2,250	51	52
2	2,800	49	49
3	2,800	49	50
4	3,300	48	48

If at any time during the operations, the noise levels remain above the maximum permissible noise levels, mitigation techniques may be utilized.

**Mitigated Noise Impact Model Results**

The *mitigated noise impact models* for drilling operations are included as **Figure 8 & 10**. It displays an estimated sound level of 44 dBA & 51 dBC for mitigated drilling operations. The *mitigated noise impact models for fracing* are included as **Figure 12 & 14**. It displays estimated sound levels to be of 44 dBA & 52 dBC for mitigated fracing operations. The nearest occupied structure (residence) is located approximately 2,25 feet to the west of the pad site. With an allowable sound level of 55 dBA during the day, 50 dBA during the night, 60 dBC at all times and a nighttime ambient level of 50.1 dBA & 68.3 dBC we can expect both drilling and fracing operations to be below the allowable sound level set by the Adams County at the Conner Pad. Noise Mitigation will be required at the Conner Pad to be within compliance sound levels. To meet the Adam County allowable sound levels Providence Energy will need to install a 32' tall temporary sound wall (STC 27) around the perimeter of the Conner Pad during drilling & fracing operations .

**(Continued on Next Page)**

**Texas Office**

3208 FM 920  
Weatherford, Texas 76088  
Office: (817) 594-4446 Fax (817) 594-4472

**Colorado Regional Office**

623 E 18<sup>th</sup> Street  
Greeley, Colorado 80631  
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447 Gantzer Ridge Road  
Triadelphia, West Virginia 26059  
Office: (304) 231-8088



## **Noise Impact Potential**

The typical primary noise sources generated by gas well drilling operations include the drilling rig engines, compressors, generators, mud pumps, shakers, and ancillary support equipment. Drilling sound levels vary from drill site to drill site depending on the type of drilling rig (top drive, rotary table, etc.) and depending on the drilling rig orientation at the site. The highest drilling related noise levels are typically measured on the generator side of the rig.

The maximum noise levels generated during gas well fracturing operations are produced from the truck mounted engines which drive the high-pressure pumps. Support equipment such as sand trucks, water pumps and generators have a small contribution to the over-all noise levels of the operations. Off-site fracturing noise levels typically do not vary greatly from operator to operator, but the off-site transmission of the noise can be affected by the surrounding topography of the fracture site.

Noise impact models were created to evaluate and predict the noise impact potential of typical drilling and fracturing operations on the site's adjacent surroundings. Noise mitigation measures were included in the models to portray possible noise reduction levels.

Please contact us if you have any questions or comments.

Sincerely,

**Manuel Alfaro**  
**Absolute Noise Control**  
**Project Engineer**  
**(682) 300-5107**



## **Attachments**

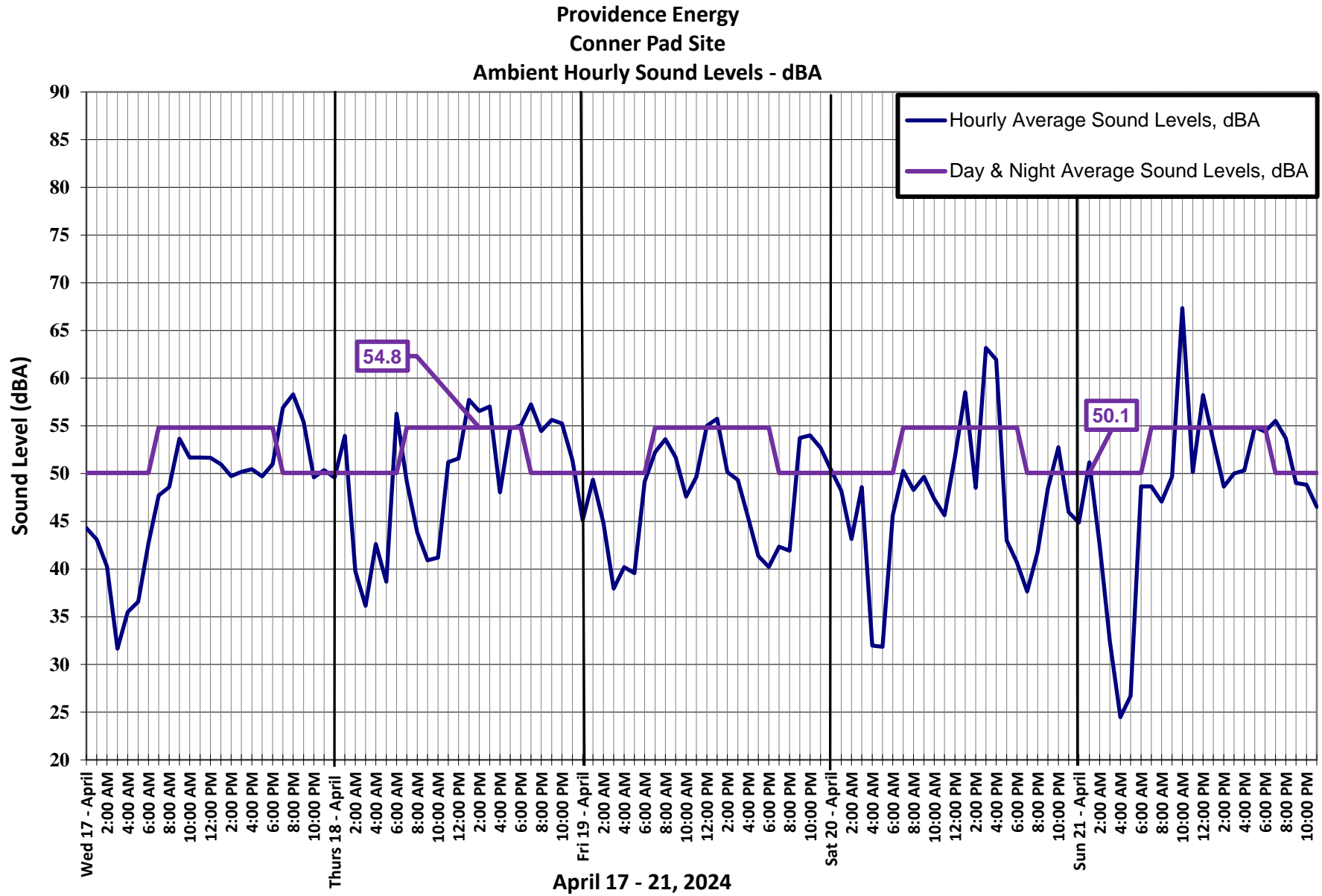
**Texas Office**  
3208 FM 920  
Weatherford, Texas 76088  
Office: (817) 594-4446 Fax (817) 594-4472

**Colorado Regional Office**  
623 E 18<sup>th</sup> Street  
Greeley, Colorado 80631  
Office: (720) 517-2552

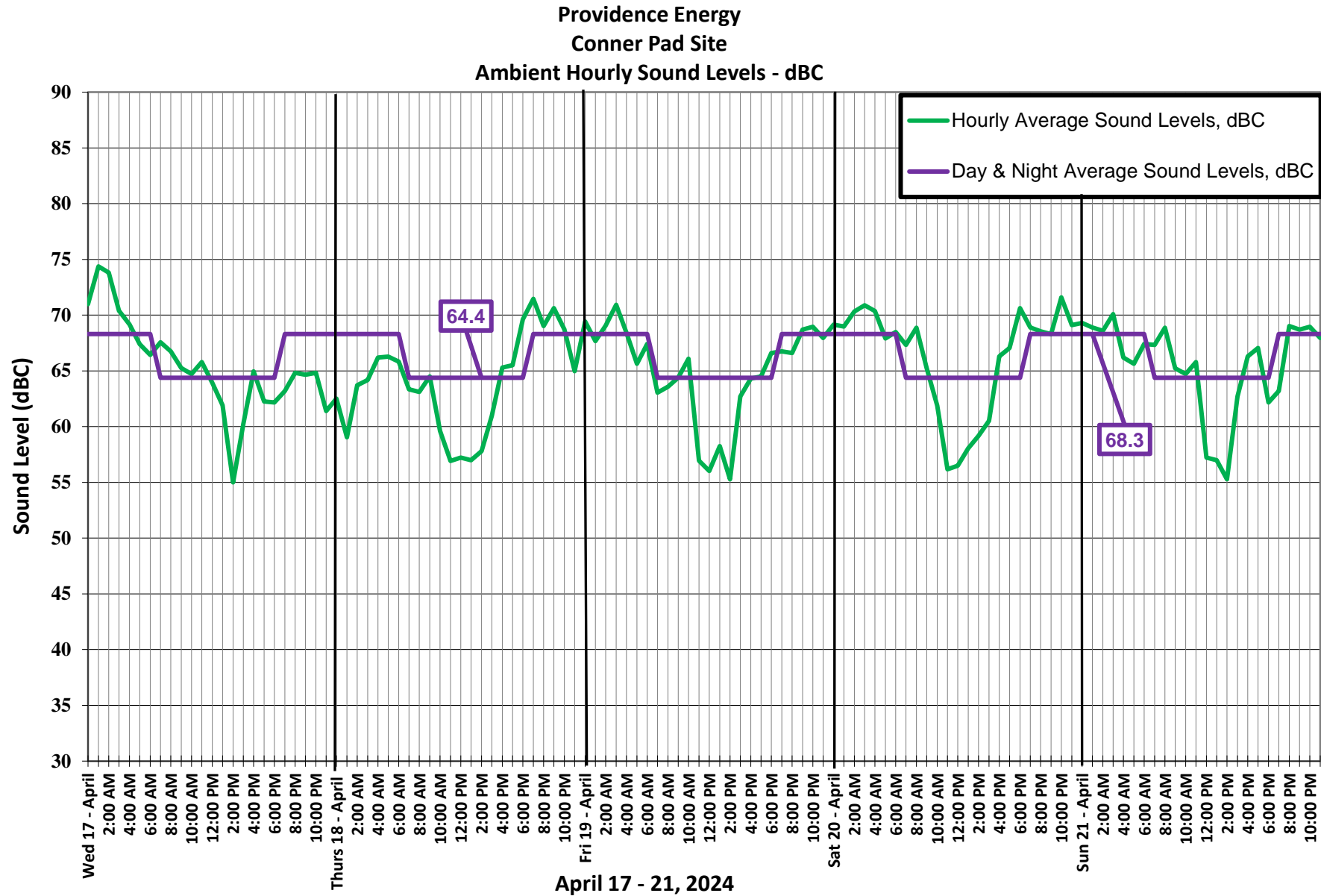
**West Virginia Regional Office**  
447 Gantzer Ridge Road  
Triadelphia, West Virginia 26059  
Office: (304) 231-8088



**Figure 1.**  
**Conner Pad Location & Noise Measurement Location**



**Figure 2.**  
**Conner Pad – Ambient Hourly Average dBA**



**Figure 3.**  
**Conner Pad – Ambient Hourly Average dBC**



Providence Energy  
Conner Pad Site  
Frequency Ambient Sound Levels

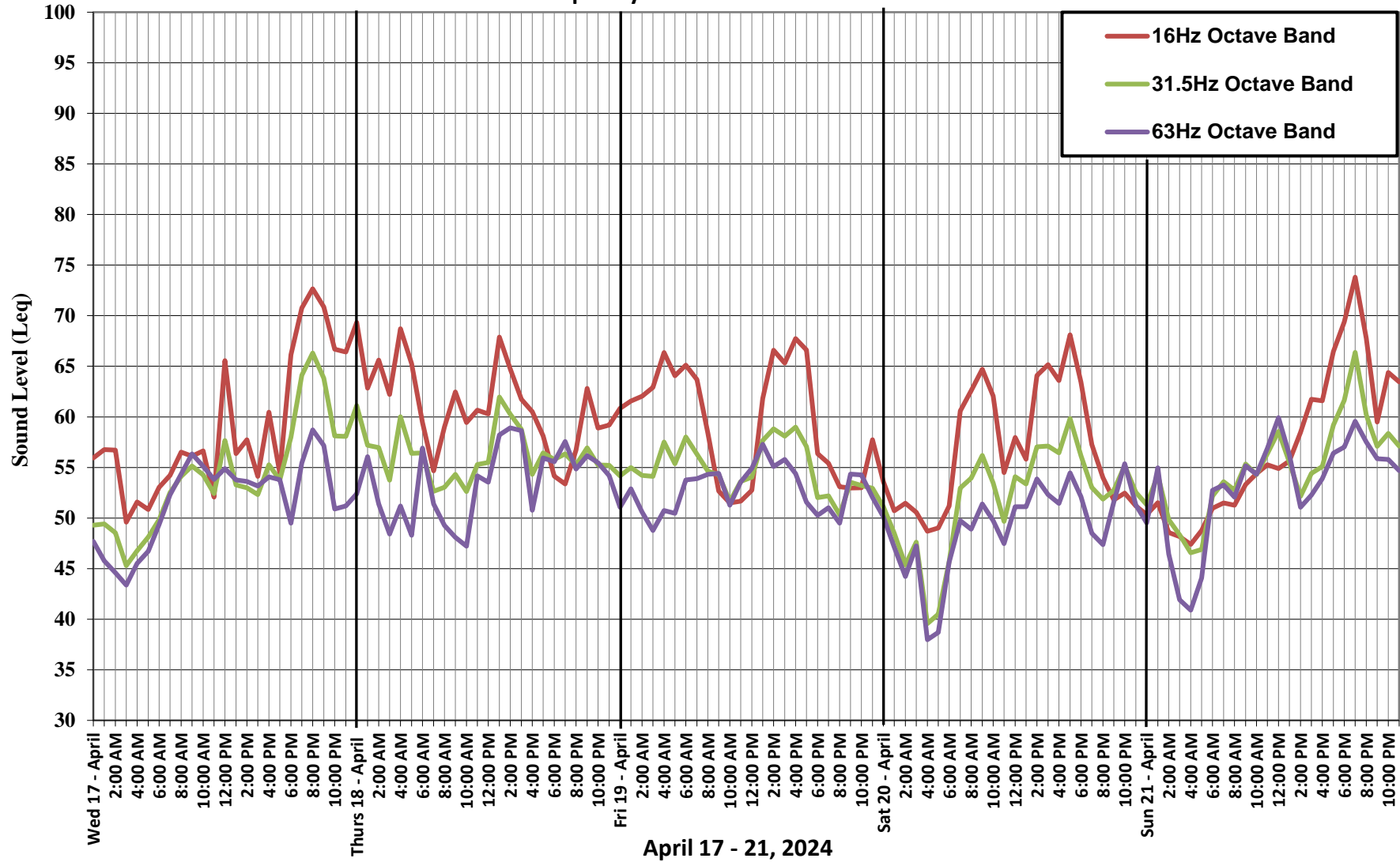


Figure 4.  
Conner Pad site – Frequency Sound Levels

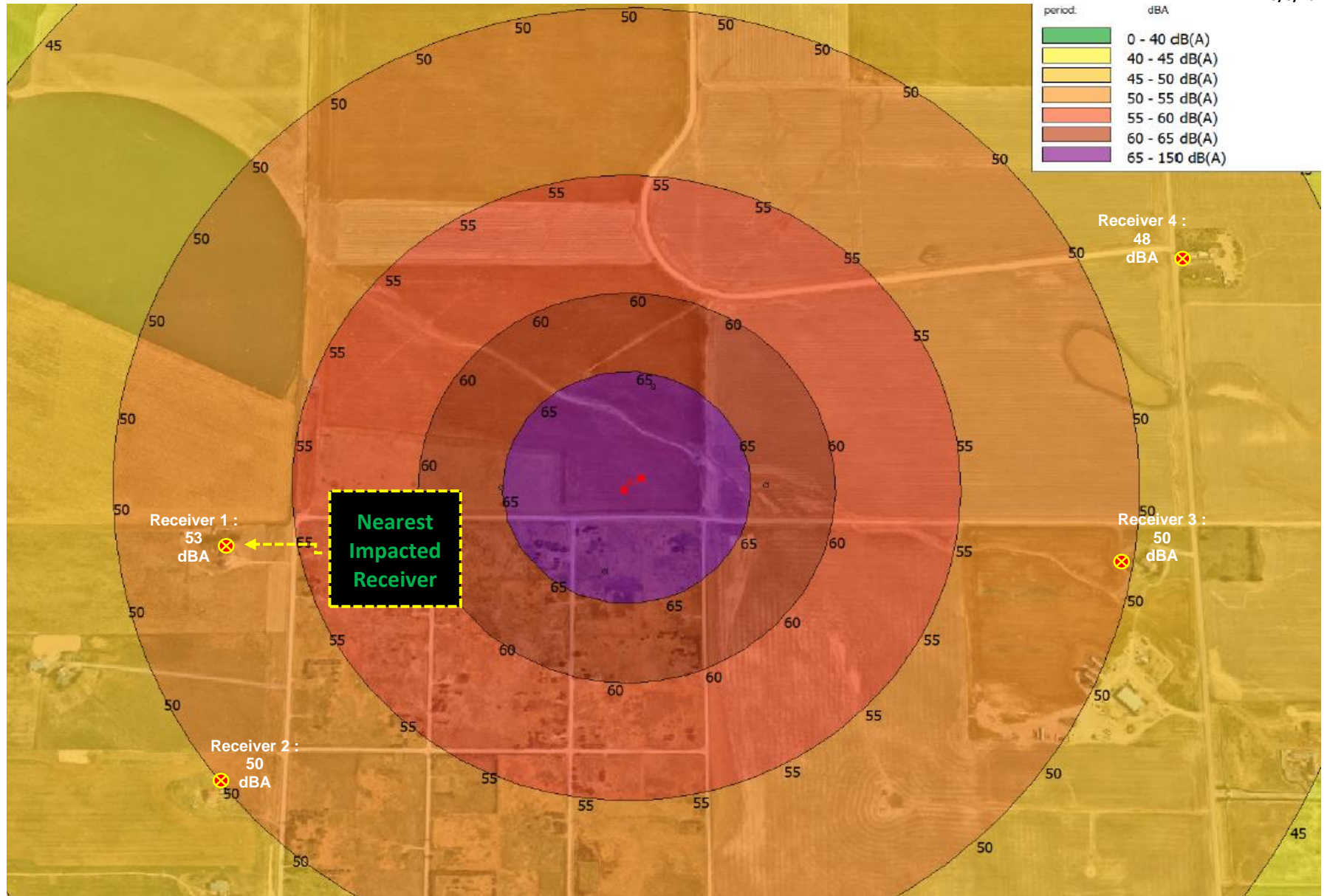
Providence Energy - Conner Pad Site					
Time	LAeq	LCeq	Time	LAeq	LCeq
<b>Wed 17 - April</b>	44.3	71.0	4:00 AM	42.6	66.2
1:00 AM	43.1	74.4	5:00 AM	38.7	66.3
2:00 AM	40.3	73.8	6:00 AM	56.3	65.8
3:00 AM	31.7	70.4	7:00 AM	49.2	63.3
4:00 AM	35.5	69.2	8:00 AM	43.8	63.1
5:00 AM	36.6	67.4	9:00 AM	40.9	64.5
6:00 AM	42.7	66.4	10:00 AM	41.2	59.6
7:00 AM	47.7	67.6	11:00 AM	51.2	56.9
8:00 AM	48.6	66.7	12:00 PM	51.6	57.2
9:00 AM	53.7	65.3	1:00 PM	57.7	57.0
10:00 AM	51.7	64.7	2:00 PM	56.6	57.8
11:00 AM	51.7	65.8	3:00 PM	57.0	61.0
12:00 PM	51.7	63.9	4:00 PM	48.1	65.3
1:00 PM	51.0	61.9	5:00 PM	54.7	65.5
2:00 PM	49.7	55.0	6:00 PM	55.0	69.6
3:00 PM	50.2	60.2	7:00 PM	57.3	71.5
4:00 PM	50.5	65.0	8:00 PM	54.5	69.0
5:00 PM	49.7	62.3	9:00 PM	55.6	70.6
6:00 PM	51.0	62.2	10:00 PM	55.3	68.7
7:00 PM	56.9	63.2	11:00 PM	51.4	65.0
8:00 PM	58.3	64.8	<b>Fri 19 - April</b>	45.1	69.4
9:00 PM	55.4	64.7	1:00 AM	49.4	67.7
10:00 PM	49.6	64.8	2:00 AM	44.8	69.1
11:00 PM	50.4	61.4	3:00 AM	37.9	70.9
<b>Thurs 18 - April</b>	49.6	62.5	4:00 AM	40.2	68.4
1:00 AM	54.0	59.0	5:00 AM	39.6	65.6
2:00 AM	39.8	63.7	6:00 AM	49.2	67.4
3:00 AM	36.1	64.2	7:00 AM	52.3	63.1
			8:00 AM	53.6	63.6

**Figure 5.**  
**Conner Pad Site – Ambient Sound Level Data – April 17 - 19, 2024**

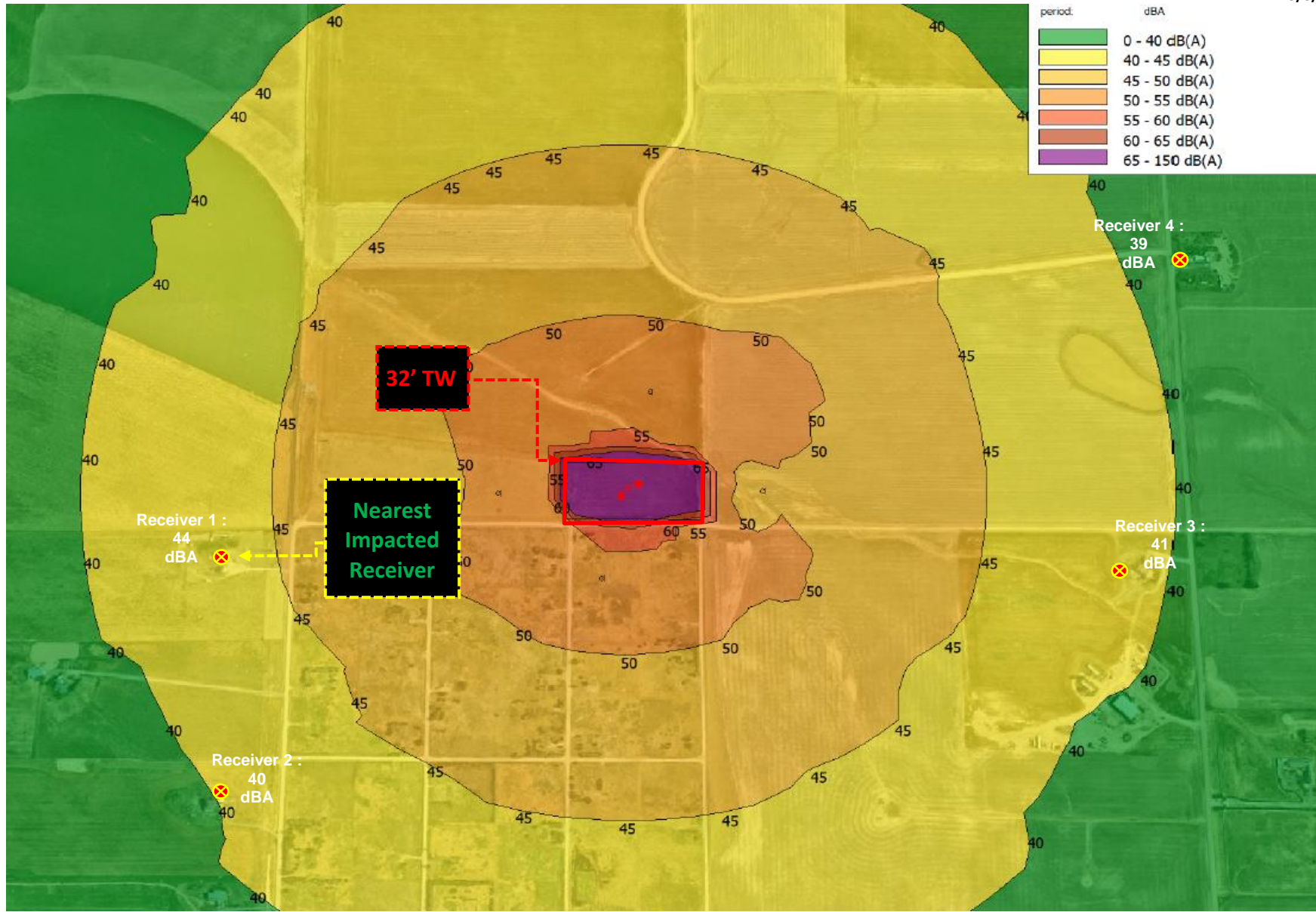


Providence Energy - Conner Pad Site					
Time	LAeq	LCeq	Time	LAeq	LCeq
9:00 AM	51.7	64.4	5:00 PM	43.0	67.1
10:00 AM	47.6	66.1	6:00 PM	40.7	70.6
11:00 AM	49.7	57.0	7:00 PM	37.7	68.9
12:00 PM	55.0	56.0	8:00 PM	41.8	68.6
1:00 PM	55.8	58.3	9:00 PM	48.5	68.3
2:00 PM	50.2	55.3	10:00 PM	52.8	71.6
3:00 PM	49.3	62.7	11:00 PM	46.0	69.1
4:00 PM	45.4	64.3	<b>Sun 21 - April</b>	44.9	69.3
5:00 PM	41.4	64.5	1:00 AM	51.2	68.9
6:00 PM	40.2	66.6	2:00 AM	42.5	68.6
7:00 PM	42.3	66.8	3:00 AM	32.4	70.1
8:00 PM	41.9	66.6	4:00 AM	24.5	66.2
9:00 PM	53.7	68.7	5:00 AM	26.7	65.6
10:00 PM	54.0	69.0	6:00 AM	48.7	67.4
11:00 PM	52.7	68.0	7:00 AM	48.7	67.3
<b>Sat 20 - April</b>	50.4	69.1	8:00 AM	47.1	68.9
1:00 AM	48.2	69.0	9:00 AM	49.7	65.2
2:00 AM	43.1	70.3	10:00 AM	67.4	64.7
3:00 AM	48.6	70.9	11:00 AM	50.2	65.8
4:00 AM	32.0	70.4	12:00 PM	58.2	57.2
5:00 AM	31.8	67.9	1:00 PM	53.5	57.0
6:00 AM	45.6	68.5	2:00 PM	48.6	55.3
7:00 AM	50.3	67.3	3:00 PM	50.0	62.7
8:00 AM	48.3	68.9	4:00 PM	50.3	66.3
9:00 AM	49.7	65.2	5:00 PM	54.9	67.1
10:00 AM	47.3	61.9	6:00 PM	54.4	62.2
11:00 AM	45.6	56.2	7:00 PM	55.5	63.2
12:00 PM	51.8	56.5	8:00 PM	53.7	69.0
1:00 PM	58.5	58.1	9:00 PM	49.0	68.7
2:00 PM	48.5	59.2	10:00 PM	48.8	69.0
3:00 PM	63.2	60.5	11:00 PM	46.5	68.0
4:00 PM	61.9	66.3		<b>LAeq</b>	<b>LCeq</b>
				<b>120-Hour (5-day) Average:</b>	<b>53.2</b>
					<b>67.0</b>

Figure 6.  
Conner Pad Site – Ambient Sound Level Data – April 19 – 21, 2024

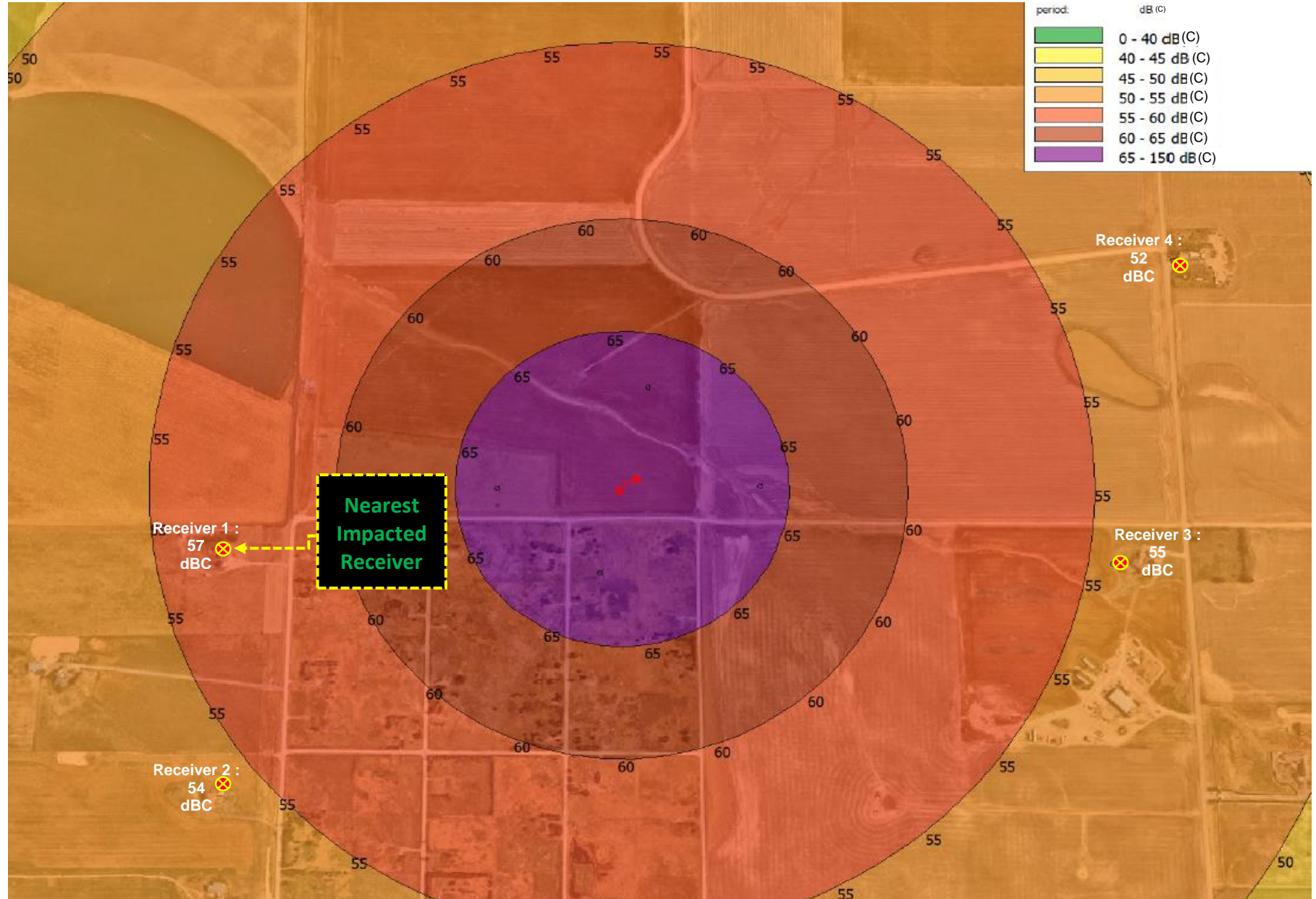


**Figure 7.**  
Conner Pad Site – dBA Unmitigated Drilling Operations

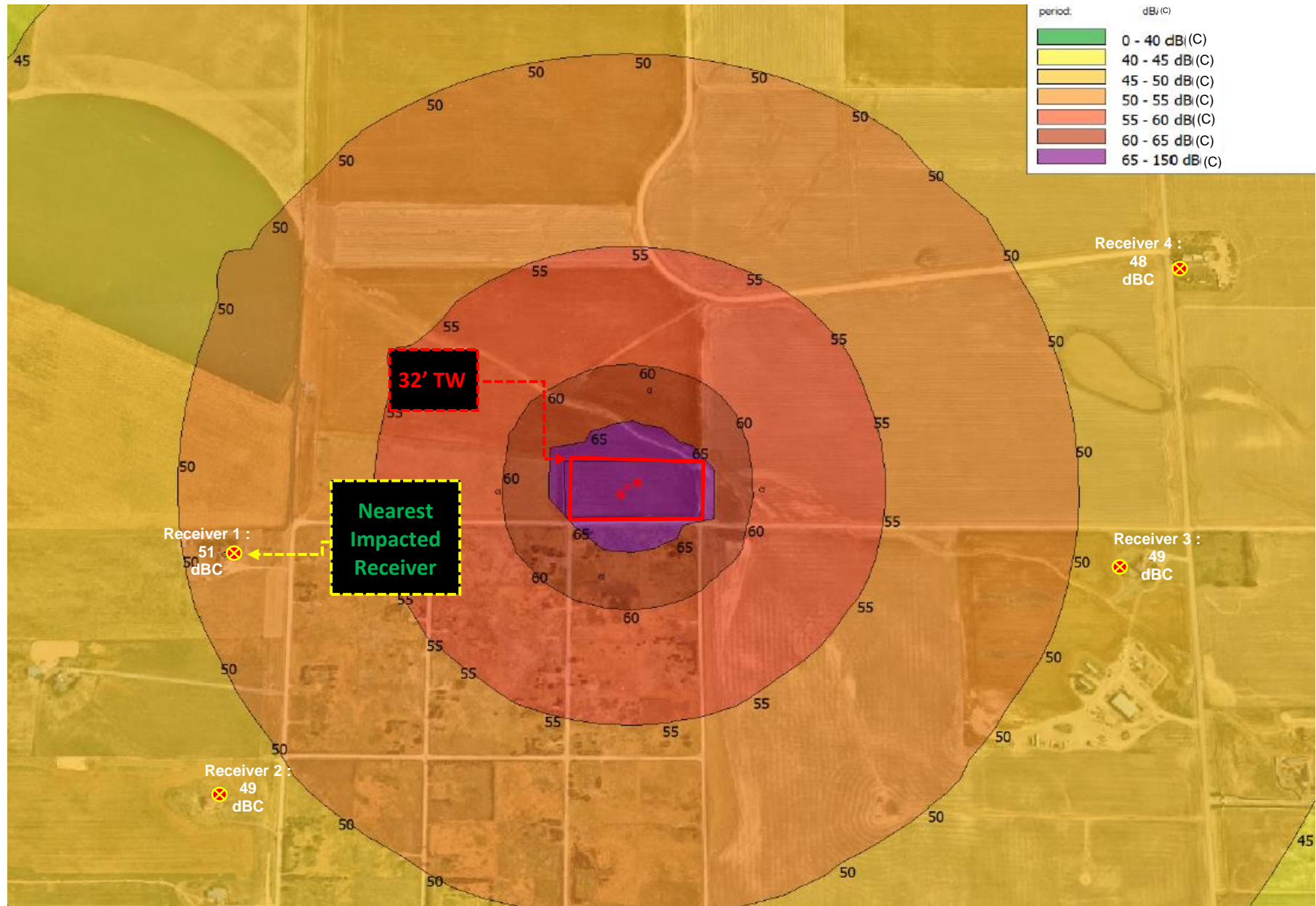


**Figure 8.**  
Conner Pad Site – dBA Mitigated Drilling Operations – 32' Tall STC 27 Sound Wall



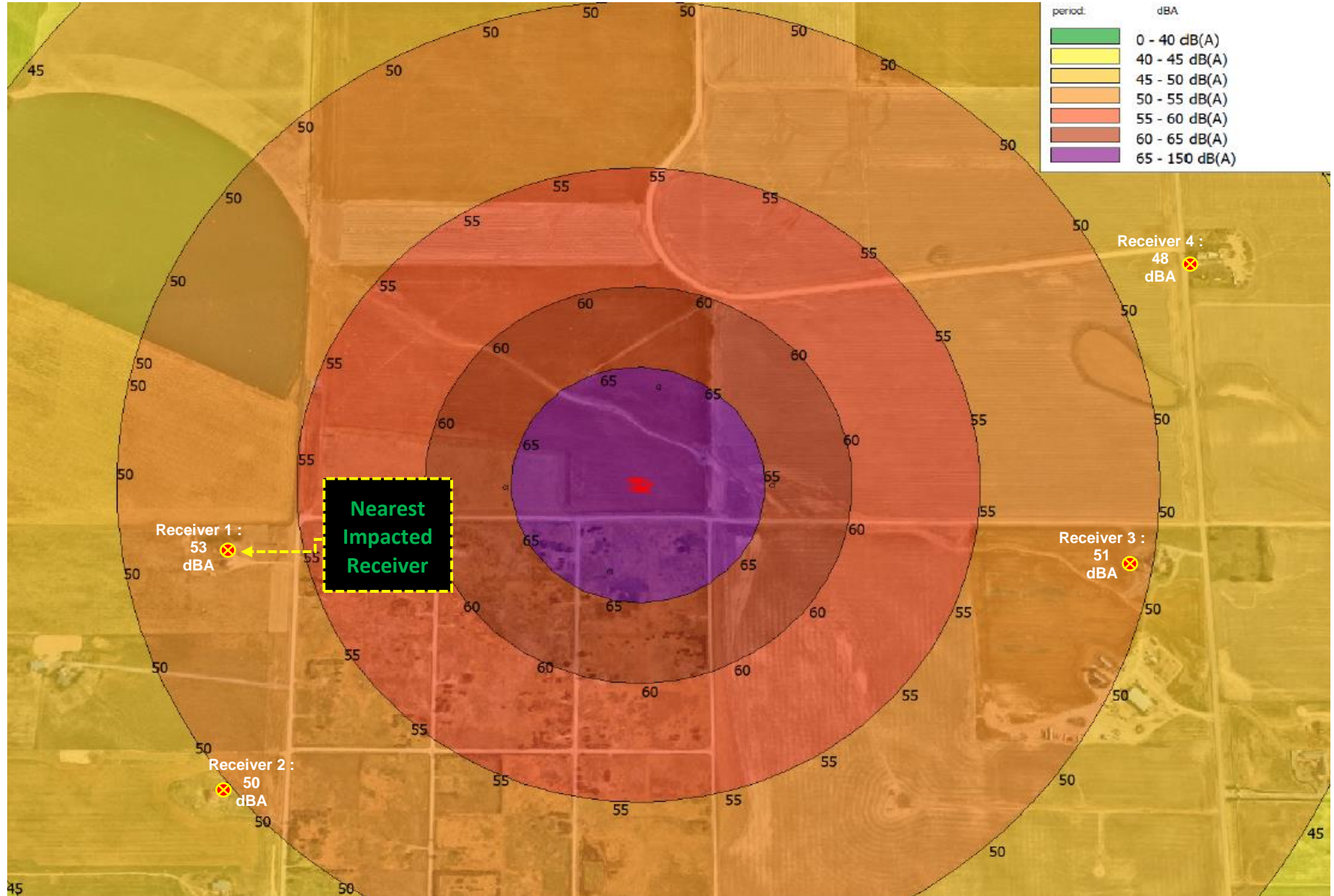


**Figure 9.**  
Conner Pad Site – dBC Unmitigated Drilling Operations



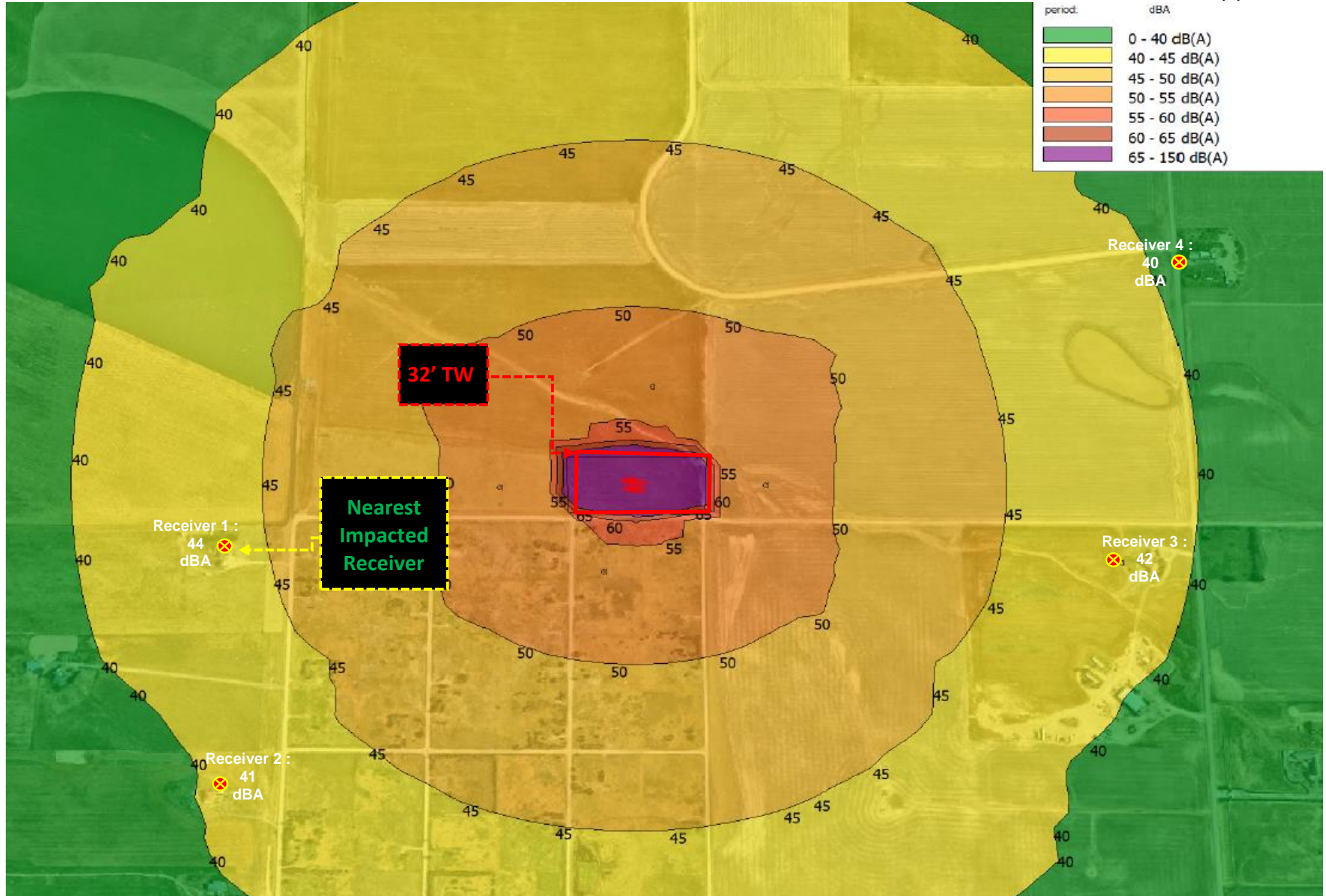
**Figure 10.**  
Conner Pad Site – dBC Mitigated Drilling Operations – 32' Tall STC 27 Sound Wall



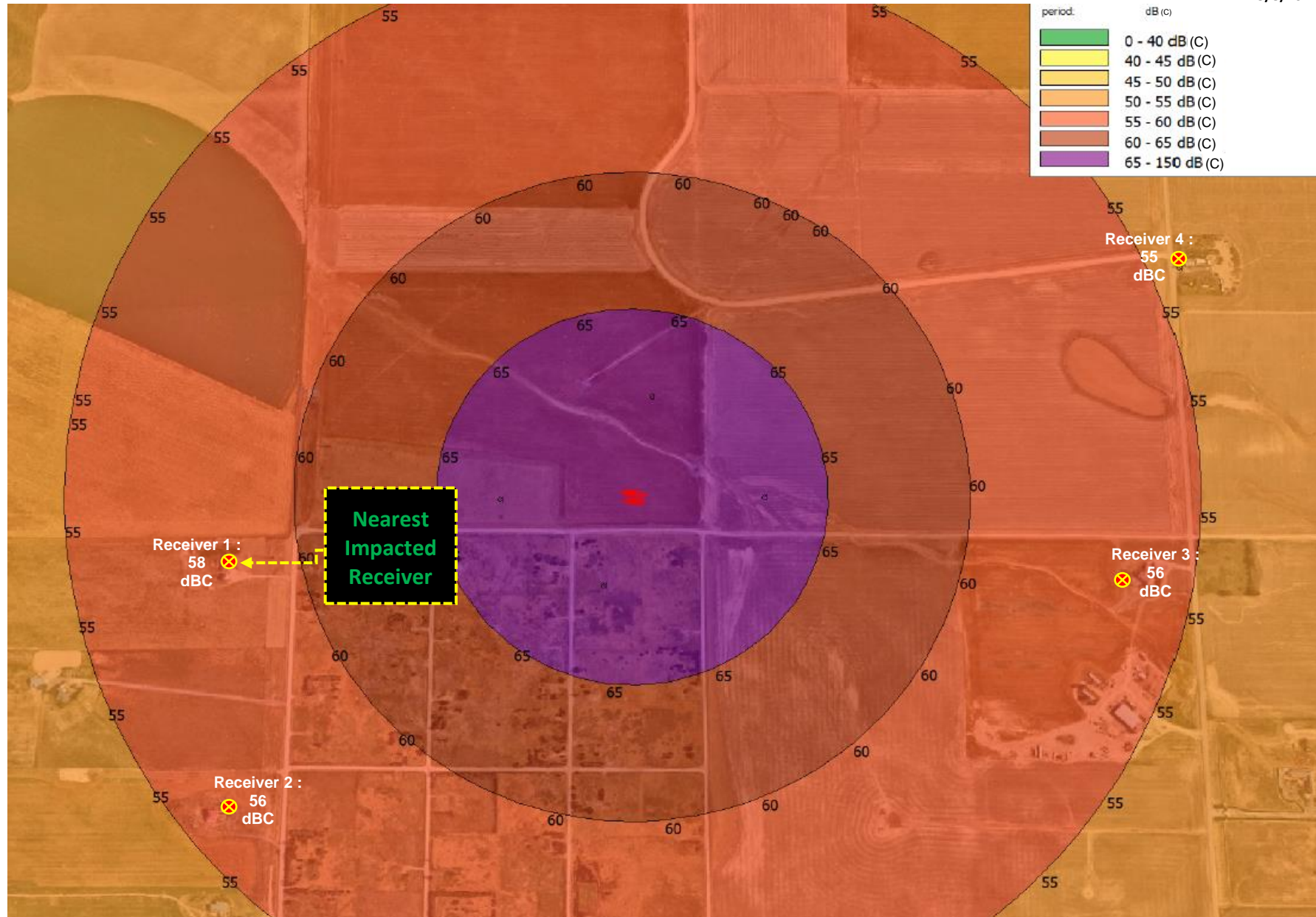


**Figure 11.**  
Conner Pad Site– dBA Unmitigated Facing Operations



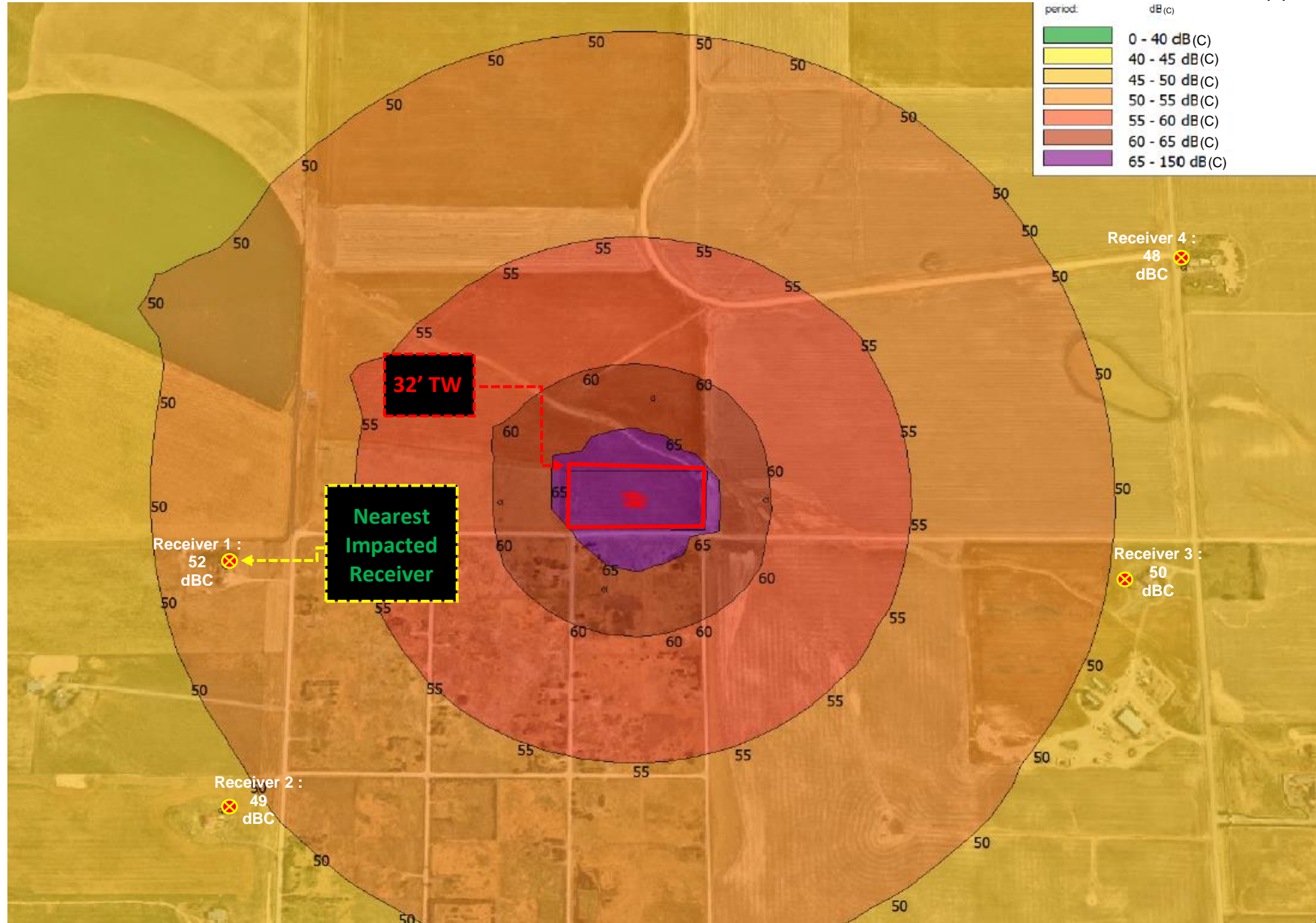


**Figure 12.**  
Conner Pad Site– dB(A) Mitigated Fracing Operations - 32' Tall STC 27 Sound Wall



**Figure 13.**  
Conner Pad Site – dBC Unmitigated Facing Operations





**Figure 14.**  
Conner Pad Site– dBC Mitigated Fracing Operations – STC-27 32' Tall Temporary Sound Wall

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# ODOR MITIGATION PLAN



## POCO Operating

**Conner 19-18 Pad**

Sec. 19 T1S R65W (SESW)

Adams County, Colorado

Surface: Fee

Submitted as an accompaniment to the Form 2A Application, this Odor Mitigation Plan is consistent with the requirements of Rule 304.c.(4)

December 6, 2022

# Providence Energy Operating LLC Adams County, Colorado

## Odor Mitigation Plan

### **Project Summary:**

Providence Energy Operating LLC's ("POCO's") proposed Conner 19-18 Pad "Location" is in Township 1 South, Range 65 West, Section 19 in Adams County, Colorado. The proposed Location is fee surface with a total pad disturbance of 8.052 acres, which includes the active working pad surface of 5.374 acres. During the interim reclamation and production phase 2.395 acres will be reclaimed, leaving a disturbed production area of 5.657. Construction is anticipated to begin no sooner than April 2023.

### **Introduction:**

POCO is committed to safe and environmentally responsible management of all Colorado Oil and Gas Conservation Commission (COGCC) rules governing public health, safety, and welfare as it relates to Odor mitigation.

POCO will comply with applicable regulations of the COGCC and the Colorado Department of Public Health and Environment (CDPHE) for mitigating odors. POCO's operations at the proposed Conner 19-18 Pad Location will be conducted in a manner such that odors do not constitute a nuisance or hazard to public health, safety, and welfare. POCO's Odor Mitigation Plan (OMP) described herein is followed at every location and is consistent with COGCC Rule 426.a.

The OMP advances POCO's safety policies and provides accountability and transparency to our operations. This plan outlines POCO's processes and Best Management Practices (BMPs) for odor mitigation.

### **Drilling Operations:**

POCO drilling operations utilize numerous BMPs and strategies to mitigate odors on and off the location. During drilling operations, all equipment is thoroughly inspected twice a day. Inspections include tanks, piping, and connections to ensure that equipment is in good condition, thus minimizing odors from contents. If excessive odors are detected emitting from equipment above standard operations, the equipment will be evaluated to ensure that all mitigating steps to minimize odors are taken. If routine inspections indicate that the equipment may need servicing, the equipment will be taken out of service and repaired to ensure that all necessary measures are taken to minimize odors. The following BMPs are used by drilling operations to minimize odors.

1. Drilling rig engine exhausts are pointed straight up so as not to be directed towards any occupied buildings.
2. To mitigate the effects of odor from POCO's operations, POCO employs only International Association of Oil & Gas Producers (IOGP) Group III drilling base fluids with <0.5 weight % aromatics and will not use drilling fluids based on diesel. These Group III drilling fluids are odorless and contain no BTEX.
3. Drilling mud chillers are used to keep drilling fluid temperatures low.
  - a. Low drilling fluid temperatures reduce the volume of fluid vaporized into the air.

4. All drilling fluids will be routed through a closed loop system.
5. No open earthen pits to store fluids or drill cuttings.
6. Drill piping is wiped down each time the drilling operation “trips” out of the hole.
7. Drill cuttings are placed in metal bins and covered to minimize odors prior to being transported to the designated waste management facilities.

### **Completions Operations**

POCO’s completion operations utilize numerous BMPs and strategies to minimize odors as listed below.

1. During the hydraulic fracturing process, diesel-fueled equipment is placed in a way that exhausts are pointed straight up and not in the direction of any occupied buildings.
2. Tier II or Tier IV diesel engines are used during hydraulic fracturing operations where available.

### **Production Operations**

POCO’s production operations utilize the following BMPs and strategies to minimize odors.

1. During operations, tanks are sealed with a thief hatch to prevent emissions.
2. Emission Control Devices (Combustors) will be used to combust any flash gas from tanks.
3. During oil loadout operations, a Truck Loadout Vapor Recovery (TLVR) system will be used to capture and direct odorous air contaminants and emissions to a combustor.

### **Response Measures**

There are no Residential Building Units within 2,000 feet of the edge of working pad surface. The nearest RBU from the edge of working pad surface is to the east approximately 2,044’.

If an odor complaint is received, POCO will respond and evaluate the location to determine if the source of the odor is related to operations. POCO will respond and evaluate equipment and potential sources of odors to determine the root cause. If the odors are determined to be caused by POCO’s oil and gas operations, POCO will resolve the issue and remove odor causing equipment from service as soon as possible to ensure that all odors are minimized outside the boundaries of the oil and gas location.