



Oil and Gas Conservation Commission

SUNDRY NOTICE

Submit original plus one copy. This form is to be used for general, technical and environmental sundry information. For proposed or completed operations, describe in full on Technical Information Page (Page 2 of this form.) Identify well or other facility by API Number or by OGCC Facility ID. Operator shall send an informational copy of all sundry notices for wells located in High Density Areas to the Local Government Designee (Rule 603b.)



1. OGCC Operator Number: 72400	4. Contact Name: Dino Lombardi	Complete the Attachment Checklist OP OGCC
2. Name of Operator: Public Service Company of Colorado	Phone: 303-294-2158	
3. Address: 1800 Larimer Street City: Denver State: CO Zip: 80102	Fax: 303-294-2859	
5. API Number 05-	OGCC Facility ID Number 120141	Survey Plat
6. Well/Facility Name: Round UP Natural Gas Storage	7. Well/Facility Number pond permit # 119077	Directional Survey
8. Location (Qtr/Qt, Sec, Twp, Rng, Meridian): NW Sec 27; T2N; R60W of the 6th PM		Surface Eqpmt Diagram
9. County: Morgan	10. Field Name: Round Up Storage Unit	Technical Info Page
11. Federal, Indian or State Lease Number:		Other

General Notice

CHANGE OF LOCATION: Attach New Survey Plat (a change of surface qtr/qtr is substantive and requires a new permit)

Change of Surface Footage from Exterior Section Lines:		FNL/FSL		FEL/FWL
Change of Surface Footage to Exterior Section Lines:				
Change of Bottomhole Footage from Exterior Section Lines:				
Change of Bottomhole Footage to Exterior Section Lines:				attach directional survey

Bottomhole location Qtr/Qt, Sec, Twp, Rng, Mer
Latitude _____ Distance to nearest property line _____ Distance to nearest bldg, public rd, utility or RR _____
Longitude _____ Distance to nearest lease line _____ Is location in a High Density Area (rule 603b)? Yes/No
Ground Elevation _____ Distance to nearest well same formation _____ Surface owner consultation date: _____

GPS DATA:
Date of Measurement _____ PDOP Reading _____ Instrument Operator's Name _____

CHANGE SPACING UNIT
Formation _____ Formation Code _____ Spacing order number _____ Unit Acreage _____ Unit configuration _____

Remove from surface bond
Signed surface use agreement attached

CHANGE OF OPERATOR (prior to drilling):
Effective Date: _____
Plugging Bond: Blanket Individual

CHANGE WELL NAME NUMBER
From: _____
To: _____
Effective Date: _____

ABANDONED LOCATION:
Was location ever built? Yes No
Is site ready for inspection? Yes No
Date Ready for Inspection: _____

NOTICE OF CONTINUED SHUT IN STATUS
Date well shut in or temporarily abandoned: _____
Has Production Equipment been removed from site? Yes No
MIT required if shut in longer than two years. Date of last MIT _____

SPUD DATE: _____

REQUEST FOR CONFIDENTIAL STATUS (6 mos from date casing set)

SUBSEQUENT REPORT OF STAGE, SQUEEZE OR REMEDIAL CEMENT WORK *submit cbl and cement job summaries
Method used _____ Cementing tool setting/perf depth _____ Cement volume _____ Cement top _____ Cement bottom _____ Date _____

RECLAMATION: Attach technical page describing final reclamation procedures per Rule 1004.
Final reclamation will commence on approximately _____ Final reclamation is completed and site is ready for inspection.

Technical Engineering/Environmental Notice

Notice of Intent Approximate Start Date: August 2012

Report of Work Done Date Work Completed: _____

Details of work must be described in full on Technical Information Page (Page 2 must be submitted.)

<input type="checkbox"/> Intent to Recomplete (submit form 2)	<input type="checkbox"/> Request to Vent or Flare	<input type="checkbox"/> E&P Waste Disposal
<input type="checkbox"/> Change Drilling Plans	<input type="checkbox"/> Repair Well	<input type="checkbox"/> Beneficial Reuse of E&P Waste
<input type="checkbox"/> Gross Interval Changed?	<input type="checkbox"/> Rule 502 variance requested	<input type="checkbox"/> Status Update/Change of Remediation Plans
<input type="checkbox"/> Casing/Cementing Program Change	<input checked="" type="checkbox"/> Other: Close Evaporation Ponds - Cg for Spills and Releases	

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

Signed: Victor Quinonez Date: 8/3/2012 Email: victor.guimenez@xcel.energy.com
Print Name: Victor Quinonez Title: Director

COGCC Approved: [Signature] Title: Gas Ops. EPS Date: 8/14/12

CONDITIONS OF APPROVAL, IF ANY:

Submit final closure documentation via Form 27. SK



1800 Larimer Street
Denver, Colorado 80202-1414

August 3, 2012

Mr. John Axelson
Environmental Specialist
Colorado Oil and Gas Conservation Commission
1120 Lincoln, Suite 800
Denver, Colorado 80203

SUBJECT: Notice of the Closure of the Two Evaporation Ponds (COGCC Permit # 119077) at the Round Up Natural Gas Storage Facility (COGCC Facility ID# - 120141) near Wiggins, Colorado.

Dear Mr. Axelson:

Xcel Energy is providing this notification of the planned closure of the two evaporation ponds at the Round-Up Natural Gas Storage field, located approximately 8 miles south of the town of Wiggins in Morgan County, Colorado. The legal description for the facility is the northwest quarter of Section 27; T2N; R60W of the 6th Prime Meridian. The address of the site is 3064 Road I Wiggins, Colorado 80654.

If you have any questions regarding this information, please contact me at (303) 294-2158 or Xcel Energy's consultant, David C. Cloutier at (720) 974-0940.

Sincerely,

Dino V. Lombardi
Environmental Analyst V
Xcel Energy, Environmental Services

Enclosure



**CONESTOGA-ROVERS
& ASSOCIATES**

14998 West 6th Avenue, # 800
Golden, Colorado 80401
Telephone: (720) 974-0940
www.CRAworld.com

August 3, 2012

Mr. John Axelson
Environmental Specialist
Colorado Oil and Gas Conservation Commission
1120 Lincoln, Suite 800
Denver, Colorado 80203

Sent via electronic mail

Re: Notice of the Closure of the Two Evaporation Ponds (COGCC Permit # 119077) at the Round Up Natural Gas Storage Facility (COGCC Facility ID# - 120141) near Wiggins, Colorado.
CRA Project # 075855

Dear Mr. Axelson:

Conestoga-Rovers & Associates, Inc. (CRA) is providing this notification of the planned closure of the two subject evaporation ponds on behalf of Xcel Energy (Xcel), formerly known as Public Service Company of Colorado (PSCo). Xcel is engaged in a project to upgrade various components at the Round-Up Natural Gas Storage field, located approximately 8 miles south of the town of Wiggins in Morgan County, Colorado. The legal description for the facility is the northwest quarter of Section 27; T2N; R60W of the 6th Prime Meridian. Figure 1 shows the general site location.

The upgrade project consists of two phases. Phase 1, including the replacement of the gathering pipeline system, permitting a salt water disposal well (SWD), and other improvements, was completed in 2011. The Phase 2 construction, including the closure of the two lined produced water evaporation ponds and other system upgrades, will be completed in 2012.

In preparation for the pond closure construction activities, Xcel prepared a Sundry Notice and a Closure Plan summarizing the proposed pond closure construction activities and describing the procedures for collecting and analyzing soil samples to verify that the soil remaining at the site meets the applicable closure limits from COGCC Table 910-1. A copy of the Sundry Notice is included in Attachment 1. A copy of the Closure Plan is included in Attachment 2.

Please review the attached Sundry Notice/Notice of Intent and Closure Plan for the closure of the two evaporation ponds at the Round Up facility and contact the undersigned if you have any questions regarding our proposed approach. Xcel is prepared to commence the



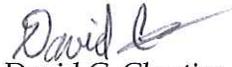
**CONESTOGA-ROVERS
& ASSOCIATES**

14998 West 6th Avenue, # 800
Golden, Colorado 80401
Telephone: (720) 974-0940
www.CRAworld.com

pond closure activities as soon as they receive your approval of the Closure Plan. If you have any questions regarding the proposed pond closure, please contact myself at (720) 974-0940 or Mr. Dino Lombardi (Xcel Environmental) at (303) 294-2158.

Sincerely,

Conestoga-Rovers & Associates, Inc.


David C. Cloutier
Senior Scientist


Brad Stephenson
Senior Hydrogeologist

Cc: Mr. John Crosthwait (without attachments)
attachments

Attachment 1
Sundry Notice of Intent



DE	ET	OE	ES

SUNDRY NOTICE

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1. OGCC Operator Number: <u>72400</u>	4. Contact Name <u>Dino Lombardi</u>	Complete the Attachment Checklist OP OGCC
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3. Address: <u>1800 Larimer Street</u> City: <u>Denver</u> State: <u>CO</u> Zip: <u>80102</u>	Fax: <u>303-294-2859</u>	
5. API Number <u>05-</u>	OGCC Facility ID Number <u>120141</u>	Survey Plat
6. Well/Facility Name: <u>Round UP Natural Gas Storage</u>	7. Well/Facility Number <u>pond permit # 119077</u>	Directional Survey
8. Location (Qtr/Qtr, Sec, Twp, Rng, Meridian): <u>NW Sec 27; T2N; R60W of the 6th PM</u>		Surface Eqpm Diagram
9. County: <u>Morgan</u>	10. Field Name: <u>Round Up Storage Unit</u>	Technical Info Page
11. Federal, Indian or State Lease Number: _____		Other

General Notice

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Change of Surface Footage to Exterior Section Lines:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Change of Bottomhole Footage from Exterior Section Lines:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Change of Bottomhole Footage to Exterior Section Lines:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Bottomhole location Qtr/Qtr, Sec, Twp, Rng, Mer _____
 Latitude _____ Distance to nearest property line _____ Distance to nearest bldg, public rd, utility or RR _____
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 Ground Elevation _____ Distance to nearest well same formation _____ Surface owner consultation date: _____

attach directional survey

GPS DATA:
 Date of Measurement _____ PDOP Reading _____ Instrument Operator's Name _____

CHANGE SPACING UNIT

Formation	Formation Code	Spacing order number	Unit Acreage	Unit configuration

Remove from surface bond
Signed surface use agreement attached

CHANGE OF OPERATOR (prior to drilling):
 Effective Date: _____
 Plugging Bond: Blanket Individual

CHANGE WELL NAME NUMBER
 From: _____
 To: _____
 Effective Date: _____

ABANDONED LOCATION:
 Was location ever built? Yes No
 Is site ready for inspection? Yes No
 Date Ready for Inspection: _____

NOTICE OF CONTINUED SHUT IN STATUS
 Date well shut in or temporarily abandoned: _____
 Has Production Equipment been removed from site? Yes No
 MIT required if shut in longer than two years. Date of last MIT _____

SPUD DATE: _____

REQUEST FOR CONFIDENTIAL STATUS (6 mos from date casing set)

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Method used	Cementing tool setting/perf depth	Cement volume	Cement top	Cement bottom	Date

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<input type="checkbox"/> Casing/Cementing Program Change	<input checked="" type="checkbox"/> Other: <u>Close Evaporation Ponds - Cg</u> for Spills and Releases	

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

Signed: Victor Quinonez
Print Name: Victor Quinonez

Date: 8/3/2012 Email: victor.quinonez@xcel-energy.com
Title: Director

COGCC Approved: _____ Title: GAS OPS. Date: _____

CONDITIONS OF APPROVAL, IF ANY:

Attachment 2
Closure Plan



CLOSURE PLAN FOR THE EVAPORATION PONDS AT THE ROUND-UP GAS STORAGE SITE

MORGAN COUNTY, COLORADO

Prepared For:

Xcel Energy - Denver, Colorado

**AUGUST 2012
REF. NO. 075855**

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FIGURE 1 GENERAL SITE LOCATION MAP

FIGURE 2 SITE MAP

LIST OF TABLES

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TABLE 1 COGCC TABLE 910-1

LIST OF APPENDICES

ATTACHMENT 1 XCEL GENERIC WORK PLAN FOR ROUND-UP FACILITY

**ATTACHMENT 2 APPLICABLE COGCC SERIES 900 RULES
FOR MANAGEMENT OF E&P WASTES**

1.0 INTRODUCTION

Xcel Energy (Xcel), formerly Public Service Company of Colorado (PSCo), is engaged in a project to upgrade various components at the Round-Up Gas Storage Facility near Wiggins, Colorado. One of the changes at the facility was to permit a salt water disposal well (SWD) at the facility for the disposal of the produced fluids. Now that the SWD well is available for disposal of produced fluids, the two lined evaporation ponds, located in the northeast $\frac{1}{4}$ of Section 27; Township 2 North; Range 60 West, are no longer needed and are scheduled to be closed this year. Figure 1 shows the General Site Location. Figure 2 is a Site Map showing the Evaporation Ponds and the facility office.

Xcel retained Conestoga-Rovers & Associates (CRA) to prepare this Closure Plan to address the verification sampling, documentation, and reporting for the closure of the two lined evaporation ponds at the Round Up facility. Xcel retained a separate contractor to complete the pond closure construction activities. This proposed Closure Plan summarizes Xcel's proposed approach to close the Evaporation Ponds (impoundment) in accordance with the applicable regulatory framework

1.1 BACKGROUND INFORMATION

The Evaporation Ponds were historically used as evaporation/retention impoundments for water recovered following natural gas injection into the storage cavern. The Evaporation Ponds were originally permitted in 1979 and the HDPE liner was installed in approximately 1986.

The upgrade project was initiated in 2011 and consists of two primary phases. The Phase 1 construction work was completed during the summer of 2011 and included the replacement of the pipeline gathering system and other improvements. The Phase 2 construction, including the closure of the two lined produced water evaporation ponds and other system upgrades, will be completed in 2012.

In preparation for the 2011 Phase 1 construction activities, Xcel prepared a generic Work Plan for soil sampling to characterize potential releases of produced water that could occur at the site during the construction activities for the replacement of the pipeline gathering system. The Work Plan describes the regulatory frame work for the site, the various potential sampling scenarios that could occur during the construction activities, the sampling frequency, and the required laboratory analyses. A copy of the generic Work Plan for the project is included in Attachment 1 for reference. Copies of applicable Colorado Oil and Gas Conservation Commission (COGCC) Series 900 Rules for E & P waste management and pond closure are included in Attachment 2.

In preparation for the Phase 2 pond closure activities Xcel prepared this Closure Plan to establish protocols for collection of pond closure verification soil samples from random locations underlying the ponds. The Closure Plan describes the environmental setting and the regulatory framework; summarizes the planned pond closure activities; identifies the compounds of concern listed in the COGCC Table 910-1; and defines the sampling procedures, locations, frequency, and laboratory analyses for the verification samples.

1.2 ENVIRONMENTAL SETTING

The Round-Up Natural Gas Storage facility is located on the eastern plains of Colorado at an elevation of approximately 4667 feet above mean sea level (amsl). The region receives approximately 15 inches of precipitation annually and is characterized by hot dry summers with occasional afternoon thunderstorms and cold winters with occasional blizzards. The ground surface is slightly rolling and slopes gently to the northeast towards Kiowa Creek which is located approximately 5 miles east of the facility.

The discussion of the geology and hydrogeology of the Roundup area provided below is based on drilling for the installation of several ground water monitoring wells at the facility in 1989. The surficial soils encountered at the Roundup facility consist of eolian deposits from ground the surface to a depth of approximately 35 feet below ground surface (bgs). At 35 feet the soils transition to fine to coarse grained alluvial deposits overlying the Pierre Shale bedrock. Bedrock was encountered at depths ranging from approximately 52 feet bgs to 65 feet bgs. Groundwater was encountered in the unconsolidated alluvial deposits overlying the Pierre Shale at depths ranging from 58 to 64 feet bgs. The groundwater flow direction is to the northeast toward Kiowa Creek.

The two evaporation ponds are located south of the compressor building at the main office for the facility. The ponds sit next to each other and each pond measures approximately 200 feet east to west by 100 feet north to south. The overall footprint cast by the liner for the two ponds measures approximately 260 feet north to south and 240 feet east to west. The HDPE liner and sub-grade perimeter drain system were reportedly installed in approximately 1989. Figure 2 is a Google Earth aerial image showing the evaporation ponds and the main office area.

1.3 REGULATORY FRAMEWORK

The COGCC has regulatory jurisdiction over oil and gas production, associated pits, ponds, and pit/pond waste in Colorado. This project will generally be regulated under the COGCC Series 900 Rules for management of E&P wastes, and more specifically

Rule 906 which provides reference guidelines for pond closures, impacted soil remediation and disposal of wastes, which are generated by oil and gas operators. Based on our experience, the COGCC requires that affected soil and ponds containing oil and gas wastes be remediated and closed in such a manner that the potential for future impacts to groundwater or the environment are minimized.

The Colorado Department of Public Health and Environment (CDPHE) has regulatory jurisdiction over storm water discharges from construction sites in Colorado that disturb more than one acre. Xcel prepared a Storm Water Pollution Prevention Plan (SWPPP) and obtained a Storm Water Discharge permit for the construction activities at the Round-Up Gas Storage Facility. Prior to beginning the ground-disturbing construction activities appropriate storm water prevention best management practices (BMPs) will be installed at the site as required by the SWPPP.

1.4 HEALTH AND SAFETY PLAN

CRA will prepare a project specific Health and Safety Plan (HASP) establishing safety protocols for the conduct of the sampling, documentation, and reporting activities associated with the closure of the two evaporation ponds at the Round-Up Gas Storage Facility. For the development of our HASP it is assumed that the construction activities will require the use of heavy equipment for the removal of the liner, excavating any impacted soil, removal of the berms, backfilling the pond and any excavated areas, and transporting the wastes generated by the construction to an approved disposal facility.

It is expected that the contractor retained by Xcel to complete the construction activities for the closure of the evaporation ponds will prepare a HASP establishing safety protocols and training requirements, as necessary for their employees and any subcontractors involved with the construction work. It is assumed that the HASP developed by the construction contractor will address heavy equipment and excavation operations, heavy truck traffic operations, personal protective equipment (ppe), air monitoring requirements, hand tool usage, excavation safety, and, considering the travel on county roads, will cover traffic awareness signage at the ingress/ egress points. In addition, it is expected that tailgate safety meetings will be conducted prior to the beginning of work each day and will include job safety analysis for specific work items.

2.0 PROPOSED CONSTRUCTION AND CLOSURE ACTIVITIES

Prior to initiating the evaporation pond closure activities, Xcel facility personnel will have removed all liquids and sediment from the pond as part of their normal operation and maintenance activities. The Xcel Waste Management Group will have managed the removal of the materials (both solids and liquids) and ensured that they were properly characterized and disposed of in accordance with Xcel's waste management protocols.

In general, Xcel plans to close the ponds by removing the liner, inspecting the underlying soil for indications of leaks (staining, wetness, odor), removing the impacted soil (if any), collecting verification soil samples of the clean underlying soil, using the soil in the berms to backfill the ponds (assuming it is clean) and returning the ground surface to the original grade. The following summarizes Xcel's proposed approach to closing the ponds.

2.1 INSTALL STORM WATER POLLUTION PREVENTION BMPS

Prior to initiating construction activities, BMPs will be installed at the site as required by the SWPPP to prevent potential pollutants from impacting storm water runoff from the construction area. The primary pollutant expected to potentially affect storm water runoff from the site is suspended sediment. Other chemicals that will be used and/ or stored on-site during various stages of the project include but are not limited to the following:

- 15W-40 and 10W-30 motor oils
- Unleaded Gasoline
- No.2 Diesel (On-road, low sulphur)
- Hydraulic fluid (10W)
- Chassis Lubricant (NGLI grease)

Erosion and sediment controls (hay bale filters/ dams and sediment/ silt fencing) will be implemented as appropriate to minimize potential pollutants from impacting storm water. In general, the control measures will be designed to minimize erosion and sedimentation by:

- Minimizing the quantity and duration of soil exposure;
- Protecting critical areas during construction by reducing the velocity of water and redirecting runoff;
- Inspecting construction sites and maintaining erosion and sediment controls, as necessary, until final stabilization is achieved; and
- Keeping the amount of soil tracked off-site by vehicles to a minimum.

2.2 DEWATERING AND STORMWATER REMOVAL

As mentioned above, the ponds will be emptied of liquids and sediment prior to initiating the pond closure activities. Subsequent removal of the accumulated rain water (if any) in the impoundment will be conducted, as needed, prior to and during construction activities. The water will be pumped out of the impoundment and either transported via piping to Xcel's onsite injection well or transported via truck to an approved disposal facility.

2.3 SEDIMENT REMOVAL

Prior to construction activities, accumulated sediments will be removed and disposed of in accordance with Xcel waste management procedures. Xcel will complete this activity as part of their normal operations and maintenance process.

2.4 LINER REMOVAL AND DISPOSAL

The existing liner will be cut into manageable pieces and collected using equipment and/ or labor, loaded, and disposed of at the closest approved disposal facility. If heavy equipment is used to help remove the liner it will not enter the ponds until after the underlying soil has been inspected for leaks. This will allow inspecting and documenting the condition of the soil underlying the liner prior to it becoming disturbed by vehicle traffic. If heavy equipment is used, it will remain outside of the pond and pull the liner out of the pond using appropriate lines or cables.

Recovered liner material designated for off-Site disposal and/ or off-site recycling will be transported in accordance with Xcel waste disposal protocols. Records of final disposition of the existing liner will be included in the final closure report.

2.5 CLOSURE ACTIVITIES

After the liner is removed the underlying soil will be inspected, remediated, and sampled as necessary to verify compliance with the COGCC closure limits in Table 910-1 as described in Section 3.0 below. For reference, a copy of COGCC Table 910-1 is attached. The following sections discuss the removal of impacted soil, utility decommissioning, and backfilling the impoundments.

2.5.1 REMOVAL OF IMPACTED SOIL

Soil that appears impacted (wetness, staining, odor, elevated PID) will be excavated, segregated from non-impacted soil, and temporarily placed on plastic sheeting adjacent

to the impoundments pending final disposition. The impacted soil pile will be sampled for waste characterization purposes and the material will be transported to an approved E & P waste disposal facility for disposal. If the impacted soil appears to extend to a depth greater than three feet below the base of the impoundment then the soil removal activities will cease and it will be necessary to assess the vertical extent of the impacted soil prior to further excavation. It is expected that such an assessment would be completed using a direct push soil sampling rig capable of sampling to depths of 60 feet bgs or more.

2.5.2 UTILITY DECOMMISSIONING

The closure of the ponds will include the decommissioning or removal and recycling (or disposal) of the existing conduit, piping, drain systems, pumps, panels, concrete debris, fencing, and any additional utilities or construction debris. Prior to removing any piping or structures, building material samples will be collected as appropriate and analyzed for lead and asbestos. All of the construction waste generated by the closure activities will be disposed of at the nearest approved facility in accordance with Xcel waste management policies. Records of the final disposition of the construction waste will be included in the final closure report.

2.5.3 BACKFILLING

Upon completion of the inspection, remediation (if any), sampling, and document activities the ponds will be backfilled by collapsing the soil in the berms (assuming the soil is clean) into the impoundment to bring the impoundment to grade. Xcel indicated that the material used to construct the berms was removed from the impoundment, so it is expected that there is sufficient soil available in the berms to backfill the impoundments. Once the impoundment is backfilled, the site will be graded to match the surrounding land surface. In the event additional soil is available the soil will be spread around the area and allow for future settling of the former impoundment. If additional fill material is needed, it will either transported to the Site from an off-site clean backfill source or generated from an on-Site borrow pit.

2.6 FINAL GRADING AND RE-VEGETATION ACTIVITIES

All disturbed areas including of the former impoundment will be graded to match the existing facility.

2.7 PROPOSED SCHEDULE

Based on our experience with similar projects, we estimate that the COGCC will approve the Closure Plan within 10 days. The inspection, sampling, and documentation activities will occur as the pond closure construction activities are underway so as to minimize delays in the pond closure work. Once the pond closure activities are complete it is expected that the draft Closure Report and all supporting documentation will be ready for review within 30 days (assuming all disposal manifests and transportation documents have been received).

3.0 CLOSURE DOCUMENTATION AND SAMPLING

The pond closure activities will be documented as described in the following sections.

3.1 LINER INSPECTION

After the ponds have been drained of all liquids Xcel will inspect the liner for tears or holes. Xcel will photograph any holes noted in the liner and also mark the location by measuring north and east from a reference stake that will be installed at the southeast corner of the ponds. After the liner inspection, the liner will be cut into strips, rolled up, and removed.

3.2 SOIL SAMPLING AND LABORATORY ANALYSIS

Once the liner is removed the soil underlying the liner will be inspected for indications of leaks (wetness, staining, and odor or PID) and the underlying soil will be photographed to document its appearance. Pond closure verification soil samples will then be collected from beneath the impoundment liner for analytical testing and evaluation. The sample locations will be determined by dividing the two ponds into a total of 12 equal-sized "cells" and one soil sample will be collected from near the mid-point of each cell. Samples will be collected at depths of 0-1 foot in areas not stained or saturated. In saturated or visually impacted areas the impacted soil will be removed to a depth of approximately 3 feet, and if the soil appears clean, a soil sample will be collected from 3-4 feet below ground surface.

Sampling personnel will wear new disposable nitrile gloves while handling the samples. It is expected that dedicated sampling tools will be utilized; therefore; no decon of sampling equipment will be necessary. However, if sampling equipment is reused, then appropriate decon procedures will be employed to ensure that the equipment is clean before each use. The soil samples will be collected at the designated locations using dedicated (or clean) sampling equipment that is appropriate for the sampling task.

Each soil sample will be placed in a sterile glass container equipped with a Teflon-lined lid furnished by the testing laboratory. Each container will be filled to capacity with soil to limit the amount of headspace present. A portion of each sample will be placed in a plastic zip-lock baggie for headspace screening with a photoionization detector (PID). All sample containers for laboratory analysis will be labeled, placed in an insulated cooler with ice under chain-of-custody. The cooler will be hand delivered to Accutest

Laboratory in Wheatridge, Colorado for laboratory testing for the compounds of concern from COGCC Table 910-1 including:

- Benzene, toluene, ethylbenzene, and xylenes (BTEX) by EPA Method 8260;
- Total petroleum hydrocarbons (TPH) gasoline range organics (GRO) by EPA Method 8015M;
- TPH diesel range organics (DRO) by EPA Method 8015M;
- Sodium Absorption ratio (SAR) by USDA Agricultural Handbook 60 method (20B);
- Electrical Conductivity (EC); and
- pH.

4.0 DOCUMENTATION AND REPORTING

A CRA Field Engineer or Project Manager will be on-site throughout the closure activities to monitor and document the closure activities and assist the construction manager with safety and compliance monitoring. The CRA staff will also maintain photographic documentation throughout the project. Site details indicating construction and disposition activities, sampling locations, analytical results, and field activity summaries will be presented in the final report. The report will also transmit the final disposition of all sediment and affected soil. The report will be available within 30 days of demobilization.

FIGURES

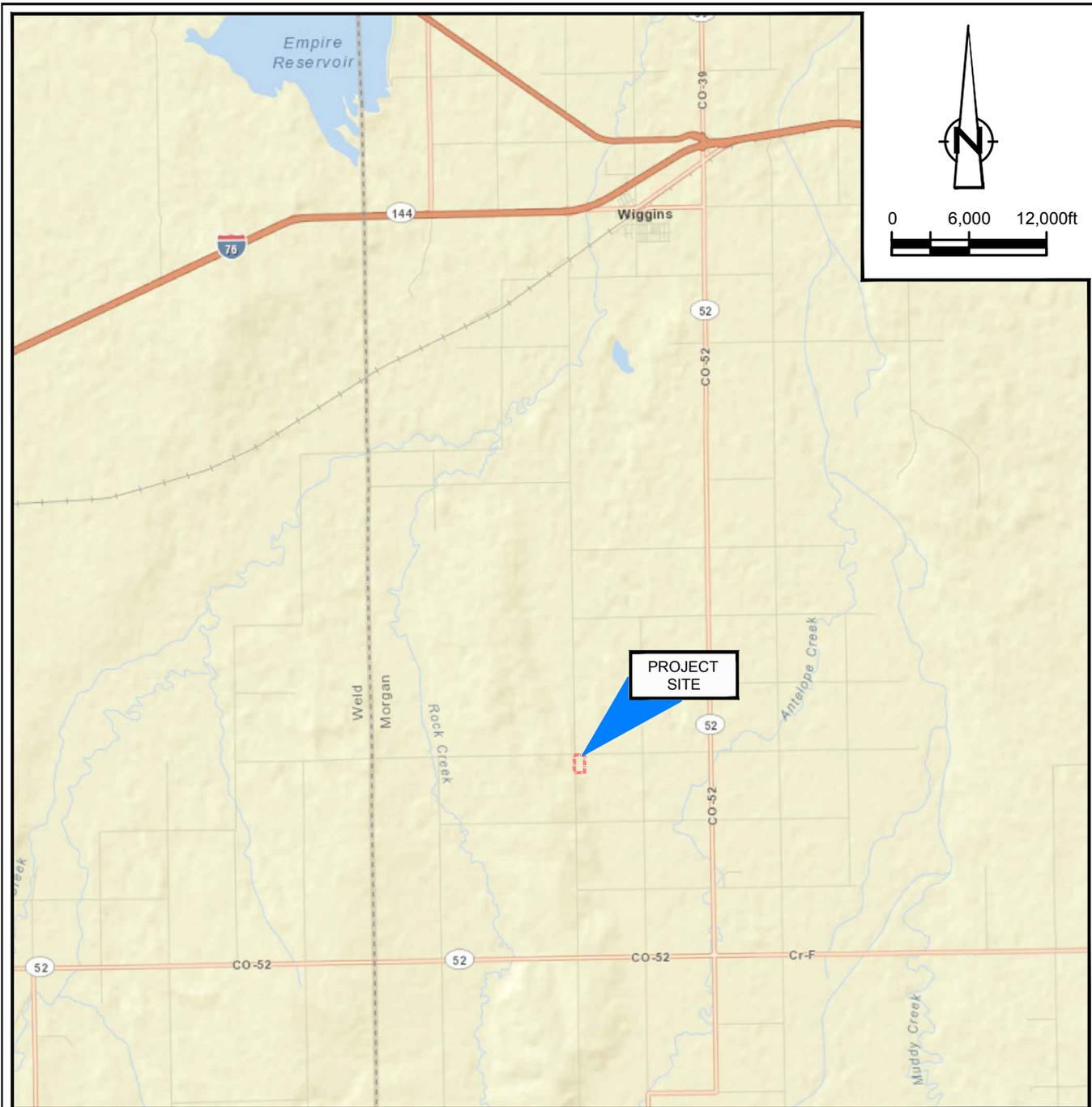
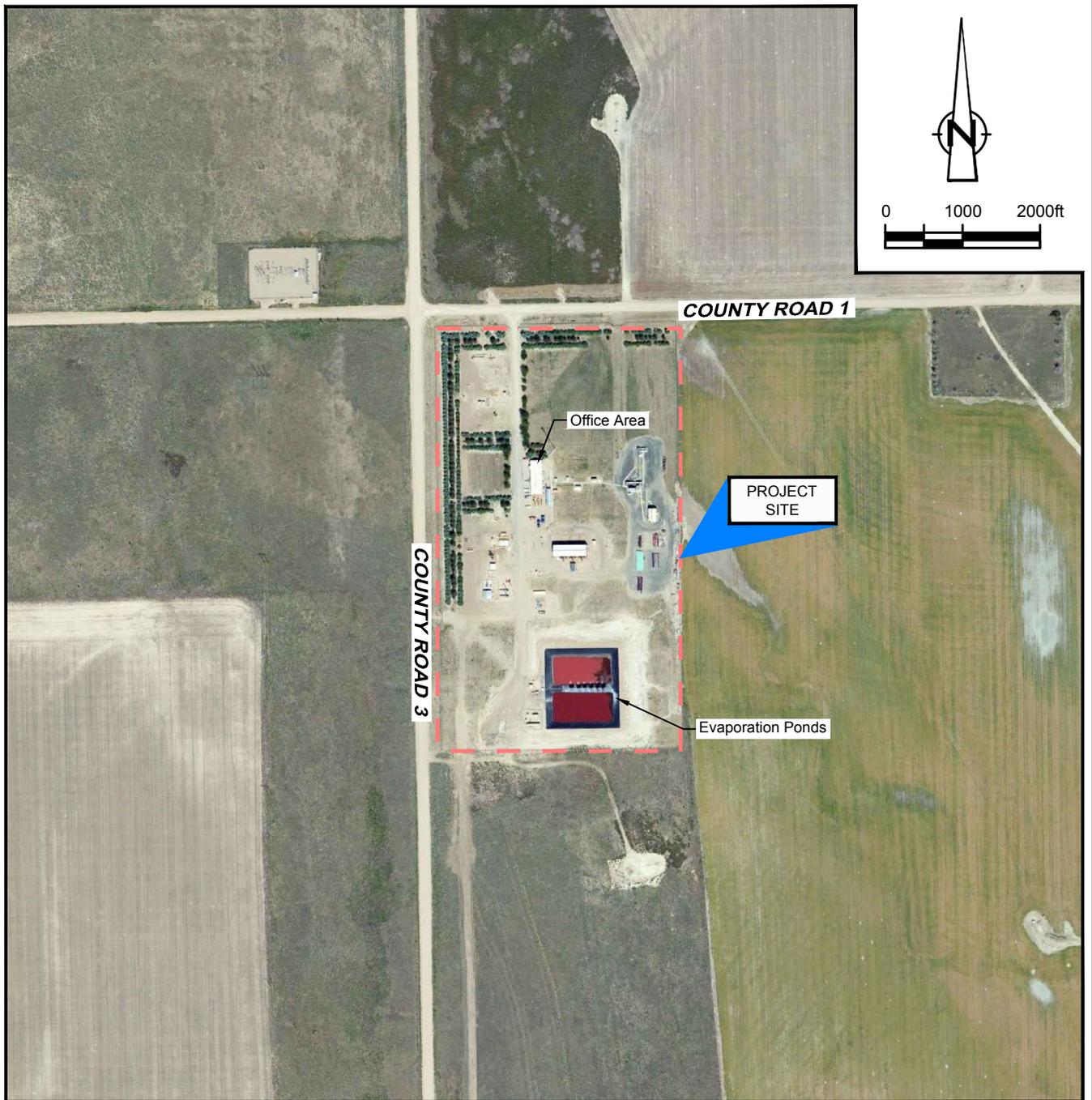


figure 1
 GENERAL SITE LOCATION
 ROUND-UP GAS STORAGE FIELD
 WIGGINS, COLORADO
Xcel Energy





LAT/LONG: 40.115° NORTH, 104.092° WEST
 COORDINATE: NAD83 DATUM, U.S. FOOT
 STATE PLANE ZONE - COLORADO NORTH

figure 2
 SAMPLING PLAN
 ROUND-UP GAS STORAGE FIELD
 WIGGINS, COLORADO
Xcel Energy



TABLES

**COGCC Table 910-1
CONCENTRATION LEVELS¹**

Contaminant of Concern	Concentrations
Organic Compounds in Soil	
TPH (total volatile and extractable petroleum hydrocarbons)	500 mg/kg
Benzene	0.17 mg/kg ²
Toluene	85 mg/kg ²
Ethylbenzene	100 mg/kg ²
Xylenes (total)	175 mg/kg ²
Acenaphthene	1,000 mg/kg ²
Anthracene	1,000 mg/kg ²
Benzo(A)anthracene	0.22 mg/kg ²
Benzo(B)fluoranthene	0.22 mg/kg ²
Benzo(K)fluoranthene	2.2 mg/kg ²
Benzo(A)pyrene	0.022 mg/kg ²
Chrysene	22 mg/kg ²
Dibenzo(A,H)anthracene	0.022 mg/kg ²
Fluoranthene	1,000 mg/kg ²
Fluorene	1,000 mg/kg ²
Indeno(1,2,3,C,D)pyrene	0.22 mg/kg ²
Napthalene	23 mg/kg ²
Pyrene	1,000 mg/kg ²
Organic Compounds in Ground Water	
Benzene	5 µg/l ³
Toluene	560 to 1,000 µg/l ³
Ethylbenzene	700 µg/l ³
Xylenes (Total)	1,400 to 10,000 µg/l ^{3,4}
Inorganics in Soils	
Electrical Conductivity (EC)	<4 mmhos/cm or 2x background
Sodium Adsorption Ratio (SAR)	<12 ⁵
pH	6-9
Inorganics in Ground Water	
Total Dissolved Solids (TDS)	<1.25 x background ³
Chlorides	<1.25 x background ³
Sulfates	<1.25 x background ³
Metals in Soils	
Arsenic	0.39 mg/kg ²
Barium (LDNR True Total Barium)	15,000 mg/kg ²
Boron (Hot Water Soluble)	2 mg/l ³
Cadmium	70 mg/kg ^{3,6}
Chromium (III)	120,000 mg/kg ²
Chromium (VI)	23 mg/kg ^{2,6}
Copper	3,100 mg/kg ²
Lead (inorganic)	400 mg/kg ²
Mercury	23 mg/kg ²
Nickel (soluble salts)	1,600 mg/kg ^{2,6}
Selenium	390 mg/kg ^{2,6}
Silver	390 mg/kg ²
Zinc	23,000 mg/kg ^{2,6}
Liquid Hydrocarbons in Soils and Ground Water	
Liquid hydrocarbons including condensate and oil	Below detection level

Notes:

COGCC recommends that the latest version of EPA SW 846 analytical methods be used where possible and that analyses of samples be performed by laboratories that maintain state or national accreditation programs.

¹ Consideration shall be given to background levels in native soils and ground water.

² Concentrations taken from CDPHE-HMWMD Table 1 Colorado Soil Evaluation Values (December 2007).

³ Concentrations taken from CDPHE-WQCC Regulation 41 - The Basic Standards for Ground Water.

⁴ For this range of standards, the first number in the range is a strictly health-based value, based on the WQCC's established methodology for human health-based standards. The second number in the range is a maximum contaminant level (MCL), established under the Federal Safe Drinking Water Act which has been determined to be an acceptable level of this chemical in public water supplies, taking treatability and laboratory detection limits into account. The WQCC intends that control requirements for this chemical be implemented to attain a level of ambient water quality that is at least equal to the first number in the range except as follows: 1) where ground water quality exceeds the first number in the range due to a release of contaminants that occurred prior to September 14, 2004 (regardless of the date of discovery or subsequent migration of such contaminants) clean-up levels for the entire contaminant plume shall be no more restrictive than the second number in the range or the ground water quality resulting from such release, whichever is more protective, and 2) whenever the WQCC has adopted alternative, site-specific standards for the chemical, the site-specific standards shall apply instead of these statewide standards.

⁵ Analysis by USDA Agricultural Handbook 60 method (20B) with soluble cations determined by method (2). Method (20B) = estimation of exchangeable sodium percentage and exchangeable potassium percentage from soluble cations. Method (2) = saturated paste method (note: each analysis requires a unique sample of at least 500 grams). If soils are saturated, USDA Agricultural Handbook 60 with soluble cations determined by method (3A) saturation extraction method.

⁶ The table value for these inorganic constituents is taken from the CDPHE-HMWMD Table 1 Colorado Soil Evaluation Values (December 2007). However, because these values are high, it is possible that site-specific geochemical conditions may exist that could allow these constituents to migrate into ground water at levels exceeding ground water standards even though the concentrations are below the table values. Therefore, when these constituents are present as contaminants, a secondary evaluation of their leachability must be performed to ensure ground water protection.

ATTACHMENT 1

XCEL GENERIC WORK PLAN FOR ROUND-UP FACILITY

GENERIC WORK PLAN FOR PRODUCED WATER RELEASES ROUNDUP OPERATIONS

1.0 INTRODUCTION

This work plan was developed as a guide for evaluation and documentation of potential spills or releases and for the management of potentially impacted media that may be generated during the assessment and cleanup of a spill or release. Please note that the Xcel Environmental Policy and Services representative must immediately be notified of all spills or releases that occur or are encountered during the performance of the work activities.

1.1 Regulatory Obligation

Per section 906 of Colorado Oil and Gas Conservation Commission (COGCC)

“Spills/releases of E&P waste, including produced fluids, shall be controlled and contained immediately upon discovery to protect the environment, public health, safety, and welfare, and wildlife resources. Impacts resulting from spills/releases shall be investigated and cleaned up as soon as practicable.”

Although there is no specific release/spill volume specified, the impact from any spill/release must be investigated relative to contaminants of concern and concentrations specified in Rule 910, Table 910-1. Reporting to COGCC is required for:

- Spill/release of 5 barrels (210 gallons), using Form 19.
- Spill/releases of 20 barrels (840 gallons), verbal report to COGCC within 24-hrs and written report within 10-days using Forms 19 and 27.
- Spill/release with impact or threat to waters of the state, residence or occupied structure, livestock or public byway, verbal report to COGCC within 24-hrs and written report within 10-days using Forms 19. Water of the State includes surface water, ground water and dry gullies or storm sewers leading to surface water.
- Spill/release with impact or threat to surface water supply area reported immediately to COGCC and CDPHE Release/Incident Hotline.

Excerpts of the rule are contained in Attachment 1.

1.2 Roundup Operations Area Geology/Hydrogeology

The geology and hydrogeology of the area around Roundup is based on ground water monitoring wells installed at the facility in 1989. The area is underlain by dune sands and alluvium (sand, clay, silt and conglomerate), which overlie the Pierre Shale. At the Roundup facility eolian deposits were encountered from ground surface to 35 feet, with alluvial deposits below 35 feet consisting of finer to coarse grained deposits with gravel lenses. Ground water was encountered at depths of ranging from 58 to 64 feet below grade in unconsolidated deposits over the Pierre Shale. Pierre shale was encountered as shallow as 52 feet at one location. Groundwater flow direction was to the northeast toward Kiowa Creek.

This document provides an overview of actions to take and guidelines for:

- Initial Assessment and Response
- Initial Site Investigation

- Expanded Site Investigation
- Remediation/Cleanup Objectives
- Waste Management

Each spill/release will be evaluated on a case-by-case basis. This document only provides general guidelines for Xcel Energy response planning.

1.3 Leak Prevention During Water Line Cuts

Precautions to prevent leaks during water line cuts shall be taken. Plan on some type of containment basin under each cut and or have rags and duct tape available to plug the pipe(s) and tape it off if water starts leaking out. We understand that the line will have been purged, however, being prepared to handle liquids prior to each cut can eliminate cleanup and or any reporting of releases. Note that Roundup Operations has a drip truck to assist with the management of any liquids that may be encountered.

2.0 INITIAL ASSESSMENT AND RESPONSE

The actions below are the responsibility of Roundup facility personnel. These should be conducted immediately upon recognition of potential spill/release of condensate, produced water, or produced water with hydrocarbons.

- Locate and stop the source of spill/release.
- Visual inspection of area for hydrocarbon staining or other visual impacts.
- Secure the area.
- Map and photo document the release/spill area to demonstrate general conditions of the area including visual extent of impacted area, what is impacted, accessibility, and safety measures put in place.
- Start completion of the Environmental Incident Report.
- Identify if we have results of produced water from associated well or lateral.
- Contact Environmental Services Representative Dino V. Lombardi at (303) 294-2158 ES Pager (303) 556-1244, to determine reporting and discuss next steps for assessment and response to the spill/release.
- Contact Xcel's Claims Department if property other than Xcel property was impacted by the spill/release.
- Contact landowner of the affected property.

2.1 Initial Site Investigation

The Initial Site Investigation will be conducted to evaluate the concentrations of impact to surface (0-1-ft), near surface (1-ft to 3-ft), and subsurface (>3-ft) soils horizons within the visually defined spill/release area. The number of samples to be collected will vary depending on the 'footprint' of the spill/release area.

- Collection of soil samples. Assume minimum 3 samples per impacted soil horizon. Table 1 provides a summary of potential sample scenarios and guidelines to determine number of

samples to be collected and approximate locations within the visually impacted spill/release area. These are BMP recommendations as the Rule does not prescribe the number of samples to be collected to characterize a spill/release.

- Soil samples may be collected by potholing with shovel or backhoe, hand auger or other mechanical means depending on surface and near surface conditions, and what method is most amenable to those conditions.
- Soil samples need to be analyzed for those parameters identified in Table 2 [based on COGCC Rule 910.b(3)E].
- Submit samples within 24 hrs of sample collection, to Accutest in Wheat Ridge Colorado, 4036 Youngfield, Wheat Ridge CO 80033, 303 425 6021.
- Compare data against the concentrations identified in Rule 910, Table 910-1 (Refer to Table 2), to determine need for Expanded Site Investigation or potential to proceed with remediation/clean-up and confirmation sampling.

2.2 Expanded Site Investigation

An Expanded Site Investigation would be conducted should the concentrations exceed the Table 910 thresholds, or if the extent of the contamination was not identified during the Initial Site Investigation. The Expanded Site Investigation must be conducted to characterize the vertical and horizontal extent of impact [909.b(5)], and the concentrations of impact to surface (0-1-ft), near surface (1-ft to 3-ft), and subsurface (>3-ft) soils within the visually defined spill/release area. The number of samples to be collected will vary depending on the 'footprint' of the spill/release area.

- Collection of soil samples. Assume minimum 3 samples per impacted soil horizon plus minimum of 3 confirmation samples in the 3-6-inch interval below the lowest impacted soil horizon. Table 1 provides a summary of potential sample scenarios and guidelines to determine number of samples to be collected and approximate locations. These are BMP recommendations as the standard does not prescribe the number of samples to be collected to characterize a spill/release.
- Soil samples may be collected through potholing with a back hoe, hand auger or mechanical means such as an auger drill rig or Geoprobe.
- Soil samples need to be analyzed for those parameters identified in Table 2 [based on COGCC Rule 910.b(3)E].
- Submit samples within 24 hrs of sample collection, to Accutest in Wheat Ridge Colorado, 4036 Youngfield, Wheat Ridge CO 80033, 303 425 6021.
- Compare data against the concentrations identified in Rule 910, Table 910-1 (Refer to Table 2), to determine remediation/clean-up requirements.

3.0 REMEDIATION/CLEANUP OBJECTIVE

Except for activities required to stop or contain a release or spill, no remediation activities should be implemented without the authorization of the Xcel Environmental Policy and Services representative. All remediation activities must be in accordance with COGCC Rule 909.b(5)

Remediation shall be performed in a manner to mitigate, remove, or reduce contamination that exceeds the concentrations in Table 910-1 in order to ensure protection of public health, safety, and welfare, and to prevent and mitigate significant

adverse environmental impacts. Soil that does not meet concentrations in Table 910-1 shall be remediated.

Remediation will include

- The removal of visually impacted soils or to the extent of the results of the Expanded Site Investigation.
- If depth allows incorporate a layer of more dense material in the 4-5 ft below grade depth to minimize potential of salts from produce water wicking back to the surface through evapotranspiration.
- Backfill of the remediated area with similar material or as identified by the landowner.

If contaminants of concern do not exceed Table 910-1, Xcel Energy will at a minimum remove any stained soils plus an additional 6-inches. Confirmation samples will be collected at the lowest depth from a minimum of 3 locations using criteria in Table 1, for analytes identified in Table 2 (consistent with Table 910-1). Additional action may be required if crop damage is identified at a later date.

4.0 WASTE MANAGEMENT

The various waste materials generated by the assessment and cleanup activities may be characterized as E&P waste, hazardous waste, or other solid waste. Waste profiling will be dependent on the laboratory results for samples and the type of material.

Kim Montgomery in Environmental Services 303 628 2829 will provide support for waste profiling, identification of disposal facility, and waste hauling.

Waste hauling could involve drums of waste staged at Roundup, or for larger spills direct haul to a disposal facility.

Please note that some types of wastes that could be encountered require special management including materials that may contain asbestos, chlorinated solvents, polychlorinated biphenyls, mercury, and lead. If it is suspected that these types of materials are encountered in the course of the assessment activities, cleanup operations, or during the demolition of existing structures (or equipment), then work must stop and Xcel Environmental must be contacted immediately.

Table 1 – Sample Scenarios

Spill/Release Area Configuration	Impacted Area	Guidance on No. of Samples to Collect
Spread along borrow ditch or crop rows	<100 linear ft, 1-2-ft width	<p>Characterization: Sample per impacted soil sample horizon (Note A) - approximately every 35 feet, minimum 3 samples per impacted soil horizon. May also collect biased sample for worst case assessment e.g., where ponding might have been observed, heaviest staining, or initial spot where liquids surfaced.</p> <p>Confirmation: Collect minimum of 3 confirmation samples from zone 3-6-inches below lowest impacted soil horizon, and 2 samples from the horizontal extent of the impacted soil horizon.</p>
Spread along borrow ditch or crop rows	>100 linear ft, 1-2-ft width	<p>Characterization: Sample per impacted soil sample horizon (Note A) – at every 60-ft, minimum 3 samples per impacted soil horizon. May also collect biased sample for worst case assessment e.g., where ponding might have been observed heaviest staining, or initial spot where liquids surfaced.</p> <p>Confirmation: Collect minimum of 3 confirmation samples from zone 3-6-inches below lowest impacted soil horizon, and 2 samples from the horizontal extent of the impacted soil horizon.</p>
Spread in circular or rectangular configuration	< 1000 sq ft	<p>Characterization: Sample per impacted soil sample horizon (Note A) – establish 4 cell grid evenly distributed over the visually impacted spill/release area. Collect samples from the center of each grid. May also collect biased sample for worst case assessment, e.g., where ponding might have been observed heaviest staining, or initial spot where liquids surfaced.</p> <p>Confirmation: Collect minimum of 3 confirmation samples from zone 3-6-inches below lowest impacted soil horizon, and 2 samples from the horizontal extent of the impacted soil horizon.</p>
Spread in circular or rectangular configuration	> 1000 sq ft	<p>Characterization: Sample per impacted soil sample horizon (Note A) – establish grid with cells covering approximately 333-1000 sq ft over the area, collect samples from the center of each grid cell, with a minimum of 3 samples from each impacted soil horizon. May also collect biased sample for worst case assessment, e.g., where ponding might have been observed heaviest staining, or initial spot where liquids surfaced.</p> <p>Confirmation: Collect minimum of 3 confirmation samples from zone 3-6-inches below lowest impacted soil horizon, and 4 samples from each edge of the horizontal extent of the impacted soil horizon.</p>

Note A - Soil sampling horizons surface (0-1-ft), near surface (1-ft to 3-ft), and subsurface (>3-ft) soils within the visually identified spill/release area. Samples for EC, SAR and pH do not need to be collected for impacts below 5-ft below grade.

Table 2 – Contaminants of Concern and Analytical

Contaminants of Concern	Concentrations	Container Type	Est. Unit Cost	
Organic Compounds in Soil				
TPH (total volatile and extractable petroleum hydrocarbons) [EPA Method 8015M]	500 mg/kg	4-oz glass, wide-mouth, Cool to 4°C, 14 days	\$95	
Benzene [EPA Method 8021]	0.17 mg/kg			
Toluene [EPA Method 8021]	85 mg/kg			
Ethylbenzene [EPA Method 8021]	100 mg/kg			
Xylenes Total [EPA Method 8021]	175 mg/kg			
Contaminants of Concern				
Inorganics in Soils				
Electrical Conductivity (EC)	<4 mmhos/cm or 2x background	16-oz glass, wide-mouth, Cool to 4°C, 30 days	\$20	
Sodium Adsorption Ratio (SAR)	<12 ^s		<u>SAR hold: 14 days</u>	\$116
pH	6-9		<u>pH Hold: <24 hrs</u>	\$20

^s Analysis by USDA Agricultural Handbook 60 method (20B) with soluble cations determined by method (2). Method (20B) = estimation of exchangeable sodium percentage and exchangeable potassium percentage from soluble cations. Method (2) = saturated paste method (note: each analysis requires a unique sample of at least 500 grams). If soils are saturated, USDA Agricultural Handbook 60 with soluble cations determined by method (3A) saturation extraction method.

Turnaround 10-working days

Rapid Turnaround: 3-5 day - 50% surcharge, 6-9 day - 25% surcharge

ATTACHMENT 2

**APPLICABLE COGCC SERIES 900
RULES FOR MANAGEMENT OF E&P WASTE**

E&P WASTE MANAGEMENT

Applicable excerpts for release response

OCGCC 900 Series Rules, April 2009

901. INTRODUCTION

a. **General.** The rules and regulations of this series establish the permitting, construction, operating and closure requirements for pits, methods of E&P waste management, procedures for spill/release response and reporting, and sampling and analysis for remediation activities.

906. SPILLS AND RELEASES

a. **General.** Spills/releases of E&P waste, including produced fluids, shall be controlled and contained immediately upon discovery to protect the environment, public health, safety, and welfare, and wildlife resources. Impacts resulting from spills/releases shall be investigated and cleaned up as soon as practicable. The Director may require additional activities to prevent or mitigate threatened or actual significant adverse environmental impacts on any air, water, soil or biological resource, or to the extent necessary to ensure compliance with the concentration levels in Table 910-1, with consideration to WQCC ground water standards and classifications.

b. Reportable spills and reporting requirements for spills/releases.

- (1) Spills/releases of E&P waste or produced fluid exceeding five (5) barrels, including those contained within lined or unlined berms, shall be reported on COGCC Spill/Release Report, Form 19.
- (2) Spills/releases which exceed twenty (20) barrels of an E&P waste shall be reported on COGCC Spill/Release Report, Form 19, and shall also be verbally reported to the Director as soon as practicable, but not more than twenty-four (24) hours after discovery.
- (3) Spills/releases of any size which impact or threaten to impact any waters of the state, residence or occupied structure, livestock, or public byway shall be reported on COGCC Spill/Release Report, Form 19, and shall also be verbally reported to the Director as soon as practicable, but not more than twenty-four (24) hours, after discovery.
- (4) Spills/releases of any size which impact or threaten to impact any surface water supply area shall be reported to the Director and to the Environmental Release/Incident Report Hotline (1-877-518-5608). Spills and releases that impact or threaten a surface water intake shall be verbally reported to the emergency contact for that facility immediately after discovery.
- (5) For all reportable spills, operators shall submit a Spill/Release Report, Form 19, within ten (10) days after discovery. An 8 1/2 x 11 inch topographic map showing the governmental section and location of the spill shall be included. Such report shall also include information relating to initial mitigation, site investigation, and remediation. The Director may require additional information.
- (6) Chemical spills and releases shall be reported in accordance with applicable state and federal laws, including the Emergency Planning and Community Right-to-Know Act, the Comprehensive Environmental Response, Compensation, and Liability Act, the Oil Pollution Act, and the Clean Water Act, as applicable.

d. **Remediation of spills/releases.** When threatened or actual significant adverse environmental impacts on any air, water, soil or other environmental resource from a spill/release exists or when necessary to ensure compliance with the concentration levels in Table 910-1, with consideration to WQCC ground water standards and classifications, the Director may require operators to submit a Site Investigation and Remediation Workplan, Form 27. Such spills/releases shall be remediated in accordance with Rules 909. and 910.

909. SITE INVESTIGATION, REMEDIATION, AND CLOSURE

a. **Applicability.** This section applies to the closure and remediation of pits other than drilling pits constructed pursuant to Rule 903.a.(3); investigation, reporting and remediation of spills/releases; permitted waste management facilities including treatment facilities; plugged and abandoned wellsites; sites impacted by E&P waste management practices; or other sites as designated by the Director.

b. General site investigation and remediation requirements.

- (2) **Sampling and analyses.** Sampling and analysis of soil and ground water shall be conducted in accordance with Rule 910 to determine the horizontal and vertical extent of any contamination in excess of the concentrations in Table 910-1.
- (3) **Management of E&P waste.** E&P waste shall be managed in accordance with Rule 907.
- (5) **Remediation.** Remediation shall be performed in a manner to mitigate, remove, or reduce contamination that exceeds the concentrations in Table 910-1 in order to ensure protection of public health, safety, and welfare, and to prevent and mitigate significant adverse environmental impacts. Soil that does not meet concentrations in Table 910-1 shall be remediated. Ground water that does not meet concentrations in Table 910-1 shall be remediated in accordance with a Site Investigation and Remediation Workplan, Form 27.

910. CONCENTRATIONS AND SAMPLING FOR SOIL AND GROUND WATER

a. **Soil and groundwater concentrations.** The concentrations for soil and ground water are in Table 910-1. Ground water standards and analytical methods are derived from the ground water standards and classifications established by WQCC.

b. Sampling and analysis.

- (2) **Methods for sampling and analysis.** Sampling and analysis for site investigation or confirmation of successful remediation shall be conducted to determine the nature and extent of impact and confirm compliance with appropriate concentration levels in Table 910-1.

B. **Sample collection.** Samples shall be collected, preserved, documented, and shipped using standard environmental sampling procedures in a manner to ensure accurate representation of site conditions.

C. **Laboratory analytical methods.** Laboratories shall analyze samples using standard methods (such as EPA SW-846 or API RP-45) appropriate for detecting the target analyte. The method selected shall have detection limits less than or equal to the concentrations in Table 910-1.

- (3) **Soil sampling and analysis.**

A. **Applicability.** If soil contamination is suspected or known to exist as a result of spills/releases or E&P waste management, representative samples of soil shall be collected and analyzed in accordance with this rule.

B. **Sample collection.** Samples shall be collected from areas most likely to have been impacted, and the horizontal and vertical extent of contamination shall be determined. The number and location of samples shall be appropriate to the impact.

C. **Sample analysis.** Soil samples shall be analyzed for contaminants listed in Table 910-1 as appropriate to assess the impact or confirm remediation. The analytical parameters shall be selected based on site-specific conditions and process knowledge and shall be agreed to and approved by the Director.

D. **Reporting.** Soil Analysis Report, Form 24, shall be used when the Director requires results of soil analyses.

E. **Soil impacted by produced water.** For impacts to soil due to produced water, samples from comparable, nearby non-impacted native soil shall be collected and analyzed for purposes of establishing background soil conditions including pH and electrical conductivity (EC). Where EC of the impacted soil exceeds the level in Table 910-1, the sodium adsorption ratio (SAR) shall also be determined. XCEL NOTE – From 2010 release received clarification from OGCC could sample EC, pH and SAR in place of trying to establish background.

F. **Soil impacted by hydrocarbons.** For impacts to soil due to hydrocarbons, samples shall be analyzed for TPH.

**Table 910-1
CONCENTRATION LEVELS¹**

Organic Compounds in Soil	
TPH (total volatile and extractable petroleum hydrocarbons) [EPA Method 8015M]	500 mg/kg
Benzene [EPA Method 8021]	0.17 mg/kg
Toluene [EPA Method 8021]	85 mg/kg
Ethylbenzene [EPA Method 8021]	100 mg/kg
Xylenes Total [EPA Method 8021]	175 mg/kg

Concentrations taken from CDPHE-HMWMD Table 1 Colorado Soil Evaluation Values (December 2007).

Inorganics in Soils	
Electrical Conductivity (EC)	<4 mmhos/cm or 2x background
Sodium Adsorption Ratio (SAR)	<12⁵
pH	6-9

⁵ Analysis by USDA Agricultural Handbook 60 method (20B) with soluble cations determined by method (2). Method (20B) = estimation of exchangeable sodium percentage and exchangeable potassium percentage from soluble cations. Method (2) = saturated paste method (note: each analysis requires a unique sample of at least 500 grams). If soils are saturated, USDA Agricultural Handbook 60 with soluble cations determined by method (3A) saturation extraction method.