

State of Colorado
Oil and Gas Conservation Commission

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



FOR OGCC USE ONLY

REM 5614
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SITE INVESTIGATION AND REMEDIATION WORKPLAN

This form shall be submitted to the Director for approval prior to the initiation of site investigation and remediation activities. Form 27 is intended to be used whenever possible. Additional documentation will be required when large volumes of soil and groundwater have been impacted or involve large facilities with multiple source areas. See Rule 910. Attach as many pages as needed to fully describe the proposed work.

CAUSE OF CONDITION BEING INVESTIGATED AND REMEDIATED

☐ Spill or Release ☐ Plug & Abandon ☐ Central Facility Closure ☐ Site/Facility Closure ☒ Other (describe): INTERIM DRILL PIT CLOSURE

OGCC Operator Number: 10200

Name of Operator: PETROHUNTER OPERATING COMPANY

Address: 1600 STOUT STREET SUITE 2000

City: DENVER State: CO Zip: 80202

Contact Name and Telephone:

PAUL MANISCALCO

No: 303 572 8900

Fax: _____

API Number: 05 103 10973 00

County: RIO BLANCO

Facility Name: _____

Facility Number: 288675

Well Name: LAKE

Well Number: 6-21

Location: (QtrQtr, Sec, Twp, Rng, Meridian): SESE 21 1N 95W 6PM Latitude: 40.03649 Longitude: -108.0498

TECHNICAL CONDITIONS

Type of Waste Causing Impact (crude oil, condensate, produced water, etc): DRILL CUTTINGS - INTERIM CLOSURE

Site Conditions: Is location within a sensitive area (according to Rule 901e)? ☐ Y ☒ N If yes, attach evaluation.

Adjacent land use (cultivated, irrigated, dry land farming, industrial, residential, etc.): OPEN RANGE

Soil type, if not previously identified on Form 2A or Federal Surface Use Plan: RIO BLANCE 34 FORELLE LOAM

Potential receptors (water wells within 1/4 mi, surface waters, etc.): POWELL PARK DITCH

Description of Impact (if previously provided, refer to that form or document):

Impacted Media (check):

☐

Soils

Extent of Impact:

SEE ATTACHED

How Determined:

☐

Vegetation

☐

Groundwater

☐

Surface Water

REMEDIATION WORKPLAN

Describe initial action taken (if previously provided, refer to that form or document):

SEE ATTACHED

Describe how source is to be removed:

SEE ATACHED

Describe how remediation of existing impacts is to be accomplished, including removal and disposal at an injection well or licensed facility, land treatment on site, removal of impacted groundwater, insitu bioremediation, burning of oily vegetation, etc.:

SEE ATTACHED



Tracking Number: _____
Name of Operator: _____
OGCC Operator No: _____
Received Date: _____
Well Name & No: _____
Facility Name & No: _____

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REMEDIATION WORKPLAN (Cont.)

OGCC Employee: _____

If groundwater has been impacted, describe proposed monitoring plan (# of wells or sample points, sampling schedule, analytical methods, etc.):

SEE ATTACHED

Describe reclamation plan. Discuss existing and new grade recontouring; method and testing of compaction alleviation; and reseeding program, including location of new seed, seed mix and noxious weed prevention. Attach diagram or drawing. Use additional sheet for description if required.

SEE ATTACHED

Attach samples and analytical results taken to verify remediation of impacts. Show locations of samples on an onsite schematic or drawing.

Is further site investigation required? ☐ Y ☐ N If yes, describe:

SEE ATTACHED

Final disposition of E&P waste (landtreated and disposed onsite, name of licensed disposal facility, recycling, reuse, etc.):

SEE ATTACHED

IMPLEMENTATION SCHEDULE

Date Site Investigation Began: _____ Date Site Investigation Completed: _____ Date Remediation Plan Submitted: _____
Remediation Start Date: _____ Anticipated Completion Date: _____ Actual Completion Date: _____

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

Print Name: _____ Signed: _____

Title: _____ Date: _____

OGCC Approved: *Chris Camfield* Title: FOR Chris Camfield Date: Feb 25, 2011
EPS NW Region



Tracking Number: _____
Name of Operator: _____
OGCC Operator No: _____
Received Date: _____
Well Name & No: _____
Facility Name & No: _____

Page 2

REMEDIATION WORKPLAN (Cont.)

OGCC Employee: _____

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SEE ATTACHED

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SEE ATTACHED

Final disposition of E&P waste (landtreated and disposed onsite, name of licensed disposal facility, recycling, reuse, etc.):

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Date Site Investigation Began: _____ Date Site Investigation Completed: _____ Date Remediation Plan Submitted: _____
Remediation Start Date: _____ Anticipated Completion Date: _____ Actual Completion Date: _____

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

Print Name: _____ Signed: _____

Title: _____ Date: _____

OGCC Approved: _____ Title: _____ Date: _____

February 8, 2011

Colorado Oil and Gas Conservation Commission (COGCC)
Attn.: Mr. Chris Canfield, Northwest Region Environmental Protection Specialist
707 Wapiti Court, Suite 204
Rifle, Colorado 81650

Subject: Proposed Work Plan for the Interim Closure of a Drill-Cutting Pit
Well Name: Lake 16-21
API No.: 05-103-10973-00
Physical Location: SE SE Section 21, T1N, R95W, 6PM
Walter Project No.: 242-04-001

Dear Chris,

Walter Environmental Group, Inc. (Walter) was contracted by PetroHunter Operating Company (PetroHunter) to prepare a Work Plan for the interim closure of the drill-cutting pit associated with the Lake 16-21 well, located in the SE1/4 of the SE1/4 of Section 21, Township 1 North, Range 95 West, of the 6th P.M. (Latitude/Longitude: 40.03649/-108.0498) (Figure 1). The purpose of this letter is to obtain COGCC approval to implement the proposed interim closure work plan. The following paragraphs summarize the regulatory history, site setting, and proposed work plan.

Regulatory History

A routine site inspection was conducted by COGCC staff on May 24, 2010. Following the site inspection, a Notice of Alleged Violation was issued. According to the Notice of Alleged Violation, the following issues were documented:

- Trash was observed on location;
- Cellar of the well was full of fluid;
- Hydrocarbons were observed on the surface of the drilling cutting pit;
- Drilling permit expired past the 3 month allowance to reclaim drilling pits on crop land;
- Production pit did not have any netting as per the drilling permit;
- Sign at entrance of location was lying down and provided inadequate information; and
- Required signs were missing from the wellhead.

Site housekeeping issues have been (or will be) addressed by PetroHunter, this work plan addresses the drill-cutting pit closure issue.

Site Setting

The Lake 16-21 well is located approximately 7.3 miles west of the town of Meeker, north of Highway 64 (Figure 1). The surrounding site topography is variable with slopes ranging from 6 to 20 percent. Surface drainage from the site is to the south. Several unnamed dry washes transport surface run-off toward Powell Park Ditch and the White River. The White River is located approximately 3,000 feet south of the site.

Shallow bedrock consists of the Wasatch Formation, which generally consists of mudstone with interbedded fine-grained sandstones. The Wasatch Formation is generally considered a confining layer. Shallow ground water is not expected beneath the site. However, shallow ground water may be present within alluvial deposits adjacent to nearby surface-drainage features.

Walter conducted a water-well search for registered wells located within a 1-mile radius of the site. Two registered water wells were identified. One domestic use water well was identified 3,500 feet south-southeast of the well site. Another domestic use water well was identified 5,100 feet south-southwest of the well site.

Field Visit

Walter field personnel conducted a site visit on November 12, 2010. **Walter** was accompanied by Mr. Bill White with White Construction and Excavation, LLC.

At the time of the site visit, the drill-cutting pit contained mixed drill cuttings, and was measured to be approximately 120 feet long by 90 feet wide. Mr. White estimated the depth of the drilling pit to be approximately 8 to 10 feet below grade. The drill-cutting pit was unlined.

Proposed Work Plan

Based on a previous conversation with Ms. Linda Spry O'Rourke, COGCC Environmental Protection Specialist, it was determined that due to increased regulatory scrutiny on pits and the recent alleged violations in connection with this site, an environmental assessment would be required for drill-cutting pit closure.

Based on this requirement, the following work plan has been developed to determine if: 1) the presence of drill cuttings and drilling fluid within the pit have negatively impacted the soil and/or ground water beneath the pit; and 2) the drill cuttings have been sufficiently mixed such that any backfill material is below the Table 910-1 Concentration Levels in soil.

In order to determine if the historical presence and use of the drill-cutting pit has negatively impacted the native soils and/or ground water beneath the site, **Walter** proposes the following scope of work:

- Collect and field screen three soil samples from a depth of one to two feet beneath the bottom of the drilling pit at the locations identified in Figure 3. Based on the reported total depth of the drilling pit, it is anticipated that the soil samples will be collected at approximately 10 to 12 feet below ground surface.

- Field screening will consist of measuring the organic vapor headspace and electrical conductivity of each soil sample. The organic vapor headspace will be measured using a photoionization detector (PID). Electrical conductivity will be measured by preparing a saturated paste (50:50 mixture of soil and distilled water). The electrical conductivity of the saturated paste will be measured using a hand-held electrical conductivity meter.
- Based on the field screening results, one soil sample will be selected for detailed laboratory analytical testing. The selected soil samples will be packaged and shipped to Accu-Test Laboratories of Houston, Texas (Accu-Test) under standard Chain-of-Custody (COC) protocol for analysis of benzene, toluene, ethyl-benzene, xylenes (collectively referred to as BTEX), total petroleum hydrocarbons (TPH), polycyclic aromatic hydrocarbons (PAHs), salinity, and metals.

It is not anticipated that ground water will be encountered during soil sampling activities.

In order to determine if the backfill material within the drill-cutting pit is below the Table 910-1 Concentration Levels in soil, **Walter** proposes the following scope of work:

- Collect six discrete soil samples from various locations within the drill pit. The soil samples will be combine to create one composite soil sample.
- The composite soil sample will be packaged and shipped to Accu-Test under standard COC protocol for analysis of BTEX,TPH, PAHs, salinity, and metals.

All soil sampling activities will be conducted using an excavator supplied by White Construction and Excavation, LLC. Soil samples will be collected from the bucket of the excavator. In most instances, the soil samples will be collected from the teeth of the excavator bucket to help ensure the soil samples represent the intended target depth and location.

For comparison purposes, background soil samples will be collected to determine the natural background concentrations of salinity parameters and metals in the site soils. The background soil samples will be collected at the same depth intervals as the soil samples collected within and beneath the drill cutting pit for direct comparison.

Results

A notice of completion will be prepared and submitted to COGCC upon completion of the environmental soil sampling. However, if laboratory data indicates impacted soil above the Table 910-1 Concentration Levels, another Form 27 will be prepared with additional sampling proposed.

PetroHunter would like to move forward with the drilling pit closure sampling as soon as possible. With your approval and depending on winter weather conditions, it is our goal to complete this work in February 2011.

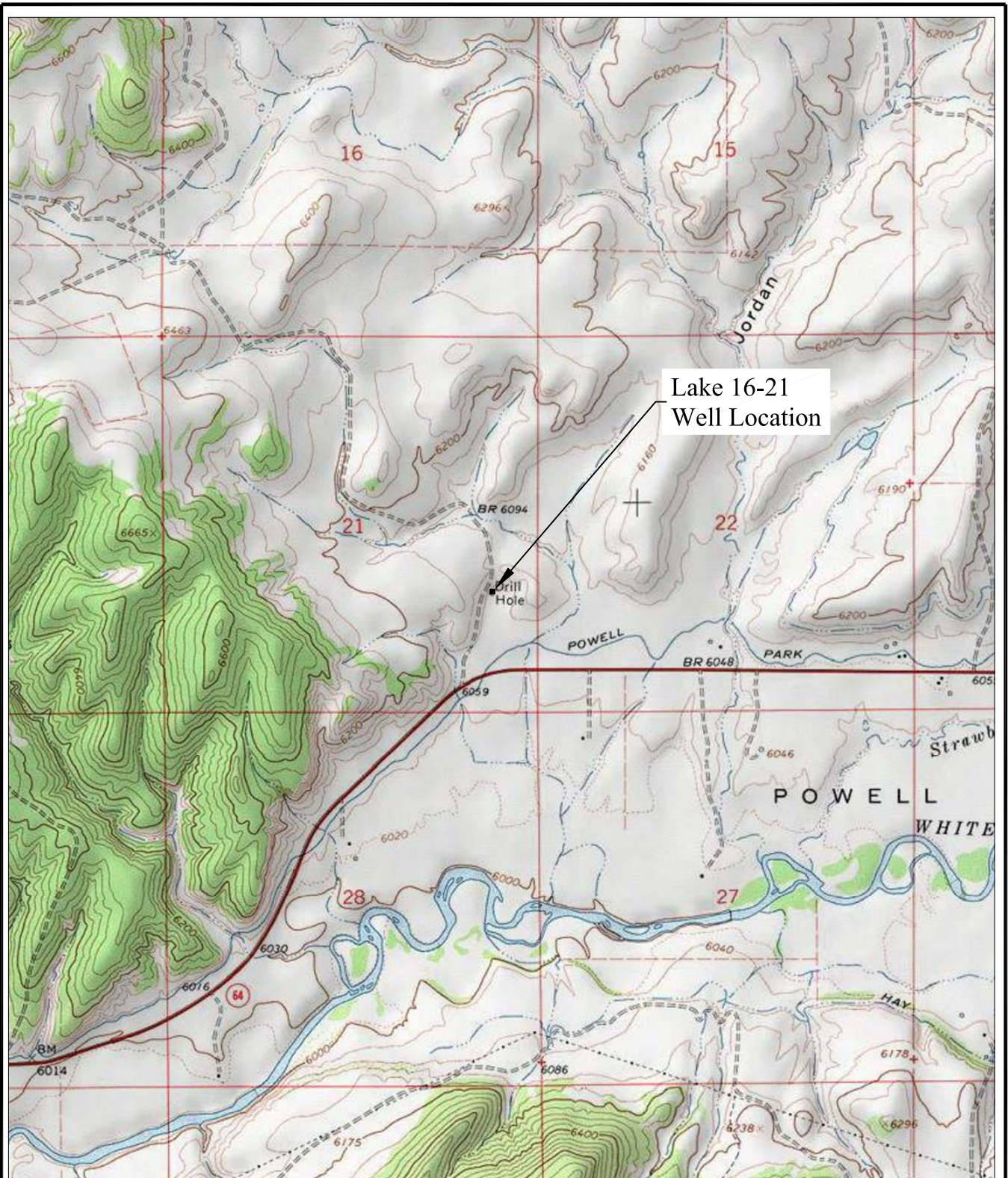
Please call me if you have any questions, comments, or concerns.

Sincerely,

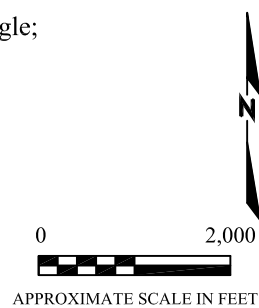


Scott Carmichael
Walter Environmental Group, Inc.

Attachments



Source: USGS, Buckskin Point, Colorado Quadrangle; 1966, photorevised 1992.



WALTER ENVIRONMENTAL
Group Inc.

Well Location Map

Lake 16-21 Well
Section 21 T1N R95W
Rio Blanco County, Colorado

01/12/2011
Project No. 242-04-001

Figure 1