

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

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



#7598

FOR OGCC USE ONLY

RECEIVED  
2/25/2013

**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): \_\_\_\_\_

OGCC Operator Number: _____	Contact Name and Telephone: _____
Name of Operator: _____	_____
Address: _____	No: _____
City: _____ State: _____ Zip: _____	Fax: _____
API Number: _____	County: _____
Facility Name: _____	Facility Number: _____
Well Name: _____	Well Number: _____
Location: (QtrQtr, Sec, Twp, Rng, Meridian): _____ Latitude: _____ Longitude: _____	

**TECHNICAL CONDITIONS**

Type of Waste Causing Impact (crude oil, condensate, produced water, etc.): \_\_\_\_\_

**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.): \_\_\_\_\_

Soil type, if not previously identified on Form 2A or Federal Surface Use Plan: \_\_\_\_\_

Potential receptors (water wells within 1/4 mi, surface waters, etc.): \_\_\_\_\_

\_\_\_\_\_

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

Impacted Media (check):	Extent of Impact:	How Determined:
Soils	_____	_____
Vegetation	_____	_____
Groundwater	_____	_____
Surface Water	_____	_____

**REMEDIATION WORKPLAN**

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

\_\_\_\_\_

**Describe how source is to be removed:**

\_\_\_\_\_

**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.:**

\_\_\_\_\_

PIT Facility ID # 302059

FORM  
27  
Rev 6/99State of Colorado  
Oil and Gas Conservation Commission  
1120 Lincoln Street, Suite 801, Denver, Colorado 80203  
(303)894-2100 Fax: (303)894-2109Tracking Number: \_\_\_\_\_  
Name of Operator: XTO  
OGCC Operator No: \_\_\_\_\_  
Received Date: \_\_\_\_\_  
Well Name & No: PCV 297-11C  
Facility Name & No: Location ID # 398836

Page 2

## REMEDIATION WORKPLAN (Cont.)

OGCC Employee: \_\_\_\_\_

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

Available information indicates that the uppermost groundwater bearing zone is greater than 200 feet below the ground surface. Soil samples were collected for laboratory analysis of subliner material to confirm no groundwater impact potential exists (see Tables 1 and 4).

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.

Please see Attachment I

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:

Based on subliner sample results no additional assessment will be necessary beneath the Freshwater, Reserve Pit or Cuttings #1, #2 and #3 Pits (see Tables 1 and 4).

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

Synthetic liners from each of the pits were removed and transported to an approved offsite disposal/recycling facility. Reserve Pit and Cuttings Pit #3 contents were transported to an approved offsite disposal/recycling facility. Cuttings #1 contents were mix/blend processed to below Table 910-1 concentration levels. Cuttings #2 contents that were mix/blend processed will be used for onsite fill.

## IMPLEMENTATION SCHEDULE

Date Site Investigation Began: <u>1/24/11</u>	Date Site Investigation Completed: <u>In progress</u>	Date Remediation Plan Submitted: <u>2/21/2013</u>
Remediation Start Date: <u>pending approval</u>	Anticipated Completion Date: <u>pending approval</u>	Actual Completion Date: <u>TBD</u>

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

Print Name: Jessica Dooling

Signed: \_\_\_\_\_

Title: Lead EH&S CoordinatorDate: 2/21/2013

OGCC Approved: \_\_\_\_\_

Title: FOR Chris CamfieldDate: 02/27/2013

## **ATTACHMENT I**

### **PCU 297-11C Pit Closure Workplan, Form 27 Page 1**

#### **Describe initial action taken:**

The site consists of Freshwater, Reserve Pit and Cuttings Pits #1, #2 and #3 (see Figure 1).

#### **1. Freshwater Pit**

- Freshwater Pit contents (de minimis) and associated synthetic liners were removed and transported to an offsite permitted disposal/recycling facility.
- Freshwater Pit subliner composite samples were collected and analyzed for Table 910-1 parameters. Results exceeded Table 910-1 concentration levels for pH (10.24) and Arsenic (3.3 mg/kg).

#### **2. Reserve Pit**

- Reserve Pit contents were sampled for Table 910-1 parameters. Results exceeded Table 910-1 concentration levels for TPH (27780 mg/kg), Benzene (1.39 mg/kg), Xylenes (216 mg/kg), EC (11.900 mmhos/cm), pH (12.40), Arsenic (3.6 mg/kg) and Barium (16400 mg/kg).
- Reserve Pit contents and associated synthetic liners were removed and transported to an offsite permitted disposal/recycling facility.
- Reserve Pit subliner composite samples were collected and analyzed for Table 910-1 parameters. Results exceeded Table 910-1 concentration levels for TPH (777 mg/kg), SAR (22.6), pH (10.67) and Arsenic (9.2 mg/kg).
- The Reserve Pit subliner impacted soils from 1' – 2' were removed and treated onsite by mix/blend processing. Subliner confirmation TPH sample at -1' was 56.8 mg/kg and 15.3 mg/kg at -2' (See Figure 2A and Table 4).

#### **3. Cuttings Pit #1**

- Cuttings Pit #1 contents were solidified and composite samples were collected and analyzed for Table 910-1 parameters. Results exceeded Table 910-1 concentration levels for TPH (542 mg/kg), EC (6.890 mmhos/cm), SAR (20.7), pH (12.44) and Arsenic (14.7 mg/kg).
- Cuttings Pit #1 contents were mix/blend processed and sampled to confirm cleanup was achieved (see Table 3).

- Cuttings Pit #1 subliner composite samples were collected and analyzed for Table 910-1 parameters. Results exceeded Table 910-1 concentration levels for pH (9.79) and Arsenic (7.2 mg/kg).

#### **4. Cuttings Pit #2**

- Cuttings Pit #2 contents were solidified and composite samples were collected and analyzed for Table 910-1 parameters. Results exceeded Table 910-1 concentration levels for EC (6.340 mmhos/cm), SAR (15.0), pH (12.30) and Arsenic (10.2 mg/kg).
- Cuttings Pit #2 subliner composite samples were collected and analyzed for Table 910-1 parameters. Results exceeded Table 910-1 concentration levels for SAR (22.7), pH (9.31) and Arsenic (10.1 mg/kg).

#### **5. Cuttings Pit #3**

- Cuttings Pit #3 contents were solidified and composite samples were collected and analyzed for Table 910-1 parameters. Results exceeded Table 910-1 concentration levels for TPH (663 mg/kg), (Benzene (0.902 mg/kg), Dibenzo(A,H)anthracene (0.115 mg/kg), EC (8.820 mmhos/cm), SAR (28.2), pH (12.23) and Arsenic (5.0 mg/kg).
- Cuttings Pit #3 contents and associated synthetic liners were removed and transported to an offsite permitted disposal/recycling facility.
- Cuttings Pit #3 subliner composite samples were collected and analyzed for Table 910-1 parameters. Results exceeded Table 910-1 concentration levels for SAR (19.6), pH (10.1) and Arsenic (4.2 mg/kg).

- Mix/blend processed Cuttings Pit #1 and Reserve Pit Subliner excavated material will be used onsite for backfill.
- Synthetic liners From the Freshwater, Reserve, Cuttings Pits #1, #2 and #3 were removed and transported to an offsite permitted disposal/recycling facility.
- Refer to Tables 1, 3 and 4 for a summary of the laboratory results and Figure 1 for layout of the pits and sample locations.
- Elevated Arsenic levels above Table 910-1 concentration were detected beneath the Freshwater, Reserve and Cuttings Pits #1, #2 and #3. Please

refer to the associated sundry requesting consideration of background Arsenic levels.

- Any remaining elevated levels of Electrical Conductivity, SAR and pH detected beneath the pits or in material used for backfill will be covered with a minimum 3 feet of clean, native soils per COGCC guidance. No additional treatment of these soils will be required.
- Material used to fill the top 3 feet of each pit will be found onsite.
- Reclamation activities will be performed in accordance with applicable COGCC 900, 1000 Series rules and as specified in the Surface Use Plan and BLM Conditions of Approval.

**Table 1**  
**Location: PCU 297-11C**  
**Lab Summary**

Last update 2/7/2013

Analytical Parameter	Fresh Water Pit	Reserve Pit		Cuttings #1		Cuttings #2		Cuttings #3		Background								COGCC	Maximum based on Background		
(with units)	FW Pit Contents	FW Pit Subliner 9/6/12	RP Contents Post Solid. 8/21/12	RP Subliner <sup>5</sup> 9/13/12	Cut #1 Contents Post Solid. <sup>6</sup> 8/8/12	Cut #1 Pit Subliner 8/28/12	Cut #2 Contents Post Solid. 8/8/12	Cut #2 Pit Subliner 9/19/12	Cut #3 Post Solid. 7/23/12	Cut #3 Pit Subliner 9/25/12	#1	#2	#3	#4	#5	#6	#7	#8		Table 910-1 Concentration Levels	
Accutest Job #	Pit Contents De Minimis	D38513	D37810	D38795	D37385	D38207	D37386	D39010	D36747	D39195	D20679 (1/24/11)				D37466 (8/13/12)				-	-	
Sample type (Composite/Discrete)		C	C	C	C	C	C	C	C	C	C	D	D	D	D	D	D	D	D	-	-
TPH (GRO) (mg/Kg)		ND	2380	21.4	67.3	ND	20.1	ND	23.8	ND	ND	-	-	-	-	-	-	-	-	-	-
TPH (DRO) (mg/Kg)		33.2	25400	756	475	50.4	178	61.8	639	ND	ND	-	-	-	-	-	-	-	-	-	-
TPH (GRO + DRO) (mg/Kg)		33.2	27780	777	542	50.4	198	61.8	663	ND	ND	-	-	-	-	-	-	-	-	500	-
Benzene (mg/Kg)		ND	1.39	ND	0.129	ND	0.0901	ND	0.902	ND	ND	-	-	-	-	-	-	-	-	0.170	-
Toluene (mg/Kg)		ND	18.0	ND	1.65	ND	0.567	0.0719	1.980	ND	ND	-	-	-	-	-	-	-	-	85	-
Ethylbenzene (mg/Kg)		ND	9.24	ND	0.46	ND	0.167	0.0307	0.138	ND	ND	-	-	-	-	-	-	-	-	100	-
Xylenes (total) (mg/Kg)		ND	216	ND	2.1	ND	0.788	0.146	1.670	ND	ND	-	-	-	-	-	-	-	-	175	-
Acenaphthene (mg/Kg)		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	1000	-
Anthracene (mg/Kg)		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	1000	-
Benzo(A)anthracene (mg/Kg)		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	0.22	-
Benzo(B)fluoranthene (mg/Kg)		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	0.22	-
Benzo(K)fluoranthene (mg/Kg)		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	2.2	-
Benzo(A)pyrene (mg/Kg)		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	0.022	-
Chrysene (mg/Kg)		ND	0.148	0.0075	0.0224	ND	0.0065	ND	ND	ND	ND	-	-	-	-	-	-	-	-	22	-
Dibenzo(A,H)anthracene (mg/Kg)		ND	ND	ND	ND	ND	ND	ND	0.115	ND	ND	-	-	-	-	-	-	-	-	0.022	-
Fluoranthene (mg/Kg)		ND	0.167	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	1000	-
Fluorene (mg/Kg)		ND	4.02	ND	ND	ND	ND	0.0054	ND	ND	ND	-	-	-	-	-	-	-	-	1000	-
Indeno(1,2,3,C,D)pyrene (mg/Kg)		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	0.22	-
Naphthalene (mg/Kg)		ND	21.6	0.208	0.365	ND	0.137	0.0365	0.547	ND	ND	-	-	-	-	-	-	-	-	23	-
Pyrene (mg/Kg)		ND	0.244	ND	0.015	ND	0.0060	ND	ND	ND	ND	-	-	-	-	-	-	-	-	1000	-
Electrical Conductivity (mmhos/cm)		0.909	11.900	2.65	6.890	0.742	6.340	1.490	8.820	3.380	3.380	-	-	-	-	-	-	-	-	4	-
Sodium Adsorption Ratio (SAR)		11.1	22.1	22.6	20.7	10.8	15.0	22.7	28.2	19.6	19.6	-	-	-	-	-	-	-	-	12	-
pH		10.24	12.40	10.67	12.44	9.79	12.30	9.31	12.23	10.1	10.1	-	-	-	-	-	-	-	-	6-9	-
Arsenic (mg/kg)		3.3	3.6	9.2	14.7	7.2	10.2	10.1	5.0	4.2	4.2	2.0	4.5	3.6	2.6	4.2	3.3	3.7	3.1	0.39	5.0
Barium (mg/kg)		1890	16400	424	2970	957	3200	572	13200	871	871	-	-	-	-	-	-	-	-	15000	-
Cadmium (mg/kg)		<1.1	<1.7	<1.1	<1.3	<1.1	<1.3	<1.1	<1.3	<1.2	<1.2	-	-	-	-	-	-	-	-	70	-
Chromium (III) (mg/Kg)		33.9	11.6	53	11.7	48.2	9.5	44.0	7.4	34.6	34.6	-	-	-	-	-	-	-	-	120000	-
Chromium (VI) (mg/Kg)		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-	-	-	-	-	-	-	23	-
Copper (mg/kg)		11.0	23.4	13.9	30.8	8.3	23.5	10.3	19.7	10.4	10.4	-	-	-	-	-	-	-	-	3100	-
Lead (inorganic) (mg/kg)		11.3	<8.3	16.3	16.8	11.1	18.5	13.7	18.7	12.3	12.3	-	-	-	-	-	-	-	-	400	-
Mercury (mg/kg)	<0.11	0.27	<0.12	<0.15	<0.12	<0.13	<0.11	<0.12	<0.11	<0.11	-	-	-	-	-	-	-	-	23	-	
Nickel (mg/kg)	19.5	5.7	21.4	15.3	20.7	13.0	18.0	11.3	13.5	13.5	-	-	-	-	-	-	-	-	1600	-	
Selenium (mg/kg)	<5.7	<8.3	<5.6	<6.5	<5.7	<6.6	<5.6	<6.4	<5.8	<5.8	-	-	-	-	-	-	-	-	390	-	
Silver (mg/kg)	<3.4	<5.0	<3.4	<3.9	<3.4	<3.9	<3.3	<3.8	<3.5	<3.5	-	-	-	-	-	-	-	-	390	-	
Zinc (mg/kg)	47.1	19.6	54.2	43.5	47.4	43.6	41.0	38.4	40.9	40.9	-	-	-	-	-	-	-	-	23000	-	
% Solids	89.9	60.9	86.6	72.3	86.6	72.7	90.8	76.0	85.7	85.7	71.5	85.9	83.5	75.7	89.7	90.3	92.0	90.3	-	-	

- Notes:
- 1) ND = not detectable to the laboratory detection limit.
  - 2) Results highlighted in yellow exceed Table 910-1 concentration levels. Results highlighted in Gray exceed Table 910-1, but are below background levels.
  - 3) "-" indicates no analysis.
  - 4) See site map for sample locations.
  - 5) See Table 4 for additional information.
  - 6) See Table 3 for additional information.

**Table 2**  
**Location: PCU 297-11C**  
**Lab Summary - Discrete Arsenic Summary**

Last update 2/7/2013

Analytical Parameter (with units)	Cut #1 Arsenic					Cut #2 Arsenic					COGCC Table 910-1 Concentration Levels	Maximum based on Background
	#1	#2	#3	#4	#5	#1	#2	#3	#4	#5		
Accutest Job #	D40538 (11/1/12)					D39555 (10/3/12)					-	-
Sample type (Composite/Discrete)	D	D	D	D	D	D	D	D	D	D	-	-
TPH (GRO) (mg/Kg)	-	-	-	-	-	-	-	-	-	-	-	-
TPH (DRO) (mg/Kg)	-	-	-	-	-	-	-	-	-	-	-	-
TPH (GRO + DRO) (mg/Kg)	-	-	-	-	-	-	-	-	-	-	500	-
Benzene (mg/Kg)	-	-	-	-	-	-	-	-	-	-	0.170	-
Toluene (mg/Kg)	-	-	-	-	-	-	-	-	-	-	85	-
Ethylbenzene (mg/Kg)	-	-	-	-	-	-	-	-	-	-	100	-
Xylenes (total) (mg/Kg)	-	-	-	-	-	-	-	-	-	-	175	-
Acenaphthene (mg/Kg)	-	-	-	-	-	-	-	-	-	-	1000	-
Anthracene (mg/Kg)	-	-	-	-	-	-	-	-	-	-	1000	-
Benzo(A)anthracene (mg/Kg)	-	-	-	-	-	-	-	-	-	-	0.22	-
Benzo(A)pyrene (mg/Kg)	-	-	-	-	-	-	-	-	-	-	0.022	-
Benzo(B)fluoranthene (mg/Kg)	-	-	-	-	-	-	-	-	-	-	0.22	-
Benzo(K)fluoranthene (mg/Kg)	-	-	-	-	-	-	-	-	-	-	2.2	-
Chrysene (mg/Kg)	-	-	-	-	-	-	-	-	-	-	22	-
Dibenzo(A,H)anthracene (mg/Kg)	-	-	-	-	-	-	-	-	-	-	0.022	-
Fluoranthene (mg/Kg)	-	-	-	-	-	-	-	-	-	-	1000	-
Fluorene (mg/Kg)	-	-	-	-	-	-	-	-	-	-	1000	-
Indeno(1,2,3,C,D)pyrene (mg/Kg)	-	-	-	-	-	-	-	-	-	-	0.22	-
Naphthalene (mg/Kg)	-	-	-	-	-	-	-	-	-	-	23	-
Pyrene (mg/Kg)	-	-	-	-	-	-	-	-	-	-	1000	-
Electrical Conductivity (mmhos/cm)	-	-	-	-	-	-	-	-	-	-	4	-
Sodium Adsorption Ratio (SAR)	-	-	-	-	-	-	-	-	-	-	12	-
pH	-	-	-	-	-	-	-	-	-	-	6-9	-
Arsenic (mg/kg)	6.6	7.9	9.4	8.4	10.0	12.1	13.7	13.5	14.7	16.1	0.39	5.0
Barium (mg/kg)	-	-	-	-	-	-	-	-	-	-	15000	-
Cadmium (mg/kg)	-	-	-	-	-	-	-	-	-	-	70	-
Chromium (III) (mg/Kg)	-	-	-	-	-	-	-	-	-	-	120000	-
Chromium (VI) (mg/Kg)	-	-	-	-	-	-	-	-	-	-	23	-
Copper (mg/kg)	-	-	-	-	-	-	-	-	-	-	3100	-
Lead (inorganic) (mg/kg)	-	-	-	-	-	-	-	-	-	-	400	-
Mercury (mg/kg)	-	-	-	-	-	-	-	-	-	-	23	-
Nickel (mg/kg)	-	-	-	-	-	-	-	-	-	-	1600	-
Selenium (mg/kg)	-	-	-	-	-	-	-	-	-	-	390	-
Silver (mg/kg)	-	-	-	-	-	-	-	-	-	-	390	-
Zinc (mg/kg)	-	-	-	-	-	-	-	-	-	-	23000	-
% Solids	87.5	87.3	88.0	87.4	86.2	84.1	80.7	83.7	82.6	83.2	-	-

Notes:

- 1) ND = not detectable to the laboratory detection limit.
- 2) Results highlighted in yellow exceed Table 910-1 concentration levels. Results highlighted in Gray exceed Table 910-1, but are below background levels.
- 3) "-" indicates no analysis.

**Table 3**  
**Location: PCU 297-11C**  
**Lab Summary - Cuttings #1 Mix/blend (MB) Summary**

Last update 2/7/2013

Analytical Parameter  (with units)	Cuttings #1 Mix Blend													COGCC
	Cut #1 Post Solid. 8/8/12	Cut 1 Mix/Blend 2:1 Trial 9/4/12	Cut 1 MB Day 1 (10/3) 10/4/12	Cut 1 MB Day 2 (10/4) 10/8/12	Cut 1 MB Day 3 (10/8) 10/9/12	Cut 1 MB Day 4 (10/9) 10/10/12	Cut 1 MB Day 5 (10/10) 10/11/12	Cut 1 MB Day 6 (10/11) 10/16/12	Cut 1 MB Day 7 (10/15) 10/16/12	Cut 1 MB Day 8 (10/16) 10/17/12	Cut 1 MB Day 9 (10/17) 10/18/12	Cut 1 MB Day 10 (10/18) 10/22/12	Cut 1 MB Day 11 (10/22) 10/23/12	Table 910-1 Concentration Levels
Accutest Job #	D37385	D38451	D39591	D39687	D39738	D39783	D39808	D40001		D40079	D40115	D40213	D40314	-
Sample type (Composite/Discrete)	C	C	C	C	C	C	C	C	C	C	C	C	C	-
TPH (GRO) (mg/Kg)	67.3	48.4	8.48	ND	6.62	ND	ND	ND	ND	ND	ND	23.2	29.6	-
TPH (DRO) (mg/Kg)	475	350	269	261	212	169	269	290	212	242	220	222	309	-
TPH (GRO + DRO) (mg/Kg)	542	398	277	261	219	169	269	290	212	242	220	245	339	500
Benzene (mg/Kg)	0.129	-	-	-	-	-	-	-	-	-	-	-	-	0.170
Toluene (mg/Kg)	1.65	-	-	-	-	-	-	-	-	-	-	-	-	85
Ethylbenzene (mg/Kg)	0.46	-	-	-	-	-	-	-	-	-	-	-	-	100
Xylenes (total) (mg/Kg)	2.1	-	-	-	-	-	-	-	-	-	-	-	-	175
Acenaphthene (mg/Kg)	ND	-	-	-	-	-	-	-	-	-	-	-	-	1000
Anthracene (mg/Kg)	ND	-	-	-	-	-	-	-	-	-	-	-	-	1000
Benzo(A)anthracene (mg/Kg)	ND	-	-	-	-	-	-	-	-	-	-	-	-	0.22
Benzo(B)fluoranthene (mg/Kg)	ND	-	-	-	-	-	-	-	-	-	-	-	-	0.22
Benzo(K)fluoranthene (mg/Kg)	ND	-	-	-	-	-	-	-	-	-	-	-	-	2.2
Benzo(A)pyrene (mg/Kg)	ND	-	-	-	-	-	-	-	-	-	-	-	-	0.022
Chrysene (mg/Kg)	0.0224	-	-	-	-	-	-	-	-	-	-	-	-	22
Dibenzo(A,H)anthracene (mg/Kg)	ND	-	-	-	-	-	-	-	-	-	-	-	-	0.022
Fluoranthene (mg/Kg)	ND	-	-	-	-	-	-	-	-	-	-	-	-	1000
Fluorene (mg/Kg)	ND	-	-	-	-	-	-	-	-	-	-	-	-	1000
Indeno(1,2,3,C,D)pyrene (mg/Kg)	ND	-	-	-	-	-	-	-	-	-	-	-	-	0.22
Naphthalene (mg/Kg)	0.365	-	-	-	-	-	-	-	-	-	-	-	-	23
Pyrene (mg/Kg)	0.015	-	-	-	-	-	-	-	-	-	-	-	-	1000
Electrical Conductivity (mmhos/cm)	6.890	-	-	-	-	-	-	-	-	-	-	-	-	4
Sodium Adsorption Ratio (SAR)	20.7	-	-	-	-	-	-	-	-	-	-	-	-	12
pH	12.44	-	-	-	-	-	-	-	-	-	-	-	-	6-9
Arsenic (mg/kg)	14.7	-	-	-	-	-	-	-	-	-	-	-	-	0.39
Barium (mg/kg)	2970	-	-	-	-	-	-	-	-	-	-	-	-	15000
Cadmium (mg/kg)	<1.3	-	-	-	-	-	-	-	-	-	-	-	-	70
Chromium (III) (mg/Kg)	11.7	-	-	-	-	-	-	-	-	-	-	-	-	120000
Chromium (VI) (mg/Kg)	<1.0	-	-	-	-	-	-	-	-	-	-	-	-	23
Copper (mg/kg)	30.8	-	-	-	-	-	-	-	-	-	-	-	-	3100
Lead (inorganic) (mg/kg)	16.8	-	-	-	-	-	-	-	-	-	-	-	-	400
Mercury (mg/kg)	<0.15	-	-	-	-	-	-	-	-	-	-	-	-	23
Nickel (mg/kg)	15.3	-	-	-	-	-	-	-	-	-	-	-	-	1600
Selenium (mg/kg)	<6.5	-	-	-	-	-	-	-	-	-	-	-	-	390
Silver (mg/kg)	<3.9	-	-	-	-	-	-	-	-	-	-	-	-	390
Zinc (mg/kg)	43.5	-	-	-	-	-	-	-	-	-	-	-	-	23000
% Solids	72.3	90.7	88.4	88.7	88.2	88.3	87.4	87.0	86.8	87.1	88.5	91.4	92.3	-

Notes:

1) ND = not detectable to the laboratory detection limit.

2) Results highlighted in yellow exceed Table 910-1 concentration levels. Results highlighted in Gray exceed Table 910-1, but are below background levels.

3) "-" indicates no analysis.



**Table 4**  
**Location: PCU 297-11C**  
**Lab Summary - RP Subliner Assessment**

2/21/2013

Analytical Parameter (with units)	Reserve Pit		RP Subliner Discrete Samples								RP Ex Material		COGCC Table 910-1 Concentration Levels
	RP Solid. Contents 8/21/12	RP Subliner 9/13/12	RP - 1	RP - 2	RP - 3	RP - 4	RP - 4 (-1) 10/3/12	RP - 5 9/13/12	RP - 5 (-2) 10/3/12	RP - 6 9/13/12	RP Ex. MTRL 10/16/12	RP Ex. MTRL MB 1/25/13	
Accutest Job #	D37810	D38795	D38799 (9/13/12)				D39560	D38799	D39560	D38799	D39999	D42916	-
Sample type (Composite/Discrete)	C	C	D	D	D	D	D	D	D	D	C	C	-
TPH (GRO) (mg/Kg)	2380	21.4	ND	ND	ND	ND	ND	108	ND	ND	ND	ND	-
TPH (DRO) (mg/Kg)	25400	756	258	54	27.7	517	56.8	3720	15.3	37.9	753	140	-
TPH (GRO + DRO) (mg/Kg)	27780	777	258	54	27.7	517	56.8	3828	15.3	37.9	753	140	500
Benzene (mg/Kg)	1.39	ND	-	-	-	-	-	-	-	-	-	-	0.170
Toluene (mg/Kg)	18.0	ND	-	-	-	-	-	-	-	-	-	-	85
Ethylbenzene (mg/Kg)	9.24	ND	-	-	-	-	-	-	-	-	-	-	100
Xylenes (total) (mg/Kg)	216	ND	-	-	-	-	-	-	-	-	-	-	175
Acenaphthene (mg/Kg)	ND	ND	-	-	-	-	-	-	-	-	-	-	1000
Anthracene (mg/Kg)	ND	ND	-	-	-	-	-	-	-	-	-	-	1000
Benzo(A)anthracene (mg/Kg)	ND	ND	-	-	-	-	-	-	-	-	-	-	0.22
Benzo(B)fluoranthene (mg/Kg)	ND	ND	-	-	-	-	-	-	-	-	-	-	0.22
Benzo(K)fluoranthene (mg/Kg)	ND	ND	-	-	-	-	-	-	-	-	-	-	2.2
Benzo(A)pyrene (mg/Kg)	ND	ND	-	-	-	-	-	-	-	-	-	-	0.022
Chrysene (mg/Kg)	0.148	0.0075	-	-	-	-	-	-	-	-	-	-	22
Dibenzo(A,H)anthracene (mg/Kg)	ND	ND	-	-	-	-	-	-	-	-	-	-	0.022
Fluoranthene (mg/Kg)	0.167	ND	-	-	-	-	-	-	-	-	-	-	1000
Fluorene (mg/Kg)	4.02	ND	-	-	-	-	-	-	-	-	-	-	1000
Indeno(1,2,3,C,D)pyrene (mg/Kg)	ND	ND	-	-	-	-	-	-	-	-	-	-	0.22
Naphthalene (mg/Kg)	21.6	0.208	-	-	-	-	-	-	-	-	-	-	23
Pyrene (mg/Kg)	0.244	ND	-	-	-	-	-	-	-	-	-	-	1000
Electrical Conductivity (mmhos/cm)	11.900	2.65	-	-	-	-	-	-	-	-	-	-	4
Sodium Adsorption Ratio (SAR)	22.1	22.6	-	-	-	-	-	-	-	-	-	-	12
pH	12.40	10.67	-	-	-	-	-	-	-	-	-	-	6-9
Arsenic (mg/kg)	3.6	9.2	-	-	-	-	-	-	-	-	-	-	0.39
Barium (mg/kg)	16400	424	-	-	-	-	-	-	-	-	-	-	15000
Cadmium (mg/kg)	<1.7	<1.1	-	-	-	-	-	-	-	-	-	-	70
Chromium (III) (mg/Kg)	11.6	53	-	-	-	-	-	-	-	-	-	-	120000
Chromium (VI) (mg/Kg)	<1.0	<1.0	-	-	-	-	-	-	-	-	-	-	23
Copper (mg/kg)	23.4	13.9	-	-	-	-	-	-	-	-	-	-	3100
Lead (inorganic) (mg/kg)	<8.3	16.3	-	-	-	-	-	-	-	-	-	-	400
Mercury (mg/kg)	0.27	<0.12	-	-	-	-	-	-	-	-	-	-	23
Nickel (mg/kg)	5.7	21.4	-	-	-	-	-	-	-	-	-	-	1600
Selenium (mg/kg)	<8.3	<5.6	-	-	-	-	-	-	-	-	-	-	390
Silver (mg/kg)	<5.0	<3.4	-	-	-	-	-	-	-	-	-	-	390
Zinc (mg/kg)	19.6	54.2	-	-	-	-	-	-	-	-	-	-	23000
% Solids	60.9	86.6	87.5	83.2	87.1	85.4	89.3	85.3	91.8	90.1	94.1	84.0	-

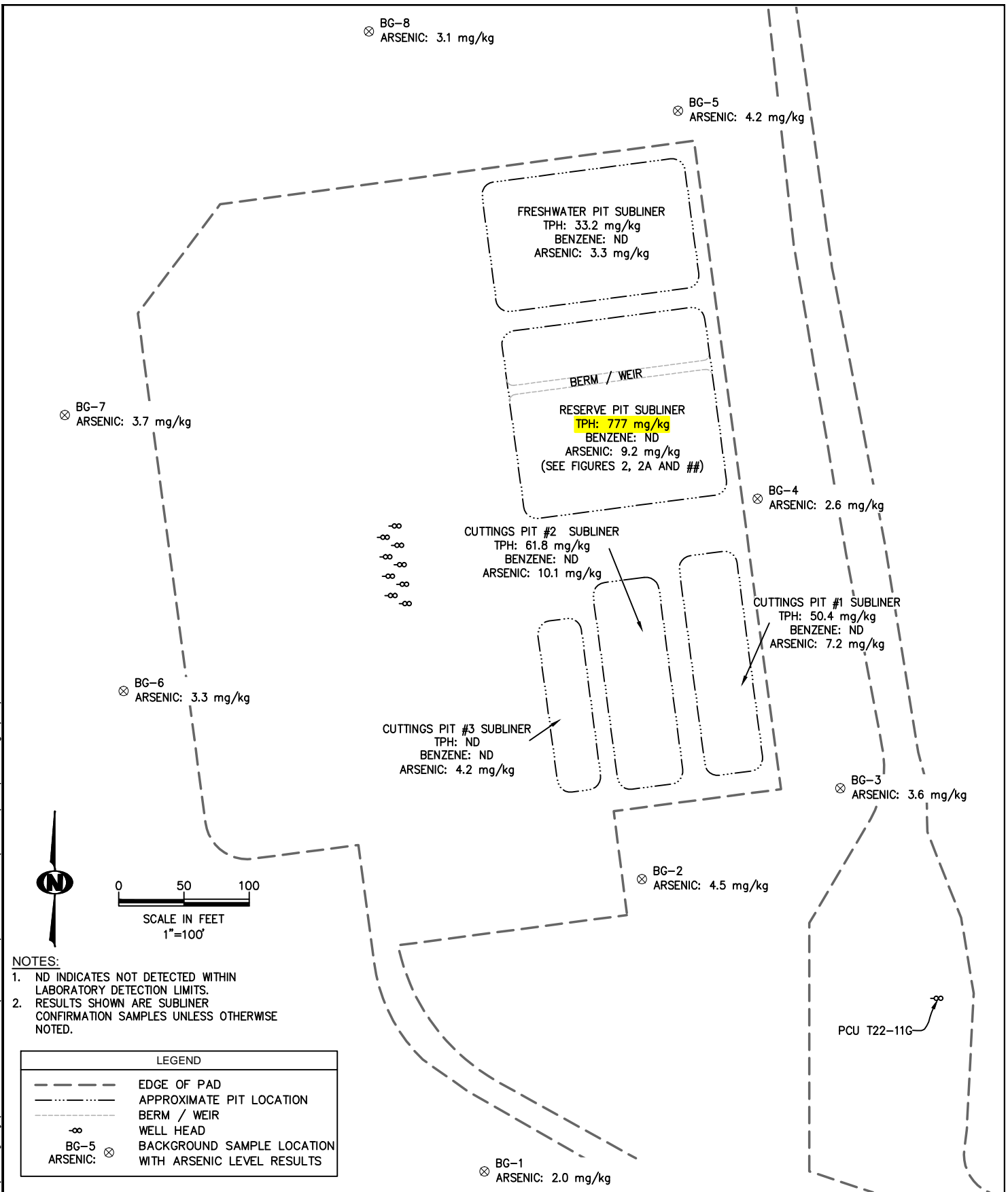
Notes:

1) ND = not detectable to the laboratory detection limit.

2) Results highlighted in yellow exceed Table 910-1 concentration levels. Results highlighted in Gray exceed Table 910-1, but are below background levels.

3) "-" indicates no analysis.

4) See site map for sample locations.

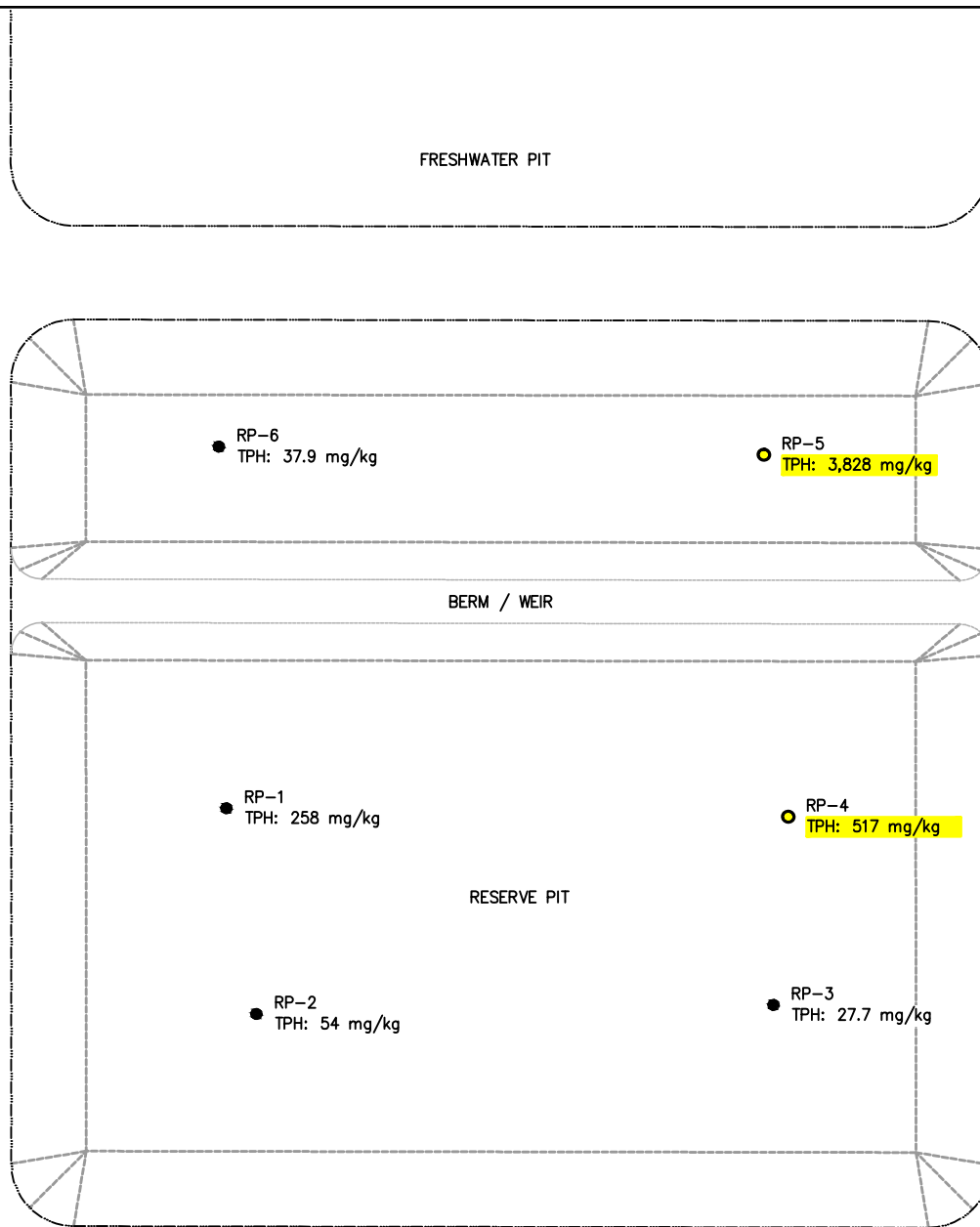


DESIGNED: —	CHECKED: DK	FIGURE 1	DATE	REVISIONS
DATE: 2/11/13	DRAWN: DF	SHEET NO. 1 of 3		
FILE NAME: samples		SCALE: 1"=100'		
PROJECT NO. 1202-06				

**KRW CONSULTING, INC.**  
8000 W. 14TH AVENUE, SUITE 200  
LAKEWOOD, COLORADO  
(303) 239-9011

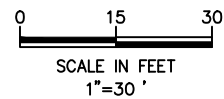
**FIGURE 1**  
PICEANCE CREEK  
PCU 297-11C  
SAMPLE LOCATIONS WITH  
ARSENIC LEVELS  
PREPARED FOR XTO ENERGY

\\hyper-v03\lkw-d-co\sdk\proj\cto environmental\1202-06 pcu 297-11c\civil3d\reserve conf.dwg.2/11/13



LEGEND	
-----	EDGE OF PAD
-----	APPROXIMATE PIT LOCATION
-----	BERM / WEIR
-----	APPROX. TOE OF PIT
● D-0 TPH: ≤ 500 mg/kg	DISCRETE SAMPLE LOCATION WITH TPH LAB RESULTS LESS THAN OR EQUAL TO 500 mg/kg
● D-0 TPH: > 500 mg/kg	DISCRETE SAMPLE LOCATION WITH TPH LAB RESULTS GREATER THAN 500 mg/kg

NOTE:  
RESULTS SHOWN ARE SUBLINER  
CONFIRMATION SAMPLES UNLESS  
OTHERWISE NOTED.

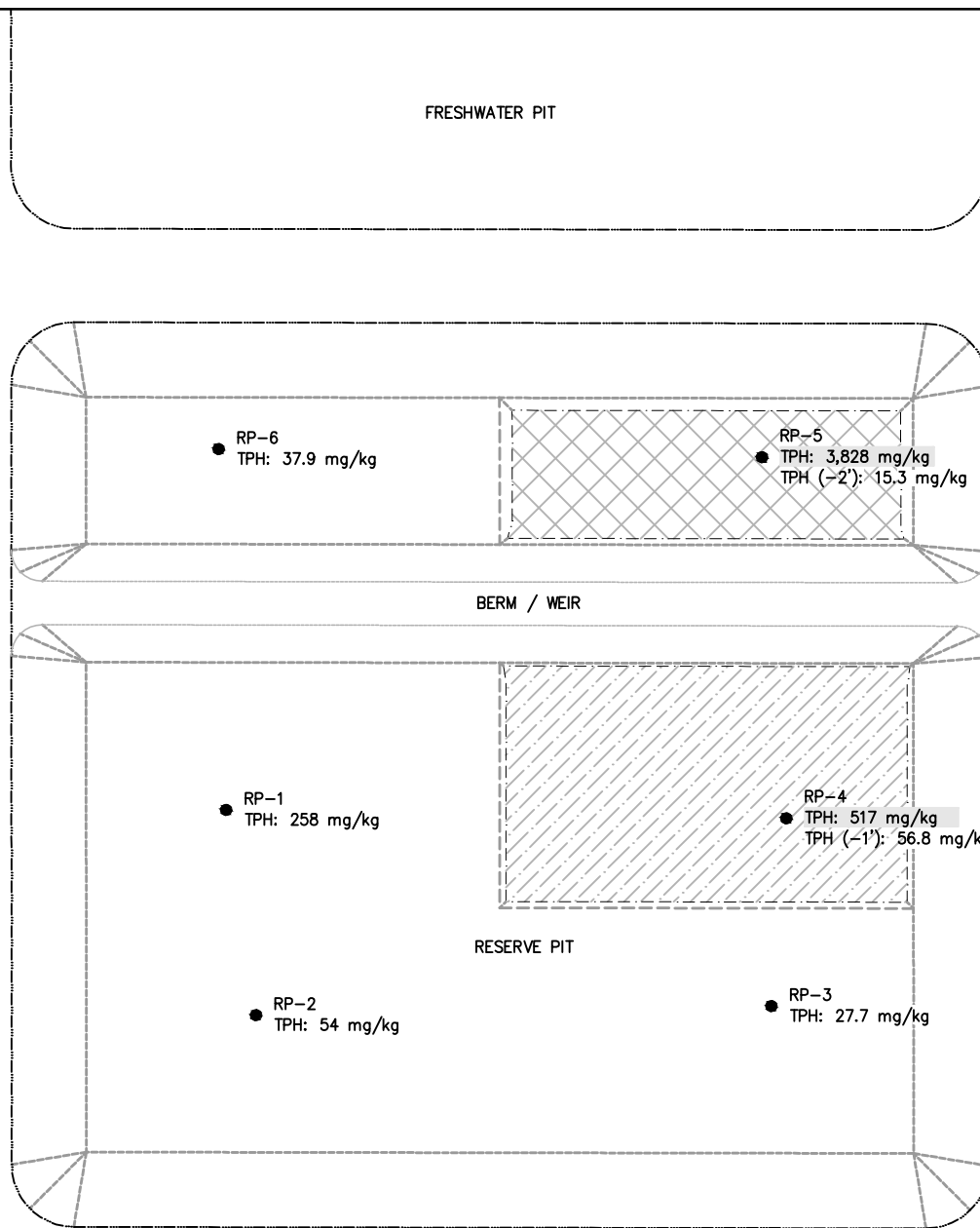


DESIGNED: —	CHECKED: DK	FIGURE 2	DATE	REVISIONS
DATE: 2/11/13	DRAWN: DF			
FILE NAME: reserve conf		SHEET NO. 2 of 3		
PROJECT NO. 1202-06		SCALE: 1"=30'		

**KRW CONSULTING, INC.**  
8000 W. 14TH AVENUE, SUITE 200  
LAKEWOOD, COLORADO  
(303) 239-9011

FIGURE 2  
PICEANCE CREEK  
PCU 297-11C  
RESERVE PIT SUBLINER  
CONFIRMATION DATA  
PREPARED FOR XTO ENERGY

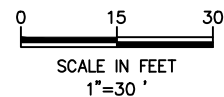
\\hyper-v03\lkw-d-co\sdk\proj\cto environmental\1202-06 pcu 297-11c\civil3d\reserve ctn.dwg,2/11/13



LEGEND	
	EDGE OF PAD
	APPROXIMATE PIT LOCATION
	BERM / WEIR
	APPROX. TOE OF PIT
	-1' EXCAVATION AREA
	-2' EXCAVATION AREA
D-0	DISCRETE SAMPLE LOCATION WITH TPH LAB
● TPH: ≤ 500 mg/kg	RESULTS LESS THAN OR EQUAL TO 500 mg/kg
RP-0	DISCRETE SAMPLE LOCATION WITH PREVIOUS
● TPH: > 500 mg/kg	TPH LAB RESULTS GREATER THAN 500 mg/kg
● TPH: ≤ 500 mg/kg	AND CURRENT RESULTS BELOW 500 mg/kg

NOTES:

1. TESTING INTERVALS ARE SHOWN AS (-2') WHERE (-2') IS 2' BELOW THE ORIGINALLY TESTED ELEVATION.
2. RESULTS SHOWN ARE SUBLINER CONFIRMATION SAMPLES UNLESS OTHERWISE NOTED.



DESIGNED:	CHECKED:	FIGURE 2A	DATE	REVISIONS
—	DK			
DATE:	DRAWN:			
2/11/13	DF			
FILE NAME:	SHEET NO.	3 of 3		
reserve ctn				
PROJECT NO.	SCALE:			
1202-06	1"=30'			

**KRW CONSULTING, INC.**  
8000 W. 14TH AVENUE, SUITE 200  
LAKEWOOD, COLORADO  
(303) 239-9011

FIGURE 2A  
PICEANCE CREEK  
PCU 297-11C  
RESERVE PIT SUBLINER  
CONFIRMATION DATA  
PREPARED FOR XTO ENERGY



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

EARTHEN PIT REPORT/PERMIT

This form is to be used for both reporting and permitting pits. Rule 903 describes when a Permit with prior approval, or a Report within 30 days, is required for pits. Submit required attachments and forms.

FORM SUBMITTED FOR:

☐ Pit Report

☒ Pit Permit

OGCC Operator Number: 28700

Name of Operator: Exxon/Mobil Oil Corporation

Address: P.O. Box 4358; CORP-MI-205

City: Houston State: Tx Zip: 77210-4358

Contact Name and Telephone:

Lynn Neely

No: (281) 654-1949

Fax: (262) 313-9747

Complete the  
Attachment Checklist

	Oper	OGCC
Detailed Site Plan	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Topo Map w/ Pit Location	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Water Analysis (Form 25)	<input type="checkbox"/>	<input type="checkbox"/>
Source Wells (Form 26)	<input type="checkbox"/>	<input type="checkbox"/>
Pit Design/Plan & Cross Sec	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Design Calculations	<input type="checkbox"/>	<input type="checkbox"/>
Sensitive Area Determ.	<input type="checkbox"/>	<input type="checkbox"/>
Mud Program	<input type="checkbox"/>	<input type="checkbox"/>
Form 2A	<input type="checkbox"/>	<input type="checkbox"/>

API Number (of associated well): \_\_\_\_\_ OGCC Facility ID (of other associated facility): Piceance Creek Unit 297-11C1, C2, C3, C4, C5, C6, C7, C8, C9

Pit Location (QtrQtr, Sec, Twp, Rng, Meridian): NWNW, Sec. 11, T2S, R97W, 6th P.M.

Latitude: 39.896106

Longitude: 108.254541

County: Rio Blanco

Pit Use: ☐ Production ☒ Drilling (Attach mud program) ☐ Special Purpose (Describe Use): \_\_\_\_\_

Pit Type: ☒ Lined ☐ Unlined Surface Discharge Permit: ☐ Yes ☒ No

Offsite disposal of pit contents: ☒ Injection ☐ Commercial Pit/Facility Name: Piceance Creek Unit 297-11C Pit/Facility No: \_\_\_\_\_

Attach Form 26 to identify Source Wells and Form 25 to provide Produced Water Analysis results.

Existing Site Conditions

Is the location in a "Sensitive Area?" ☐ Yes ☐ No Attach data used for determination. NA; Pit will be lined.

Distance (in feet) to nearest surface water: +/- 200' ground water: unknown water wells: > 1 mile

LAND USE (or attach copy of Form 2A if previously submitted for associated well) Select one which best describes land use:

Crop Land: ☐ Irrigated ☐ Dry Land ☐ Improved Pasture ☐ Hay Meadow ☐ GRP

Non-Crop Land: ☒ Rangeland ☐ Timber ☐ Recreational ☐ Other (describe): \_\_\_\_\_

Subdivided: ☐ Industrial ☐ Commercial ☐ Residential

SOILS (or attach copy of Form 2A if previously submitted for associated well)

Soil map units from USNRCS survey: Sheet No: 30 Soil Complex/Series No: 96

Soils Series Name: Veatch Channery Loam Horizon thickness (in inches): A: 8 ; B: 5 ; C: 5

Soils Series Name: \_\_\_\_\_ Horizon thickness (in inches): A: \_\_\_\_\_ ; B: \_\_\_\_\_ ; C: \_\_\_\_\_

Attach detailed site plan and topo map with pit location.

Pit Design and Construction

Size of pit (feet): Length: 160 Width: 145 Depth: 12' & 15'

Calculated pit volume (bbls): 30,850 w2' frbd. Daily inflow rate (bbls/day): Various

Daily disposal rates (attach calculations): Evaporation: N/A bbls/day Percolation: 0 bbls/day

Type of liner material: Impermeable synthetic Thickness: 24 mil woven coated polyethylene liner with an 8 ounce geotextile felt padding under the liner.

Attach description of proposed design and construction (include sketches and calculations).

Method of treatment of produced water prior to discharge into pit (separator, heater treater, other): separator

Is pit fenced? ☒ Yes ☐ No Is pit netted? ☒ Yes ☐ No

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

Print Name: Lynn Neely

Signed: \_\_\_\_\_

Title: Regulatory Specialist

Date: 01/09/2009

OGCC Approved: Chris Canfield

Title: EPS-NW Area

Date: 02-25-09

CONDITIONS OF APPROVAL, IF ANY:

FACILITY NUMBER: