

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



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#7531

FOR OGCC USE ONLY

RECEIVED  
1/28/2013

**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): Pit Closure

OGCC Employee:  
 Spill  Complaint  
 Inspection  NOAV  
Tracking No:

OGCC Operator Number: <u>100264</u>	Contact Name and Telephone: <u>Jessica Dooling</u>
Name of Operator: <u>XTO Energy Inc.</u>	No: <u>970-675-4122</u>
Address: <u>PO Box 6501</u>	Fax: <u>970-675-4150</u>
City: <u>Englewood</u> State: <u>CO</u> Zip: <u>80155</u>	
API Number: <u>05-103-11081-00</u>	County: <u>Rio Blanco</u>
Facility Name: <u>North Piceance Unit</u>	Facility Number: <u>292458 Drilling Pit</u>
Well Name: <u>North Piceance Unit</u>	Well Number: <u>196-19B</u>
Location: (QtrQtr, Sec, Twp, Rng, Meridian): <u>SENE, Sec. 19, T1S, R96W, 6th P.M.</u> Latitude: <u>39.954937</u> Longitude: <u>-108.201444</u>	

**TECHNICAL CONDITIONS**

Type of Waste Causing Impact (crude oil, condensate, produced water, etc): Drill Cuttings and Fluids

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.): Non-Crop Land, Rangeland

Soil type, if not previously identified on Form 2A or Federal Surface Use Plan: Redcreek-Rentsac Complex, 5 - 30% slopes

Potential receptors (water wells within 1/4 mi, surface waters, etc.): Closest water well is >1 mile; closest surface water ~1500'

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

Impacted Media (check):	Extent of Impact:	How Determined:
<input checked="" type="checkbox"/> Soils	<u>TPH, Benzene and Arsenic</u>	<u>laboratory analysis</u>
<input type="checkbox"/> Vegetation		
<input type="checkbox"/> Groundwater		
<input type="checkbox"/> Surface Water		

**REMEDIATION WORKPLAN**

Describe initial action taken (if previously provided, refer to that form or document):  
See Attachment I for details regarding initial action taken.

Describe how source is to be removed:  
Synthetic liners from all pits have been removed and transported offsite to a permitted disposal facility. Reserve Pit and Cuttings Pit contents will either be treated onsite with a temporary Thermal Desorption Unit; by mix/blend processing and/or transported offsite to a permitted disposal facility.

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.:  
Any remaining impacted soils will either be treated onsite or removed to a permitted disposal/recycling facility.



Tracking Number: \_\_\_\_\_  
Name of Operator: XTO  
OGCC Operator No: \_\_\_\_\_  
Received Date: APR 10 3 11 081  
Well Name & No: NPU 196-19B  
Facility Name & No: Location ID # 316658

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 100 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 3).

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 Pits (see Tables 1 and 3).

Final disposition of E&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 and Cuttings Pits contents will either be treated onsite with a temporary Thermal Desorption Unit; mix/blend processed to below Table 910-1 concentration levels and/or transported to an approved offsite disposal/recycling facility. Material mix/blend and/or Thermal Desorption Unit processed will be used for onsite fill.

IMPLEMENTATION SCHEDULE

Date Site Investigation Began: 10/26/12 Date Site Investigation Completed: In progress Date Remediation Plan Submitted: 1/28/2013  
Remediation Start Date: pending approval Anticipated Completion Date: pending approval Actual Completion Date: TBD

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  
Title: Environmental Coordinator

Signed: \_\_\_\_\_  
Date: 1/28/2013

OGCC Approved: [Signature] Title: FOR Chris Camfield Date: 01/30/2013  
EPS NW Region

## ATTACHMENT I

### NPU 196-19B Pit Closure Workplan, Form 27 Page 1

#### Describe initial action taken:

The site consists of Freshwater, Reserve Pit (NW and SE sections) and Cuttings Pit (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 Arsenic (9.7 mg/kg).

#### 2. Reserve Pit NW Section

- Reserve Pit NW contents were solidified and mixed with the Reserve Pit SE contents then sampled for Table 910-1 parameters. Results exceeded Table 910-1 concentration levels for TPH (2606 mg/kg), EC (12.300 mmhos/cm), pH (12.44) and Arsenic (4.8 mg/kg).
- Reserve Pit NW subliner composite samples were collected and analyzed for Table 910-1 parameters. Results exceeded Table 910-1 concentration levels for pH (9.61) and Arsenic (5.4 mg/kg).

#### 3. Reserve Pit SE Section

- Reserve Pit SE contents were addressed in the manner described above.
- Reserve Pit SE subliner composite samples were collected and analyzed for Table 910-1 parameters. Results exceeded Table 910-1 concentration levels for TPH (1115 mg/kg), pH (9.25) and Arsenic (7.2 mg/kg).
- The Reserve Pit SE subliner impacted soils were removed and will be treated onsite or disposed of offsite at a permitted disposal/recycling facility. Subliner confirmation samples were collected for TPH and ranged from 30.4 mg/kg to 62.2 mg/kg.

#### 4. Cuttings Pit

- Cuttings Pit contents were solidified and composite samples were collected and analyzed for Table 910-1 parameters. Results exceeded Table 910-1

concentration levels for Benzene (0.221 mg/kg), EC (7.910 mmhos/cm), SAR (18.5), pH (12.41) and Arsenic (7.7 mg/kg).

- Cuttings Pit subliner composite samples were collected and analyzed for Table 910-1 parameters. Results exceeded Table 910-1 concentration levels for pH (9.83) and Arsenic (8.1 mg/kg).
- Reserve and Cuttings Pit contents were removed from the respective pits and will either be treated on-site with a temporary Thermal Desorption Unit; mix/blend processed and sampled to ensure Table 910 compliance and/or transported to an offsite permitted disposal/recycling facility.
- Mix/blend and/or Thermal Desorption Unit processed Reserve and Cuttings Pit material that meets Table 910-1 concentration levels will be used onsite for backfill.
- All associated Reserve and Cuttings Pit synthetic liners were removed and transported to an offsite permitted disposal/recycling facility.
- Refer to Tables 1 through 3 for a summary of the laboratory results and Figures 1 through 2A 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. 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: NPU 196-19B**  
**Lab Summary**

Analytical Parameter  (with units)	Fresh Water Pit		Reserve Pit			Cuttings Pit		Background								COGCC	
	FW Pit Contents	FW Pit Subliner 10/26/12	RP Post Solid. 11/12/12	RP N.W. Subliner 11/15/12	RP S.E. Subliner <sup>5</sup> 11/15/12	Cut Pit Post Solid. <sup>6</sup> 11/12/12	Cut Pit Subliner 11/14/12	#1	#2	#3	#4	#5	#6	#7	#8	Table 910-1 Concentration Levels	Maximum based on Background
		D40379	D40911	D41043	D41042	D40911	D41013	D40380 (10/26/12)									
Accutest Job #		C	C	C	C	C	C	D	D	D	D	D	D	D	D		
Sample type (Composite/Discrete)		ND	306	ND	14.6	15.1	ND	-	-	-	-	-	-	-	-	-	-
TPH (GRO) (mg/Kg)		24.0	2300	380	1100	298	10.9	-	-	-	-	-	-	-	-	-	-
TPH (DRO) (mg/Kg)		24.0	2606	380	1115	313	10.9	-	-	-	-	-	-	-	-	-	-
TPH (GRO + DRO) (mg/Kg)		ND	0.0779	ND	ND	0.221	ND	-	-	-	-	-	-	-	-	-	-
Benzene (mg/Kg)		ND	1.84	ND	ND	0.928	ND	-	-	-	-	-	-	-	-	-	500
Toluene (mg/Kg)		ND	0.838	ND	ND	0.218	ND	-	-	-	-	-	-	-	-	-	0.170
Ethylbenzene (mg/Kg)		ND	18.2	ND	ND	1.11	ND	-	-	-	-	-	-	-	-	-	85
Xylenes (total) (mg/Kg)		ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-	100
Acenaphthene (mg/Kg)		ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-	175
Anthracene (mg/Kg)		ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-	1000
Benzo(A)anthracene (mg/Kg)		ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-	1000
Benzo(A)pyrene (mg/Kg)		ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-	0.22
Benzo(B)fluoranthene (mg/Kg)		ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-	0.022
Benzo(K)fluoranthene (mg/Kg)		ND	ND	ND	ND	ND	0.0073	-	-	-	-	-	-	-	-	-	0.022
Chrysene (mg/Kg)		ND	0.0365	0.0067	0.0204	0.0155	ND	-	-	-	-	-	-	-	-	-	2.2
Dibenzo(A,H)anthracene (mg/Kg)		ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-	22
Fluoranthene (mg/Kg)		ND	0.0380	ND	ND	0.0095	ND	-	-	-	-	-	-	-	-	-	0.022
Fluorene (mg/Kg)		ND	0.432	ND	0.132	0.0431	0.0083	-	-	-	-	-	-	-	-	-	1000
Indeno(1,2,3,C,D)pyrene (mg/Kg)		ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-	1000
Naphthalene (mg/Kg)		ND	2.330	0.0434	0.0771	0.240	0.0313	-	-	-	-	-	-	-	-	-	0.22
Pyrene (mg/Kg)		ND	0.0459	0.0061	0.0239	0.0220	ND	-	-	-	-	-	-	-	-	-	23
Electrical Conductivity (mmhos/cm)		1.280	12.300	2.250	3.850	7.910	0.538	-	-	-	-	-	-	-	-	-	1000
Sodium Adsorption Ratio (SAR)		3.32	11.8	4.34	9.59	18.5	4.69	-	-	-	-	-	-	-	-	-	4
pH		8.96	12.44	9.61	9.25	12.41	9.83	-	-	-	-	-	-	-	-	-	12
Arsenic (mg/kg)		9.7	4.8	5.4	7.2	7.7	8.1	4.6	3.5	3.7	3.1	4.2	4.6	4.8	4.2	-	6-9
Elevation in feet (MSL)		6868	-	6867	6869	-	6864.5	6898	6894	6867	6861	6868	6856	6858	6868	-	0.39
Barium (mg/kg)		341	9410	2090	2350	6210	1000	-	-	-	-	-	-	-	-	-	5.3
Cadmium (mg/kg)		<1.3	<1.4	<1.1	<1.2	<1.2	<1.2	-	-	-	-	-	-	-	-	-	15000
Chromium (III) (mg/Kg)		22.5	15.8	24.4	25.7	18.7	34.1	-	-	-	-	-	-	-	-	-	70
Chromium (VI) (mg/Kg)		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-	-	-	-	-	-	-	-	120000
Copper (mg/kg)		17.3	14.6	14.8	16.4	24.4	12.6	-	-	-	-	-	-	-	-	-	23
Lead (inorganic) (mg/kg)		13.2	<7.2	11.6	12.9	16.7	11.5	-	-	-	-	-	-	-	-	-	3100
Mercury (mg/kg)		<0.11	<0.11	<0.093	<0.099	<0.095	<0.10	-	-	-	-	-	-	-	-	-	400
Nickel (mg/kg)		14.5	128	14.9	15.2	55.7	17.5	-	-	-	-	-	-	-	-	-	23
Selenium (mg/kg)		<6.7	<7.2	<5.5	<6.1	<6.1	<6.1	-	-	-	-	-	-	-	-	-	1600
Silver (mg/kg)		<4.0	<4.3	<3.3	<3.6	<3.7	<3.7	-	-	-	-	-	-	-	-	-	390
Zinc (mg/kg)		45.7	23.7	43.9	48.5	43.5	46.7	-	-	-	-	-	-	-	-	-	390
% Solids		76.9	68.5	89.6	85.8	80.7	82.9	84.9	88.3	85.5	85.0	91.0	87.5	88.5	83.8	-	23000

- Notes:
- 1) ND = not detectible 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 3 for Reserve Pit SE Subliner assessment.
  - 6) See Table 4 for the Cuttings Pit Mix/blend summary.
  - 7) Background #8 was reported in a separate lab report (D40380R).

**Table 2**  
**Location: NPU 196-19B**  
**Lab Summary - Discrete Arsenic Summary**

Analytical Parameter (with units)	Cuttings						Background								COGCC	Maximum based on Background	
	Cut Pit Post Solid. 11/12/12	Discrete AS #1	Discrete AS #2	Discrete AS #3	Discrete AS #4	Discrete AS #5	#1	#2	#3	#4	#5	#6	#7	#8	Table 910-1 Concentration Levels		
Accutest Job #	D40911	D40909 (11/12/12)					D40380 (10/26/12)								R <sup>4</sup>	-	
Sample type (Composite/Discrete)	C	D	D	D	D	D	D	D	D	D	D	D	D	D	D	-	
TPH (GRO) (mg/Kg)	15.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
TPH (DRO) (mg/Kg)	298	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
TPH (GRO + DRO) (mg/Kg)	313	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Benzene (mg/Kg)	0.221	-	-	-	-	-	-	-	-	-	-	-	-	-	-	500	
Toluene (mg/Kg)	0.928	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.170	
Ethylbenzene (mg/Kg)	0.218	-	-	-	-	-	-	-	-	-	-	-	-	-	-	85	
Xylenes (total) (mg/Kg)	1.11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100	
Acenaphthene (mg/Kg)	ND	-	-	-	-	-	-	-	-	-	-	-	-	-	-	175	
Anthracene (mg/Kg)	ND	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1000	
Benzo(A)anthracene (mg/Kg)	ND	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1000	
Benzo(A)pyrene (mg/Kg)	ND	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.22	
Benzo(B)fluoranthene (mg/Kg)	ND	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.022	
Benzo(K)fluoranthene (mg/Kg)	ND	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.22	
Chrysene (mg/Kg)	0.0155	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.2	
Dibenzo(A,H)anthracene (mg/Kg)	ND	-	-	-	-	-	-	-	-	-	-	-	-	-	-	22	
Fluoranthene (mg/Kg)	0.0095	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.022	
Fluorene (mg/Kg)	0.0431	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1000	
Indeno(1,2,3,C,D)pyrene (mg/Kg)	ND	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1000	
Naphthalene (mg/Kg)	0.240	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.22	
Pyrene (mg/Kg)	0.0220	-	-	-	-	-	-	-	-	-	-	-	-	-	-	23	
Electrical Conductivity (mmhos/cm)	7.910	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1000	
Sodium Adsorption Ratio (SAR)	18.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	
pH	12.41	-	-	-	-	-	-	-	-	-	-	-	-	-	-	12	
Arsenic (mg/kg)	7.7	7.3	10.3	9.4	7.9	9.6	4.6	3.5	3.7	3.1	4.2	4.6	4.8	4.2	-	6-9	
Barium (mg/kg)	6210	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.39	5.3
Cadmium (mg/kg)	<1.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	15000	
Chromium (III) (mg/Kg)	18.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	70	
Chromium (VI) (mg/Kg)	<1.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	120000	
Copper (mg/kg)	24.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	23	
Lead (inorganic) (mg/kg)	16.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3100	
Mercury (mg/kg)	<0.095	-	-	-	-	-	-	-	-	-	-	-	-	-	-	400	
Nickel (mg/kg)	55.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	23	
Selenium (mg/kg)	<6.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1600	
Silver (mg/kg)	<3.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	390	
Zinc (mg/kg)	43.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	390	
% Solids	80.7	87.2	79.8	79.0	80.1	80.4	84.9	88.3	85.5	85.0	91.0	87.5	88.5	83.8	-	23000	

Notes:

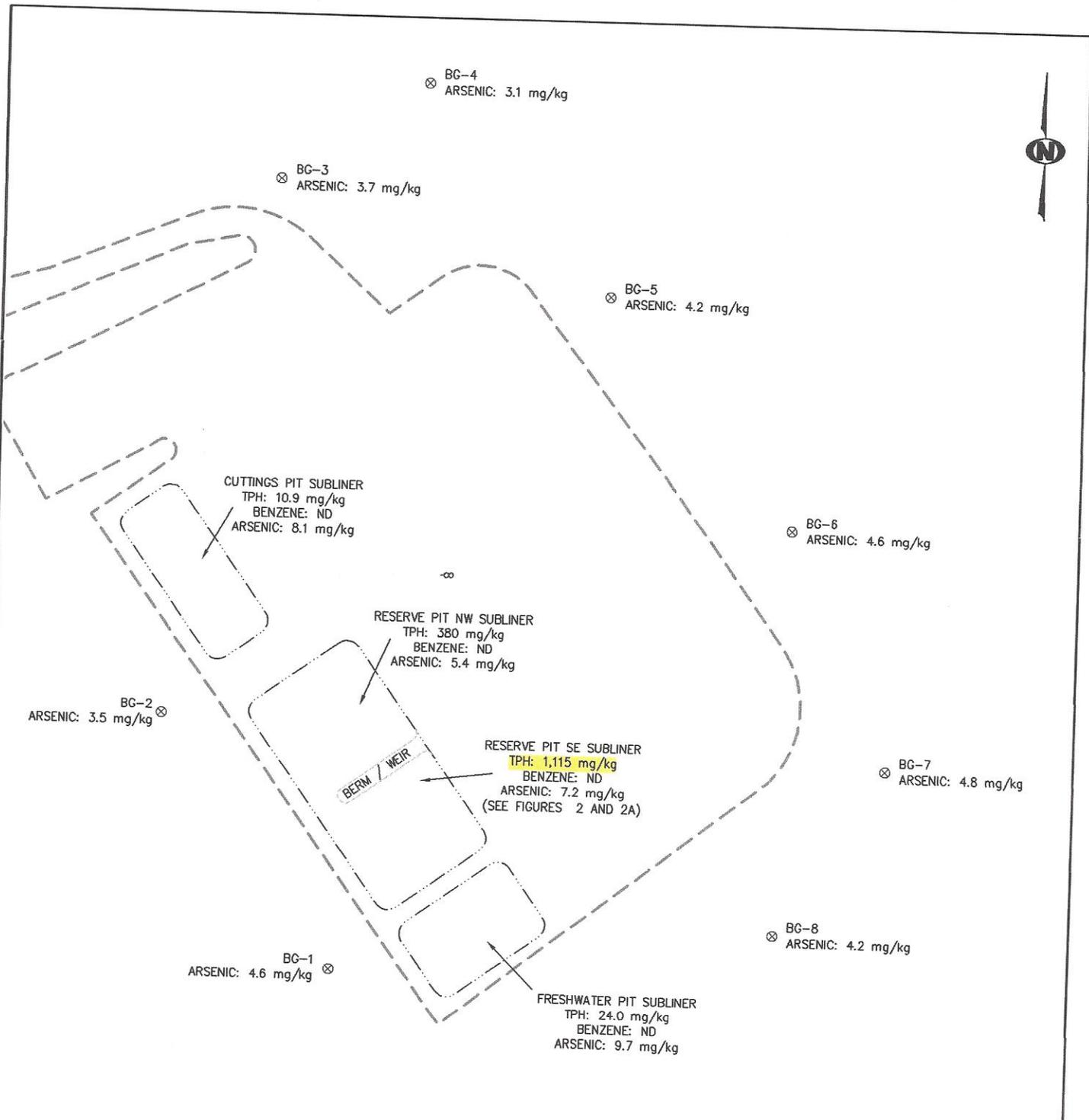
- 1) ND = not detectible to the laboratory detection limit.
- 2) Results highlighted in yellow exceed Table 910-1 concentration levels. Results highlighted in Gray exceed Table 910-1, but are below background levels.
- 3) "-" indicates no analysis.
- 4) Background #8 was reported in a separate lab report (D40380R).

**Table 3**  
**Location: NPU 196-19B**  
**Lab Summary - Reserve Pit SE Assessment**

Analytical Parameter (with units)	Reserve Pit		S.E. RP Subliner Discrete					Post 2' Excavation			Ex. MTRL	COGCC
	RP Post Solid. 11/12/12	RP S.E. Subliner 11/15/12	SE RP 1	SE RP 2	SE RP 3	SE RP 4	SE RP 5	SE RP 1 (-2')	SE RP 3 (-2')	SE RP 5 (-2')	RP Excavated Material MB 1/7/13	Table 910-1 Concentration Levels
	D40911	D41042	D41047 (12/6/12)					D41998 (12/17/12)			D42444	-
Accutest Job #	D40911	D41042	D41047 (12/6/12)					D41998 (12/17/12)			D42444	-
Sample type (Composite/Discrete)	C	C	D	D	D	D	D	D	D	D	C	-
TPH (GRO) (mg/Kg)	306	14.6	76.5	ND	ND	ND	ND	ND	ND	ND	ND	-
TPH (DRO) (mg/Kg)	2300	1100	3150	30.4	1540	34.9	526	62.2	59.1	39.5	90.8	-
TPH (GRO + DRO) (mg/Kg)	2606	1115	3227	30.4	1540	34.9	526	62.2	59.1	39.5	90.8	-
Benzene (mg/Kg)	0.0779	ND	-	-	-	-	-	62.2	59.1	39.5	90.8	500
Toluene (mg/Kg)	1.84	ND	-	-	-	-	-	-	-	-	-	0.170
Ethylbenzene (mg/Kg)	0.838	ND	-	-	-	-	-	-	-	-	-	85
Xylenes (total) (mg/Kg)	18.2	ND	-	-	-	-	-	-	-	-	-	100
Acenaphthene (mg/Kg)	ND	ND	-	-	-	-	-	-	-	-	-	175
Anthracene (mg/Kg)	ND	ND	-	-	-	-	-	-	-	-	-	1000
Benzo(A)anthracene (mg/Kg)	ND	ND	-	-	-	-	-	-	-	-	-	1000
Benzo(A)pyrene (mg/Kg)	ND	ND	-	-	-	-	-	-	-	-	-	0.22
Benzo(B)fluoranthene (mg/Kg)	ND	ND	-	-	-	-	-	-	-	-	-	0.022
Benzo(K)fluoranthene (mg/Kg)	ND	ND	-	-	-	-	-	-	-	-	-	0.22
Chrysene (mg/Kg)	0.0365	0.0204	-	-	-	-	-	-	-	-	-	2.2
Dibenzo(A,H)anthracene (mg/Kg)	ND	ND	-	-	-	-	-	-	-	-	-	22
Fluoranthene (mg/Kg)	0.0380	ND	-	-	-	-	-	-	-	-	-	0.022
Fluorene (mg/Kg)	0.432	0.132	-	-	-	-	-	-	-	-	-	1000
Indeno(1,2,3,C,D)pyrene (mg/Kg)	ND	ND	-	-	-	-	-	-	-	-	-	1000
Naphthalene (mg/Kg)	2.330	0.0771	-	-	-	-	-	-	-	-	-	0.22
Pyrene (mg/Kg)	0.0459	0.0239	-	-	-	-	-	-	-	-	-	23
Electrical Conductivity (mmhos/cm)	12.300	3.850	-	-	-	-	-	-	-	-	-	1000
Sodium Adsorption Ratio (SAR)	11.8	9.59	-	-	-	-	-	-	-	-	-	4
pH	12.44	9.25	-	-	-	-	-	-	-	-	-	12
Arsenic (mg/kg)	4.8	7.2	-	-	-	-	-	-	-	-	-	6-9
Barium (mg/kg)	9410	2350	-	-	-	-	-	-	-	-	-	0.39
Cadmium (mg/kg)	<1.4	<1.2	-	-	-	-	-	-	-	-	-	15000
Chromium (III) (mg/Kg)	15.8	25.7	-	-	-	-	-	-	-	-	-	70
Chromium (VI) (mg/Kg)	<1.0	<1.0	-	-	-	-	-	-	-	-	-	120000
Copper (mg/kg)	14.6	16.4	-	-	-	-	-	-	-	-	-	23
Lead (inorganic) (mg/kg)	<7.2	12.9	-	-	-	-	-	-	-	-	-	3100
Mercury (mg/kg)	<0.11	<0.099	-	-	-	-	-	-	-	-	-	400
Nickel (mg/kg)	128	15.2	-	-	-	-	-	-	-	-	-	23
Selenium (mg/kg)	<7.2	<6.1	-	-	-	-	-	-	-	-	-	1600
Silver (mg/kg)	<4.3	<3.6	-	-	-	-	-	-	-	-	-	390
Zinc (mg/kg)	23.7	48.5	-	-	-	-	-	-	-	-	-	390
% Solids	68.5	85.8	82.1	87.1	86.4	87.3	86.3	89.0	89.0	87.1	83.5	-

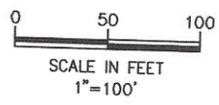
Notes:

- 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.



LEGEND	
	EDGE OF PAD
	APPROX. PIT LOCATION
	BERM / WEIR
	INDICATES TPH LAB RESULTS ABOVE 500 mg/kg
	APPROX WELL HEAD LOCATION
	BACKGROUND TEST LOCATION
→	WITH LAB RESULTS

- NOTES:
- BACKGROUND ARSENIC RESULTS ARE DISCRETE SAMPLES.
  - ND INDICATES NOT DETECTED WITHIN LABORATORY DETECTION LIMITS.
  - RESULTS SHOWN ARE SUBLINER CONFIRMATION SAMPLES UNLESS OTHERWISE NOTED.



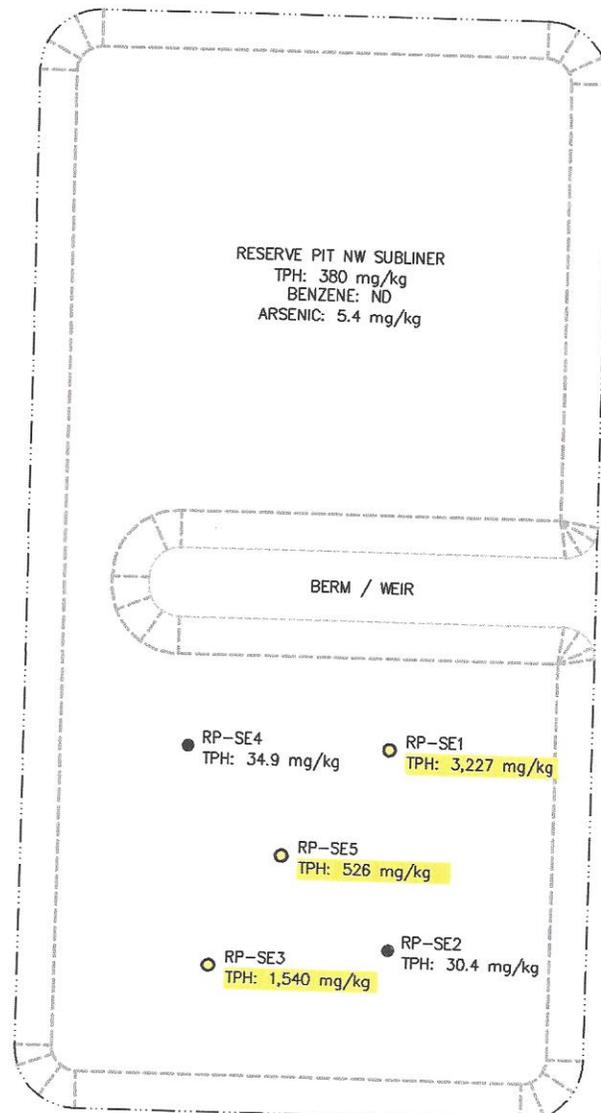
\\hyper-v03\kwd-co\esdk\proj\cto environmental\1202-08 npu 196-19b\civil 3d\samples.dwg, 1/25/13

OPS: Trimble DATE: 1/25/13 FILE NAME: samples PROJECT NO. 1202-08	CHECKED: DK DRAWN: DRF SHEET NO. 1 of 3 SCALE: 1" = 100'	<b>FIGURE</b> <b>1</b> DATE REVISIONS
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**KRW CONSULTING, INC.**  
 8000 W. 14TH AVENUE, SUITE 200  
 LAKEWOOD, COLORADO  
 (303) 239-9011

**FIGURE 1**  
**PICEANCE CREEK**  
**NPU 196-19B**  
**SAMPLE LOCATIONS**  
**WITH ARSENIC LEVELS**  
 PREPARED FOR XTO ENERGY

\\hyper-v03\kwd-co\esdk\proj\to environmental\1202-08 npu 196-19b\civil\_3d\reserve.dwg.1/25/13



RESERVE PIT NW SUBLINER  
 TPH: 380 mg/kg  
 BENZENE: ND  
 ARSENIC: 5.4 mg/kg

BERM / WEIR

● RP-SE4  
 TPH: 34.9 mg/kg

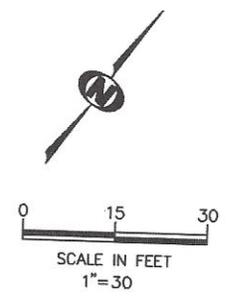
● RP-SE1  
 TPH: 3,227 mg/kg

● RP-SE5  
 TPH: 526 mg/kg

● RP-SE3  
 TPH: 1,540 mg/kg

● RP-SE2  
 TPH: 30.4 mg/kg

FRESHWATER PIT



LEGEND	
	EDGE OF PAD
	APPROX. PIT LOCATION
	BERM / WEIR
	APPROX. TOE OF PIT (ORIGINAL)
●	DISCRETE SAMPLE LOCATION WITH TPH LAB RESULTS LESS THAN OR EQUAL TO 500 mg/kg
○	DISCRETE SAMPLE LOCATION WITH TPH LAB RESULTS GREATER THAN 500 mg/kg

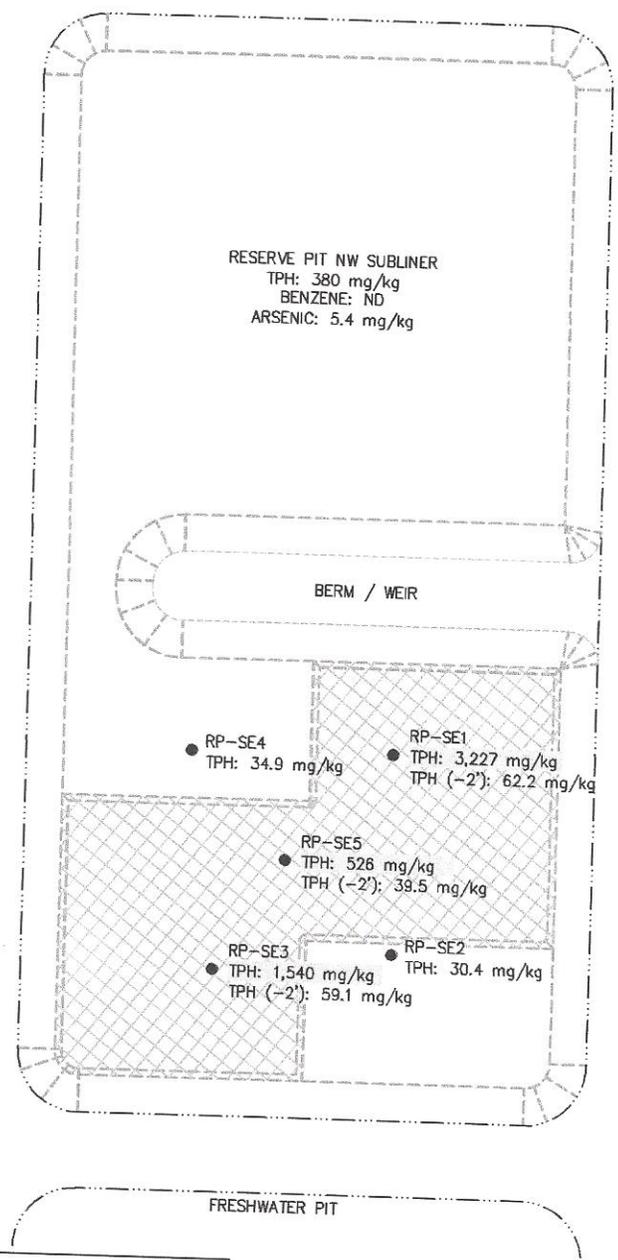
- NOTES:
1. ND INDICATES NOT DETECTED WITHIN LABORATORY DETECTION LIMITS.
  2. RESULTS SHOWN ARE SUBLINER CONFIRMATION SAMPLES UNLESS OTHERWISE NOTED.

QPS:	CHECKED:	FIGURE	DATE	REVISIONS
Trimble	DK			
DATE:	DRAWN:	2		
1/25/13	DRF			
FILE NAME:	SHEET NO.	2 of 3		
reserve				
PROJECT NO.	SCALE:	1" = 30'		
1202-08				

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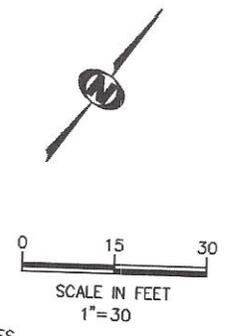
FIGURE 2  
 PICEANCE CREEK  
 NPU 196-19B  
 RESERVE PIT SE  
 SUBLINER CONFIRMATION DATA  
 PREPARED FOR XTO ENERGY

\\hyper-v03\kwd-co\sask\proj\to environmental\1202-08 npu 196-19b\civil 3d\reserve cl.dwg.1/25/13



LEGEND	
	EDGE OF PAD
	APPROX. PIT LOCATION
	BERM / WEIR
	APPROX. TOE OF PIT
	SOILS REMOVED
	APPROX WELL HEAD LOCATION
	DISCRETE SAMPLE LOCATION WITH TPH LAB RESULTS LESS THAN OR EQUAL TO 500 mg/kg
	DISCRETE SAMPLE LOCATION WITH TPH LAB RESULTS GREATER THAN 500 mg/kg

- NOTES:
1. ND INDICATES NOT DETECTED WITHIN LABORATORY DETECTION LIMITS.
  2. RESULTS SHOWN ARE SUBLINER CONFIRMATION SAMPLES UNLESS OTHERWISE NOTED.



GPS:	CHECKED:	FIGURE	DATE	REVISIONS
Trimble	DK			
DATE:	DRAWN:	2A		
1/25/13	DRF			
FILE NAME:	SHEET NO.	3 of 3		
reserve cl				
PROJECT NO.	SCALE:	1" = 30'		
1202-08				

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FIGURE 2A  
 PICEANCE CREEK  
 NPU 196-19B  
 RESERVE PIT SE  
 SELECT SAMPLE RESULTS  
 PREPARED FOR XTO ENERGY