

State of Colorado
Oil and Gas Conservation Commission



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

#7466

FOR OGCC USE ONLY

RECEIVED
12/3/2012

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>05-103-10441-00</u>	County: <u>Rio Blanco</u>
Facility Name: <u>Piceance Creek Unit</u>	Facility Number: <u>Drilling Pits #272560 and 272879</u>
Well Name: <u>Piceance Creek Unit</u>	Well Number: <u>T78X-12G</u>
Location: (QtrQtr, Sec, Twp, Rng, Meridian): <u>SESE, Sec. 12, T2S, R97W, 6th P.M.</u>	Latitude: <u>39.8849</u> Longitude: <u>-108.22245</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: Yamac loam, 2-15%

Potential receptors (water wells within 1/4 mi, surface waters, etc.): water wells > 1.0 miles; Hatch Gulch Diversion Spring - approx. 2000 ft.

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>Arsenic, TPH and Benzene</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 will be transported offsite to a permitted disposal/recycling facility. Cuttings Pits #1 and #2 contents will be treated onsite with a temporary Thermal Desorption Unit, by mix/blend processing or transported offsite to a permitted disposal/recycling 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.

XTO Pits Closure

FORM 27 Rev 6/99

State of Colorado Oil and Gas Conservation Commission 1120 Lincoln Street, Suite 801, Denver, Colorado 80203 (303)894-2100 Fax (303)894-2109



Tracking Number: Name of Operator: OGCC Operator No: XTO Received Date: Location ID# 335878 Well Name & No: API # 103-10441 Facility Name & No: Pit # 272560 & 272879

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 150 feet below the ground surface. Soil samples were collected for laboratory analysis of subliner material to confirm no groundwater impact potential exists (see Table 1).

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 II

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 [x] N If yes, describe:

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

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 will be transported offsite to an approved disposal/recycling facility. Cuttings Pits #1 and #2 contents will either be treated onsite with a temporary Thermal Desorption Unit, mix/blend processed to below Table 910-1 concentration levels, or transported offsite to an approved disposal/recycling facility. Material mix/blend and/or Thermal Desorption Unit processed will be used for on-site fill.

IMPLEMENTATION SCHEDULE

Date Site Investigation Began: 8/28/12 Date Site Investigation Completed: In progress Date Remediation Plan Submitted: 12/3/2012 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: 12/3/2012

OGCC Approved:

[Signature]

Title FOR Chris Canfield

Date: 12/18/2012

EPS NW Region

ATTACHMENT I

PCU T78X-12G Pit Closure Workplan, Form 27 Page 1

Describe initial action taken:

- i. The site consists of Freshwater, Reserve and Cuttings Pits #1 and #2 (see Figure 1).
- ii. Freshwater Pit contents (de minimis) and associated synthetic liners were removed and will be transported to an offsite permitted disposal/recycling facility.
- iii. The Freshwater Pit subliner composite samples were collected and analyzed for Table 910-1 parameters. Results exceeded Table 910-1 concentration levels for EC (8.52), SAR (12.9), pH (9.08) and Arsenic (4.7 mg/kg).
- iv. The Reserve Pit contents were sampled for Table 910-1 parameters. Results exceeded Table 910-1 concentration levels for EC (12.1), pH (12.53) and Arsenic (10.2 mg/kg).
- v. Reserve Pit subliner composite samples were collected and analyzed for Table 910-1 parameters. Results exceeded Table 910-1 concentration levels for pH (9.73) and Arsenic (6.6 mg/kg).
- vi. Cuttings Pit #1 contents were sampled for Table 910-1 parameters. Results exceeded Table 910-1 concentration levels for Benzene (0.744 mg/kg), EC (8.560), SAR (14.7), pH (12.49) and Arsenic (10.9 mg/kg).
- vii. Cuttings Pit #2 contents were sampled for Table 910-1 parameters. Results exceeded Table 910-1 concentration levels for TPH (601 mg/kg), Benzene (0.419 mg/kg), EC (13.5), SAR (62.7), pH (12.35) and Arsenic (14.2 mg/kg).
- viii. Cuttings Pits #1 and #2 contents were removed from the respective pits and will be treated on-site with a temporary Thermal Desorption Unit or mix/blend processing (with confirmation samples to ensure Table 910 compliance) or disposed of offsite.

- ix. Cuttings Pit #1 subliner composite samples were collected and analyzed for Table 910-1 parameters. Results exceeded Table 910-1 concentration levels for pH (9.65) and Arsenic (6.8 mg/kg).
- x. Cuttings Pit #2 subliner composite samples were collected and analyzed for Table 910-1 parameters. Results exceeded Table 910-1 concentration levels for pH (9.58) and Arsenic (6.5 mg/kg).
- xi. Mix/blend and/or Thermal Desorption Unit processed Cuttings Pits #1 and #2 material that meets Table 910-1 concentration levels will be used onsite for backfill.
- xii. All associated Reserve, Cuttings Pits #1 and #2 synthetic liners were removed and will be transported to an offsite permitted disposal/recycling facility.
- xiii. Refer to Table 1 for a summary of the laboratory results and Figure 1 for layout of the pits and sample locations.
- xiv. Elevated Arsenic levels above Table 910-1 concentration were detected beneath the Freshwater, Reserve and Cuttings Pits #1 and #2. Please refer to the associated sundry requesting consideration of background Arsenic levels.

ATTACHMENT II

PCU T78X-12G Pit Closure Workplan, Form 27 Page 2

REMEDIATION WORKPLAN

Describe Reclamation Plan:

1. Fresh Water Pit

- The pit will be backfilled with Thermal Desorption Unit processed, mix/blended, native onsite material or material transported to the site.

2. Reserve Pit

- The pit will be backfilled with Thermal Desorption Unit processed, mix/blended, native onsite material or material transported to the site.

3. Cuttings Pit #1

- The pit will be backfilled with Thermal Desorption Unit processed, mix/blended, native onsite material or material transported to the site.

4. Cuttings Pit #2

- The pit will be backfilled with Thermal Desorption Unit processed, mix/blended, native onsite material or material transported to the site.
- Elevated Arsenic levels above the Table 910-1 concentration level were detected beneath the Freshwater, Reserve and Cuttings Pits #1 and #2. Please refer to associated sundry requesting consideration of background Arsenic levels.
- Please refer to Table 1 for a summary of laboratory results, analytical reports are attached.
- 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 and 1000 Series rules, as specified in the Surface use Plan and BLM Conditions of Approval.

Table 1
Location: PCU T78X-12G
Lab Summary

Analytical Parameter (with units)	Fresh Water Pit		Reserve Pit		Cuttings #1		Cuttings #2		Background (8/28/12)						Last update			
	FW Pit Subliner 9/10/12	FW Pit Contents	RP Post Solid, 9/18/12	RP Subliner 9/18/12	Cut #1 Post Solid, 9/6/12	Cut #1 Subliner 9/7/12	Cut #2 Post Solid, 9/6/12	Cut #2 Subliner 9/7/12	CGCC	Table 910-1 Concentration Levels								
Accutest Job #	D38644		D38940	D38939	D38578	D38599	D38518	D38605										10/19/2012
Sample type (Composite/Discrete)	C		C	C	C	C	C	C										
TPH (GRO) (mg/Kg)	ND		ND	ND	46.7	ND	ND	77.6	ND									
TPH (DRO) (mg/Kg)	141		301	29.9	310	32.4	18.4	523	18.4									
TPH (GRO + DRO) (mg/Kg)	141		301	29.9	357	32.4	18.4	601	18.4									
Benzene (mg/Kg)	ND		ND	ND	0.744	ND	0.419	ND	ND									500
Toluene (mg/Kg)	ND		ND	ND	1.78	ND	1.93	ND	ND									0.170
Ethylbenzene (mg/Kg)	ND		ND	ND	0.277	ND	0.370	ND	ND									85
Xylenes (total) (mg/Kg)	ND		ND	ND	1.56	ND	1.95	ND	ND									100
Acenaphthene (mg/Kg)	ND		ND	ND	ND	ND	ND	ND	ND									175
Anthracene (mg/Kg)	ND		ND	ND	ND	ND	ND	ND	ND									1000
Benzo(A)anthracene (mg/Kg)	ND		ND	ND	ND	ND	ND	ND	ND									1000
Benzo(B)fluoranthene (mg/Kg)	ND		ND	ND	ND	ND	ND	ND	ND									0.22
Benzo(K)fluoranthene (mg/Kg)	ND		ND	ND	ND	ND	ND	ND	ND									0.22
Benzo(A)pyrene (mg/Kg)	ND		ND	ND	ND	ND	ND	ND	ND									2.2
Chrysene (mg/Kg)	ND		ND	ND	ND	ND	ND	ND	ND									0.022
Dibenzo(A,H)anthracene (mg/Kg)	0.0076		ND	ND	0.0621	ND	0.0280	ND	ND									22
Fluoranthene (mg/Kg)	ND		ND	ND	ND	ND	ND	ND	ND									0.022
Fluorene (mg/Kg)	ND		ND	ND	0.0165	ND	ND	ND	ND									1000
Indeno(1,2,3-C,D)pyrene (mg/Kg)	ND		ND	ND	0.102	ND	ND	ND	ND									1000
Naphthalene (mg/Kg)	ND		ND	ND	ND	ND	ND	ND	ND									0.22
Pyrene (mg/Kg)	0.0248		0.0354	ND	0.519	ND	0.336	0.0178	ND									23
Electrical Conductivity (mmhos/cm)	0.0257		ND	ND	0.0380	ND	0.0389	ND	ND									1000
Sodium Adsorption Ratio (SAR)	8.52		12.100	0.835	8.560	0.851	13.500	0.477	ND									4
pH	12.9		6.94	5.56	14.7	5.35	62.7	2.89	ND									12
Arsenic (mg/kg)	9.08		12.53	9.73	12.49	9.65	12.35	9.58	ND									6-9
Barium (mg/kg)	4.7		10.2	6.6	10.9	6.8	14.2	6.5	5.5	5.5	5.8	5.3	4.8	4.4	4.8	6.3	6.9	0.39
Cadmium (mg/kg)	1780		4220	914	2020	1340	2100	1530	-	-	-	-	-	-	-	-	-	15000
Chromium (III) (mg/Kg)	<1.2		<1.6	<1.1	<1.2	<1.2	<1.2	<1.2	<1.2									70
Chromium (VI) (mg/Kg)	39.3		<22	41.4	12.1	48.1	17.4	56.2	-	-	-	-	-	-	-	-	-	120000
Copper (mg/kg)	<1.0		<20	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0									23
Lead (Inorganic) (mg/kg)	15.7		18.2	10.3	28.2	11.4	31.6	10.3	-	-	-	-	-	-	-	-	-	3100
Mercury (mg/kg)	15.5		19.8	11.1	20.4	12.8	15.5	12.6	-	-	-	-	-	-	-	-	-	400
Nickel (mg/kg)	<0.12		<0.16	<0.11	<0.12	<0.11	<0.12	<0.11	-	-	-	-	-	-	-	-	-	23
Selenium (mg/kg)	19.6		130	18.5	85.9	19.5	52.8	19.6	-	-	-	-	-	-	-	-	-	1600
Silver (mg/kg)	<6.2		<7.9	<5.4	<6.0	<5.9	<6.1	<5.8	-	-	-	-	-	-	-	-	-	390
Zinc (mg/kg)	<3.7		<4.7	<3.3	<3.6	<3.5	<3.7	<3.5	-	-	-	-	-	-	-	-	-	390
% Solids	50.1		54.3	39.2	40.5	47.1	49.4	46.2	-	-	-	-	-	-	-	-	-	23000
	82.7		62.8	92.8	81.3	86.4	79.9	85.6	93.4	96.9	94.8	95.5	95.5	96.0	95.9	95.6	-	-

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.

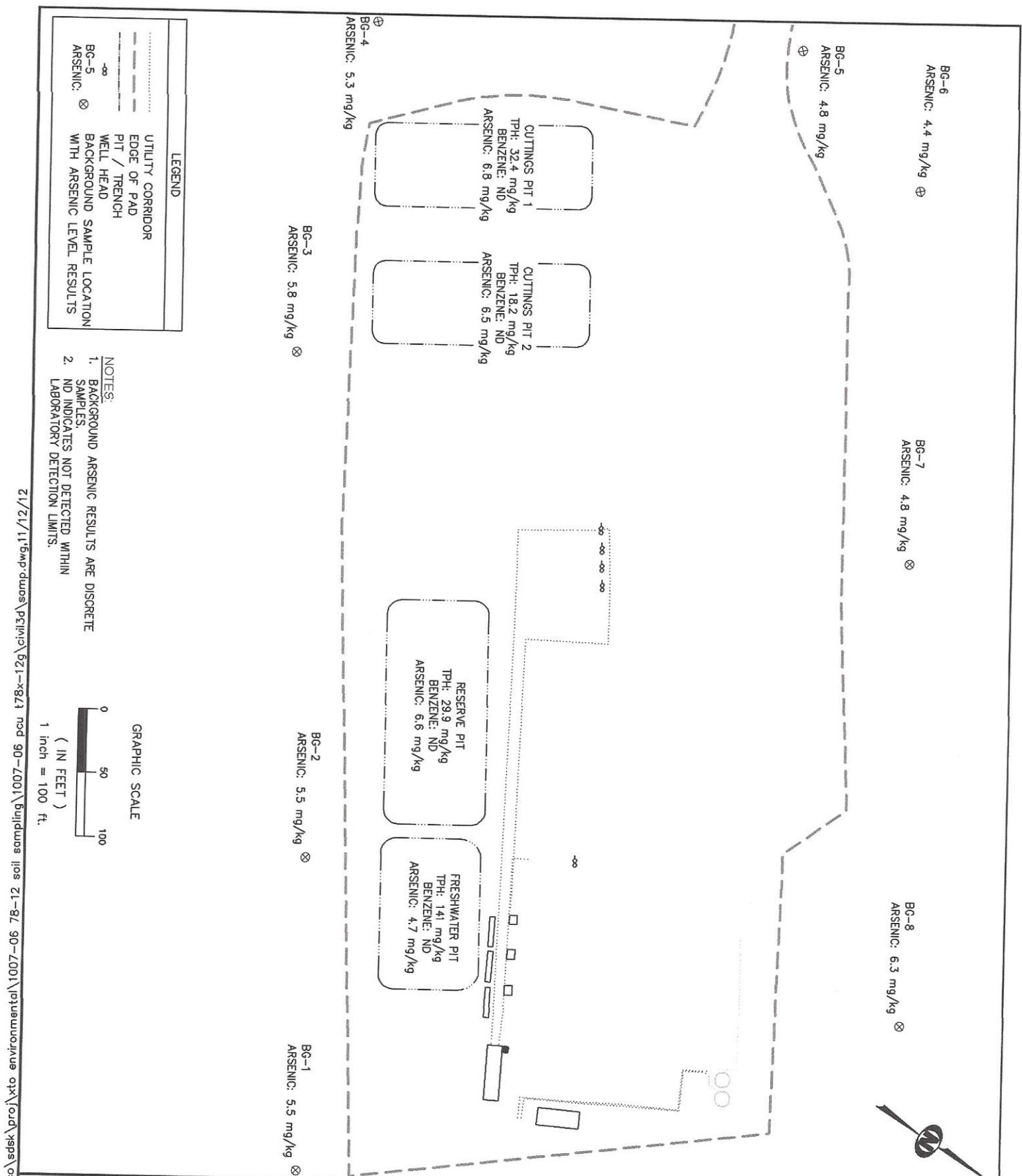
Table 2
Location: PCU T78X-12G
Lab Summary - Arsenic Summary

Analytical Parameter (with units)	Reserve Pit Discrete Arsenic					Cuttings #1 Discrete Arsenic					Cuttings #2 Discrete Arsenic					Background (8/28/12)								Last update	Maximum based on Background		
	#1	#2	#3	#4	#5	#1	#2	#3	#4	#5	#1	#2	#3	#4	#5	BG-1	BG-2	BG-3	BG-4	BG-5	BG-6	BG-7	BG-8			COGCC	Table 910-1 Concentration Levels
	D40650 (11/5/12)					D40648 (11/6/12)					D40649 (11/6/12)					D38124											
Accutest Job #	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	-	-		
Sample type (Composite/Discrete)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
TPH (GRO) (mg/Kg)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
TPH (DRO) (mg/Kg)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
TPH (GRO + DRO) (mg/Kg)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Benzene (mg/Kg)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	500	0.170		
Toluene (mg/Kg)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	85	85		
Ethylbenzene (mg/Kg)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100	100		
Xylenes (total) (mg/Kg)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	175	175		
Acenaphthene (mg/Kg)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1000	1000		
Anthracene (mg/Kg)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1000	1000		
Benzo(A)anthracene (mg/Kg)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.22	0.22		
Benzo(B)fluoranthene (mg/Kg)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.22	0.22		
Benzo(K)fluoranthene (mg/Kg)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.2	2.2		
Benzo(A)pyrene (mg/Kg)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.022	0.022		
Chrysene (mg/Kg)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	22	22		
Dibenzo(A,H)anthracene (mg/Kg)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.022	0.022		
Fluoranthene (mg/Kg)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1000	1000		
Fluorene (mg/Kg)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1000	1000		
Indeno(1,2,3-C,D)pyrene (mg/Kg)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.22	0.22		
Naphthalene (mg/Kg)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	23	23		
Pyrene (mg/Kg)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1000	1000		
Electrical Conductivity (mmhos/cm)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	4		
Sodium Adsorption Ratio (SAR)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	12	12		
pH	6.7	7.3	6.3	7.4	6.4	12.5	9.8	16.4	9.0	8.6	13.2	14.2	12.6	12.4	9.0	5.5	5.5	5.8	5.3	4.8	4.4	4.8	6.3	6-9	0.39		
Arsenic (mg/kg)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	15000	15000		
Barium (mg/kg)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	70	70		
Cadmium (mg/kg)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	120000	120000		
Chromium (III) (mg/Kg)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	23	23		
Chromium (VI) (mg/Kg)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3100	3100		
Copper (mg/kg)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	400	400		
Lead (inorganic) (mg/kg)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	23	23		
Mercury (mg/kg)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1600	1600		
Nickel (mg/kg)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	390	390		
Selenium (mg/kg)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	390	390		
Silver (mg/kg)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	23000	23000		
Zinc (mg/kg)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
% Solids	65.3	63.8	66.2	66.9	65.6	93.0	97.8	96.5	96.6	94.9	92.3	93.5	96.7	89.6	85.2	93.4	96.9	94.8	95.5	96.0	95.9	95.6	-	-			

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.



DESIGNED: -	CHECKED: DK	FIGURE 1	NOTES:	
DATE: 11/12/12	DRAWN: DRF		DATE	REVISIONS
FILE NAME: Somp	SHEET NO. 1 of 1			
PROJECT NO. 1007-06	SCALE: 1"=100'			

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

FIGURE 1
PICEANCE CREEK
PCU T78X-12G
SAMPLE LOCATIONS WITH
BACKGROUND ARSENIC
PREPARED FOR XTO ENERGY