FORM
27
Rev 6/99

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State of Colorado
Oil and Gas Conservation Commission

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

#8231

FOR OGCC USE ONLY

OGCC Employee:

☒ Spill ☐ Complaint
☐ Inspection ☐ NOAV
Tracking No: 2147739

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): Form 27 update

OGCC Operator Number: 100264
Name of Operator: XTO Energy Inc.
Address: PO Box 6501
City: Englewood State: CO Zip: 80155

Contact Name and Telephone:
Jessica Dooling
No: 970-675-4122
Fax: 970-675-4150

API Number:
Facility Name:
Well Name:

County: Rio Blanco
Facility Number: 436190
Well Number:

Location: (QtrQtr, Sec, Twp, Rng, Meridian): NWSW, Sec. 9, T2S, R97W, 6th P.M. Latitude: 39.899583 Longitude: -108.294083

TECHNICAL CONDITIONS

Type of Waste Causing Impact (crude oil, condensate, produced water, etc): Produced Water

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.): Irrigated grazing

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

Potential receptors (water wells within 1/4 mi, surface waters, etc.): No water wells within 1/4 mile, Piceance Creek ~359 feet to the east

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

Impacted Media (check):	Extent of Impact:	How Determined:
☑ Soils	Benzene, EC, pH, SAR and Arsenic	laboratory analysis
☐ Vegetation		
☐ Groundwater		
☐ Surface Water		

REMEDIATION WORKPLAN

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

See Attachment I and II for details regarding background Arsenic and initial action taken.

Describe how source is to be removed:

Impacted soils from the excavation area have been removed and transported offsite to a permitted disposal/recycling facility. Impacted water/groundwater previously collected has been disposed of at permitted XTO injection wells.

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.:

N/A

Submit Page 2 with Page 1

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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.):

The current groundwater bearing zone in and around the excavation area is approximately 7 feet below the ground surface. Initial samples collected of the water ponding in the release area were above Table 910-1 concentration levels for Benzene, Toluene, and Xylenes (See Table 1). Groundwater samples collected from the excavation bottom at ~7 feet were below Table 910-1 concentration levels for Benzene, Toluene, Ethylbenzene and Xylenes. Prior to backfilling the excavation area, additional groundwater samples were collected and indicate Non-detect for BTEX constituents.

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 ☑ N If yes, describe:

Assessment has been completed and impacts have been identified, removed and transported offsite to a permitted disposal/recycling facility. No further assessment will be necessary (See Figures 1-4).

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

Impacted soil has been removed and transported offsite to a permitted disposal/recycling facility. Impacted groundwater has been removed and disposed of at permitted XTO injection wells.

IMPLEMENTATION SCHEDULE

Date Site Investigation Began: 2/4/13	Date Site Investigation Completed: in progress	Date Remediation Plan Submitted: 2/19/2013
Remediation Start Date: pending approval	Anticipated Completion Date: pending approval	Actual Completion Date: 5/2/2013

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: Piceance EH&S Supervisor Date: 2/20/2014

OGCC Approved: Stanley C. Spencer Title: EPS Northwest Region Date: 2/24/2014

ATTACHMENT I

PWDD Workplan, Form 27 Page 1

Background Arsenic:

XTO Energy herein requests consideration of site-specific background Arsenic levels as an alternative to the Table 910-1 value for the PWDD location. COGCC Table 910-1 Concentration Levels list the allowable concentration level for Arsenic in soil at 0.39 mg/kg. Footnote 1 of Table 910-1 states "Consideration shall be given to background levels in native soils and ground water". At other locations COGCC has allowed the determination of allowable levels based upon a 10% variability factor applied to background soil concentration values where the maximum allowable level is computed by multiplying the highest detected background concentration by 1.1.

1. Five representative background samples were collected from undisturbed areas adjacent to the subject location. Arsenic concentrations in those samples ranged from 4.2 mg/kg to 15.9 mg/kg. Applying the 10% variability factor to the highest concentration detected results in an allowable Arsenic concentration level of 17.5 mg/kg.

2. Arsenic samples collected from the excavation bottom and sidewalls range from 4.5 to 5.2 mg/kg. Arsenic samples collected laterally from the release area range from 4.5 to 9.3 mg/kg. These Arsenic concentrations are within the allowable background Arsenic concentration of 17.5 mg/kg.

Please find the Lab Data Summary Tables and the Site Map indicating Arsenic sampling locations attached.

ATTACHMENT II

PWDD Line Release Closure Workplan, Form 27 Pages 1 and 2

Describe initial action taken:

1. Upon discovery of the release, immediate steps were taken to identify the leak and contain potentially impacted soils.
    - Pot-holing of the ROW was initiated to locate the leak.
    - A lined containment area was constructed to temporarily hold the excavated soils from the excavation.
    - Water samples were collected from the water pooled at the surface. These samples were analyzed for Table 910-1 parameters for water. Results exceeded Table 910-1 concentration levels for Benzene (13,000 µg/L), Toluene (21,600 µg/L), and Xylenes (9,390 µg/L).
    - Groundwater samples were collected from the excavation bottom at ~7 ft below ground surface. These samples were analyzed for Table 910-1 parameters for water. Results were below Table 910-1 BTEX concentration levels.
        - Water removed from the pot-hole/excavation area was transported to the XTO Salt Water Disposal (SWD) facility and was injected in permitted XTO injection wells.
        - A cattle panel fence was installed around the release area throughout the project.

2. The 10” Produced Water Disposal and Distribution (PWDD) pipeline was excavated, the leak was identified, the line was isolated and soil samples were collected to determine extent of impacts.
    - Soil samples were collected from the sidewalls of the excavation (north, south, east and west) and analyzed for Table 910-1 parameters. Results exceeded Table 910-1 concentration levels for pH (range: 9.15 to 9.70) and Arsenic (range: 4.5 mg/kg to 5.2 mg/kg).
    - Soil samples were collected from the bottom of the excavation and analyzed for Table 910-1 parameters. Results exceeded Table 910-1 concentration levels for Benzene (0.438 mg/kg), SAR (13.6 mg/kg), pH (9.44) and Arsenic (4.8 mg/kg).
        - Discrete samples that made up the initial composite samples indicate Benzene was impacted in the north half of the excavation.

- Soil was removed in the north half from 2’ to 6’ beneath the pipe and sampled to ensure Table 910 compliance.

3. The damaged section of pipeline was removed and replaced. Integrity of the pipeline segment was verified with a magnetic linear survey (smart pig). The excavation was backfilled on 5/2/2013 as verbally approved by Chris Canfield, COGCC on 4/19/2013.

- Refer to Tables 1-4 for a summary of the laboratory results and Figures 1 - 4 for the release and sample locations.

- Elevated Arsenic levels above Table 910-1 concentration were detected in the bottom, sidewall and lateral samples. Please refer to Attachment I requesting consideration of background Arsenic levels (See Table 4).

- Reclamation activities were completed on 7/1/2013 in accordance with applicable COGCC 900, 1000 Series rules and as specified in the Surface Use Plan and BLM Conditions of Approval for the Phase I pipeline ROW.

Table 1
Location: PWDD 10" Spill
Lab Summary - Background Data

Last update 2/20/2014

Analytical Parameter	Love Ranch 8 Background					COGCC	Maximum based on Background
(with units)	*BG - 1*	*BG - 2*	*BG - 3*	*BG - 4*	*BG - 5*	*Table 910-1 Concentration Levels*	
Accutest Job #	D20760 (1/27/11)					-	-
Sample type (**C**omposite/**D**iscrete)	**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 or 2x BG	-
Sodium Adsorption Ratio (SAR)	-	-	-	-	-	12	-
pH	-	-	-	-	-	6-9	-
Arsenic (mg/kg)	13.5	15.9	9.8	5.5	4.2	0.39	17.5
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	-

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 Tabl
3) "-" indicates no analysis.
4) See Figure(s) for sample locations.

Table 2
Location: PWDD 10" Line Release
Lab Summary - Water Sampling Assessment

Last update 2/20/2014

Analytical Parameter	PWDD Water Samples			COGCC
(with units)	***PWDD Water Surface 2/4/13***	***PWDD Water at 7' Excavation 2/4/13***	***PWDD Composite Groundwater 4/3/13***	***Table 910-1 Concentration Levels***
Accutest Job #	**D43109**	**D43110**	**D45050**	-
Sample type	**Grab**	**Grab**	**Composite**	-
Benzene (µg/l)	13000	0.30	ND	5
Toluene (µg/l)	21600	ND	ND	560 to 1000
Ethylbenzene (µg/l))	573	ND	ND	700
Xylenes (total) (µg/l)	9390	ND	ND	1400 to 10000
Total Dissolved Solids (mg/l)	10900	1540	1580	<1.25 BG
Chloride (mg/l)	5200	23.4	26.3	<1.25 BG
Sulfate (mg/l)	71.8	641	612	<1.25 BG
Bromide (mg/l)	38.9	<0.50	-	N/A
Fluoride (mg/l)	<2.0	1.2	-	N/A
Nitrogen, Nitrate (mg/l)	<0.20	<0.050	-	N/A
Nitrogen, Nitrite (mg/l)	<0.080	<0.020	-	N/A
Phosphate, Ortho (mg/l)	<1.3	<0.33	-	N/A
Calcium (mg/l)	77.200	90.900	-	N/A
Magnesium (mg/l)	56.900	152.000	-	N/A
Potassium (mg/l)	32.400	1.620	-	N/A
Sodium (mg/l)	3310.0000	226.000	-	N/A

Notes:
1) ND = not detectible to the laboratory detection limit noted.
2) Results highlighted in yellow exceed Table 910-1 concentration levels.
3) "-" indicates no analysis.

Table 3
Location: PWDD 10" Spill
Lab Summary - Excavation Samples

Last update 2/20/2014

Analytical Parameter	PWDD Excavation Samples														COGCC	*Maximum based on Background*
	North Sidewall	South Sidewall	East Sidewall	West Sidewall	Excavation Bottom					Post 2' Ex.		Post 6' Ex.		Stockpile		
(with units)	*Composite 2/7/13*	*Composite 2/7/13*	*Composite 2/7/13*	*Composite 2/7/13*	*Composite 2/7/13*	*#1*	*#2*	*#3*	*#4*	*Bottom #3 (-2')*	*Bottom #4 (-2')*	*Bottom #4 Pipe -6'*	*Bottom #4 North - 6'*	*Stockpile 2/8/13*	*Table 910-1 Concentration Levels*	
Accutest Job #	D43341	D43339	D43342	D43340	D43343	D43348 (2/7/13)				D44517 (3/19/13)		D44827 (3/28/13)		D43395	-	-
Sample type (**C**omposite/**D**iscrete)	C	C	C	C	C	D	D	D	D	D	D	D	D	C	-	-
TPH (GRO) (mg/Kg)	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	ND	-	-
TPH (DRO) (mg/Kg)	5.65	ND	ND	ND	5.53	-	-	-	-	-	-	-	-	19.3	-	-
TPH (GRO + DRO) (mg/Kg)	5.65	ND	ND	ND	5.53	-	-	-	-	-	-	-	-	19.3	500	-
Benzene (mg/Kg)	0.0457	ND	ND	ND	0.438	ND	ND	1.56	0.501	0.0803	1.10	ND	ND	ND	0.170	-
Toluene (mg/Kg)	0.392	ND	ND	ND	1.44	-	-	-	-	-	-	-	-	0.115	85	-
Ethylbenzene (mg/Kg)	0.0430	ND	ND	ND	0.0899	-	-	-	-	-	-	-	-	ND	100	-
Xylenes (total) (mg/Kg)	0.433	ND	ND	ND	1.57	-	-	-	-	-	-	-	-	ND	175	-
Acenaphthene (mg/Kg)	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	ND	1000	-
Anthracene (mg/Kg)	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	ND	1000	-
Benzo(A)anthracene (mg/Kg)	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	ND	0.22	-
Benzo(A)pyrene (mg/Kg)	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	ND	0.022	
Benzo(B)fluoranthene (mg/Kg)	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	ND	0.22	-
Benzo(K)fluoranthene (mg/Kg)	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	ND	2.2	-
Chrysene (mg/Kg)	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	ND	22	-
Dibenzo(A,H)anthracene (mg/Kg)	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	ND	0.022	-
Fluoranthene (mg/Kg)	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	ND	1000	-
Fluorene (mg/Kg)	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	0.0091	1000	-
Indeno(1,2,3,C,D)pyrene (mg/Kg)	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	ND	0.22	-
Naphthalene (mg/Kg)	ND	ND	ND	ND	0.0163	-	-	-	-	-	-	-	-	0.115	23	-
Pyrene (mg/Kg)	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	ND	1000	-
Electrical Conductivity (mmhos/cm)	2.900	1.060	2.040	1.460	2.870	1.480	0.548	1.400	3.620	-	-	-	-	2.330	<4 or 2x BG	-
Sodium Adsorption Ratio (SAR)	10.6	5.31	7.60	6.10	13.6	4.95	2.25	13.7	34.1	-	-	-	-	10.7	12	-
pH	9.15	9.34	9.21	9.70	9.44	9.10	8.79	9.31	8.93	-	-	-	-	9.30	6-9	-
Arsenic (mg/kg)	4.5	5.2	5.2	4.8	4.8	-	-	-	-	-	-	-	-	2.9	0.39	17.5
Barium (mg/kg)	254	245	258	297	231	-	-	-	-	-	-	-	-	251	15000	-
Cadmium (mg/kg)	<1.3	<1.3	<1.3	<1.2	<1.3	-	-	-	-	-	-	-	-	<1.3	70	-
Chromium (III) (mg/Kg)	30.4	28.2	32.1	32.7	30.5	-	-	-	-	-	-	-	-	28.5	120000	-
Chromium (VI) (mg/Kg)	<1.0	<1.0	<1.0	<1.0	<1.0	-	-	-	-	-	-	-	-	<1.0	23	-
Copper (mg/kg)	12.0	11.0	12.6	11.4	12.7	-	-	-	-	-	-	-	-	12.1	3100	-
Lead (inorganic) (mg/kg)	12.2	11.4	12.6	12.6	12.1	-	-	-	-	-	-	-	-	12.4	400	-
Mercury (mg/kg)	<0.11	<0.12	<0.094	<0.11	<0.097	-	-	-	-	-	-	-	-	<0.11	23	-
Nickel (mg/kg)	15.1	14.4	15.8	15.8	15.2	-	-	-	-	-	-	-	-	15.2	1600	-
Selenium (mg/kg)	<6.3	<6.3	<6.4	<6.1	<6.6	-	-	-	-	-	-	-	-	<6.4	390	-
Silver (mg/kg)	<3.8	<3.8	<3.8	<3.7	<4.0	-	-	-	-	-	-	-	-	<3.8	390	-
Zinc (mg/kg)	46.1	40.3	45.5	45.7	47.4	-	-	-	-	-	-	-	-	45.5	23000	-
% Solids	78.6	77.6	77.0	79.5	74.0	77.5	71.3	72.0	76.4	68.5	70.4	72.5	69.8	76.7	-	-

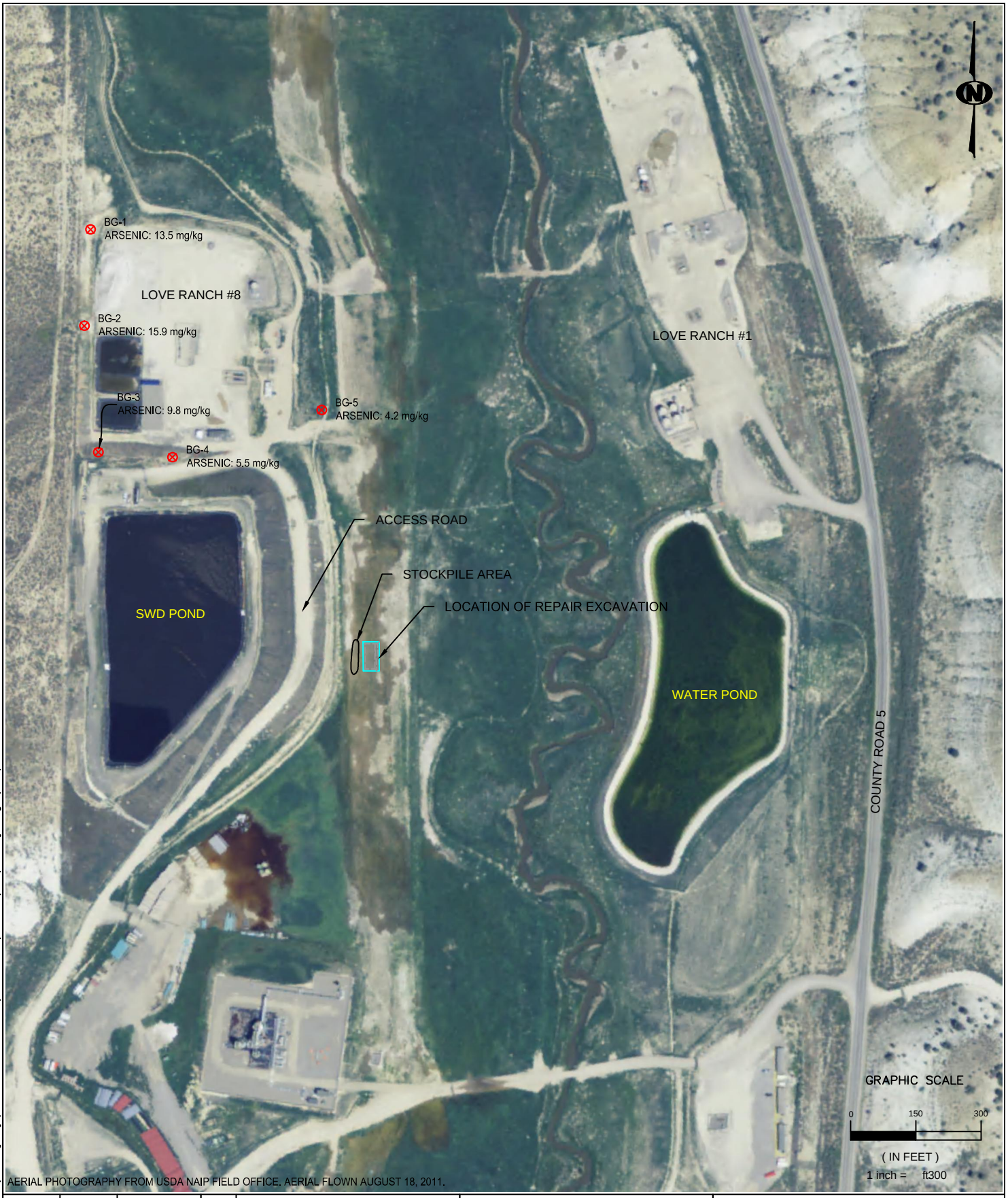
Notes:
1) ND = not detectible to the laboratory detection limit.
2) Results highlighted in yellow exceed Table 910-1 concentration levels. Results highlighted in Gray exceed Table 910-1, but are below background levels.
3) "-" indicates no analysis.
4) See Figure(s) for sample locations.
5) See Table 4 for determination of background levels.

Table 4
Location: PWDD 10" Spill
Lab Summary - Lateral Assessment

Last update 2/20/2014

Analytical Parameter	PWDD Lateral Surface Samples																		COGCC	Maximum based on Background
	Northeast				North Center				Northwest				Southeast		South Center		Southwest			
(with units)	#1	#2	#3	#4	#1	#2	#3	#4	#1	#2	#3	#4	#1	#2	#1	#2	#1	#2	Table 910-1 Concentration Levels	
Accutest Job #	D43399 (2/8/13)				D43396 (2/8/13)				D43398 (2/8/13)				D43397 (2/8/13)						-	-
Sample type (**C**omposite/**D**iscrete)	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	-	-
TPH (GRO) (mg/Kg)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
TPH (DRO) (mg/Kg)	8.11	ND	12.1	7.21	ND	ND	ND	ND	ND	8.56	5.66	ND	14.5	9.00	7.89	ND	5.59	13.5	-	-
TPH (GRO + DRO) (mg/Kg)	8.11	ND	12.1	7.21	ND	ND	ND	ND	ND	8.56	5.66	ND	14.5	9.00	7.89	ND	5.59	13.5	500	-
Benzene (mg/Kg)	ND	ND	ND	ND	0.042	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.170	-
Toluene (mg/Kg)	ND	ND	ND	ND	0.146	ND	ND	0.0923	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	85	-
Ethylbenzene (mg/Kg)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	100	-
Xylenes (total) (mg/Kg)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	175	-
Acenaphthene (mg/Kg)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1000	-
Anthracene (mg/Kg)	ND	ND	ND	ND	ND	ND	ND	ND	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	ND	ND	ND	ND	ND	ND	ND	ND	0.22	-
Benzo(A)pyrene (mg/Kg)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.022	
Benzo(B)fluoranthene (mg/Kg)	ND	ND	ND	ND	ND	ND	ND	ND	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	ND	ND	ND	ND	ND	ND	ND	ND	2.2	-
Chrysene (mg/Kg)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	22	-
Dibenzo(A,H)anthracene (mg/Kg)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.022	-
Fluoranthene (mg/Kg)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1000	-
Fluorene (mg/Kg)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1000	-
Indeno(1,2,3,C,D)pyrene (mg/Kg)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.22	-
Naphthalene (mg/Kg)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	23	-
Pyrene (mg/Kg)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1000	-
Electrical Conductivity (mmhos/cm)	3.720	3.430	5.470	2.130	3.190	2.830	3.240	2.830	3.540	3.430	5.320	2.140	2.360	7.740	2.170	4.610	4.200	4.290	<4 or 2x BG	-
Sodium Adsorption Ratio (SAR)	19.5	17.6	11.4	9.06	13.8	11.3	13.9	14.4	9.66	5.39	6.44	4.59	11.4	15.7	11.9	12.0	13.1	14.3	12	-
pH	9.72	9.65	9.21	9.30	9.35	9.11	8.90	9.16	9.13	8.83	8.95	9.17	9.22	9.09	9.73	9.12	8.94	9.34	6-9	-
Arsenic (mg/kg)	5.6	7.6	5.5	5.1	8.0	7.4	8.0	7.8	8.8	9.3	7.4	8.3	4.5	7.0	5.0	7.8	5.2	5.7	0.39	17.49
Barium (mg/kg)	345	215	321	326	188	195	262	253	226	193	174	206	293	258	281	220	309	338	15000	-
Cadmium (mg/kg)	<1.2	<1.4	<1.2	<1.4	<1.2	<1.2	<1.1	<1.3	<1.3	<1.3	<1.2	<1.3	<1.3	<1.3	<1.2	<1.2	<1.2	<1.3	70	-
Chromium (III) (mg/Kg)	34.7	17.2	34.1	33.9	13.7	14.5	15.9	21.5	18.1	16.5	14.3	14.4	31.3	34.3	30.7	19.6	34.0	33.9	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	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	23	-
Copper (mg/kg)	15.4	13.3	14.5	15.6	12.7	13.4	14.6	13.8	13.8	15.4	12.5	13.5	15.5	11.9	12.6	13.5	14.3	14.3	3100	-
Lead (inorganic) (mg/kg)	13.8	10.4	13.6	12.4	10	10.3	10.8	11.7	11.3	12.2	8.4	10.7	12.5	12.9	12.4	10.3	13.7	13.7	400	-
Mercury (mg/kg)	<0.10	<0.12	<0.11	<0.12	<0.10	<0.10	<0.10	<0.11	<0.11	<0.11	<0.097	<0.11	<0.11	<0.11	<0.10	<0.11	<0.12	<0.11	23	-
Nickel (mg/kg)	18.0	16.8	17.2	15.8	16.7	17.4	18.3	17.1	16.6	19.4	19.5	17.6	16.5	17.1	17.1	20.4	21.1	17.8	1600	-
Selenium (mg/kg)	<5.9	<7.1	<6.1	<6.9	<6.0	<5.9	<5.7	<6.3	<6.3	<6.4	<5.9	<6.5	<6.7	<6.3	<6.1	<5.9	<6.2	<6.5	390	-
Silver (mg/kg)	<3.6	<4.3	<3.6	<4.1	<3.6	<3.5	<3.4	<3.8	<3.8	<3.8	<3.5	<3.9	<4.0	<3.8	<3.6	<3.5	<3.7	<3.9	390	-
Zinc (mg/kg)	55.1	42.8	52.5	48.5	39.8	43.4	46.4	45.4	44.9	61.5	39.3	45.4	53.3	49.7	46.2	43.8	48.7	48.9	23000	-
% Solids	78.2	69.5	76.2	68.2	80.8	80.7	79.8	74.1	77.9	72.0	82.1	76.4	76.8	78.8	80.7	76.6	72.2	72.2	-	-

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 Figure(s) for sample locations.
5) See Table 4 for determination of background levels.



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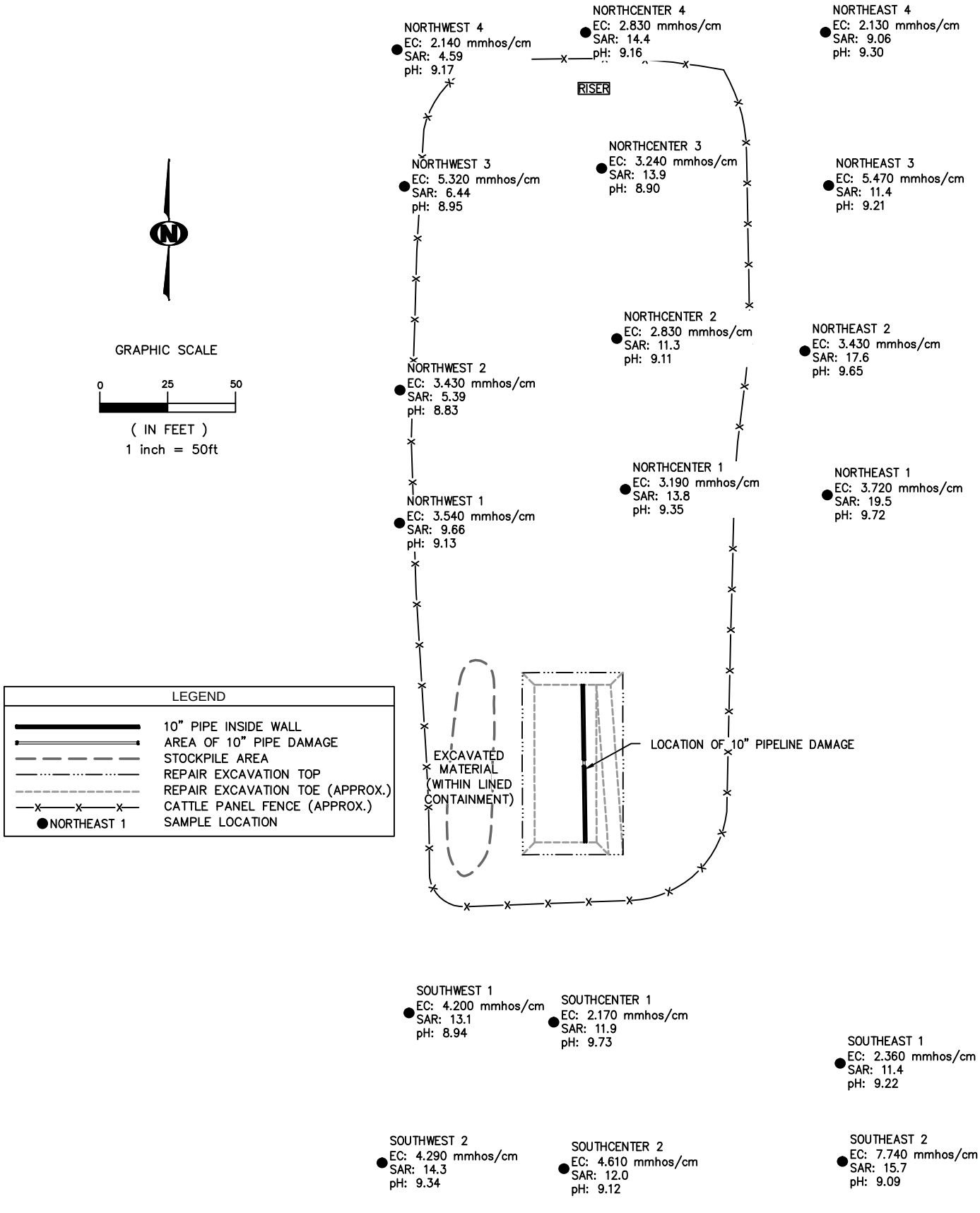
GPS: DS	CHECKED: DK	FIGURE 1	DATE	REVISIONS	KRW CONSULTING, INC. 8000 W. 14TH AVENUE, SUITE 200 LAKEWOOD, COLORADO (303) 239-9011
DATE: 2/20/14	DRAWN: DRF				
FILE NAME: vicinity		SHEET NO. 1 of 4			
PROJECT NO. 1302-03		SCALE: 1" = 300'			

FIGURE 1
PICEANCE CREEK PWDD RELEASE VICINITY MAP

PREPARED FOR XTO ENERGY



GPS: DS	CHECKED: DK	FIGURE 2	
DATE: 2/20/14	DRAWN: DRF		
FILE NAME: sample		SHEET NO. 2 of 4	
PROJECT NO. 1302-03		SCALE: 1" = 50'	

DATE	REVISIONS

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FIGURE 2
PICEANCE CREEK PWDD RELEASE SAMPLE LOCATIONS

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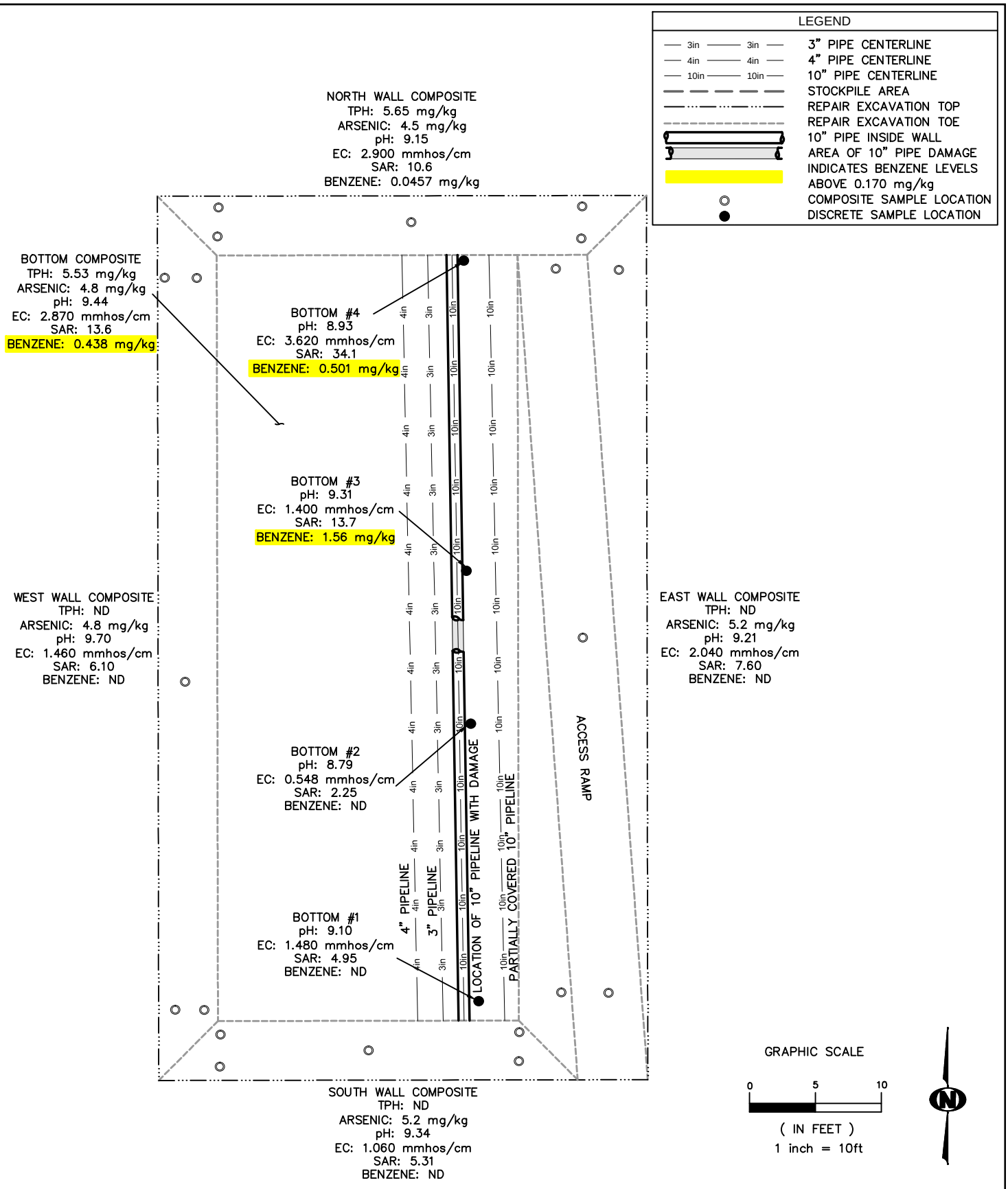

GPS: DS	CHECKED: DK	FIGURE 3
DATE: 2/20/14	DRAWN: DRF	
FILE NAME: sample		SHEET NO. 3 of 4
PROJECT NO. 1302-03		SCALE: 1" = 10'

DATE	REVISIONS

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FIGURE 3
PICEANCE CREEK PWDD RELEASE
COLLECTED SAMPLE LOCATIONS WITH SELECT RESULTS

PREPARED FOR XTO ENERGY

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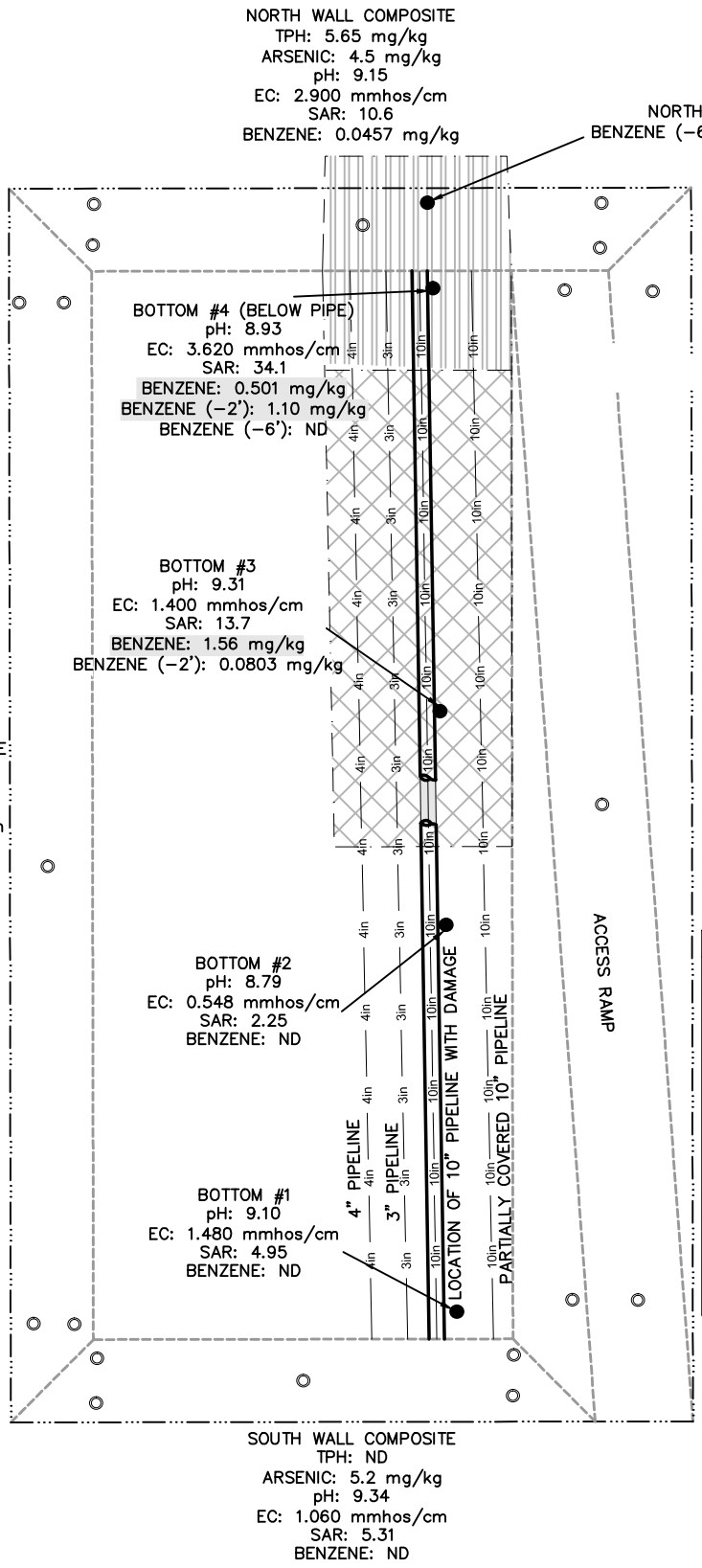

\\hyper-v03\lkwd-co\sdsk\proj\xto environmental\1302-03 pwwd spill\sample cl.dwg,2/20/14

GPS: DS	CHECKED: DK	FIGURE 4	
DATE: 2/20/14	DRAWN: DRF		
FILE NAME: sample cl		SHEET NO. 4 of 4	
PROJECT NO. 1302-03		SCALE: 1" = 10'	

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FIGURE 4
PICEANCE CREEK PWDD RELEASE
COLLECTED SAMPLE CONFIRMATION

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