Received by OCD: 8/29/2019 5:39:28 PM

Form C-141

Page 3

State of New Mexico

Oil Conservation Division

## TLDKX-190829-C-1410

Incident ID	NAB 1909136893
District RP	2RP-5324
Facility ID	fAB 1909136494
Application ID	pAB 1909136607

## Site Assessment/Characterization

This information must be provided to the appropriate district office no later than 90 days after the release discovery date.

What is the shallowest depth to groundwater beneath the area affected by the release?	(ft bgs)
Did this release impact groundwater or surface water?	🗌 Yes 🛛 No
Are the lateral extents of the release within 300 feet of a continuously flowing watercourse or any other significant watercourse?	🗌 Yes 🛛 No
Are the lateral extents of the release within 200 feet of any lakebed, sinkhole, or playa lake (measured from the ordinary high-water mark)?	🗌 Yes 🛛 No
Are the lateral extents of the release within 300 feet of an occupied permanent residence, school, hospital, institution, or church?	🗌 Yes 🛛 No
Are the lateral extents of the release within 500 horizontal feet of a spring or a private domestic fresh water well used by less than five households for domestic or stock watering purposes?	🗌 Yes 🛛 No
Are the lateral extents of the release within 1000 feet of any other fresh water well or spring?	🗌 Yes 🛛 No
Are the lateral extents of the release within incorporated municipal boundaries or within a defined municipal fresh water well field?	🗌 Yes 🛛 No
Are the lateral extents of the release within 300 feet of a wetland?	🗌 Yes 🛛 No
Are the lateral extents of the release overlying a subsurface mine?	🗌 Yes 🛛 No
Are the lateral extents of the release overlying an unstable area such as karst geology?	🗌 Yes 🛛 No
Are the lateral extents of the release within a 100-year floodplain?	🗌 Yes 🛛 No
Did the release impact areas not on an exploration, development, production, or storage site?	🛛 Yes 🗌 No

Attach a comprehensive report (electronic submittals in .pdf format are preferred) demonstrating the lateral and vertical extents of soil contamination associated with the release have been determined. Refer to 19.15.29.11 NMAC for specifics.

Characterization Report Checklist: Each of the following items must be included in the report.

Scaled site map showing impacted area, surface features, subsurface features, delineation points, and monitoring wells.

Field data

Data table of soil contaminant concentration data

Depth to water determination

Determination of water sources and significant watercourses within ½-mile of the lateral extents of the release

- Boring or excavation logs
- Photographs including date and GIS information
- Topographic/Aerial maps
- Laboratory data including chain of custody

If the site characterization report does not include completed efforts at remediation of the release, the report must include a proposed remediation plan. That plan must include the estimated volume of material to be remediated, the proposed remediation technique, proposed sampling plan and methods, anticipated timelines for beginning and completing the remediation. The closure criteria for a release are contained in Table 1 of 19.15.29.12 NMAC, however, use of the table is modified by site- and release-specific parameters.

Form C-141	State of New Mexico		Г	Incident ID	NAD 1000126902
Page 4	Oil Conservation Division			District RP	2RP-5324
				Facility ID	fAB 1909136494
				Application ID	pAB 1909136607
I hereby certify that the infor regulations all operators are r public health or the environm failed to adequately investiga addition, OCD acceptance of and/or regulations. Printed Name: Rol Signature: Rol email: rob.kirk@solar	mation given above is true and complete to required to report and/or file certain releases nent. The acceptance of a C-141 report by the and remediate contamination that pose a Ta C-141 report does not relieve the operator o Kirk ismidstream.com	the best of my notifications a ne OCD does threat to groun of responsibi Title: Date: Telepho	y knowledge and and perform corn not relieve the c ndwater, surface ility for complia General Ma August 2 one:432-2	d understand that purs rective actions for rel operator of liability sh e water, human health ince with any other fe anager, HSE a 29, 2019 03-9020	suant to OCD rules and eases which may endanger nould their operations have or the environment. In ederal, state, or local laws nd Compliance
OCD Only					
Received by:		I	Date:		

Form C-141 Page 5 State of New Mexico Oil Conservation Division

Remediation Plan Checklist: Each of the following items must be included in the plan.

Incident ID	NAB 1909136893
District RP	2RP-5324
Facility ID	fAB 1909136494
Application ID	pAB 1909136607

## **Remediation Plan**

<ul> <li>Detailed description of proposed remediation technique</li> <li>Scaled sitemap with GPS coordinates showing delineation points</li> <li>Estimated volume of material to be remediated</li> <li>Closure criteria is to Table 1 specifications subject to 19.15.29.12</li> <li>Proposed schedule for remediation (note if remediation plan time</li> </ul>	2(C)(4) NMAC line is more than 90 days OCD approval is required)
Deferred De moste Only Each of the full wine it was the	
Deterral Requests Only: Each of the following items must be conj	irmed as part of any request for deferral of remediation.
Contamination must be in areas immediately under or around prodeconstruction.	duction equipment where remediation could cause a major facility
Extents of contamination must be fully delineated.	
Contamination does not cause an imminent risk to human health,	the environment, or groundwater.
I hereby certify that the information given above is true and complete rules and regulations all operators are required to report and/or file ce which may endanger public health or the environment. The acceptan liability should their operations have failed to adequately investigate a surface water, human health or the environment. In addition, OCD ac responsibility for compliance with any other federal, state, or local lar	to the best of my knowledge and understand that pursuant to OCD rtain release notifications and perform corrective actions for releases ce of a C-141 report by the OCD does not relieve the operator of and remediate contamination that pose a threat to groundwater, cceptance of a C-141 report does not relieve the operator of ws and/or regulations.
Printed Name: Rob Kirk	Title: General Manager, HSE and Compliance
Signature: RRK	Date: August 29, 2019
email: rob.kirk@solarismidstream.com	Telephone: 432-203-9020
OCD Only	
Received by:	Date:
Approved Approved with Attached Conditions of A	pproval Denied Deferral Approved
Signature:	Date:

## Amended Release Investigation and Remedial Action Plan

#### **General Site Information**

Stella Blue Produced Water Release NMOCD Reference No. 2RP-5324 Terracon Project No. AR197123

#### Site Contact

Mr. Rob Kirk, Solaris Water Midstream, LLC 907 Tradewinds Blvd., Suite B, Midland, Texas 79706 (432) 203-9020

> Depth to Ground Water Greater than 100 feet below grade surface

#### **Distance to Nearest Surface Water**

Red Bluff Reservoir (North-western Loving County, TX), approximately 6.1 miles to the Southwest

#### **Driving Directions**

From Hwy 128, South on Hwy 1 15.2 miles, West on State Line road 6.52 miles, North 0.05 mile, to release location.

Legal Description

Unit M, Section 30, T26S, R31E, Eddy County, New Mexico

Prepared for: Solaris Water Midstream, LLC Midland, Texas

#### Prepared by:

Terracon Consultants, Inc. Lubbock, Texas TBPG Firm No. 50058

Offices Nationwide Employee-Owned Established in 1965 terracon.com



Geotechnical

Environmental

Construction Materials

Facilities

# lerracon

July 8, 2019

Solaris Water Midstream LLC 907 Tradewinds Blvd., Suite B Midland, Texas 79706

Attn: Mr. Rob Kirk

P: (432) 203-9020

E: rob.kirk@solarismidstream.com

#### RE: Amended Release Investigation and Remedial Action Plan

Stella Blue Produced Water Release Unit M, Section 30, Township 26 South, Range 31 East Eddy County, New Mexico NMOCD Reference No. 2RP-5324 Terracon Project No. AR197123

Dear Mr. Kirk,

This Release Investigation and Remedial Action Plan has been amended by Terracon Consultants, Inc. (Terracon) in accordance with the New Mexico Oil Conservation Division (NMOCD) regulation concerning Restoration, Reclamation, and Re-vegetation (19.15.29.13 NMAC – D (Reclamation of areas no longer in use)). The amended RAP addresses changes to Terracon's proposed remediation of contaminated soils in Section 9.0, Subsection 9.1, of the report, to state:

- Soils within the release margins, illustrated on Figure 2 of Appendix A, will be excavated to remove as much as possible waste containing, contaminated, earthen material with chloride concentrations greater than 600 mg/kg. If a restrictive barrier is encountered at a depth of less than 4-feet below ground surface, heavy equipment will be utilized to dig an appropriate number of trenches across the release area to 4-feet below ground surface to collect a bottom confirmation grab sample to demonstrate that impacted materials have been sufficiently mitigated.
- If impacted materials have not been sufficiently mitigated, a 20-mil liner will either be installed at the top of the restrictive barrier or at 4-feet (if no restrictive barrier encountered) below ground surface to encapsulate the remaining impacted soil at depth.
- Prior to liner installation, composite (if applicable) confirmation bottom samples will be collected to establish remaining BTEX, TPH, and Chloride concentration levels. In addition, composite confirmation wall samples will also be collected to establish horizontal





delineation and to determine that BTEX, TPH and Chloride concentrations are acceptable for requesting backfilling and restoration of the excavated area.

Terracon appreciates this opportunity to provide environmental services to Solaris Water Midstream. Should you have any questions or require additional information, please do not hesitate to contact our office.

Sincerely, **Terracon Consultants, Inc.** 

Joseph Guesnier Staff Scientist Lubbock Erin Loyd, P.G. Principal Office Manager - Lubbock

## Terracon

#### TABLE OF CONTENTS

1.0	SITE D	DESCRIPTION	1
2.0	SCOP	E OF SERVICES	1
3.0	INTRO	DUCTION AND NOTIFICATION	1
4.0	INITIA	L RESPONSE ACTIONS	3
	4.1	Source Elimination and Site Security	3
	4.2	Containment and Site Stabilization	3
5.0	GENE	RAL SITE CHARACTERISTICS	3
	5.1	Depth to Groundwater	3
	5.2	Distance to Nearest Potable Water Well	3
	5.3	Distance to Nearest Surface Water	3
	5.4	Soil Characteristics	3
60			4
0.0		Demodiction Levels	4
70			C A
7.0	7 1	Sail Sampling Procedures for Laboratory Analysis	6
8.0	RELE	ASE INVESTIGATION DATA EVALUATION	6
0.0	8 1	Background Data Evaluation	7
	8.2	Release Margins Data Evaluation	7
	8.3	Release Investigation Data Summary	8
9.0	SOIL F	REMEDIATION	8
	9.1	Contaminated Soils	8
	9.2	Soil Management	9
10.0	TERM	INATION OF REMEDIAL ACTIONS, FINAL CLOSURE AND REPORTING	9
	10.1	Termination of Remedial Action	9
	10.2	Final Closure	9
	10.3	Final Report	9

## Terracon

#### **APPENDIX A – Exhibits**

Exhibit 1 – Topographic Map Exhibit 2 – Site Diagram Exhibit 3 – NMOSE POD Location Map Exhibit 4 – Soil Contaminant Concentration Map

#### **APPENDIX B – Tables**

Table 1 – Soil Sample Analytical Data Summary

#### **APPENDIX C – Photographic Documentation**

Photographic Log – 03/21/2019

#### **APPENDIX D – Certified Laboratory Reports and Chain of Custody**

**APPENDIX E – Standard of Care, Limitations, and Reliance Policies** 

Amended Release Investigation and Remedial Action Plan Stella Blue Produced Water Release Unit M, Section 30, Township 26 South, Range 31 East Eddy County, New Mexico Terracon Project No. AR197123 July 8, 2019

## **1.0 SITE DESCRIPTION**

The site is comprised of a meandered 1.5-mile long release with widths varying between 4 and 15 ft. wide along its extent within the Unit Letter M, Section 30, Township 26 South, Range 31 East, Eddy County, New Mexico and extending into Loving County, Texas (hereinafter, the site). The site consists primarily of rights-of-way for pipelines, lease roads and pipeline crossings with the origin of the release being a 6-inch pipeline fusion coupling that became detached at a connection. A Topographic Map illustrating the site location is included as Exhibit 1 and a Site Diagram illustrating soil sample locations is included as Exhibit 2 in Appendix A. A water well record search is also included as New Mexico Office of the State Engineer (NMOSE) Point of Diversion (POD) Location Map as Exhibit 3 in Appendix A.

## 2.0 SCOPE OF SERVICES

Terracon Consultants Inc. (Terracon) scope of services is to investigate the magnitude and extent of the documented release and develop a Release Investigation and Remedial Action Plan (RAP) in accordance with the New Mexico Oil Conservation Division (NMOCD) and Bureau of Land Management (BLM) requirements that detail site closure activities to be completed. This RAP addresses the March 20, 2019 release of approximately 990 barrels (bbls) of produced water which contained an estimated 10 bbls of crude originating from a detached fusion coupling on a 6-inch pipeline connection on a Solaris Water Midstream LLC (Solaris) pipeline.

## 3.0 INTRODUCTION AND NOTIFICATION

A release of approximately 990 bbls of produced water which contained an estimated 10 bbls of crude oil occurred on March 20, 2019 at the Stella Blue site in Eddy County, New Mexico. The site is operated by Solaris Water Midstream LLC, and is comprised of an approximate 3-acre undeveloped area, approximately 21 miles southeast of Malaga, New Mexico. Incident information is provided in the following table:



Incident information is provided in the following table:

<b>Required Information</b>	Site and Release information		
Responsible Party Local Contact	The Produced Water Line is operated by Solaris Water Midstream LLC		
	Contact: Mr. Rob Kirk	P: (469	) 978-5620
		E: rob.	kirk@solarismidstream.com
NMOCD Notification	Notice of the release was of the NMOCD. Rob Kirk Artesia Hydrologist on Ma	provideo (Solaris) arch 20, 2	d to Jim Griswold, Bureau Chief notified Brad Billings, District 2 2019.
Facility Description	The Stella Blue transfer line is in Eddy County, New Mexico. It is an approximate 3-acre area located within Unit M, Section 30, Township 26 South, Range 31 East, approximately 21 miles southeast of Malaga, New Mexico. The site is being developed as an area for a transfer line.		
Time of Incident	March 20, 2019, discovered at 11:00 a.m.		
Discharge Event	A 6-inch pipeline fusing coupling detached at a connection allowing produced water to be released. At the release point, released fluid saturated proximal surface soil before pooling, then flowing west down the pipeline ROW until encountering a drainage channel which trends to the south-southwest and crosses State Line Road. After crossing State Line Road, released fluid continued to flow down the drainage channel to the south- southwest before terminating in rural pasture land. The release margins are illustrated on Figure 2 of Appendix A		
Type of Discharge	The documented fluids release occurred at the surface and appears to be limited to near surface soils.		
Quantity of Spilled Material	Total Fluids Released: 99	0 bbls	Produced Water: 990 bbls which contained an estimated 10 bbls of crude oil
	Total Fluids Recovered: 1	20 bbls	Produced Water: 118 bbls
			Crude Oil: 2 bbls
Site Characteristics	Relatively flat topography with the native ground surface very gently sloping to the southwest.		
Immediate Corrective Actions	Pipeline was shut in, and an onsite Solaris Contractor (C2) scraped the affected area proximate to the release origin.		



### 4.0 INITIAL RESPONSE ACTIONS

#### 4.1 Source Elimination and Site Security

Initial source elimination was accomplished by the Solaris Water Midstream foreman shutting in the leaking line and repairing the malfunctioning poly line with a saddle fusion. Solaris Water Midstream deployed C2 Oilfield Services (C2), an on-site contractor, to secure the site and perform containment and site stabilization activities.

#### 4.2 Containment and Site Stabilization

C2 Oilfield Services hydro vacuumed and trenched at the poly line to repair and scraped up and dusted up the affected soil proximate to the release origin, comprising an area measuring approximately 3,000 square feet (sf). From this area, C2 scraped affected materials totaling an estimated 50 yards (cy). Following consolidation of these materials, another Solaris contractor, M&J fenced off the area to deter inadvertent contact with the materials.

## 5.0 GENERAL SITE CHARACTERISTICS

#### 5.1 Depth to Groundwater

A water well record search of the NMOSE POD Geographic Information System (GIS) data portal identified one registered well (C-02165) within 1.8 miles of the site. The depth to groundwater at the site is anticipated to be over 100 feet bgs. NMOSE registered wells within a 5-mile radius of the site have an average depth to groundwater of 266 feet bgs, with a minimum reported groundwater depth of 180 feet bgs (Exhibit 3 of Appendix A).

#### 5.2 Distance to Nearest Potable Water Well

Based on review of the NMSEO database, registered potable water wells were not present within 0.5 miles of the site.

#### 5.3 Distance to Nearest Surface Water

The Red Bluff Reservoir is located approximately 6.1 miles southwest of the site.

#### 5.4 Soil Characteristics

Soils at the site are mapped as Pajarito loamy, fine sand, 0 to 3 percent slopes, eroded. This soil has a surface layer of fine- to coarse-grained sand. While the Pajarito is comprised of fine- to



coarse-grained sands at the surface depth to restrictive features, are greater than 80 inches bgs resulting in the formation being categorized with a very low runoff classification.

#### 5.5 Groundwater Quality

Groundwater quality is unknown at the site. As stated previously, there are no wells registered with the NMSEO website within 0.5 miles of the site.

## 6.0 SOIL REMEDIAL ACTION LEVELS

Produced water facilities in New Mexico are generally regulated by the NMOCD. Terracon proposes to remediate produced flowback water impacted soil from the Eddy State Gathering Line Produced Water Release consistent with the remediation/abatement goals and objectives set forth in the New Mexico Oil Conservation Division (NMOCD) *Closure Criteria for Soils Impacted by a Release, June 21, 2018.* 

The guidance document provides direction for initial response actions, site assessment, sampling procedures and provides a total ranking score based on the depth to groundwater, distance to private and domestic water sources, and the distance to the nearest surface water body as follows:

Toble 1			
I alde 1			
NMOCD Clos	ure Criteria for So	oils Impacted by a	n Release
Minimum depth below any point within the horizontal boundary of the release to ground water less than 10,000 mg/L TDS	Constituent	Method*	Limit**
<u>&lt;</u> 50 feet	Chloride***	EPA 300.0 or SM4500 Cl B	600 milligram per kilogram (mg/kg)
	TPH (GRO+DRO+MRO)	EPA SW-846 Method 8015 M	100 mg/kg
	BTEX	EPA SW-846 Method 8021B or 8260B	50 mg/kg
	Benzene	EPA SW-846 Method 8021B or 8260B	50 mg/kg
51 feet-100 feet	Chloride***	EPA 300.0 or SM4500 CI B	10,000 mg/kg
	TPH (GRO+DRO+MRO)	EPA SW-846 Method 8015 M	2,500 mg/kg

#### Amended Release Investigation and Remedial Action Plan



Stella Blue Produced Water Release 
Eddy County, New Mexico July 8, 2019 
Terracon Project No. AR197123

	GRO+DRO	EPA SW-846 Method 8015 M	1,000 mg/kg
	BTEX	EPA SW-846 Method 8021B or 8260B	50 mg/kg
	Benzene	EPA SW-846 Method 8021B or 8260B	10 mg/kg
	Chloride***	EPA 300.0 or SM4500 CI B	20,000 mg/kg
	TPH (GRO+DRO+MRO)	EPA SW-846 Method 8015 M	2,500 mg/kg
> 100 foot	GRO+DRO	EPA SW-846 Method 8015 M	1,000 mg/kg
>100 leet	втех	EPA SW-846 Method 8021B or 8260B	50 mg/kg
	Benzene	EPA SW-846 Method 8021B or 8260B	10 mg/kg

\*Or other methods approved by the division

\*\*Numerical limits or natural background level, whichever is greater

\*\*\*This applies to releases of produced water or other fluids, which may contain chloride

#### 6.1 Remediation Levels

NMOCD remediation action limits for Chlorides, TPH (GRO+DRO+MRO), GRO+DRO, BTEX (includes benzene, toluene, ethylbenzene and xylenes), and Benzene are selected based on the minimum depth below any point within the horizontal boundary of the release to ground water of being <100 feet:

Constituent	Remediation Limits
Chloride	20,000 mg/kg
ТРН	2,500 mg/kg
(GRO+DRO+MRO)	
GRO+DRO	1,000 mg/kg
BTEX	50 mg/kg
Benzene	10 mg/kg



## 7.0 SOIL SAMPLING PROCEDURES

Soil sampling procedures are detailed as follows:

#### 7.1 Soil Sampling Procedures for Laboratory Analysis

#### Soil Sampling Procedures

The collection of soil sampling for laboratory analysis were conducted in accordance with to NMOCD-approved industry standards or other NMOCD-approved procedures. Accepted NMOCD soil sampling procedures and laboratory analytical methods are as follows:

- Collect samples in clean, air-tight glass jars supplied by the laboratory which will conduct the analysis or from a reliable laboratory equipment supplier.
- Label the samples with a unique code for each sample.
- Cool and store samples with cold packs or on ice.
- Promptly ship sample to the lab for analysis following chain of custody procedures.
- All samples must be analyzed within the holding times for the laboratory analytical method specified by EPA.

#### Analytical Methods

All soil samples must be analyzed using EPA methods, or by other NMOCD-approved methods and must be analyzed within the holding time specified by the method. Below are laboratory analytical methods the selected laboratory will use for analysis of soil samples analyzed for petroleum related constituents.

- Chloride EPA Method 300.0
- Total Petroleum Hydrocarbons TPH (GRO+DRO+MRO) EPA Method 8015M
- Benzene, toluene, ethylbenzene and total xylenes (BTEX) EPA Method 8021B
- Benzene EPA Method 8021B

### 8.0 RELEASE INVESTIGATION DATA EVALUATION

During Terracon's March 25, 2019 release investigation activities, a total of 34 soil samples were collected from the site and analyzed for BTEX, chloride, and/or TPH. Twenty-six samples were collected from within the release margins; eight samples were collected outside of the impacted area to evaluate background concentrations. A Soil Contaminant Concentration Map illustrating the soil sample locations and contaminant concentrations is included as Exhibit 4 in Appendix A.



#### 8.1 Background Data Evaluation

One of eight background samples analyzed for Benzene exhibited concentrations above applicable laboratory sample detection limits (SDLs). Soil sample BG-3 (Surface to 0.5 ft. bgs) contained a Benzene concentration above the SDL estimated at 0.000575 mg/kg.

One of eight background samples analyzed for Total BTEX exhibited concentrations above applicable laboratory SDLs. Soil sample BG-3 (Surface to 0.5 ft. bgs) contained an estimated total BTEX concentration of 0.00105J mg/kg.

Chloride was detected above applicable laboratory SDLs in each of the analyzed background samples. The chloride concentrations ranged from 1.85 mg/kg in soil sample BG-3 (Surface to 0.5 ft. bgs) to 26.3 mg/kg in soil sample BG-1 (surface to 0.5 ft. bgs).

The background samples analyzed for Total TPH did not exhibit concentrations above applicable SDLs.

Detected concentrations for BTEX, chloride, and TPH in background samples did not exceed NMOCD Action Levels based on the criteria ranking parameters. Based on the analytical results of the background samples, NMOCD Action Levels will continue to be utilized as the applicable Remedial Action Levels (RALs) for the site.

#### 8.2 Release Margins Data Evaluation

Benzene was not detected above applicable laboratory SDLs in the 20 soil samples analyzed within the release margins. The detected benzene concentrations did not exceed the applicable NMOCD RAL for benzene of 10 mg/kg, as summarized in Table 1.

Total BTEX was detected above applicable laboratory SDLs in 3 of the 20 soil samples analyzed within the release margins. The Total BTEX concentrations ranged from 0.000467 mg/kg in soil sample HA-6 (surface to 0.5 ft. bgs) to 0.0294 mg/kg in soil sample HA-2 (Surface to 0.5 ft. bgs). The detected Total BTEX concentrations did not exceed the applicable NMOCD RAL for Total BTEX of 120 mg/kg, as summarized in Table 1.

Chloride was detected above applicable laboratory SDLs in each of the 24 soil samples analyzed within the release margins. The chloride concentrations ranged from 68.2 mg/kg in soil sample HA-1 (Surface to 0.5 ft. bgs) to 2,820 mg/kg in soil sample HA-4 (Surface to 0.5 ft. bgs). The soil samples analyzed within the release margins did not exhibit chloride concentrations exceeding the applicable NMOCD RAL for chloride of 20,000 mg/kg, as summarized in Table 1.

DRO was detected above applicable laboratory SDLs in 21 of the 26 soil samples analyzed within the release margins. The DRO concentrations ranged from 11.2 mg/kg in soil sample HA-6 (1.5

Amended Release Investigation and Remedial Action Plan Stella Blue Produced Water Release 
Eddy County, New Mexico July 8, 2019 
Terracon Project No. AR197123



ft. bgs to 2.0 ft. bgs) to 1,990 mg/kg in soil sample HA-2 (surface to 0.5 ft. bgs). The soil samples analyzed within the release margins did not exhibit DRO concentrations above NMOCD RAL of 1,000 mg/kg for DRO, with soil sample HA-2 (surface to 0.5 ft. bgs) being the exception, as summarized in Table 1

Total TPH was detected above applicable laboratory SDLs in 21 of the 23 soil samples analyzed within the release margins. The Total TPH concentrations ranged from 11.2 mg/kg in soil sample HA-6 (1.5 ft. bgs to 2.0 ft. bgs) to 2,200 mg/kg in soil sample HA-2 (surface to 0.5 ft. bgs). The soil samples analyzed within the release margins did not exhibit Total TPH concentrations above the NMOCD RAL of 2,500 mg/kg for Total TPH, as summarized in Table 1.

#### 8.3 Release Investigation Data Summary

Based on the review of the above release investigation analytical results, the areas within the release margins exhibit concentrations of benzene, Total BTEX, chloride and Total TPH in multiple locations. Based on these exceedances above NMOCD RALs, Sections 9.0 and subsequent detail recommended remedial response actions to be implemented at the site.

### 9.0 SOIL REMEDIATION

Contaminated soil will be remediated and managed according to the criteria described below which will remove contaminants to protect fresh waters, public health and the environment.

#### 9.1 Contaminated Soils

Soils exceeding the designated NMOCD RALs described in Section 6 will be remediated as follows:

- Soils within the release margins, illustrated on Figure 2 of Appendix A, will be excavated to remove as much as possible waste containing, contaminated, earthen material with chloride concentrations greater than 600 mg/kg. If a restrictive barrier is encountered at a depth of less than 4-feet below ground surface, heavy equipment will be utilized to dig an appropriate number of trenches across the release area to 4-feet below ground surface to collect a bottom confirmation grab sample to demonstrate that impacted materials have been sufficiently mitigated.
- If impacted materials have not been sufficiently mitigated, a 20-mil liner will either be installed at the top of the restrictive barrier or at 4-feet (if no restrictive barrier encountered) below ground surface to encapsulate the remaining impacted soil at depth.
- Prior to liner installation, composite (if applicable) confirmation bottom samples will be collected to establish remaining BTEX, TPH, and Chloride concentration levels. In addition, composite confirmation wall samples will also be collected to establish



horizontal delineation and to determine that BTEX, TPH and Chloride concentrations are acceptable for requesting backfilling and restoration of the excavated area.

#### 9.2 Soil Management

The selected method of soil management is removal and disposal at a NMOCD-approved facility. Excavated soils will be transported by truck (20 cubic yard capacity) and disposed of at the R360 Disposal Facility operated by R360 Environmental Solutions, Inc., located in Halfway, New Mexico.

## 10.0 TERMINATION OF REMEDIAL ACTIONS, FINAL CLOSURE AND REPORTING

#### **10.1 Termination of Remedial Action**

Remedial action of soils at the site will be terminated when the following criteria have been met. Contaminated soils will be removed from the site. Sufficient contaminated soil will be removed so that residual contaminant concentrations are below the soil remediation action levels. If soil action levels cannot practicably be attained, an evaluation of risk will be performed and provided to NMOCD for approval showing that the remaining contaminants will not pose a threat to present or foreseeable beneficial use of fresh water, public health and the environment.

#### 10.2 Final Closure

Upon termination of remedial actions (Sections 6 and 9) the area of the release will be closed by backfilling the excavated area, contouring to surrounding area topography and reseeding the area with approved-native vegetative seed.

#### **10.3 Final Report**

Upon completion of remedial activities, a final report summarizing all actions taken to mitigate environmental damage related to the release will be provided to NMOCD for approval.

#### **APPENDIX A – Exhibits**

Exhibit 1 – Topographic Map Exhibit 2 – Site Diagram Exhibit 3 – OSE POD Location Map Exhibit 4 – Soil Contaminant Concentration Map

#### APPENDIX B – Tables

Table 1 – Soil Sample Analytical Data Summary

#### APPENDIX C

Photographic Log – 03/21/2019

#### APPENDIX D

Certified Laboratory Analytical Report and Chain of Custody

#### APPENDIX E

#### Standard of Care, Limitations, and Reliance Policies

#### **Standard of Care**

Terracon's services were performed in a manner consistent with generally accepted practices of the profession undertaken in similar studies in the same geographical area during the same time. Terracon makes no warranties, either express or implied, regarding the findings, conclusions, or recommendations. Please note that Terracon does not warrant the work of laboratories, regulatory agencies, or other third parties supplying information used in the preparation of the report. These services were performed in accordance with the scope of work agreed with you, Solaris Water Midstream, as reflected in our proposal (PA4197040).

#### **Additional Scope Limitations**

Development of this RAP is based upon information provided by the Client and Terracon's remediation and construction services line. Such information is subject to change over time. Certain indicators of the presence of hazardous substances, petroleum products, or other constituents may have been latent, inaccessible, unobservable, nondetectable, or not present during these services. We cannot represent that the site contains no hazardous substances, toxic materials, petroleum products, or other latent conditions beyond those by information provided by the Client. The data, interpretations, findings, and our recommendations are based solely upon reformation executed within the scope of these services.

#### Reliance

This report has been prepared for the exclusive use of Solaris Water Midstream, and any authorization for use or reliance by any other party (except a governmental entity having jurisdiction over the site) is prohibited without the express written authorization of Solaris Water Midstream and Terracon. Any unauthorized distribution or reuse is at Solaris Water Midstream sole risk. Notwithstanding the foregoing, reliance by authorized parties will be subject to the terms, conditions, and limitations stated in the proposal and Solaris Water Midstream and Terracon's Master Services Agreement. The limitation of liability defined in the terms and conditions is the aggregate limit of Terracon's liability to Solaris Water Midstream and all relying parties unless otherwise agreed in writing.