General Information

NMOCD District:	District 2	Incident #	NMAP1825441890
Landowner:	Federal	RP #	2RP-4955
Client:	Mack Energy Corporation	Site Location:	Thunderbay
Date:	June 23, 2020	Project #:	19E-04217-004
Client Contact:	Matt Buckles	Phone #:	(575) 748-1288
Vertex PM:	Natalie Gordon	Phone #:	(505) 506-0040

Objective

The objective of this environmental remediation work plan is to identify areas of exceedance for constituents of concern found during spill assessment and site characterization activities and propose appropriate remediation techniques to address the open release at Thunderbay. This incident was discovered on August 20, 2018, and is the result of a clamp on Pureline's lay flat line that was not securely fastened, allowing a section of the line to drain. Approximately 500 barrels (bbls) of produced water were released into pasture area. Approximately 40 bbls of produced water were recovered. The release was reported to the New Mexico Oil Conservation Division (NM OCD) District 2 office and incident tracking number NMAP1825441890 was assigned to the spill. The original location and boundaries of this release, as mapped shortly after the incident, are identified on Figure 1 (Attachment 1).

Initial site research and characterization has been completed and a closure criteria determination worksheet is included in Attachment 2. The release at Thunderbay is not subject to the requirements of Paragraph (4) of Subsection C of 19.15.29.12 *New Mexico Administrative Code* (NMAC) and the closure criteria for the site are determined to be associated with the following constituent concentration limits.

Table 1. Closure Criteria for Soils Impacted by a Release

Minimum depth below any point within the horizontal boundary of the release to groundwater less than 10,000 mg/L TDS[1]	Constituent	Limit
< 50 feet	Chloride	600 mg/kg
	TPH[2] (GRO + DRO + MRO)	100 mg/kg
	BTEX[3]	50 mg/kg
	Benzene	10 mg/kg

[1]Total Dissolved Solids (TDS)

[2]Total petroleum hydrocarbons (TPH) = gasoline range organics (GRO) + diesel range organics (DRO) + motor oil range organics (MRO)

[3]Benzene, toluene, ethyl benzene and xylenes (BTEX)

Site Assessment/Characterization

The Thunderbay release characterization was originally completed by American Safety Services, Inc (ASI) in November 2018, after which some level of remediation was completed. However, the release was not closed with NM OCD. In December 2019, Mack Energy retained Vertex Resource Group (Vertex) to complete additional site assessment and remediation fieldwork, as necessary, to obtain closure of the incident with the requisite regulatory agencies. A second site assessment was completed to characterize any remaining contamination associated with this release.

A total of thirteen sample points were established across the release area as shown on Figure 2 (Attachment 1) and soil samples were collected from these locations at varying depths up to 3 feet below ground surface (bgs). Each soil sample was

field screened, using an electrical conductivity (EC) meter to estimate the level of chloride in the soil. The results were then used to determine the horizontal extent of the release. Typically, this same method is used to determine the vertical extent of the release; however, at Thunderbay, there is a layer of rock refusal at approximately 1-1.5 feet bgs across much of the area that prevented soil sampling at deeper depths. Based on field screening and lab data from soil samples collected at this rock layer, chloride appears to have penetrated to that layer and remained there. Additional sampling of the rock itself is advised to demonstrate that contaminants have not permeated past the layer of refusal and can be done at the time of remediation fieldwork.

The NM OCD requires full release delineation to the extent possible and has provided guidance specific to this situation, whereby remediation to the rock layer is required and full documentation should be conducted to demonstrate that everything possible was done to clean up contaminants. The NM OCD response regarding this remediation process is included as Attachment 3.

Data from the field screening process have been compared to the above-noted closure and reclamation criteria to establish the appropriate level of remediation required. Field screening and laboratory results associated with the release characterization are presented in Table 2 (Attachment 4) and exceedances are identified in the table as bold with a grey background. Because this was a produced water release, the presence of hydrocarbons is considered to be negligible.

Proposed Remedial Activities

Vertex proposes areas identified with contaminant concentrations approaching, or above, closure criteria be remediated through excavation and removal of contaminated soil with the use of mechanical equipment, to a depth of approximately 1.5 feet bgs or to rock refusal. Excavation would be guided by an onsite Vertex environmental technician, who would be conducting field screening during the excavation activities. Approximately 2,550 cubic yards of contaminated soil are projected to be removed. Contaminated soils should be stored on a heavy-duty liner prior to disposal at an approved facility.

Once the environmental technician confirms removal of contaminated soil to below applicable closure and reclamation criteria as shown in Table 1, confirmatory sampling will be conducted. Five-point composite confirmatory samples will be collected from the base and sidewalls of the excavation, in accordance with the sampling plan detailed in Attachment 5. This sampling plan is based on a non-parametric statistical sampling design using the Hahn and Meeker method through the Visual Sample Plan (VSP) program that meets the Environmental Protection Agency's data quality assessment standards for composite sampling.

Confirmatory samples will be placed into laboratory-provided containers, preserved on ice and submitted to a National Environmental Laboratory Accreditation Program-approved laboratory for chemical analysis. Laboratory analyses will include Method 300.0 for chlorides, Method 8021B for volatile organics, including benzene and BTEX, and EPA Method 8015 for TPH, including MRO, DRO and GRO.

A GeoExplorer 7000 Series Trimble global positioning system (GPS) unit, or equivalent, will be used to map the approximate center of each of the five-point composite samples.

Following laboratory analysis of confirmatory samples, excavations will be backfilled with clean soil sourced locally. Because the native soil at Thunderbay is not currently four feet deep, the depth of clean soil meeting Table 1 criteria will likely be limited to no more than two feet, as required to reconstruct existing grade, and pending NM OCD and Bureau of Land Management (BLM) approval. The remediated area will be re-seeded with a BLM-approved seed mix at the appropriate time of year to take advantage of seasonal rains, in order to aid in the reestablishment of vegetation over the impacted area.

Timeline for Completion

Remediation activities, as outlined in this workplan, are projected to be completed within 90 days of NM OCD approval of the sampling plan.

If there are any questions regarding this report, please contact Natalie Gordon at 505-506-0040.

Sincerely,

Natalie Gordon
PROJECT MANAGER

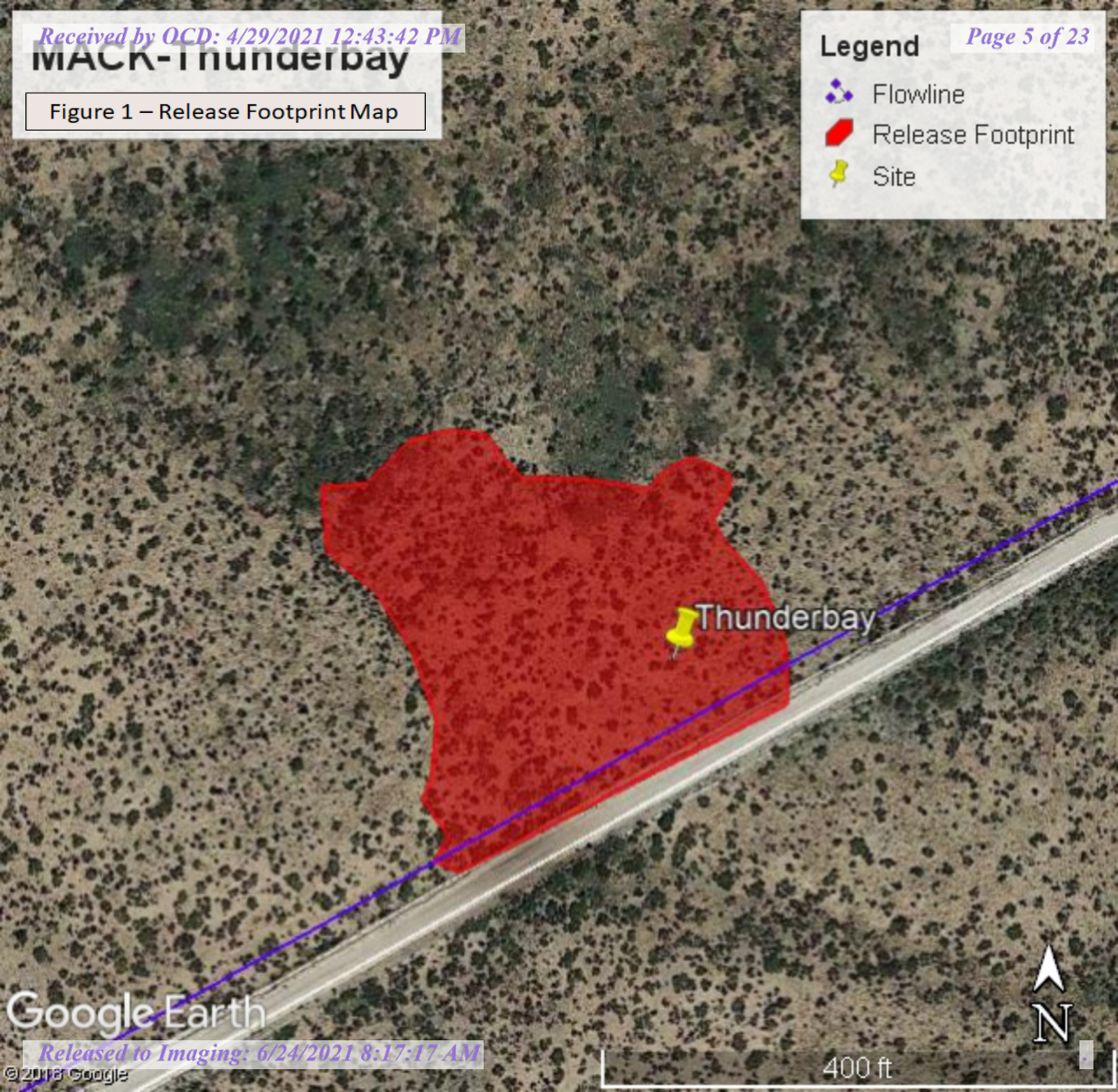
Attachments

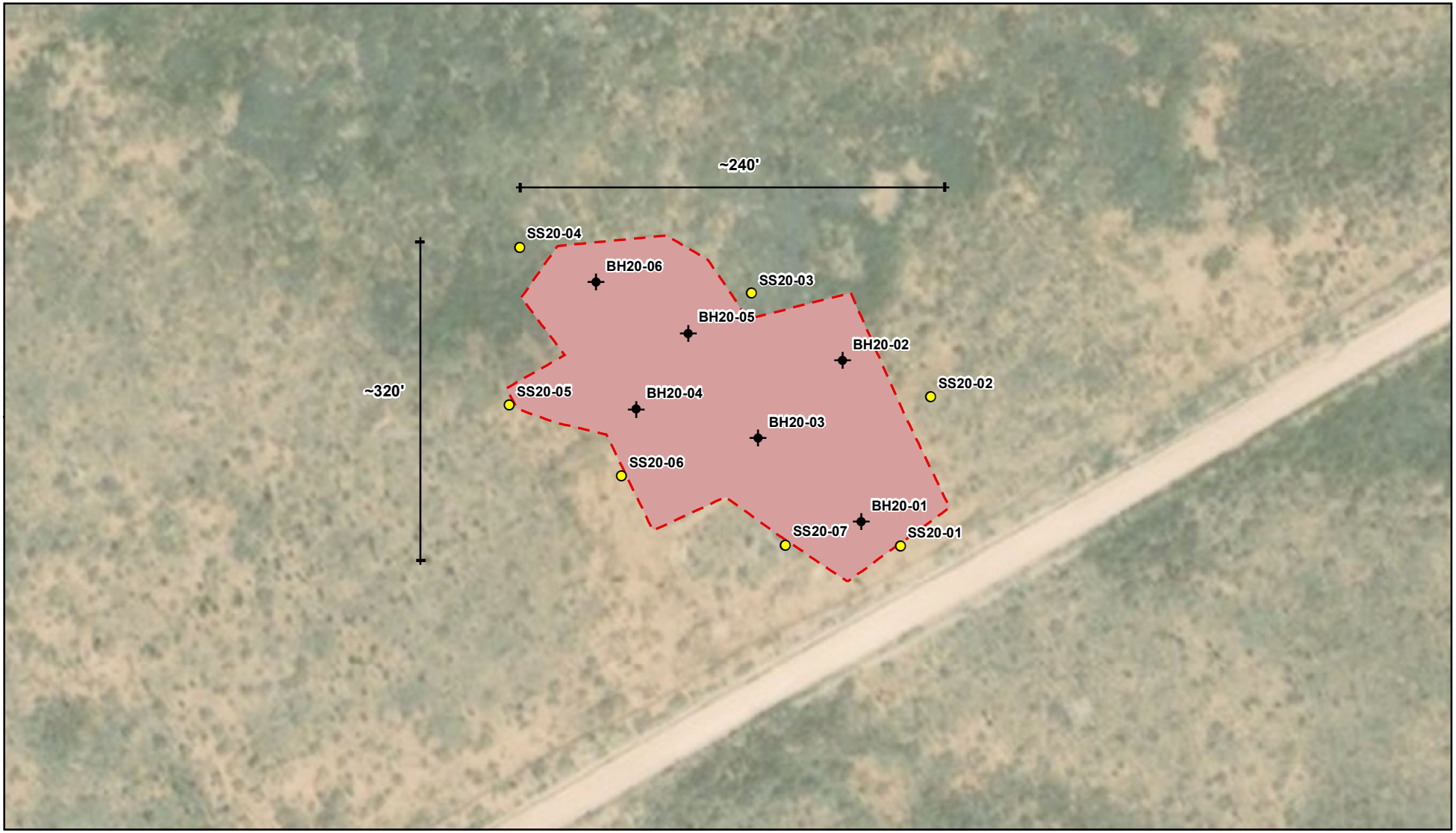
Attachment 1. Figures
Attachment 2. Closure Criteria Determination Worksheet
Attachment 3. NM OCD Guidance on Remediation of Soils on Solid Rock
Attachment 4. Table 2 – Release Characterization Sampling – Field Screen and Laboratory Data
Attachment 5. Sampling Plan

ATTACHMENT 1

MACK-Thunderbay

Figure 1 – Release Footprint Map





Borehole

Surface Sample

Spill (~45,735 sq. ft.)

VERTEX

0 25 50 100 Feet

Map Center:
Lat/Long: 33.002218, -104.056481

NAD 1983 UTM Zone 13N
Date: May 19/20

N

Site Schematic and Release Re-Characterization
Thunderbay

FIGURE:
2

MACK Energy Corporation

Geospatial data presented in this figure may be derived from external sources and Vertex does not assume any liability for inaccuracies. This figure is intended for reference use only and is not certified for legal, survey, or engineering purposes.

Note: Imagery from ESRI, 2018.

VERSATILITY. EXPERTISE.

Document Path: G:\1-Projects_US PROJECTS\Mack Energy\19E-04217\004 - Thunderbay\Fig 1 Thunderbay Initial Characterization (19E-04217).mxd

ATTACHMENT 2

Ranking Criteria			Ranking Score
Depth to Groundwater	<50 feet	20	**20**
	50 to 99 feet	10	
	>100 feet	0	
Wellhead Protection Area, <1,000 feet from a water source, or; <200 feet from private domestic water source.	Yes	20	**0**
	No	0	
Distance to Surface Water Body	<200 feet	20	**0**
	200 to 1,000 feet	10	
	>1,000 feet	0	
Total Ranking Score			**20**

Based on evaluation of the scoring criteria, Thunderbay would have a Total Ranking Score of 20. This ranking is based on the following:

- The depth to the initial groundwater-bearing zone is less than 50 feet at the site.
- The impacted area is greater than 200 feet from a private domestic water source.
- Distance to the nearest surface water body is greater than 1,000 ft.

ATTACHMENT 3

Natalie Gordon

From: Dhugal Hanton <vertexresourcegroupusa@gmail.com>
Sent: Tuesday, May 12, 2020 4:30 PM
To: Natalie Gordon
Subject: Fwd: [EXT] Release characterization/delineation question

---------- Forwarded message ---------
From: **Hamlet, Robert, EMNRD** <Robert.Hamlet@state.nm.us>
Date: Tue, May 12, 2020 at 4:11 PM
Subject: RE: [EXT] Release characterization/delineation question
To: Dhugal Hanton <vertexresourcegroupusa@gmail.com>, Venegas, Victoria, EMNRD <Victoria.Venegas@state.nm.us>, Bratcher, Mike, EMNRD <mike.bratcher@state.nm.us>, rmann@slo.state.nm.us <rmann@slo.state.nm.us>

Dhugal,

Rock Refusal (Remediation Process)

If rock refusal interferes with the remediation process, use a back-hoe/track-hoe to remove the rock. If the rock is immovable and target depth cannot be reached, use a hydrovac to clean the contaminated soil off of the rock surface and outline specific locations and steps taken on the Closure Report.

The OCD likes to see samples taken from the rock to see if the liquids have permeated the rock. This might consist of a 12-18" hole drilled with a rotary drill. If the drill sample doesn't show contaminants, spray the rock with Microblaze or other surfactants that will digest the organics (Get Approval by State/Federal Agency). At that point you've shown the OCD that you've done everything possible to clean up the contaminants.

Hopefully this helps.

Robert J Hamlet

State of New Mexico

Energy, Minerals, and Natural Resources

Oil Conservation Division

811 S. First St., Artesia NM 88210

(575) 748-1283

Robert.Hamlet@state.nm.us

From: Dhugal Hanton <vertexresourcegroupusa@gmail.com>
Sent: Tuesday, May 12, 2020 2:27 PM
To: Venegas, Victoria, EMNRD <Victoria.Venegas@state.nm.us>; Hamlet, Robert, EMNRD <Robert.Hamlet@state.nm.us>; Bratcher, Mike, EMNRD <mike.bratcher@state.nm.us>; rmann@slo.state.nm.us
Subject: [EXT] Release characterization/delineation question

Hello District 2 and SLO reps,

I have a question regarding delineating a release vertically. When we try to vertically delineate a produced water release and hit a solid hardpan/refusal at approximately 1-2 feet below ground surface, are we supposed to try to drill or break through that rock layer? The soil collected and field screened/analyzed from immediately atop the refusal layer still shows chloride levels of greater than 10,000 mg/Kg so within closure criteria for the area, but NOT within reclamation standards of 600 mg/Kg for the off-pad portion.

Breaking through the solid layer opens a conduit for contamination to move deeper into the soil so it seems like a less-than-great idea. However, fully delineating the release is a necessity.

Please advise the OCD preferred method for handling this type of situation.

Thank you,

Natalie

Natalie Gordon
Project Manager

Vertex Resource Group Ltd.
213 S. Mesa Street
Carlsbad, NM 88220

P 575.725.5001 ext 709
C 505.506.0040
F

www.vertex.ca

ATTACHMENT 4

Client Name: Mack Energy Corporation
Site Name: Thunderbay
NM OCD Incident Tracking Numbers: NMAP1825441890
Project #: 19E-04217-004
Lab Report: 2005973

Table 2. Characterization Field Screening and Sampling Laboratory Data - Depth to Groundwater < 50 feet

Sample Description			Field Screening			Petroleum Hydrocarbons							Inorganic
						Volatile		Extractable					
Sample ID	Depth (ft)	Sample Date	Volatile Organic Compounds (PID)	Extractable Organic Compounds (Petro Flag)	Inorganics (Electroconductivity)	Benzene	BTEX (Total)	Gasoline Range Organics (GRO)	Diesel Range Organics (DRO)	Motor Oil Range Organics (MRO)	(GRO + DRO)	Total Petroleum Hydrocarbons (TPH)	Chloride
			(ppm)	(ppm)	(ppm)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
SS20-01	0-0.5	May 19, 2020	-	-	114	-	-	-	-	-	-	-	88
SS20-02	0-0.5	May 19, 2020	-	-	<0	-	-	-	-	-	-	-	-
SS20-03	0-0.5	May 19, 2020	-	-	<0	-	-	-	-	-	-	-	<60
SS20-04	0-0.5	May 19, 2020	-	-	<0	-	-	-	-	-	-	-	<60
SS20-05	0-0.5	May 19, 2020	-	-	1	-	-	-	-	-	-	-	-
SS20-06	0-0.5	May 19, 2020	-	-	<0	-	-	-	-	-	-	-	<61
SS20-07	0-0.5	May 19, 2020	-	-	<0	-	-	-	-	-	-	-	-
BH20-01	0	May 19, 2020	-	-	**1,665**	<0.025	<0.221	<4.9	<9.9	<49	<14.8	<63.8	**2,300**
BH20-01	0.5	May 19, 2020	-	-	**650**	-	-	-	-	-	-	-	-
BH20-01	1	May 19, 2020	-	-	**874**	<0.025	<0.224	<5.0	<9.6	95	<14.6	95	**1,300**
BH20-02	0	May 19, 2020	-	-	278	-	-	-	-	-	-	-	-
BH20-02	0.5	May 19, 2020	-	-	**1,703**	-	-	-	-	-	-	-	-
BH20-02	1.25	May 19, 2020	-	-	**1,688**	-	-	-	-	-	-	-	-
BH20-03	0	May 19, 2020	-	-	<0	<0.025	<0.221	<4.9	<9.6	<48	<14.5	<62.5	<60
BH20-03	0.5	May 19, 2020	-	-	95	-	-	-	-	-	-	-	-
BH20-03	1	May 19, 2020	-	-	466	-	-	-	-	-	-	-	-
BH20-03	2	May 19, 2020	-	-	**1,098**	-	-	-	-	-	-	-	-
BH20-03	3	May 19, 2020	-	-	128	<0.025	<0.225	<5.0	<9.4	<47	<14.4	<61.4	210
BH20-04	0	May 19, 2020	-	-	421	-	-	-	-	-	-	-	-
BH20-04	0.5	May 19, 2020	-	-	**1,167**	-	-	-	-	-	-	-	-
BH20-04	1	May 19, 2020	-	-	**1,645**	-	-	-	-	-	-	-	-
BH20-05	0	May 19, 2020	-	-	**4,205**	-	-	-	-	-	-	-	-
BH20-05	0.5	May 19, 2020	-	-	**1,924**	-	-	-	-	-	-	-	-
BH20-05	1	May 19, 2020	-	-	**1,405**	-	-	-	-	-	-	-	-
BH20-06	0	May 19, 2020	-	-	**6,877**	-	-	-	-	-	-	-	**9,700**
BH20-06	0.5	May 19, 2020	-	-	**2,188**	-	-	-	-	-	-	-	-
BH20-06	1	May 19, 2020	-	-	**1,993**	-	-	-	-	-	-	-	**2,900**

"-" - Not applicable/assessed

Bold and shaded indicates exceedance outside of applied action level

ATTACHMENT 5

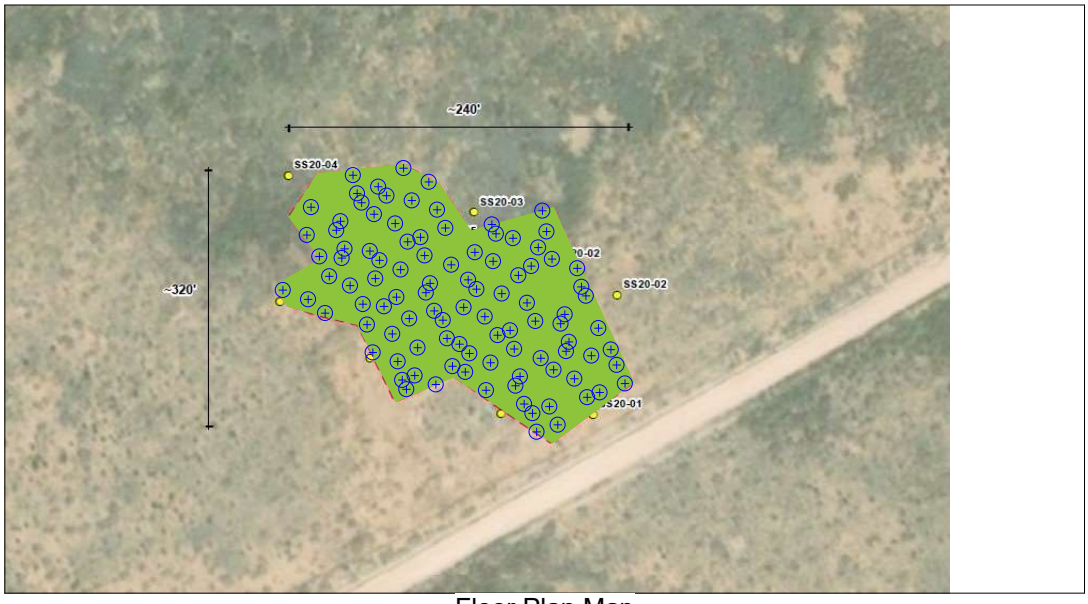
Sampling to Compute a Nonparametric (Distribution-Free) One-Sided Upper Tolerance Limit to Test that a Large Portion of Room Surfaces Does Not Contain Contamination

Summary

This report summarizes the sampling design developed by VSP based on inputs provided by the VSP user. The following table summarizes the sampling design developed by VSP. A figure that shows the sample placement on the map is also provided below.

SUMMARY OF SAMPLING DESIGN	
Primary Objective of Design	Use a nonparametric (distribution-free) one-sided upper tolerance limit (UTL) to test if the true P^{th} percentile of a population exceeds the action level
Required fraction of the population to be less than the action level	0.955 (P=95.5)
Required percent confidence on the decision made using the UTL	99%
Method used to compute the number of samples, *n*	Hahn and Meeker (1991, page 169) (See equations below)
Sample placement method	Simple random point sampling
Calculated total number of samples	101
Number of samples on map [a]	101
Number of selected sample areas that are not rooms	1
Total sampling surface area [b]	50191.79 ft^2
Total cost of sampling [c]	$11,807.00

[a] This number may differ from the calculated number because of 1) grid edge effects, 2) adding judgment samples, or 3) selecting or unselecting sample areas (rooms).
[b] This is the total surface area of all selected rooms and other selected sample areas on the map of the site.
[c] Including measurement analyses and fixed overhead costs. See the Cost of Sampling section for an explanation of the costs presented here.



Floor Plan Map

Primary Sampling Objective

The primary objective of this sampling effort is to make a decision whether an unacceptably large portion (fraction) of a

specified surface area (target population) is contaminated above a specified action level (AL) or is otherwise defective. It is presumed that suitable actions have been identified to be implemented for either way the decision may go.

Population Parameter of Interest
The population parameter of interest is the true P^{th} percentile of the population of contaminant concentrations, where $0 < P < 100$, in this case, the 95.5^{th} percentile ($P = 95.5$). The true P^{th} percentile is the value above which (100 - P)% of the population lies and below which P% of the population lies. The objective is to reject the null hypothesis if the true P^{th} percentile exceeds the specified action level (AL). But, the true P^{th} percentile will never be known with 100% confidence because all possible measurements from the population cannot be obtained. Hence the decision whether to reject the null hypothesis is made using the computed upper tolerance limit (UTL) for the P^{th} percentile, that is, by computing the upper 100(1-α)% confidence limit on the P^{th} percentile (see Decision Rule below). For the current design α is 0.01, which means that the decision will be made using the computed UTL for the 99% confidence limit on the 95.5^{th} percentile.

Hypothesis Being Tested
The null hypothesis (baseline assumption) is as follows:

H_o: The true P^{th} percentile $\leq$ AL
or equivalently,
H_o: Less than P% of the population < AL

The H_o is rejected if UTL < AL, in which case the alternative hypothesis (H_a) is accepted as being true, where:

H_a: More than P% of the population < AL

Sampling Design Options
VSP offers many options to determine the locations at which measurements are made or samples are collected and subsequently measured. For this design, simple random point sampling was chosen. Locating the sample points randomly provides data that are separated by varying distances, providing good information about the spatial structure of the potential contamination. Knowledge of the spatial structure is useful for geostatistical analysis. However, it may not ensure that all portions of the site are equally represented.

Decision Rule and Number of Samples, *n*
The null hypothesis is rejected and the alternative hypothesis is accepted if the nonparametric (distribution-free) UTL for the P^{th} percentile is less than the specified action level (AL). The nonparametric UTL is simply the maximum of the n measurements obtained from the population of interest, where n is computed using the following equation

$$n = \frac{\ln(\alpha)}{\ln(P/100)}$$

(from Hahn and Meeker 1991, page 169). These authors discuss the statistical meaning, use, and computation of nonparametric tolerance limits and the number of samples required (pages 91, 92,169, and 326).

The following table displays the values of the input parameters used for this design:

Parameter	Value
Input	
P	95.5
α	0.01 (1%)
Confidence (1-α)	99%
Output	
n	101

Statistical Assumptions
1. Representative measurements have been obtained from a defined target population using simple random sampling or a systematic grid pattern that has a randomly selected starting location.
2. The n measurements are statistically independent, i.e., there is no spatial correlation (no spatial patterns) of

contaminant levels throughout the target population.

3. The maximum of the *n* measurements is not an invalid value, i.e., it is not a mistake or an unacceptably uncertain value due to faulty sample handling, transport, treatment, storage, or measurement.

Sensitivity Analysis

The sensitivity of the calculation of number of samples was explored by varying the required percent of the population to be less than the action level. and confidence level (1-α) (%). The following table shows the results of this analysis.

Number of Samples					
	CL=99	**CL=97**	**CL=95**	**CL=93**	**CL=91**
P=91	49	38	32	29	26
P=95	90	69	59	52	47
P=99	459	349	299	265	240

P = Required Percent of the Population to be Less Than the Action Level.
CL = Confidence Level (1-α) (%)

Cost of Sampling

The total cost of the completed sampling program depends on several cost inputs, some of which are fixed, and others that are based on the number of samples collected and measured. Based on the numbers of samples determined above, the estimated total cost of sampling and analysis at this site is $11,807.00, which averages out to a per sample cost of $116.90. The following table summarizes the inputs and resulting cost estimates.

COST INFORMATION			
Cost Details	**Per Analysis**	**Per Sample**	**101 Samples**
Field collection costs		$7.00	$707.00
Analytical costs (Analyte 1)	$100.00	$100.00	$10,100.00
Sum of Field & Analytical costs		**$107.00**	**$10,807.00**
Fixed planning and validation costs			$1,000.00
Total cost			**$11,807.00**

Recommended Data Analysis Activities

Post data collection activities generally follow those outlined in EPA's Guidance for Data Quality Assessment (EPA, 2000). The data analysts should become familiar with the context of the problem and goals for data collection and assessment. The *n* data should be verified and validated before being used to test the null hypothesis. The VSP user should enter the validated and verified *n* data values into the VSP dialog box and click on appropriate tabs to obtain the following statistical summaries of the data. If there is strong evidence that the *n* data are normally distributed, the VSP user may want to use VSP to determine the number of samples, *n*, required to compute the normal distribution UTL and then use that UTL (rather than the nonparametric UTL) to test the null hypothesis.

Summary statistics: *n*, minimum and maximum of the *n* measurements, range of the *n* data, mean, median, standard deviation, variance, skewness, percentiles, and the interquartile range

Statistical Tests of Normality Assumption: Shapiro-Wilk test (if $n \leq 50$) (Gilbert 1987), Lilliefors test (if $n > 50$) (EPA 2000).

Graphical Displays of the Data: Histogram, box-and-whisker plots and quantile-quantile (probability) plots (EPA 2000).

References

EPA. 2000. *Guidance for Data Quality Assessment, Practical Methods for Data Analysis*, EPA QA/G-9, EPA/600/R-96/084, July 2000, Office of Environmental Information, U.S. Environmental Protection Agency.

Gilbert, R.O. 1987. *Statistical Methods for Environmental Pollution Monitoring*, Wiley & Sons, New York, NY.

Hahn, G.J. and W.Q. Meeker. 1991. *Statistical Intervals*. Wiley & Sons, Inc, New York, NY.

A

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Form C-141
Page 3

State of New Mexico
Oil Conservation Division

Incident ID	NMAP1825441890
District RP	2RP-4955
Facility ID	
Application ID	pMAP1824763569

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?	<50 (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
- ☒ NA 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.

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Page 4

State of New Mexico
Oil Conservation Division

Incident ID	NMAP1825441890
District RP	2RP-4955
Facility ID	
Application ID	pMAP1824763569

I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to OCD rules and regulations all operators are required to report and/or file certain release notifications and perform corrective actions for releases which may endanger public health or the environment. The acceptance of a C-141 report by the OCD does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to groundwater, surface water, human health or the environment. In addition, OCD acceptance of a C-141 report does not relieve the operator of responsibility for compliance with any other federal, state, or local laws and/or regulations.

Printed Name: Matt Buckles Title: Project Manager

Signature: MBuckles Date: 8-7-2020

email: mattbuckles@mec.com Telephone: 575-748-1288

OCD Only

Received by: Date:

Form C-141
Page 5

State of New Mexico
Oil Conservation Division

Incident ID	NMAP1825441890
District RP	2RP-4955
Facility ID	
Application ID	pMAP1824763569

Remediation Plan

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

- [X] Detailed description of proposed remediation technique
- [X] Scaled sitemap with GPS coordinates showing delineation points
- [X] Estimated volume of material to be remediated
- [X] Closure criteria is to Table 1 specifications subject to 19.15.29.12(C)(4) NMAC
- [X] Proposed schedule for remediation (note if remediation plan timeline is more than 90 days OCD approval is required)

Deferral Requests Only: *Each of the following items must be confirmed as part of any request for deferral of remediation.*

- [ ] Contamination must be in areas immediately under or around production equipment where remediation could cause a major facility deconstruction.
- [ ] 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 to the best of my knowledge and understand that pursuant to OCD rules and regulations all operators are required to report and/or file certain release notifications and perform corrective actions for releases which may endanger public health or the environment. The acceptance of a C-141 report by the OCD does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to groundwater, surface water, human health or the environment. In addition, OCD acceptance of a C-141 report does not relieve the operator of responsibility for compliance with any other federal, state, or local laws and/or regulations.

Printed Name: Matt Buckles . Title: Project Manager .

Signature: [signature] Date: 8-7-2020

email: mattbuckles@mec.com Telephone: 575-748-1288 .

OCD Only

Received by: Chad Hensley Date: 06/24/2021

- [ ] Approved
- [X] Approved with Attached Conditions of Approval
- [ ] Denied
- [ ] Deferral Approved

Signature: [signature] Date: 06/24/2021

District I
1625 N. French Dr., Hobbs, NM 88240
Phone:(575) 393-6161 Fax:(575) 393-0720
District II
811 S. First St., Artesia, NM 88210
Phone:(575) 748-1283 Fax:(575) 748-9720
District III
1000 Rio Brazos Rd., Aztec, NM 87410
Phone:(505) 334-6178 Fax:(505) 334-6170
District IV
1220 S. St Francis Dr., Santa Fe, NM 87505
Phone:(505) 476-3470 Fax:(505) 476-3462

State of New Mexico
Energy, Minerals and Natural Resources
Oil Conservation Division
1220 S. St Francis Dr.
Santa Fe, NM 87505

CONDITIONS

Action 26346

CONDITIONS

Operator: MACK ENERGY CORP P.O. Box 960 Artesia, NM 882110960	OGRID: 13837
	Action Number: 26346
	Action Type: [C-141] Release Corrective Action (C-141)

CONDITIONS

Created By	Condition	Condition Date
chensley	Samples are representative of more than 200 square feet. Please collect more confirmation samples, representing no more than 200 square feet, unless MACK chooses to provide a sampling plan for approval prior to conduction additional sampling.	6/24/2021
chensley	The OCD request an attempt be made in the center of the spill area. A bore sample be taken to prove contaminates have not penetrated past the rock layer.	6/24/2021