

**SUPPLEMENTAL INFORMATION AND RESPONSES TO LDNR REGARDING
THE PROPOSED REMEDIATION PLAN
The Sweet Lake Land and Oil Company, LLC, vs.
Oleum Operating Company, L.C., et al.
East Bell City Oil and Gas Field
Section 34, Township 10 South, Range 06 West
Bell City, Calcasieu Parish, Louisiana
LDNR OC Legacy Project No. 014-006-001
April 11, 2016**

Prepared for

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**SUPPLEMENTAL INFORMATION AND RESPONSES TO THE LDNR REGARDING
THE PROPOSED REMEDIATION PLAN**

April 11, 2016

Hydro-Environmental Technology, Inc. (HET) is submitting this supplemental information in response to comments raised by Gary Snellgrove, Director of Environmental Division with the Louisiana Department of Natural Resources (LDNR) Office of Conservation, in electronic correspondence dated March 24, 2016, regarding the proposed most feasible restoration plan dated December 10, 2015, submitted by HET to the LDNR at the request of the law firm of Kean Miller LLP, on behalf of BP Products North America, Inc., BP Exploration & Oil, Inc., BP Exploration, Inc., and Sohio Petroleum Company, for work performed during investigations of the Sweet Lake Land and Oil Company, LLC, property located in Section 34, Township 10 South, Range 06 West in the East Bell City Oil and Gas Field in Bell City, Calcasieu Parish, Louisiana. HET adopts and incorporates by reference the position and statements by counsel set forth in the Kean Miller cover letter dated April 11, 2016, transmitting this report. HET and counsel have conferred regarding the regulatory interpretation set forth in said cover letter, and HET is in agreement with same. This additional information was prepared in adherence to Hydro-Environmental Technology, Inc.'s strict quality assurance/quality control procedures to ensure that the report meets the highest standards in terms of the methods used to obtain the information presented.

This Supplemental Information and Responses to the LDNR Regarding the Proposed Remediation Plan was reviewed by the following experts, on behalf of BP Products North America, Inc. (BP), but was prepared utilizing the data presented in the previously submitted plan: Robinan Gentry, PhD., Principal with Ramboll Environ U.S. Corporation; John Frazier, PhD., Health Physicist; Calvin Barnhill, Professional Petroleum Engineer; Daniel Viator, PhD., Agronomist with Gulf Coast Agricultural Associates; Donald Sagrera, Agronomist with Gulf Coast Agricultural Associates; and Jerry Daigle Soil Scientist with Blue Frog Environmental, Soils, and Wetland Services, LLC.

This supplemental information is based on field data collected and information received from the client, other parties associated with the client and other third parties retained during the period of March 23, 2011 to April 11, 2016. All conclusions and recommendations are based on available information cited herein, and should be reviewed within this context. Should conditions at the sites in question change, or additional information become available, especially with regard to prior site conditions, it may be necessary to modify these conclusions and recommendations accordingly in the future. The contents of this supplemental information are proprietary, and text, illustrations, and/or any other parts of this supplemental information may not be reproduced without the express written permission of Hydro-Environmental Technology, Inc.

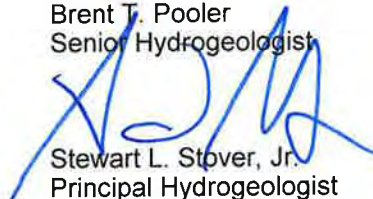
Should you have any questions or need further information, please feel free to call.

Sincerely,

HYDRO-ENVIRONMENTAL TECHNOLOGY, INC.
Project #4651.22



Brent T. Pooler
Senior Hydrogeologist



Stewart L. Stover, Jr.
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TABLE OF CONTENTS

	<u>Page</u>
1.0: INTRODUCTION	1
1.1: Site Description	1
2.0: LDNR COMMENTS	2
2.1: Response to LDNR Comment No. 3	3
2.2: Response to LDNR Comment No. 4	8
3.0: ALTERNATE SOIL AND GROUNDWATER RESTORATION PLAN	8
3.1: Alternate Plan Option A: Soil Excavation Only	8
3.2: Alternate Plan Option B: Groundwater Restoration via Pump and Treat	9
4.0: CONCLUSIONS	10

Appendix A: List of Figures

	<u>No.</u>
Topographic Location Map	1
2015 Aerial of Site with HET Areas of Investigation	2
2015 Aerial With LDNR Oil and Gas Well Locations and Designation of AOIs	3
Alternate Plan, Option A, Areas of Soil Excavation	4
Alternate Plan, Option B, Location of Groundwater Recovery Wells	5

Appendices

Supporting Documentation to December 10, 2015, Plan	B
Supporting Documentation to Alternate Plan, Option A	C
Supporting Documentation to Alternate Plan, Option B	D

1.0: INTRODUCTION

Hydro-Environmental Technology, Inc. (HET) previously submitted a most feasible restoration option to the Louisiana Department of Natural Resources (LDNR) regarding the property owned by the Sweet Lake Land and Oil Company, LLC (SLLO) located in Section 34, Township 10 South, Range 06 West, Calcasieu Parish, Louisiana. In electronic correspondence dated March 24, 2016, Gary Snellgrove, Director of Environmental Division with the Louisiana Department of Natural Resources (LDNR) Office of Conservation, presented five (5) comments on the December 10, 2015, plan that the defense experts presented at the request of Kean Miller, LLP (Kean Miller), on behalf of BP Products North America, Inc., BP Exploration & Oil, Inc., BP Exploration, Inc., and Sohio Petroleum Company (the "December 2015 plan"). Therefore, the purpose of this supplemental submission is to address those comments raised by the department in preparation of the LAC 43:XIX.Subpart 1.Chapter 6 administrative review that has since been set for the week of April 25, 2016, to evaluate and determine the most feasible plan for the site, which has been assigned the Office of Conservation Legacy Project No. 014-006-001.

In addition, plaintiff's consultants, Approach Environmental (AE) and Perry Evans, have submitted additional documents, including the Proposed Remediation Plan and a separate letter commenting on the defense plan, both dated March 09, 2016. While some information contained within this submission either comments on or responds to the plan proposed by AE, HET and the defense experts plan to respond to AE's plan more formally in a separate document before the administrative hearing. While previously submitted information on exploration history, qualification of experts, and review of data is maintained as separate and contained within the December 2015 plan, it is incorporated herein by reference.

1.1: Site Description

The SLLO, Section 34, property is located at the southwest corner of Sidney Derouen and Lognion Roads, being situated south of Sidney Derouen Road, west of Lognion Road, and north of Louisiana Highway 14. The portions of the property investigated include areas either historically or currently subject to oilfield exploration and production activities along the central and eastern portions of the Section. The property is geographically located in Section 34, Township 10 South, Range 06 West, in Calcasieu Parish, Louisiana. Figure 1 contains a topographic map illustrating the location of the property. Figure 2 contains a 2015 aerial photograph of the site illustrating the areas of investigation.

For investigative purposes, the property was subdivided into six (6) areas of investigation. The first two (2) areas of investigation (Areas 1 and 2) consist of the central portions of the property, being the former salt water disposal well and tank battery area that has since been decommissioned and the Sweet Lake Land and Oil Company, LLC, No. 005/005D former well site (Serial Nos. 67773/66878), respectively. The northeast corner of the property consists of Areas 3 and 4, which correspond to the Sweet Lake Land and Oil Company, LLC, Nos. 003 and 002 (LDNR Serial Nos. 64709 and 63282), respectively. The east-central portions of the property consist of Areas 5 and 6, being the Sweet Lake Land and Oil Company, LLC, Nos. 007 and 009 (Serial Nos. 68920 and 216967). Figure 3 illustrates the locations of the areas of investigation as they relate to the former oil and gas sites for reference purposes.

2.0: LDNR COMMENTS

In an electronic correspondence dated March 24, 2016, Gary Snellgrove, Director of Environmental Division with the LDNR-OC, presented the following five (5) comments on the December 2015 plan most feasible restoration plan prepared by the defense experts:

1. LAC 43:XIX.609.A Provide a CD or CDs of the plan, all appendices and data to satisfy the electronic copy requirement.
2. LAC 43:XIX.609.A.1 Provide a statement that a reasonable effort has been made to obtain a complete list of parties (as defined in 603).
3. LAC 43:XIX.609.A.1 Page 2, paragraph 1 of the December 10, 2015, Proposed Remediation Plan (Plan) prepared by Hydro-Environmental Technology, Inc. (HET) states that "The applicable of RECAP standards is pursuant to LAC 43.XIX.319 and the memorandum of understanding between the LDNR and the LDEQ dated February 2011." However, the Plan appears to only address regulatory conditions of 611.F.2.a.-c. for a separate plan that includes excavations to LAC 43.XIX.Subpart 1.Chapter 3. The Plan does not appear to meet the requirements to provide a plan that complies with all the provisions of Statewide Order 29-B, exclusive of LAC 43.XIX.319.Exceptions, as stipulated in 611.F.1.
4. LAC 43.XIX.611.G.1 Pages 45-46, Section 9.10: Anticipated Time Frame and Section 10.0 Cost Estimate of the Plan lacks clarity and comprehensiveness to satisfy the requirements for the plan to include a chronological work schedule or proposal for a chronological work schedule detailing all activities necessary for its implementation and an estimated cost for each item.
5. LAC 43.XIX.611.G.3 Staff were unable to locate Plan certification of review and approval signed by a licensed or authorized attorney.

Representatives of Kean Miller previously responded to comments raised in Item Nos. 1, 2, 3, and 5 in an electronic correspondence dated March 31, 2016; however, the purpose of this supplemental document is to address the comments raised above in Item Nos. 3 and 4. Therefore, the following documentation is offered.

2.1: Response to LDNR Comment No. 3

As stated in the December 2015 plan, the investigations conducted by the experts retained on behalf of BP were done in accordance with applicable and appropriate regulations to determine the most feasible plan for the site, including Statewide Order 29-B per the LDNR regulations (LAC 43:XIX Chapter 3) and the Risk Evaluation/Corrective Action Program (RECAP), as promulgated by the Louisiana Department of Environmental Quality (LDEQ) under the most recent guidance document dated October 20, 2003 (LAC 33:1 Chapter 13). RECAP standards were applied pursuant to the memorandum of understanding between the LDNR and the LDEQ dated February 2011, which constitutes good cause under LAC 43:XIX.319.

Review of data was done in a tiered fashion without proceeding immediately to the request of an exception, being: 1) determination of those concentrations that exceeded Statewide Order 29-B and 2) further evaluation of those constituents under RECAP to determine whether the concentrations were protective of human health and the environment. Specifically, the following review process was conducted to determine any exceedances of Statewide Order 29-B, Chapter 3, standards:

1. First, HET reviewed all data from both parties and considered the confirmatory sampling conducted during HET's investigation. AE either ignores and/or disregards a significant amount of HET data done in their March 09, 2016, plan. Examples of the data in which AE ignores includes the arbitrary elimination of the fraction and SPLP data generated during the course of HET's investigation. Alternatively, HET considered split data by either averaging the concentrations per state and federal guidelines and reviewing the additional analyses performed as examples to determine the constituent concentrations or evaluating the data to determine those areas that required confirmatory sampling where the split data differed greatly. AE also continues to propose that methylene-chloride, a common laboratory contaminant utilized in the volatile analytical process, as a constituent of concern, which should not be considered as a result of oilfield exploration and production purposes, especially at the low levels identified in the AE data.

2. Secondly, HET converted those metals, other than True Total Barium reported by AE, to a wet weight basis per the LDNR Memorandum of Understanding dated November 20, 2007, and a confirmatory declaration by the LDNR in the Agri-South case. The continued use of metals on a dry weight basis by AE, the contention that "AE believes that LDNR accepts either wet weight or dry weight for metals analyses", and the erroneously drawn concentration contours that include areas without data or non-detect data by AE, grossly exaggerate the proposed extent of impact.
3. Thirdly, the defense plan considers the use of RECAP screening standards as the background concentration for those parameters not specifically included in Statewide Order 29-B, Chapter 3, as ruled by the LDNR in the Savoie case in lieu of using any detected concentration. As a result, the evaluation by HET demonstrates a more complete understanding of the regulations than that proposed by AE.
4. Finally, it is imperative to determine background conditions before proceeding with design or implementation of a restoration plan, as necessary and appropriate. AE either ignored or did not consider the background conditions, thus resulting in a plaintiff's remediation plan that seeks to restore the property to a condition less than background as conceded by Mr. Moore at trial by drawing the TDS contours to a 500 ppm concentration but admitting that the background concentration of TDS was 1,215 ppm. The factors that should be considered to determine background conditions include, but are not limited to, the geological setting, depositional environment, data collection and interpretations, source locations, and groundwater flow directions, among other factors. At the SLLO property itself, the defense group, particularly Mr. Stover, conducted an extensive study utilizing both the plaintiff and defense testing data. The data demonstrates that the parties agree on the groundwater flow directions and thus there is no question on the up-gradient positions (and conversely, the down-gradient positions) of select monitor wells installed on this property as it relates to former oilfield exploration and production sites. In addition, the non-natural indicator compounds, such as benzene and hydrocarbons, are utilized for screening purposes as concentrations of these parameters which would not be detected in background areas. HET considered not only the above criteria but also evaluated the chloride/bromide ratios to aid in the determination of the background conditions with respect to chlorides based on published documents that indicate a ratio of less than 400 would be

indicative of natural conditions. Based on a review of the data, background chlorides range from 536 ppm (AE-TMW23) to 4,680 ppm (AE-TMW26) sampled on January 30, 2013, as depicted on the revised Figure 38 prepared by AE and drawn in February 2014. Furthermore, the HET background chloride data ranges from 921 ppm (HET A1-MW4) to 2,350 ppm (HET A1-MW5), both sampled on May 29, 2013. Therefore, the background chloride concentrations range from 536 ppm to 4,680 ppm on this property.

A review of the laboratory analytical results demonstrates that the extent of constituent concentrations in the soil above Statewide Order 29-B Chapter 3 standards, other than chloride related parameters, is limited. This is confirmed by the review of data conducted separately by AE in Section 4.2 Areas of Soil Contamination of the March 09, 2016, plan. Listed below is a summary of how the December 2015 plan addressed the various Statewide Order 29-B Chapter 3 exceedances of non-chloride related constituents, which are discussed separately below:

1. Oil and Grease: The extent of oil and grease concentrations detected above the Statewide Order 29-B standard of one (1) percent is limited to the footprints of the former pit areas in Areas 1, 2, and 5. Significant differences between the HET and AE oil and grease split data exist at the following boring locations which are located outside of the HET proposed soil restoration areas: HET A1-SB10 and HET A2-SB1/AE A2-SB3 at various depths. Therefore, HET proposes that confirmatory sampling be conducted at the time of soil restoration activities to confirm the previously reported concentrations in the AE data.

HET originally proposed soil restoration to meet the Statewide Order 29-B standard for oil and grease at all other locations, and the proposed soil restoration was designed to continue until which time the target remedial standard was met as determined by confirmation samples taken upon completion of excavation/soil mixing. In fact, the intent of the proposed excavation in Area 1 was to reduce the oil and grease concentrations below the Statewide Order 29-B standard despite the fact that the hydrocarbon fraction data demonstrated that the concentrations were protective of human health and the environment under a non-industrial exposure scenario per RECAP, Management Option 1. The proposed excavation also resulted in the elimination of elevated total petroleum hydrocarbons and associated indicator compounds taking into consideration the fraction results despite the fact that Statewide Order 29-B lists only a standard for oil and grease.

2. Benzene: Benzene is not specifically listed under the pit closure standards per Statewide Order 29-B, Chapter 3 and is thus initially addressed by comparing the concentrations to the RECAP screening standards of either 0.051 ppm (Soil_{ssgw}) or 1.5 ppm (Soil_{ni}). Laboratory data demonstrates that the detected concentrations of benzene were relatively limited to select locations in Areas 1 and 2 of the site. The originally proposed soil restoration plan presented by HET included the excavation of elevated benzene concentrations in Area 2 only as the remaining concentrations were below the RECAP non-industrial screening standard on 1.5 parts per million (ppm), taking into considering the results of Synthetic Precipitation Leachate Procedure (SPLP) results analyzed on soil samples in both Areas 1 and 2 and the average concentration between the split samples. Therefore, the original plan by HET resulted in the excavation of benzene to meet the non-industrial screening standards as established by the department in the Savoie case.
3. Arsenic: Laboratory analytical results from both the HET and AE data reported limited concentrations of arsenic above the Statewide Order 29-B standard of ten (10) ppm or the LDEQ Statewide Background concentration of twelve (12) ppm, especially taking into consideration the conversion of the AE metals data from dry weight to wet weight per the requirement under the regulations. Significant differences between the HET and AE arsenic split data exist at the following boring locations which are located outside of the HET proposed soil restoration areas: A1-AE SB22A(30-32') and A5-AESB4(0-1'). In addition, the elevated concentration detected in HET A2-SB5(15-17') is below the threshold considered to result in cross media transfer and is not subject to the non-industrial standard; however, HET proposes that confirmatory sampling be conducted at the time of soil restoration activities to confirm the previously reported concentrations in the AE and/or HET data.
4. Selenium: Laboratory analytical results reported one (1) boring location that exhibited an elevated concentration of selenium above the Statewide Order 29-B, Chapter 3, standard of ten (10) ppm, being A1-AESB22 (24-26', 26-28'). However, the concentrations of selenium were reported as below the standards in the following samples: A1-AESB22A (28-30',30-32') Unfortunately, HET was not made aware that AE planned the analyses of selenium at these depths and there is no split data to confirm the anomaly of selenium at these depths. Given the limited nature of the detection of selenium at the site and the unfeasible nature of soil restoration at this depth for the lone constituent, HET proposes that confirmatory sampling be conducted at the time of soil restoration activities to confirm the previously reported concentrations in the AE data.
5. True Total Barium: Laboratory analytical results reported only one (1) location that exhibited an elevated concentration of True Total Barium above the Statewide Order 29-B standard of 20,000 ppm, being A2-AESB6. The originally submitted soil restoration plan by HET included the excavation of this area to remove not only the True Total Barium concentrations, but also the elevated concentrations of oil and grease and hydrocarbon fractions above the respective standards.

The December 2015 plan addressed chlorides in two (2) manners: 1) the restoration of surface soils within the root zone plus an arbitrary depth of three (3) feet below root zone as ruled as the applicable depth of chlorides in the Agri-South case; and 2) alternative standards outside of Chapter 3 have been determined that higher limits for EC, SAR, and ESP can be justified for future land use per LAC 43.XIX.313.D without requesting an exception under 319. Furthermore, the December 2015 plan establishes a groundwater monitoring plan per Statewide Order 29-B, Section 309 to establish the concentration over times in accordance with the requirements of Statewide Order 29-B. This is further justified by the fact that all the concentrations in the groundwater are either associated with natural conditions or meet the proposed RECAP standards.

Therefore, the December 2015 plan demonstrated that non-chloride related parameters either were below or would meet, upon completion of the proposed soil restoration plan, the Statewide Order 29-B standards under Chapter 3. Furthermore, the December 2015 plan demonstrates that the horizontal and vertical extent of elevated concentrations, limited to specific areas of the site, have been defined to the screening standards, especially given the naturally saline depositional environment and the establishment of background conditions via a review of the chloride/bromide ratios and groundwater analytical results from un-impacted/up-gradient samples. Finally, the December 2015 plan demonstrates that the proposed soil restoration and groundwater monitoring plan is protective of both the underground source of drinking water (USDW) and human health and the environment for subsurface concentrations of chlorides. No impact to the Chicot aquifer, which is utilized by SLLO on the property at depths of 255 and 285 feet BLS, has been documented or exists below this property. As a result, the December 2015 plan is the most feasible plan for the site, **meets the requirements of Statewide Order 29-B without an exception**, and utilizes RECAP to demonstrate that the plan is protective of human health and the environment and would not result in any limitations or encumbrances to the potential uses of the property for any non-industrial scenario despite the fact that portions of the property are still utilized for exploration and production purposes by multiple operators.

Only out of abundance of caution and in response to Mr. Snellgrove's comments on the December 2015 plan, an alternate plan is presented in Section 3.0 below for the purpose of the administrative hearing only should the department rule that such a plan is necessary to meet the requirements of 611.F.1 and to address EC/SAR/ESP concentrations at all depths either by soil excavation or groundwater pump and treat. This alternate plan is not required by Statewide Order 29-B, nor is the plan endorsed, nor suggested in any fashion to be the most feasible plan as it is completely unfeasible, impracticable, would result in more harm than good for the property, and would render the property unusable for over eight (8) years during implementation of such an unrealistic plan.

2.2: Response to LDNR Comment No. 4

The cost estimate presented in the December 2015 plan included ranges to conduct either soil mixing in Area 1 or soil excavation in Areas 2 and 5, as well as select areas, to address elevated naturally occurring radioactive material (NORM) as proposed by Dr. Frazier. As requested by the department, Appendix B includes more details on the implementation of the December 2015 plan, including the Project/Activity Schedule regarding timing and a breakdown of the proposed costs. These costs have been updated based on a bid obtained from Crown Oilfield Service dated March 31, 2014.

3.0: ALTERNATE SOIL AND GROUNDWATER RESTORATION PLAN

The following alternate plan is presented by the defense group at the request of Kean Miller for the purpose of the administrative hearing only to satisfy the requirements of the of 611.F.1 should the department rule it necessary. This alternate plan is not endorsed in any fashion as the appropriate application of the regulatory standards. The alternate plan seeks to present a third option to those presented in the December 2015 plan, that would address EC/SAR/ESP concentrations above the elevated wetland criteria at depth either through soil excavation/off-site disposal or groundwater withdrawal, and despite the fact that the December 2015 plan is compliant with the requirements in Statewide Order 29-B for the reasons discussed above in Section 2.1.

The alternate plan presented below would render the property useless for over eight (8) years during implementation, prevent the property from being used for its intended purposes, and create safety issues in relation to active oil and gas operations and the resulting transportation issues. In fact, the result of the alternate plan, as presented to satisfy the potential administrative hearing ruling only, would result in the total destruction of the soil structure and shallow groundwater bearing zone to depths upward of thirty-four (34) feet below land surface (BLS) which has taken over 3.5 million years to create. SLLO's plan and this alternate plan will result in the destruction of the soil and groundwater. Therefore, neither plan is the most feasible option for the site.

3.1: Alternate Plan Option A: Soil Excavation Only

Option A includes the excavation and off-site disposal of EC/SAR/ESP related parameters below the root zone despite the fact that these chloride concentrations have been determined to be protective of human health and the environment in the December 2015 plan. The excavation plan is presented in the event that

the department requires such a plan to satisfy the requirements of 611.F.1 for the administrative purpose only and in the event that the department finds that the December 2015 plan does not comply with Statewide Order 29-B, Sections 309 or 311, despite the fact that the subsurface chloride concentration does not meet the definition of contamination under Statewide Order 29-B. Option A of the alternate plan includes the excavation of all chloride related parameters to the maximum extent both horizontally and vertically from the former source areas to a depth of thirty-four (34) feet BLS and would result in the complete removal of the impacted portions of the shallow water bearing zone. Therefore, no groundwater remedy would be necessary under Option A because of the total destruction of the water bearing zone and the fact that remaining areas are consistent with background concentrations.

Figure 4 illustrates the general boundaries of the areas of excavation drawn to satisfy the potential requirements of the administrative hearing. Appendix C contains the supporting documentation for the costs associated with the unfeasible additional excavation plan.

3.2: Alternate Plan Option B: Groundwater Restoration via Pump and Treat

Option B includes active groundwater treatment through recovery and either disposal or injection with the intent to reduce concentrations in the groundwater to either natural conditions (chlorides) or the RECAP screening standards (hydrocarbons/metals). No additional soil excavation is proposed other than that originally proposed in the December 2015 plan. HET assumes that the water bearing zone would be undisturbed and that excavation has not disrupted or impacted the capability for groundwater withdrawal under Option B.

Figure 5 illustrates the locations of the proposed groundwater recovery wells and the injection well associated with the groundwater withdrawal program submitted for the purpose of the administrative hearing only. Appendix D contains the supporting documentation for this unfeasible groundwater withdrawal plan that is unnecessary as the concentrations have been determined to be protective of human health and the environment.

4.0: CONCLUSIONS

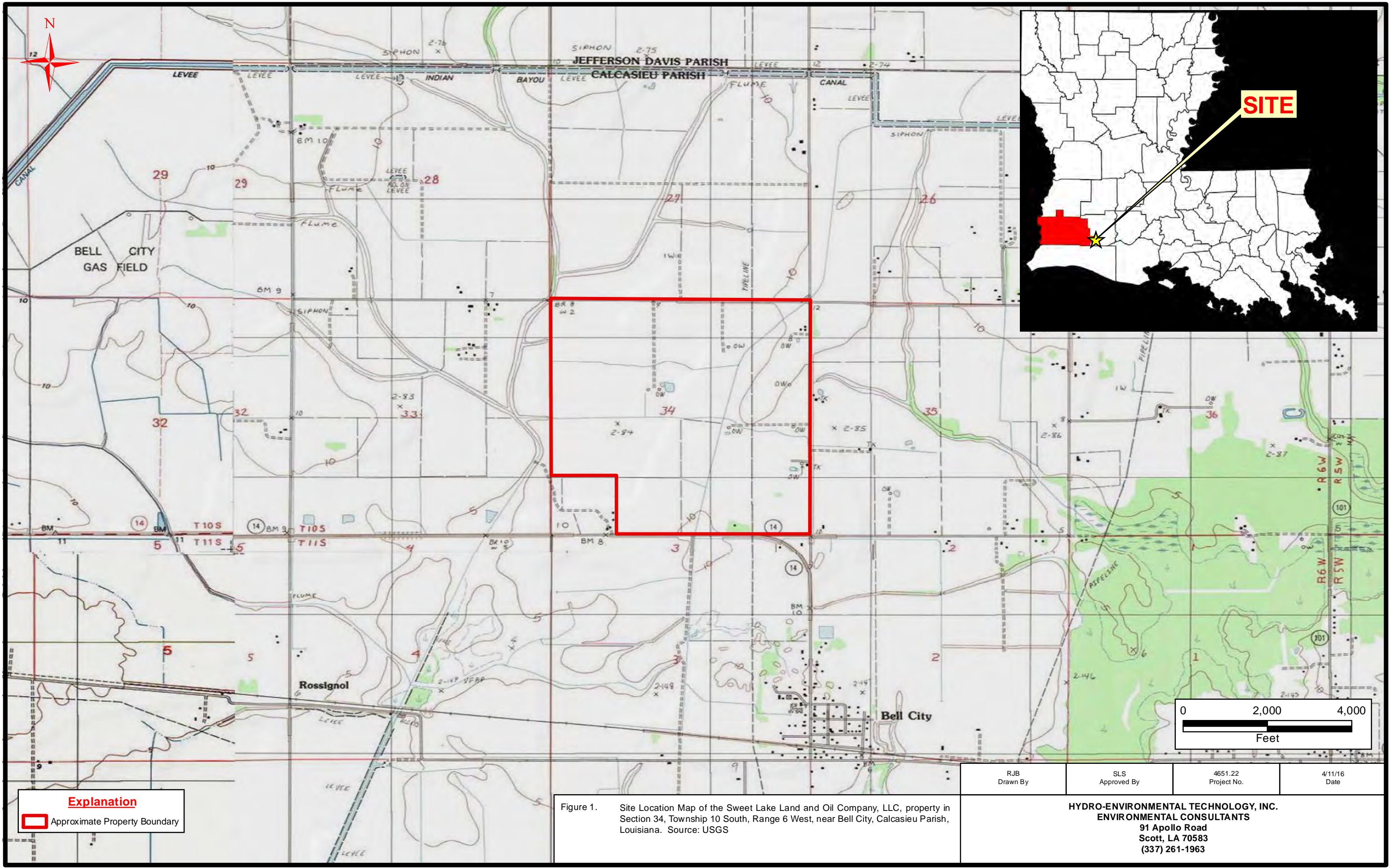
Kean Miller, on behalf of behalf of BP Products North America, Inc., BP Exploration & Oil, Inc., BP Exploration, Inc., and Sohio Petroleum Company, previously submitted the proposed remediation plan dated December 10, 2015, prepared by HET and other experts - a plan that fully complies with the requirements of Statewide Order 29-B to determine the most feasible plan for the property owned by Sweet Lake Land and Oil Company in Section 34, Township 10 South, Range 06 West, Calcasieu Parish, Louisiana. Data generated during the course of the assessments conducted by both the plaintiff's consultant, AE, and the defense group, including HET, demonstrates that the December 2015 plan results in protection of human health and the environment considering a non-industrial scenario, does not limit in any fashion the intended or any uses of the property, is protective of the USDW, and offers the most feasible and realistic plan toward obtaining regulatory closure. In addition, the December 2015 plan would continue until such time that confirmatory sampling demonstrates compliance. Therefore, the defense group recommends that the December 2015 plan be implemented as previously proposed and that an exception under LAC 43.XIX.319, if required, be granted for groundwater upon completion of soil restoration and post-remediation groundwater monitoring per the requirements of LAC 43.XIX.309.

The alternate plan submitted herein in Section 3.0 above is not endorsed as, nor suggested to be, the most feasible plan by the defense group and was submitted as part of the administrative hearing process and only to the extent that the department required such a plan. The defense group firmly believes that such a massive, unfeasible, unrealistic, unnecessary, and damaging plan should not be selected and that the plaintiff's plan for similar soil and groundwater restoration should similarly be rejected. Furthermore, the plan as presented by the plaintiff dated March 09, 2016, is: 1) grossly exaggerated in nature and extent through the depiction of inflated contour lines; 2) ignores or disregards without proper explanation large amounts of data and confirmatory sampling, 3) fails to establish alternate standards, including RECAP, or properly evaluate the data in hand to determine the most feasible plan; 4) fails to properly evaluate background conditions and thus attempts to restore the property to a groundwater concentration less than identified background conditions; 5) would render the property unuseable for its intended purposes for large periods of time during the implementation of the faulty restoration plan; 6) would destroy the soil structure and remove the groundwater bearing zone that took over 3.5 millions year to create; 7) fails to consider the fact that the proposed soil excavation generates more volume than the capacity at the nearest landfill; 8) relies on a groundwater classification that is not sustainable and a result of an aquifer test that was conducted from an improperly constructed monitor wells and does not comply with the state regulations; 9) fails to consider the

impact to another site as a result of the need for a massive amount of backfill required upon completion of the soil excavation plan; and 10) fails to consider the safety implications of such a plan regarding transportation and the active nature of the oil and gas exploration and production currently on-site. Therefore, both the plan proposed by the plaintiff, as well as the alternate plan submitted herein for the purpose of the administrative hearing only, should be rejected.

In preparation for the administrative hearing, the defense group plans to submit a separate response to address the criticisms raised by AE in its letter dated March 09, 2016. The defense group will also offer comments on the plan presented by AE and dated March 09, 2016. Also, the defense group plans to attend the site visit scheduled for April 18, 2016.

APPENDIX A
FIGURES

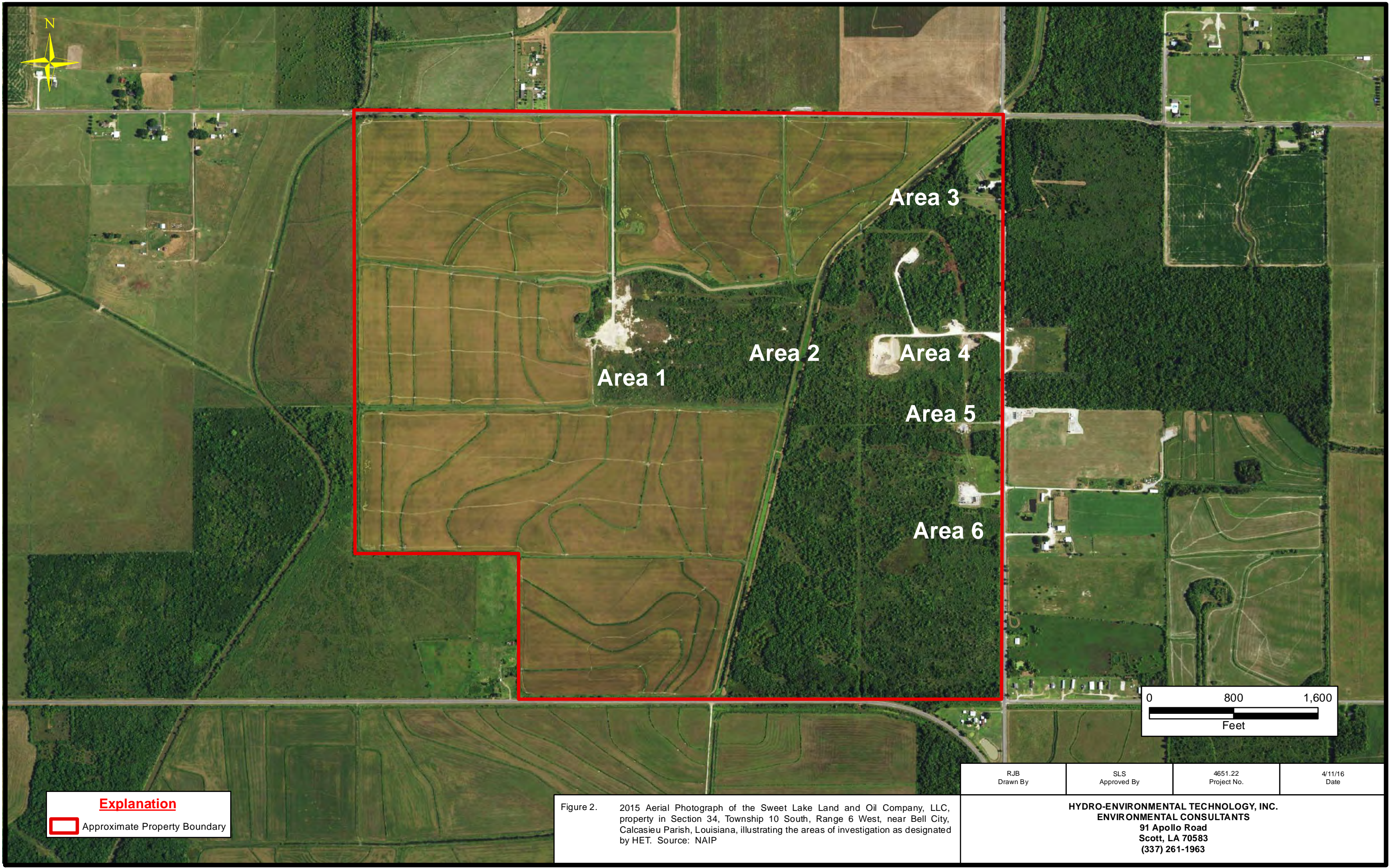


Explanation
 [Red Rectangle] Approximate Property Boundary

Figure 1. Site Location Map of the Sweet Lake Land and Oil Company, LLC, property in Section 34, Township 10 South, Range 6 West, near Bell City, Calcasieu Parish, Louisiana. Source: USGS

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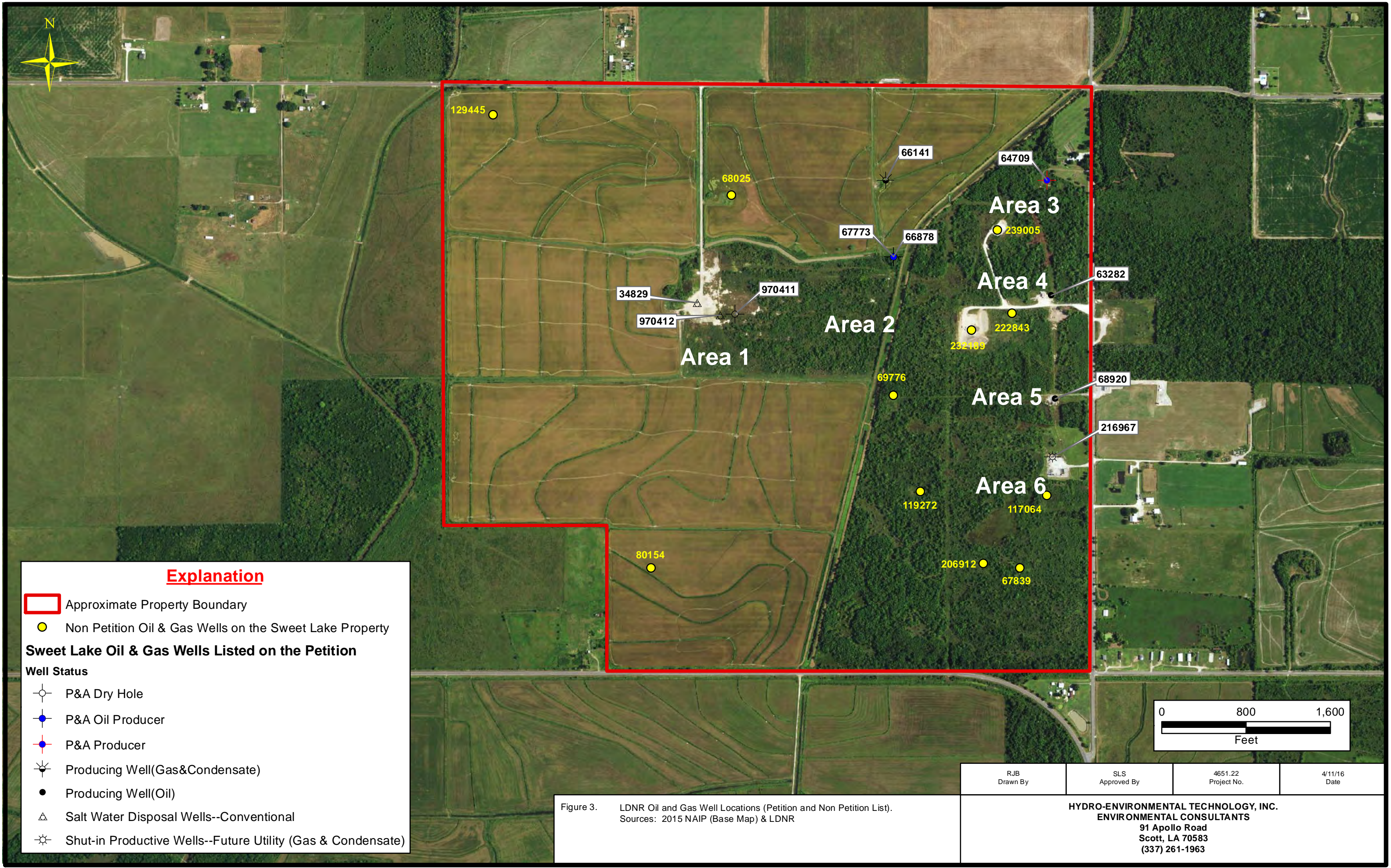
Explanation
 Approximate Property Boundary

Figure 2. 2015 Aerial Photograph of the Sweet Lake Land and Oil Company, LLC, property in Section 34, Township 10 South, Range 6 West, near Bell City, Calcasieu Parish, Louisiana, illustrating the areas of investigation as designated by HET. Source: NAIP

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Explanation

- Approximate Property Boundary
- Non Petition Oil & Gas Wells on the Sweet Lake Property

Sweet Lake Oil & Gas Wells Listed on the Petition

- Well Status**
- ⊗ P&A Dry Hole
 - P&A Oil Producer
 - ⊕ P&A Producer
 - ⊙ Producing Well(Gas&Condensate)
 - Producing Well(Oil)
 - △ Salt Water Disposal Wells--Conventional
 - ⊙ Shut-in Productive Wells--Future Utility (Gas & Condensate)

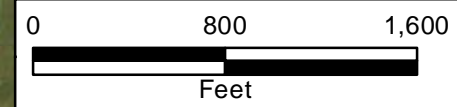


Figure 3. LDNR Oil and Gas Well Locations (Petition and Non Petition List).
Sources: 2015 NAIP (Base Map) & LDNR

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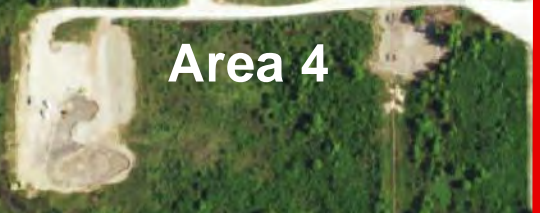
Area 1



Area 2



Area 3



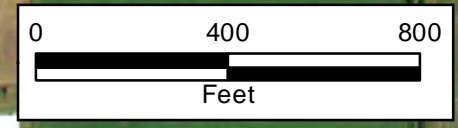
Area 4



Area 5



Area 6





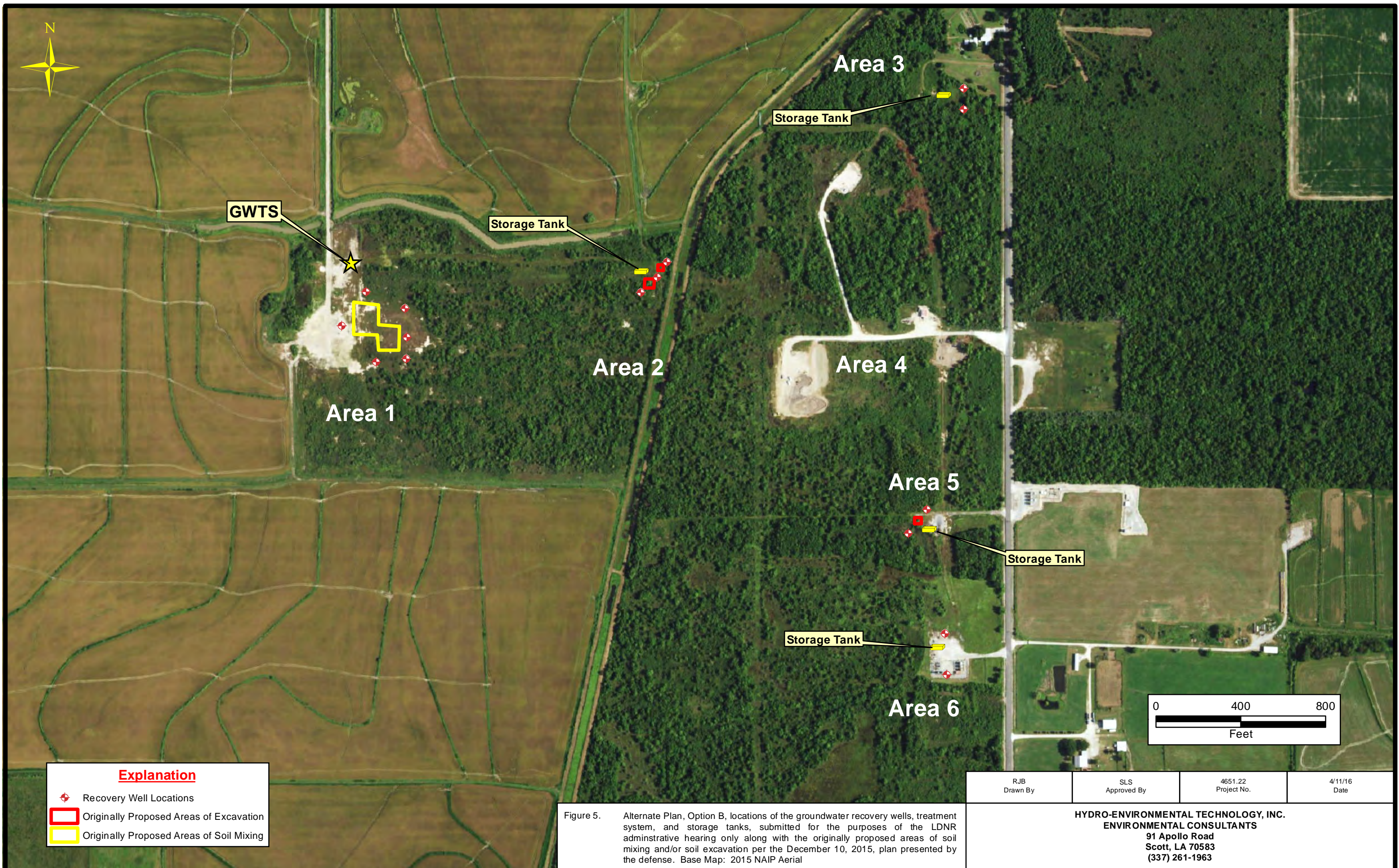
Explanation	
	Approximate Property Boundary
	Soil Excavation Areas

Figure 4. Alternate Plan, Option A, areas of soil excavation submitted for the purposes of the LDNR administrative Hearing only. Base Map: 2015 NAIP Aerial

RJB Drawn By	SLS Approved By	4651.22 Project No.	04/11/16 Date
HYDRO-ENVIRONMENTAL TECHNOLOGY, INC. ENVIRONMENTAL CONSULTANTS 91 Apollo Road Scott, LA 70583 (337) 261-1963			



Explanation	
	Recovery Well Locations
	Originally Proposed Areas of Excavation
	Originally Proposed Areas of Soil Mixing

Figure 5. Alternate Plan, Option B, locations of the groundwater recovery wells, treatment system, and storage tanks, submitted for the purposes of the LDNR administrative hearing only along with the originally proposed areas of soil mixing and/or soil excavation per the December 10, 2015, plan presented by the defense. Base Map: 2015 NAIP Aerial

RJB Drawn By	SLS Approved By	4651.22 Project No.	4/11/16 Date
HYDRO-ENVIRONMENTAL TECHNOLOGY, INC. ENVIRONMENTAL CONSULTANTS 91 Apollo Road Scott, LA 70583 (337) 261-1963			

APPENDIX B
SUPPORTING DOCUMENTATION TO DECEMBER 10, 2015, PLAN

Capital Cost - Sweet Lake - December 10, 2015 – Proposed Remediation Plan

Area 1 - Site 1 (3000 yd³) and Site 2 (3000yd³)

TIME FRAME: Two (2) to Three (3) Weeks

Item	Description	Unit Cost	Quantity	Cost	Source
Crown Estimate	Cost Estimate Option 1	\$399,606.00	1	\$399,606.00	3/31/2014 Bid
Crown Estimate	Cost Estimate Option 2	\$793,600.00	1	\$793,600.00	3/31/2014 Bid
On Site Project Manager	Hydrogeologist	\$90.00	150	\$13,500.00	Professional Judgement and Actual Costs
Equipment	Field and Sampling Kits	\$50.00	15	\$750.00	Professional Judgement and Actual Costs
Mileage: 1 truck	125 mile round trip @ \$1.50 per mile	\$187.50	15	\$2,812.50	Professional Judgement and Actual Costs
Laboratory Analyses	29B @ \$500.00 per sample	\$500.00	10	\$5,000.00	Professional Judgement and Actual Costs
Subtotal: Option 1				\$421,668.50	
10% Contingency: Option 1				\$42,166.85	
Total Capital Cost: Option 1				\$463,835.35	Option 1
Subtotal: Option 2				\$815,662.50	
10% Contingency: Option 2				\$163,132.50	
Total Capital Cost: Option 2				\$978,795.00	Option 2

Area 2 - Site 1 (250 yd³) and Site 2 (950yd³)

TIME FRAME: One (1) to Two (2) Weeks

Item	Description	Unit Cost	Quantity	Cost	Source
Crown Estimate	Cost Estimate	\$155,690.00	1	\$155,690.00	3/31/2014 Bid
On Site Project Manager	Hydrogeologist	\$90.00	100	\$9,000.00	Professional Judgement and Actual Costs
Equipment	Field and Sampling Kits	\$50.00	10	\$500.00	Professional Judgement and Actual Costs
Mileage: 1 truck	125 mile round trip @ \$1.50 per mile	\$187.50	10	\$1,875.00	Professional Judgement and Actual Costs
Laboratory Analyses	29B @ \$500.00 per sample	\$500.00	10	\$5,000.00	Professional Judgement and Actual Costs
Subtotal:				\$172,065.00	
10% Contingency:				\$17,206.50	
Total Capital Cost:				\$189,271.50	

Area 5 (90 yd³)

TIME FRAME: One (1) Week

Item	Description	Unit Cost	Quantity	Cost	Source
Crown Estimate	Cost Estimate	\$11,916.00	1	\$11,916.00	3/31/2014 Bid
On Site Project Manager	Hydrogeologist	\$90.00	50	\$4,500.00	Professional Judgement and Actual Costs
Equipment	Field and Sampling Kits	\$50.00	5	\$250.00	Professional Judgement and Actual Costs
Mileage: 1 truck	125 mile round trip @ \$1.50 per mile	\$187.50	5	\$937.50	Professional Judgement and Actual Costs
Laboratory Analyses	29B @ \$500.00 per sample	\$500.00	5	\$2,500.00	Professional Judgement and Actual Costs
Subtotal:				\$20,103.50	
10% Contingency:				\$2,010.35	
Total Capital Cost:				\$22,113.85	

Capital Cost - Sweet Lake - December 10, 2015 – Proposed Remediation Plan

NORM Areas (60 yd ³)					
TIME FRAME: One (1) Week					
Item	Description	Unit Cost	Quantity	Cost	Source
Tigress Estimate	Cost Estimate	\$49,950.00	1	\$49,950.00	8/30/2013 Bid
On Site Project Manager	Senior Environmental Scientist	\$150.00	50	\$7,500.00	Professional Judgement and Actual Costs
Equipment	Field and Sampling Kits	\$50.00	5	\$250.00	Professional Judgement and Actual Costs
Mileage: 1 truck	125 mile round trip @ \$1.50 per mile	\$187.50	5	\$937.50	Professional Judgement and Actual Costs
Laboratory Analyses	Radium 226/228 @ \$150.00 per sample	\$150.00	6	\$900.00	Professional Judgement and Actual Costs
Subtotal:				\$59,537.50	
10% Contingency:				\$5,953.75	
Total Capital Cost:				\$65,491.25	

Groundwater Monitoring of Twenty-Six (26) Wells					
TIME FRAME: Maximum of Three (3) Years					
Item	Description	Unit Cost	Quantity	Cost	Source
Quarterly Sampling	First Year Only	\$35,602.50	4	\$142,410.00	Professional Judgement and Actual Costs
Semi-Annual Sampling	Two (2) years	\$35,602.50	4	\$142,410.00	Professional Judgement and Actual Costs
Annual Reporting	Three (3) years	\$1,200.00	3	\$3,600.00	Professional Judgement and Actual Costs
Per Quarter Costs:	Per Event				
On Site Groundwater Sampler	Environmental Scientist	\$85.00	30	\$2,550.00	Professional Judgement and Actual Costs
Mileage	125 mile round trip @ \$1.50 per mile	\$187.50	3	\$562.50	Professional Judgement and Actual Costs
Disposal	\$90 pumpout per drum for 3 drums	\$90.00	3	\$270.00	Professional Judgement and Actual Costs
Project Management	Senior Hydrogeologist	\$150.00	8	\$1,200.00	Professional Judgement and Actual Costs
Field Equipment	\$350 per day (Generator, Meters, etc.)	\$350.00	3	\$1,050.00	Professional Judgement and Actual Costs
Laboratory Analyses	Chlorides, Hydrocarbons, Metals	\$975.00	30	\$29,250.00	Professional Judgement and Actual Costs
Tabulation and Review of Data	Hydrogeologist	\$90.00	8	\$720.00	Professional Judgement and Actual Costs
Subtotal Per Quarter:				\$35,602.50	
Preparation of Report	Senior Hydrogeologist	\$150.00	8	\$1,200.00	Professional Judgement and Actual Costs
Re-Installation of Monitor Well A2-MW5	Subcontracted Cost	\$5,000.00	1	\$5,000.00	Walker-Hill
10% Contingency:				\$29,342.00	
Total Capital Cost:				\$322,762.00	

Surface Soil Restoration: GCAA					
TIME FRAME: Five (5) Year Plan					
Item	Description	Unit Cost	Quantity	Cost	Source
GCAA	Soil Evaluation and Plan	\$100,065.00	1	\$100,065.00	9/05/2015 Estimate
Subtotal:				\$100,065.00	
10% Contingency:				\$10,006.50	
Total Capital Cost:				\$110,071.50	

Capital Cost - Sweet Lake - December 10, 2015 – Proposed Remediation Plan

HET Closure Report Upon Receipt of Data

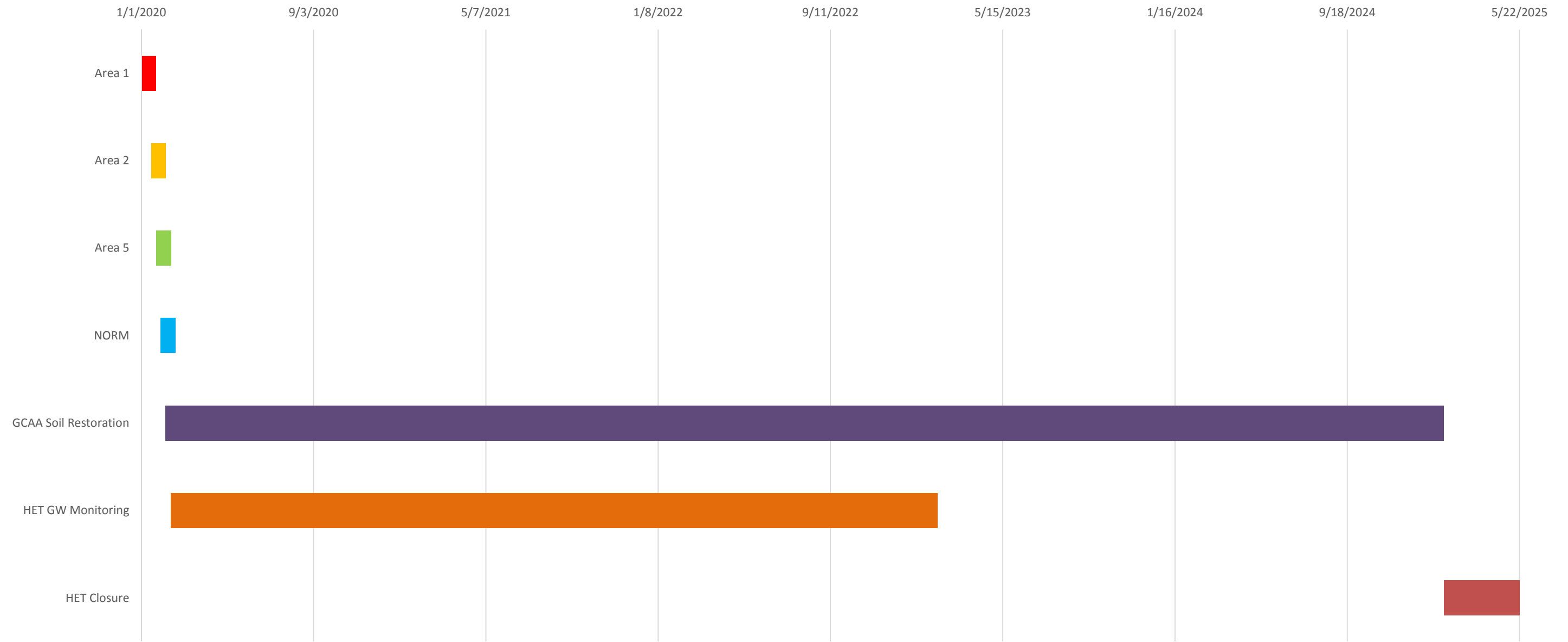
TIME FRAME: Two (2) to Three (3) Months

Item	Description	Unit Cost	Quantity	Cost	Source
Project Management	Senior Hydrogeologist	\$150.00	40	\$6,000.00	Professional Judgement and Actual Costs
Tabulate and Review Data	Senior Hydrogeologist	\$150.00	24	\$3,600.00	Professional Judgement and Actual Costs
Closure Report	Senior Hydrogeologist	\$7,500.00	1	\$7,500.00	Professional Judgement and Actual Costs
Subtotal:				\$17,100.00	
10% Contingency:				\$1,710.00	
Total Capital Cost:				\$18,810.00	

Total Capital Costs Summary

Item	Description	Unit Cost	Quantity	Cost	Source
Area 1	Option 1	\$463,835.35	1	\$463,835.35	Professional Judgement and Actual Costs: Option 1
Area 1	Option 2	\$978,795.00	1	\$978,795.00	Professional Judgement and Actual Costs: Option 2
Area 2		\$189,271.50	1	\$189,271.50	Professional Judgement and Actual Costs
Area 5		\$22,113.85	1	\$22,113.85	Professional Judgement and Actual Costs
Groundwater Monitoring		\$322,762.00	1	\$322,762.00	Professional Judgement and Actual Costs
NORM Areas		\$65,491.25	1	\$65,491.25	Professional Judgement and Actual Costs
Surface Soil Restoration		\$110,071.50	1	\$110,071.50	Professional Judgement and Actual Costs
HET Closure Report		\$18,810.00	1	\$18,810.00	Professional Judgement and Actual Costs
Total Capital Cost: Option 1				\$1,192,355.45	Option 1
Total Capital Cost: Option 2				\$1,707,315.10	Option 2

Projected Timeline: December 10, 2015 – Proposed Remediation Plan





March 31, 2014

Brent T. Pooler
 Senior Hydro geologist
 Hydro-Environmental Technology, Inc.
 PO Box 60295
 Lafayette, LA 70596-0295

**SLLO Oleum Soil Remediation Project
 Sweet Lake, La.**

Crown Oilfield Construction & Marine Service (Crown) is pleased to provide the following proposal to **Hydro-Environmental Technology, Inc. (HET)** to supply all the personnel, equipment, tools, and supplies necessary to complete the above referenced scope of work. **Crown** has the personnel who possess the knowledge, skills and experience necessary to complete this project in a cost effective and timely manner. As per request by **HET**, **Crown** has prepared the options below for remediation of the affected areas (Area 1; Area 2; Area 5) of the Sweet Lake field area, each option has short summary of tasks to perform with costs.

Project Summary/Costs: Area 1 (Option 1)

Remediation of Area 1 will consists of Soil Mixing and final site grading, dimensions of Area 1 consists of two locations onsite:

Site 1: Dimensions 100' x 100' x 8' depth; 3000 cubic yards

Site 2: Dimensions 100' x 100' x 8' depth; 3000 cubic yards

- Mobilization/Demobilization.....\$ 8,185.00
 (*Equipment and Personnel Setup*)
- Excavation and Mixing.....\$379,588.00
 (*Estimated 6,000 cubic Yards*)
- Final Grading.....\$ 11,832.00
- **Cost Estimate for Above Area 1 (Option 1).....\$399,606.00**

Project Summary/Costs: Area 1 (Option 2)

Remediation of Area 1 will consists of removal of contaminated soil, transport and dispose of soil and backfill excavation areas with clean soil and final site grading, dimensions of Area 1 consists of two locations onsite:

Site 1: Dimensions 100' x 100' x 8' depth; 3000 cubic yards

Site 2: Dimensions 100' x 100' x 8' depth; 3000 cubic yards

- Mobilization/Decontamination/Demobilization..... \$ 10,382.00
(Equipment and Personnel Setup)
- Excavation & Load/out.....\$144,831.00
(Estimated 6,000 cubic Yards)
- Transportation & Disposal\$521,180.00
(Estimated 6,000 cubic yards)
- Backfill and Final Grading.....\$117,208.00
(Estimated 8,500 cubic yards)

Cost Estimate for Above Area 1 (Option 2).....\$793,600.00

Project Summary/Costs Area 2

Soil Excavation and offsite disposal of benzene affected soils, this area will require board road installation; optional pricing below for approximately 1650 linear feet of board road. This area will also be backfill with offsite material, final grading will proceed after backfill operation.

Site 1: Dimensions: 25' x 25' x 10' depth; 250 cubic yards

Site 2: Dimensions: 50' x 50' x 10' depth; 950 cubic yards

- Mobilization/Demobilization..... \$ 2,500.00
(Equipment and Personnel Setup)
- Excavation & Load/out.....\$ 25,498.00
(Estimated 1,200 cubic Yards)
- Transportation & Disposal\$104,232.00
(Estimated 1,200 cubic yards)
- Backfill and Final Grading.....\$ 23,460.00
(Estimated 1,700 cubic yards)

Cost Estimate for Area 2.....\$ 155,690.00

Area 2 may require installation of Board Road Access; below is the costs for approximately 1650 linear feet of Board Road (19,800 square feet)

**Board Road Installation.....\$ 34,650.00*

Project Summary/Costs Area 5

Soil Excavation and offsite disposal of hydrocarbon affected soils, this area will be backfill with offsite material, final grading will proceed after backfill operation.

Site Dimensions: 35' x 35' x 2' depth; 90 cubic yards

- Excavation & Load/out.....\$ 1,500.00
(Estimated 90 cubic Yards)
- Transportation & Disposal\$ 7,817.00
(Estimated 90 cubic yards)
- Backfill and Final Grading.....\$ 2,599.00
(Estimated 130 Cubic yards)

Cost Estimate for Area 5.....\$ 11,916.00

ASSUMPTIONS/CLARIFICATIONS

- Waste Material deemed to be non-hazardous and classified for disposal at approved 29-B Facility
- Material will passed required analytical parameters needed for acceptance at landfill
- Any additional volume of materials needed or waste disposed will be at calculated rates equivalent to above pricing
- Water disposal costs are not included in this proposal, assuming all runoff and retention water can be handled onsite by discharge; or **Crown** can setup water collection and retention at approved costs by **HET**(In the event of ground water or rainfall incurred during project)
- Backfill material utilized for Project will consist of Material native to the Area
- Generator Number will be provided by others for Manifesting
- Additional work required outside of scope identified in Proposal will be charged as per **Crown** Oilfield rate sheet
- Any additional board road footage required above estimated total above will be charged at \$1.75 per square foot
- Area 5 will be performed along with Area 2 Remediation phase
- **Crown** will perform all operations under the direction of **HET**; methods of operations will be initiated by **HET** and followed by **Crown**

If there are any questions or comments regarding our proposal, or you would like to discuss any details please contact me on my cell at 225-235-5970. **Crown** appreciates the opportunity to provide pricing to **HET** for this Remediation Project

Sincerely,

Tracy Comardelle

Crown Oilfield Construction & Marine Service

Based on the delineated areas, the following practices are recommended for on-site restoration:

1. Remove all foreign material from the site.
2. Spread and level any hills or unusual irregularities in the landscape.
3. Excavate and burn any woody vegetation that would not easily decompose.
4. Disk to incorporate any other vegetation such as leaves, stems and grass.
5. Precision level.
6. Apply the correct rate of gypsum to the area and incorporate to the two foot depth by ripping in a crisscross pattern. Rate and frequency of application will be determined by monitoring.
7. Apply physical amendments if necessary.
8. Apply irrigation water.
9. Plant common Bermuda grass and fertilize in accordance with the LSU recommendations (See Attachment 9).
10. Install a suitable surface drainage system.
11. Monitoring will be necessary in order to determine progress and a possible need for adjustment of restoration practices.

The estimated costs of these practices are shown in the following tables:

COST ESTIMATES FOR RECOMMENDED ON-SITE RESTORATION PRACTICES ON AREAS OF CONCERN ON SWEET LAKE PROPERTY*

Practice	1 st year	2 nd year	3 rd year	4 th year	5 th year	TOTAL
1 Removal of debris	\$1,500					
2.&3 Level hills and holes and remove trees and shrubs	3,650					
4 Disk	2,075			1,000.		
5 Precision level	6,000					
6 V-rip	2,600			1,000		
7 Gypsum**	5,950		2,975		1,488	
8 Apply physical amendments	2,000					
9 Apply Irrigation water	12,000	1,000	1,000	1,000	1,000	
10 Plant Bermuda grass and fertilize	2,800	1,225	1,225	1,800	1,225	
11 Install surface drainage	1,659	1,037	1,037	1,037	1,037	
12 Monitor	7,949	7,949	7,949	7,949	7,949	
TOTAL	\$48,183	11,211	14,186	13,786	12,699	\$100,065

*First 3 years represents cost estimates for the entire restoration area (9.214 acres). Years 4 and 5 represent additional cost estimates for area requiring moderate restoration (1.851).

**Appropriate rates of gypsum will be applied based on soil analysis results. A variable rate applicator will be used to apply the gypsum

Units and values used to prepare estimate of cost for onsite restoration of oil and gas sites on Sweet Lake property.

Restoration practice	Unit used	Cost per unit	No. of times practice performed	TOTAL
1 debris removal	2 men 1 foreman 1 truck	\$160/day each (\$320) \$320/ day \$160/day Total = \$750/day	2 days	\$1,500
2&3 level hills and holes remove trees and shrubs	Dozier Excavator	\$120/hour \$150/hour	14 hours 14 hours	\$1,550 <u>2,100</u> \$3,650
4 Disk	Tractor and disk	\$120/hr	4.3 hours 4 times/year= \$2,075	\$2,075 1 st year 1,000 4 th year
5 Precision level	Cubic yards Surveying	\$2/ yard moved \$50/acre	300 estimated per acre (1 st year)=\$600.00 One acre=\$50.00	9.241 (estimated acres) \$6,000
6 V-rip	Large tractor with V-ripper	\$150/hour	8.6 hrs/pass x 2 passes= 18 hrs 1 st yr. One pass 4th year	\$2,600 1 st year \$1,000
7 Apply Gypsum	Tons	\$170.00	35 tons	\$5,950
			17.5 tons	\$2,975
			8.75	\$1,488

8 Apply physical amendment (hay)	4 round bales /acre	\$50/bale	\$200/acre	\$2,000
9 Apply irrigation water	Pumps, pipes, engines etc.	\$12,000/site	One site	\$12,000
	Flushing expense (levees, fuel, men)	1,000	2 sites twice/year	\$4,000
10 Install surface drainage	Tractor with ditching machine	\$120.00	2 hours x 8 passes 1 st year 2 hours x 5 passes 2 nd -7 th year	\$1,659.00 \$1,039.00
11 Plant bermudagrass and fertilize	\$1,575 plant and fertilize complete fert. Top dress N	\$171/acre \$136/acre (N)	2 app 5 app (N)	2,800 1 st yr. 1,225 2-5yr
12 Monitoring	2 Agronomist/soil scientist	\$1,000/day each	1 days x 4 times/year	\$6,912.00
	Travel	\$300/trip	1days x 4 times/year	\$1,037.00

The total estimated cost for the on-site restoration for all areas of concern is \$100,065.00

320 Jacquelyn Street
Abbeville, Louisiana 70510



Office: 337.893.7299
877.893.7299
Fax: 337.893.7630

August 30, 2013

John Frazier
Phone # 865-414-9271
E-mail jnpfrazier@charter.net

RE: Prepare/Submit the Remedial Plan to LDEQ, Remove approximately 60 cubic yards of contaminated soil in three areas, pull samples and analyze samples, backfill holes with dirt, haul waste to disposal site, Prepare/Submit request for release of the property for unrestricted use to LDEQ and clean 100 feet of 2 7/8" tubing.

Mr. Frazier,

Tigress Environmental appreciates the opportunity to submit a price for the remediation of the contaminated soil at the well site at the East Bell City Field as we discussed. All work will be done with the highest regards for quality and safety following all local, state and federal regulations.

Tigress Environmental will do the project in two phases. The first phase will be to dig up the contaminated area and pull samples to make sure the area is clean of radiation. The second phase will be to haul the waste to the disposal site and backfill the holes with clean dirt.

(The Oil Company will have to supply their disposal code number and well number so we can dispose of the waste as 29-B)

Tigress Environmental will submit plans to LDEQ, remediate the contaminated areas, sample soil, backfill holes, haul waste to disposal site and clean 100 feet of 2 7/8" tubing for the sum of \$49,950.00

Again, we thank you for the opportunity to provide pricing information and look forward to working with you. Should you have any questions or need additional information, please call me.

Sincerely,

John Tweedel
Operations Manager/RSO
Phone 337-893-7299
Cell 337-356-3500
E-mail jtweedel@tigerenviro.com

APPENDIX C
SUPPORTING DOCUMENTATION TO ALTERNATE PLAN, OPTION A

Capital Cost - Sweet Lake - Alternate Remediation Plan – Soil Excavation – Option A

Areas 1, 2, 3, 5, and 6 (564,418 yd³)

TIME FRAME: Over Eight (8) Years

Item	Description	Unit Cost	Quantity	Cost	Source
HET Estimate	Cost Estimate based on unit rates by Crown (\$130 per yd ³)	\$130.00	564,418	\$73,374,340.00	Professional Judgement and Actual Costs
On Site Project Manager	Hydrogeologist per day @ \$90 per hour (10 hour day)	\$900.00	1900	\$1,710,000.00	Professional Judgement and Actual Costs
Equipment	Field and Sampling Kits	\$50.00	1900	\$95,000.00	Professional Judgement and Actual Costs
Mileage: 1 truck	125 mile round trip @ \$1.50 per mile	\$187.50	1900	\$356,250.00	Professional Judgement and Actual Costs
Laboratory Analyses	29B @ \$500.00 per sample	\$500.00	175	\$87,500.00	Professional Judgement and Actual Costs
Subtotal:				\$75,623,090.00	
10% Contingency:				\$7,562,309.00	
Total Capital Cost:				\$83,185,399.00	

HET Closure Report Upon Receipt of Data

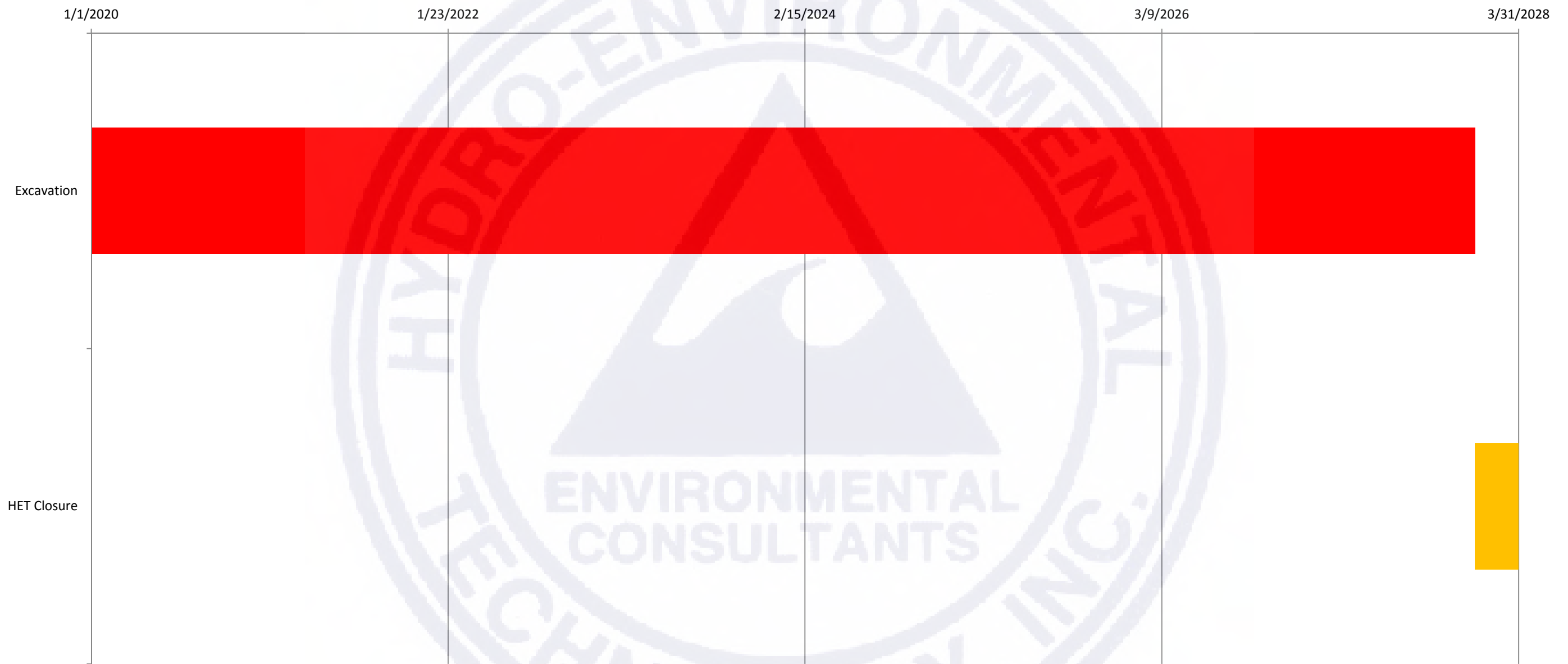
TIME FRAME: Two (2) to Three (3) Months

Item	Description	Unit Cost	Quantity	Cost	Source
Project Management	Senior Hydrogeologist per day @ \$150 per hour (10 hour day)	\$1,200.00	250	\$300,000.00	Professional Judgement and Actual Costs
Tabulate and Review Data	Senior Hydrogeologist per day @ \$150 per hour (10 hour day)	\$1,200.00	250	\$300,000.00	Professional Judgement and Actual Costs
Closure Report		\$15,000.00	1	\$15,000.00	Professional Judgement and Actual Costs
Subtotal:				\$615,000.00	
10% Contingency:				\$61,500.00	
Total Capital Cost:				\$676,500.00	

Total Capital Costs Summary

Item	Description	Unit Cost	Quantity	Cost	Source
Areas 1, 2, 3, 5, and 6 (515,274 yd ³)	HET Senior Hydrogeologist Oversight	\$83,185,399.00	1	\$83,185,399.00	Professional Judgement and Actual Costs
HET Closure Report	HET Senior Hydrogeologist Oversight	\$676,500.00	1	\$676,500.00	Professional Judgement and Actual Costs
Total Capital Cost:				\$83,861,899.00	

Projected Timeline: Alternate Remediation Plan – Soil Excavation – Option A



Capital Cost - Sweet Lake - Alternate Remediation Plan – Soil Excavation – Option A

Soil Volumes and Costs per Area

Area 1 All Area in (0-4') Range

Area 1 (0-4') Square Feet	Depth in Feet	Cubic Feet	To Cubic Yards	Cubic Yards	Cost per Cubic Yard	Total Cost Interval @ (0-4')
394294	4	1577176	27	58413.93	\$130.00	\$7,593,810.37
Area 1 (4-8') Square Feet	Depth in Feet	Cubic Feet	To Cubic Yards	Cubic Yards	Cost per Cubic Yard	Total Cost Interval @ (4-8')
489876	4	1959504	27	72574.22	\$130.00	\$9,434,648.89
Area 1 (8-14') Square Feet	Depth in Feet	Cubic Feet	To Cubic Yards	Cubic Yards	Cost per Cubic Yard	Total Cost Interval @ (8-14')
951427	6	5708562	27	211428.22	\$130.00	\$27,485,668.89
Area 1 (14-20') Square Feet	Depth in Feet	Cubic Feet	To Cubic Yards	Cubic Yards	Cost per Cubic Yard	Total Cost Interval @ (14-20')
764844	6	4589064	27	169965.33	\$130.00	\$22,095,493.33
Area 1 (20-30') Square Feet	Depth in Feet	Cubic Feet	To Cubic Yards	Cubic Yards	Cost per Cubic Yard	Total Cost Interval @ (20-30')
41173	10	411730	27	15249.26	\$130.00	\$1,982,403.70
Area 1 (Total) Square Feet	Total Depth in Feet	Total Cubic Feet	To Cubic Yards	Total Cubic Yards	Cost per Cubic Yard	Total Cost for Area 1
2641614	30	14246036	27	527630.96	\$130.00	\$68,592,025.19

Area 2 All Area in (0-4') Range

Area 2 (0-4') Square Feet	Depth in Feet	Cubic Feet	To Cubic Yards	Cubic Yards	Cost per Cubic Yard	Total Cost Interval @ (0-4')
42921	4	171684	27	6358.67	\$130.00	\$826,626.67
Area 2 (4-8') Square Feet	Depth in Feet	Cubic Feet	To Cubic Yards	Cubic Yards	Cost per Cubic Yard	Total Cost Interval @ (4-8')
29584	4	118336	27	4382.81	\$130.00	\$569,765.93
Area 2 (8-14') Square Feet	Depth in Feet	Cubic Feet	To Cubic Yards	Cubic Yards	Cost per Cubic Yard	Total Cost Interval @ (8-14')
23635	6	141810	27	5252.22	\$130.00	\$682,788.89
Area 2 (Total) Square Feet	Total Depth in Feet	Total Cubic Feet	To Cubic Yards	Total Cubic Yards	Cost per Cubic Yard	Total Cost for Area 2
96140	14	431830	27	15993.70	\$130.00	\$2,079,181.48

Area 3 All Area in (0-4') Range

Area 3 (0-4') Square Feet	Depth in Feet	Cubic Feet	To Cubic Yards	Cubic Yards	Cost per Cubic Yard	Total Cost Interval @ (0-4')
10084	4	40336	27	1493.93	\$130.00	\$194,210.37
Area 3 (4-8') Square Feet	Depth in Feet	Cubic Feet	To Cubic Yards	Cubic Yards	Cost per Cubic Yard	Total Cost Interval @ (4-8')
4422	4	17688	27	655.11	\$130.00	\$85,164.44
Area 3 (8-14') Square Feet	Depth in Feet	Cubic Feet	To Cubic Yards	Cubic Yards	Cost per Cubic Yard	Total Cost Interval @ (8-14')
4391	6	26346	27	975.78	\$130.00	\$126,851.11
Area 3 (Total) Square Feet	Total Depth in Feet	Total Cubic Feet	To Cubic Yards	Total Cubic Yards	Cost per Cubic Yard	Total Cost for Area 3
18897	14	84370	27	3124.81	\$130.00	\$406,225.93

Area 5

Area 5 (0-4') Square Feet	Depth in Feet	Cubic Feet	To Cubic Yards	Cubic Yards	Cost per Cubic Yard	Total Cost Interval @ (0-4')
3250	4	13000	27	481.48	\$130.00	\$62,592.59
Area 5 (Total) Square Feet	Total Depth in Feet	Total Cubic Feet	To Cubic Yards	Total Cubic Yards	Cost per Cubic Yard	Total Cost for Area 3
3250	4	13000	27	481.48	\$130.00	\$62,592.59

Area 6

Area 6 (0-4') Square Feet	Depth in Feet	Cubic Feet	To Cubic Yards	Cubic Yards	Cost per Cubic Yard	Total Cost Interval @ (0-4')
5665	4	22660	27	839.26	\$130.00	\$109,103.70
Area 6 (4-8') Square Feet	Depth in Feet	Cubic Feet	To Cubic Yards	Cubic Yards	Cost per Cubic Yard	Total Cost Interval @ (4-8')
2391	4	9564	27	354.22	\$130.00	\$46,048.89
Area 6 (Total) Square Feet	Total Depth in Feet	Total Cubic Feet	To Cubic Yards	Total Cubic Yards	Cost per Cubic Yard	Total Cost for Area 6
8056	8	32224	27	1193.48	\$130.00	\$155,152.59

Totals for All Areas

TOTAL Square Feet	Total Depth in Feet	Total Cubic Feet	To Cubic Yards	Total Cubic Yards	Cost per Cubic Yard	Total Cost for ALL AREAS
2,864,097.00	84	15,239,290.00	27	564,418.15	130	\$73,374,359.26

APPENDIX D
SUPPORTING DOCUMENTATION TO ALTERNATE PLAN, OPTION B

Capital Cost - Sweet Lake - Alternate Remediation Plan – Groundwater Treatment – Option B

I. Pilot Study: 72 Hour Step Draw Down Test					
TIME FRAME: 35 Days					
Item	Description	Unit Cost	Quantity	Cost	Source
Project Management	Design and implementation: Senior Hydrogeologist	\$150.00	36	\$5,400.00	HET
Well Installations	Geoprobe: one (1) 4" and five (5) 2" wells	\$2,500.00	5	\$12,500.00	HET Geoprobe - Per Day Rate
Mobilization	One time fee	\$500.00	1	\$500.00	HET
Drill Crew for Installations	Hydrogeologist and Two (2) Field Technicians	\$260.00	50	\$13,000.00	HET
On Site Project Manager	Senior Hydrogeologist	\$150.00	20	\$3,000.00	HET
Mileage: 1 ton truck	125 mile round trip @ \$1.50 per mile	\$187.50	5	\$937.50	HET
Well Installation Supplies	PVC casing and screen, caps, sand/pea gravel, etc.	\$1,500.00	1	\$1,500.00	Professional Judgement
Drums	Drums for drill cuttings @ \$56.00 per drum	\$56.00	15	\$840.00	Professional Judgement
Solid Waste	Disposal and transportation of drill cuttings	\$1,500.00	1	\$1,500.00	Professional Judgement
72 Hour Test: Personnel	Senior Hydrogeologist, Hydrogeologist, and Environmental Scientist	\$325.00	72	\$23,400.00	HET
72 Hour Test: Equipment	Pump, Data logger, Generator, Probe, etc.	\$600.00	3	\$1,800.00	HET
Mileage: 1/2 ton truck	125 mile round trip @ \$1.00 per mile	\$125.00	3	\$375.00	HET Personnel Rotation
Data acquisition and analysis	Senior Hydrogeologist	\$150.00	24	\$3,600.00	HET
Produce Water Containment	Tote Tanks (275gal)	\$268.00	4	\$1,072.00	National Tank Outlet
Water Disposal: Transport of Waste Water	One (1) load @ \$500 per load	\$500.00	1	\$500.00	Gator Environmental Services
Subtotal:				\$69,924.50	
10% Contingency:				\$6,992.45	
Total Capital Cost:				\$76,916.95	

II. Design Phase: Calculations of the Design Performance of the Groundwater Withdrawal Program					
TIME FRAME: 30 to 90 Days After Completion of Pilot Study					
Item	Description	Unit Cost	Quantity	Cost	Source
Inward Hydraulic Gradient and Capture Zones	Remedial Team: Hydrogeologist and Engineers day rate	\$2,000.00	3	\$6,000.00	Professional Judgement
pumping rates	Remedial Team: Hydrogeologist and Engineers day rate	\$2,000.00	5	\$10,000.00	Professional Judgement
pore volume flushing	Remedial Team: Hydrogeologist and Engineers day rate	\$2,000.00	3	\$6,000.00	Professional Judgement
mass removal	Remedial Team: Hydrogeologist and Engineers day rate	\$2,000.00	8	\$16,000.00	Professional Judgement
Treatment effluent and influent	Remedial Team: Hydrogeologist and Engineers day rate	\$2,000.00	3	\$6,000.00	Professional Judgement
System Design	Remedial Team: Hydrogeologist and Engineers day rate	\$2,000.00	15	\$30,000.00	Professional Judgement
Recover well construction	Remedial Team: Hydrogeologist and Engineers day rate	\$2,000.00	4	\$8,000.00	Professional Judgement
Groundwater Monitoring program	Remedial Team: Hydrogeologist and Engineers day rate	\$2,000.00	2	\$4,000.00	Professional Judgement
Subtotal:				\$86,000.00	
10% Contingency:				\$8,600.00	
Total Capital Cost:				\$94,600.00	

Capital Cost - Sweet Lake - Alternate Remediation Plan – Groundwater Treatment – Option B

III. Groundwater Withdrawal and Treatment Implementation						
TIME FRAME: 30 to 60 Days After Completion of Design Phase						
Item	Description	Unit Cost	Quantity	Cost	Source	
Water Supply		\$4,500.00	1	\$4,500.00	Black's Pumps, Water Wells, and Sewage	
Electrician		\$10,000.00	1	\$10,000.00	Professional Judgement	
Installation of Wells	15 Recovery Wells	\$49,300.00	1	\$49,300.00	Walker-Hill Estimate 1337 (4/6/2016)	
Surface Completion/road box installation	15 Recovery Wells	\$25,000.00	1	\$25,000.00	Walker-Hill/HET	
Reverse Osmosis System		\$149,080.00	1	\$149,080.00	EVOQUA Quote No. 2015-102675	
Holding Tank		\$2,000.00	1	\$2,000.00	Raw Tanks, Broussard, LA	
Carbon Drums		\$600.00	8	\$4,800.00	Carbon Air, San Marcos, Texas	
Installation of Piping & System	HET Installation Crew at \$250 per hour	\$250.00	300	\$75,000.00	HET	
PVC Transfer/Injection Lines & Fittings	26 Recovery Wells	\$2,000.00	26	\$52,000.00	Plumbing Supply	
Extraction Pumps	Estimated annual replacement	\$4,000.00	4	\$16,000.00	Wholesale Pump and Supply - Grundfos, 5E5, submersible pump	
Treatment System Structure	Housing or Canopy for System	\$15,000.00	1	\$15,000.00	Professional Judgement	
Na2SO4 Dosage System		\$5,000.00	1	\$5,000.00	Professional Judgement	
Na2SO4 Reaction Tank	700 Gal HDPE Closed Vertical Tank	\$2,000.00	1	\$2,000.00	Snyder Industrials Product 1700100N	
Electrical Mixer for Reaction Tank	Hazardous-Location Dual Propeller, 1.5 hp	\$3,100.00	1	\$3,100.00	McMaster-Carr Product 3487K38	
Transfer Pump to Settling Tank	High-Efficiency Circulation Pump, 3 hp	\$1,000.00	1	\$1,000.00	McMaster-Carr Product 9923K47	
Settling Tank	6,000 Gal HDPE Clarifier Tank	\$12,700.00	1	\$12,700.00	Snyder Industrials Product 5280200N	
Stand for Settling Tank		\$5,900.00	1	\$5,900.00	Snyder Industrials Stand for Product 5280200N	
Break Tank/Settling Overflow Allowance	700 Gal HDPE Closed Vertical Tank	\$2,000.00	1	\$2,000.00	Snyder Industrials Product 1700100N	
Transfer Pump to Oxygenation Tank	High-Efficiency Circulation Pump, 3 hp	\$1,000.00	1	\$1,000.00	McMaster-Carr Product 9923K47	
Oxygenation Tank	700 Gal HDPE Closed Vertical Tank	\$2,000.00	1	\$2,000.00	Snyder Industrials Product 1700100N	
Air Blower - For Oxygenation Tank	148 cfm airflow at 0 psi, 2.25	\$1,500.00	1	\$1,500.00	McMaster-Carr Product 1010K23	
Permits	Air Quality Exemption Permit	\$1,200.00	1	\$1,200.00	Professional Judgement	
Transfer Pump to Injection Wells	High-Efficiency Circulation Pump, 3 hp	\$1,000.00	1	\$1,000.00	McMaster-Carr Product 9923K47	
Transfer Pump to RO Holding Tank	High-Efficiency Circulation Pump, 3 hp	\$1,000.00	1	\$1,000.00	McMaster-Carr Product 9923K47	
Equipment Delivery		\$10,000.00	1	\$10,000.00	Professional Judgment	
Project management		\$25,000.00	1	\$25,000.00	HET - Professional Judgement	
Subtotal:				\$477,080.00		
10% Contingency:				\$47,708.00		
Total Capital Cost:				\$524,788.00		



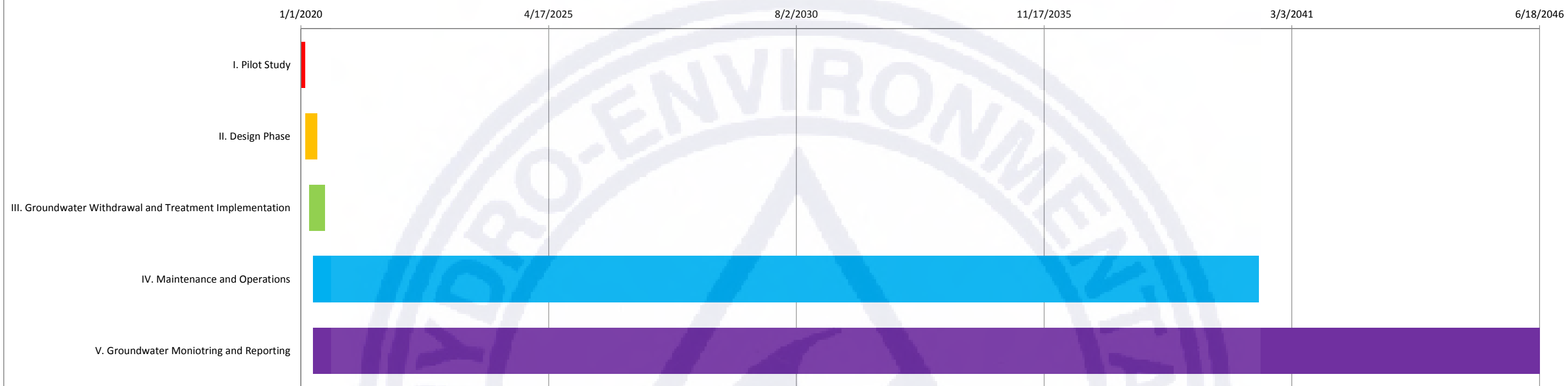
Capital Cost - Sweet Lake - Alternate Remediation Plan – Groundwater Treatment – Option B

IV. Maintenance and Operations						
TIME FRAME: 15 Days After Installation of Groundwater Withdrawal and Treatment System						
Maintenance and Operations of System						
Item	Description	Unit Cost	Quantity	Cost	Source	
Seawater RO Membranes		\$12,000.00	2	\$24,000.00	Consumables from Evoqua	
Sodium Sulfate Anhydrous Na ₂ SO ₄	\$144.5 per 55.12lb bag	\$144.50	100	\$14,450.00	Wintersun Chemical	
Weekly System Maintenance	1,800 per week for 52 weeks	\$1,800.00	52	\$93,600.00	Professional Judgement	
Subtotal:				\$132,050.00		
10% Contingency:				\$13,205.00		
Total Capital Cost: First Year				\$145,255.00		
Maintenance and Operations will continue for 19 years					\$2,759,845.00	
Waste Water Management - Gator Environmental						
Disposal of RO Waste Water	13,500 gpd at \$0.06 per gallon	\$810.00	365	\$295,650.00	R360 in Mermentau	
Transport of RO Waste Water	3 loads per Week @ \$500 per load	\$1,500.00	52	\$78,000.00	Gator Environmental	
Frac Tank Rental	\$30/Day	\$30.00	365	\$10,950.00	Gator Environmental	
Subtotal:				\$384,600.00		
10% Contingency:				\$38,460.00		
Total Capital Cost: First Year				\$423,060.00		
Waste Water Management will continue for 19 years					\$8,038,140.00	
Waste Water Management - On Site Disposal Well						
Installation of Injection Well	Crown Drilling Incorporated	\$917,000.00	1	\$917,000.00	April 8, 2016 Turnkey Drilling Proposal	
Leasing and Permitting		\$1,000.00	1	\$1,000.00	Professional Judgement Petroleum Engineer	
Operation of Injection Well		\$25,000.00	1	\$25,000.00	Professional Judgement Petroleum Engineer	
Maintenance of Injection Well		\$25,000.00	1	\$25,000.00	Professional Judgement Petroleum Engineer	
Subtotal:				\$968,000.00		
10% Contingency:				\$96,800.00		
Total Capital Cost: First Year				\$1,064,800.00		
Waste Water Management will continue for 19 years					\$950,000.00	
Power Source: Jeff-Davis Coop						
Item	Description	Unit Cost	Quantity	Cost	Source	
Jeff-Davis Coop Power Supply	1/2 Mile South from Sidney Derouen Rd.	\$50,000.00	1	\$50,000.00	Jeff-Davis Coop Power Supply	
Electrical Service	\$0.09 per KW/Hr, Cost per Quarter	\$15,000.00	4	\$60,000.00	Jeff-Davis Coop Professional Judgement	
Subtotal:				\$110,000.00		
10% Contingency:				\$11,000.00		
Total Operating & Maintenance Cost (Jeff-Davis Coop): First Year				\$121,000.00		
Power Service will continue for 19 years					\$1,368,000.00	Electrical Service (\$60,000 per year plus 10% Contingency) for 19 years
Power Source: McKoin Power - Generator						
Item	Description	Unit Cost	Quantity	Cost	Source	
Electrical Power Service	On-site Generator on rental and service	\$1,800.00	12	\$21,600.00	McKoin Power - 40KW, 208-240 3PH	
Electrical Service Charge	\$400 per Month	\$400.00	12	\$4,800.00	McKoin Power	
On-site Fuel Usage	1 Gallon per Hour @ \$2.50 per gallon	\$1,800.00	12	\$21,600.00	McKoin Power through Lard Oil	
On-Site Fuel Storage	1,000 gallon rental	\$400.00	12	\$4,800.00	McKoin Power through Lard Oil	
Subtotal:				\$52,800.00		
10% Contingency:				\$5,280.00		
Total Operating & Maintenance Cost (McKoin Power): First Year				\$58,080.00		
Power Service will continue for 19 years					\$1,103,520.00	

Capital Cost - Sweet Lake - Alternate Remediation Plan – Groundwater Treatment – Option B

V. Groundwater Monitoring and Reporting						
TIME FRAME: 20 to 26 years						
First Year of Monitoring						
Item	Description	Unit Cost	Quantity	Cost	Source	
Semi-Annual Groundwater Monitoring	Active Monitoring during Operation	\$35,602.50	2	\$71,205.00	Professional Judgement and Actual Costs	
Semi-Annual Report Preparation	Includes Project Management	\$1,200.00	2	\$2,400.00	Professional Judgement and Actual Costs	
Subtotal:				\$73,605.00		
10% Contingency:				\$7,360.50		
Total Capital Cost:				\$80,965.50		
19 Years of Monitoring and Reporting						
Semi-Annual Groundwater Monitoring	Active Monitoring during Operation	\$35,602.50	38	\$1,352,895.00	Professional Judgement and Actual Costs	
Semi-Annual Report Preparation	Includes Project Management	\$1,200.00	38	\$45,600.00	Professional Judgement and Actual Costs	
Subtotal:				\$1,398,495.00		
10% Contingency:				\$139,849.50		
Total Capital Cost:				\$1,538,344.50		
6 Years Post Remediation Monitoring and Closure						
Quarterly Post Remediation Monitoring	1-Year Period of Post Remediation	\$35,602.50	4	\$142,410.00	Professional Judgement and Actual Costs	
Annual Post Remediation Monitoring	5-Year Period of Post Remediation	\$35,602.50	5	\$178,012.50	Professional Judgement and Actual Costs	
Closure Report	Post Remediation Monitoring Data and Closure Report	\$7,500.00	1	\$7,500.00	Professional Judgement and Actual Costs	
Subtotal:				\$327,922.50		
10% Contingency:				\$32,792.25		
Total Capital Cost:				\$360,714.75		
TOTAL CAPITAL COSTS SUMMARY						
First Year						
Item	Description	Unit Cost	Quantity	Cost	Source	
I. Pilot Study	72 hour step draw down test, 1 Recovery well, 5 Observation wells			\$76,916.95		
II. Design Phase	Calculations of the design performance of the groundwater withdrawal program			\$94,600.00		
III. Groundwater Withdrawal and Treatment Implementation	System Installation and associated costs			\$524,788.00		
IV. Maintenance and Operations: System	Maintenance and Operations of System			\$145,255.00		
IV. Maintenance and Operations: Waste Water Management	Waste Water Management - Gator Environmental			\$423,060.00		
IV. Maintenance and Operations: Waste Water Management	Waste Water Management - On Site Disposal Well			\$1,064,800.00		
IV. Maintenance and Operations: Power Source	Power Source: Jeff-Davis Coop			\$121,000.00		
IV. Maintenance and Operations: Power Source	Power Source: McKoin Power - Generator			\$58,080.00		
V. Groundwater Monitoring and Reporting	First Year of Monitoring			\$80,965.50		
19 Year Projection						
Item	Description	Unit Cost	Quantity	Cost	Source	
IV. Maintenance and Operations: System	Maintenance and Operations of System	\$145,255.00	19	\$2,759,845.00		
IV. Maintenance and Operations: Waste Water Management	Waste Water Management - Gator Environmental	\$423,060.00	19	\$8,038,140.00		
IV. Maintenance and Operations: Waste Water Management	Waste Water Management - On Site Disposal Well Operation and Maintenance	\$50,000.00	19	\$950,000.00		
IV. Maintenance and Operations: Power Source	Power Source: Jeff-Davis Coop	\$72,000.00	19	\$1,368,000.00		
IV. Maintenance and Operations: Power Source	Power Source: McKoin Power - Generator	\$58,080.00	19	\$1,103,520.00		
V. Groundwater Monitoring and Reporting	19 Year Monitoring	\$80,965.50	19	\$1,538,344.50		
Final 6 Years						
Item	Description	Unit Cost	Quantity	Cost	Source	
Post Remediation Monitoring and Closure	Post Remediation Monitoring and Closure Report			\$360,714.75		
TOTAL CAPITAL COSTS						
Item	Description	Unit Cost	Quantity	Cost	Source	
CAPITAL COST - GROUNDWATER TREATMENT with Offsite Disposal				\$15,531,629.70	Total Estimated Costs with Gator Environmental and Jeff-Davis Coop	
CAPITAL COST - GROUNDWATER TREATMENT with Onsite Disposal				\$9,085,229.70	Total Estimated Costs with Onsite Injection Well and Jeff-Davis Coop	

Projected Remediation Timeline: Alternate Remediation Plan – Groundwater Treatment – Option B



Projected Remediation Timeline: Alternate Remediation Plan – Groundwater Treatment – Option B





P.O Box 51433
Lafayette, Louisiana 70505
337-332-8563
337-332-8598

April 8th, 2016

Hydro Environmental
91 Apollo Rd.
Scott LA 70583

Attention: Mr. Stover.

Re: **Turnkey Drilling Proposal**
Bell City Injection well
Calcasieu Parish, LA

Dear Mr. Stover:

Crown Drilling, Inc. proposes to drill the subject wells to a total depth of 2,500' TVD using Crown Drilling, Inc. Rig #2, a Cox 75-D drilling rig. The rig is operated by a rig superintendent, two toolpushers, and 5 men crews.

Turnkey price includes the following services by Contractor

1. Furnish and drive 16'' x 3/8'' 62.58 #/ft Grade B conductor to 120' or refusal (200bpf)
2. Furnish fuel and water.
3. Move in, rig up, rig down and move out.
4. Drill 14-3/4'' hole to 1,500' MD / TVD.
5. Run Dual Induction-GR-CAL wireline log
6. Run and cement 1,500' of 10-3/4'', 40.50#, J-55 STC, (cement volumes based on caliper + 100%) new API casing and SEA inspected complete with 18 bow spring centralizers. A 200 sx top-out will be performed if no cement returns at surface. **WOC 12 hrs**
7. Install 11'' 3M x 10-3/4'' staring head A-section complete with base plate
8. Nipple up and test BOP's, choke manifold and all associated equipment to 250/5000 PSI.
9. Test casing to 1000 psi for 30 min using test chart.
10. Drill 9-7/8'' hole to contract depth of 2,500 MD/TVD
11. Run Dual Induction-GR-CAL open hole wireline log
12. Run and cement 2,500' of 7'' 26#, N-80 LTC (cement volumes based on caliper + 100% as per injection permit) new API casing and SEA inspected complete with 54 bow spring centralizers. **WOC 12 hrs**
13. Hang casing with 110K on slips, make casing cut and install 11'' 3M x 11'' 3m B-section tubing head with hanger bowl for 4-1/2'' tubing.
14. Run cased hole CBL to determine cement bond.

15. P/U bit and scraper run to bottom displacing casing with lease sale water in preparation to set Arrow Tension Packer.
16. Lay down 4" drill pipe.
17. Make up Arrow Tension Packer on 3 1/2" tubing and run it hole to 2,200'.
18. R/U perforating gun and run in the hole to perforate injection interval with 12spf.
19. Perform 15minute injection test.
20. Furnish drilling mud, chemicals and lubricant for mud while working on a turnkey basis. Maintain water loss of 6cc or less from 5,000' to total depth with maximum mud weight of 10.5 ppg.
21. Well is to be drilled on a closed loop basis and all closed loop equipment, personnel, trucking and disposal is included in the turnkey price.
22. Furnish drill recorder (ROP, Gas Detection, PVT) in accordance with 29-B Office of Conservation rules and regulations.

TURNKEY PRICE (MIRU – RDMO).....\$917,000

Operator to furnish:

1. Necessary right-of-way permits, well permits, well sign, and stake location.
2. Maintain access roads and pay stand-by time at the applicable day rate for any down time derived from impassable road conditions.
3. Perform final cleanup and pay land, road and crop damages.
4. Be responsible for all daywork operations and all services and supplies associated with daywork.
5. Be responsible for all loss and damages caused by failure of service or supplies furnished by Operator.

Proposal is contingent on a review of Operator's geology for the well, rig availability, rig move not to exceed 100 miles, suitable financial arrangements, and execution of an I.A.D.C. Model Turnkey Contract prior to spudding well. Crown Rig 2 will be available 1st Quarter 2013. Crown Drilling requires funds for turnkey operations plus \$50,000 for daywork to be placed in an escrow account at MidSouth National Bank in Lafayette prior to spud. Contractor reserves the right to review turnkey proposal if contract is not started within 30 days of this date. If Crown Drilling is the successful bidder, our representatives could meet with you to discuss location issues and offer a location bid.

Please call if you have any questions regarding this proposal.

Yours very truly,

Crown Drilling, Inc

Andy Simon
President



P.O. Box 1728
Walker, LA 70785

Cost Proposal

Date	Proposal #
4/6/2016	1337

Name / Address
HydroEnvironmental Derek Broussard P.O. Box 60295 Lafayette, LA 70596-0295

Project Description
Drill (15) 4-inch PVC wells to 20' 10' screen, Sonic rig Bell City, LA

Description	Unit	Qty	Rate	Total
Mobilization/Demobilization	Lump Sum	1	1,200.00	1,200.00
Sonic Rig Day Rate, skidsteer, water truck	Day	3	5,250.00	15,750.00
4-inch Well Material	Feet	300	18.00	5,400.00
Surface Completions	Each	15	600.00	9,000.00
Well Development	Hour	20	175.00	3,500.00
Frac Tank Mob	Event	2	1,000.00	2,000.00
Frac Tank	Day	15	80.00	1,200.00
Vacuum Truck and Fluid Disposal	Gallon	10,000	0.90	9,000.00
Per Diem	Day	5	450.00	2,250.00

Customer's Acceptance of Cost Proposal:

Authorized Signature

Date

Name/Title

Subtotal	\$49,300.00
Sales Tax (0.0%)	\$0.00
Total	\$49,300.00

*Payment terms nte (30) days upon project completion.

Walker-Hill Environmental, Inc.
Phone: (225) 667-3297 - Fax: (225) 667-3298
Email: rizzor@earthlink.net