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February 14, 2014

University of California, Los Angeles
RE Asset Management Department
10920 Wilshire Boulevard, Suite 815
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Sent via email to:

Loreilly-Rosenblatt@re.ucla.edu

ATTN: Loana O'Reilly-Rosenblatt, Director, UCLA Asset Management

**RE: Addendum to the March 5, 2013 Site Characterization,
Remediation, and Closure Report
Former HIPAS Observatory, Fairbanks (Two Rivers), Alaska**

Loana:

NORTECH is pleased to present University of California, Los Angeles (UCLA) with this Addendum to the March 5, 2013 Site Characterization, Remediation, and Closure Report (2013 Report) at the former High Power Aurora Stimulation (HIPAS) Observatory near Fairbanks, Alaska (the Site). This Addendum presents the results of the work outlined in the August 30, 2013 Proposed Work Plan and Cost Estimate letter (2013 WP) and the October 4, 2013 electronic mail conditional approval from the Alaska Department of Environmental Conservation (ADEC) for these activities expected to result in unrestricted land use for the former HIPAS site.

BACKGROUND AND SCOPE OF WORK

The 2013 Report provides a detailed background of the history and environmental characterization and cleanup activities that have occurred at the former HIPAS Observatory since its closure in 2008. This site history is also summarized in the 2013 WP, which is included as Attachment 6. The 2013 WP tasks were the result of a June 21, 2013 meeting with **NORTECH**, UCLA, and the landowner the University of Alaska (UA) to discuss report results and the potential for future environmental and land use concerns following review of the 2013 Report. ADEC indicated they concurred the site cleanup activities were adequate to address petroleum related concerns. ADEC was comfortable using the 2013 Report data to close the site with future land use restricted to commercial/industrial designation, but not for unrestricted future use that might include potential residential or agricultural use. UCLA and UA agreed unrestricted land use was needed and requested ADEC identify specific assessment activities that could be completed to achieve this goal.

After further discussions, ADEC indicated the specific additional concerns were related to PCBs in the leachfields left in place, potential PCB soil contamination associated with inappropriate disposal near backdoors of this type of facility, and potential mercury exposure under a residential scenario at the former LIDAR Tower location. On July 24, 2013, ADEC verbally requested additional site data to address three remaining





concerns prior to providing closure and unrestricted land use for the Site. The 2013 WP was submitted for ADEC approval in August 2013 and approved via email with a few conditions in October 2013. Attachment 6 provides the 2013 Work Plan and October 2013 ADEC conditional approval: The approved 2013 WP included additional investigation of the following three items and conditions:

- Soil borings and laboratory sampling at the former soil absorption systems (leachfields) to evaluate potential contamination
 - Samples collected at the interface between the leach rock and native soil
 - Locations were the former active wastewater disposal systems (Bunkhouse/LIDAR, Generator Building, and Transmitter Building)
- Assessment and soil sampling for polychlorinated biphenyl (PCB) oil disposal the former “back doorway” areas, transformer pad, and LIDAR staging area
 - Sampling to use composite sampling following the Toxic Substances Control Act (TSCA) preferred method
 - Investigate and sample down to two feet below ground surface (bgs) to account for surface disturbance and new fill
- Soil and soil gas testing to assess potential mercury exposure around the former LIDAR Tower
 - Additional soil sampling around the perimeter of the former LIDAR Tower
 - Soil gas testing to assess potential health risks from mercury remaining below the ADEC Method 2 cleanup levels
 - Following ADEC’s Vapor Intrusion Guidance methodology
 - At depth of 2013 soil results
 - Risk analysis and discussion based for future residential or agricultural activity

FIELD ACTIVITIES, LABORATORY RESULTS, AND DISCUSSION

NORTECH completed the field work for this project in October, November, and December 2013. Field activities were generally completed in accordance with the methodology approved in the work plan and ADEC guidance documents. Field activities and observations for each of the three tasks are discussed below, along with the laboratory results and associated data quality parameters. The impact of these results on the overall cleanup and closure of the overall site is also discussed. A summary of conclusions and recommendations is located at the end of this document.

Soil Absorption System Assessment

Field Activities

The approximate locations of the soil absorption systems were identified and marked in October 2013, prior to the presence of snow on the Site. The initial soil boring locations were estimated based on site drawings, surface morphology, and site photographs because the cleanouts and other evidence of the on-site wastewater systems had been





removed in 2012. **NORTECH** subcontracted GeoTek Alaska (GTA), to complete one direct push soil boring at each of the three soil absorption systems (Bunkhouse/LIDAR, Generator Building, and Transmitter Building). **NORTECH** and GTA completed the field work on November 15, 2013. Figure 4 in Attachment 1 shows the sample locations. The photo log is presented in Attachment 3. Soil boring logs are presented in Attachment 4. A summary of the laboratory results for these samples is included in Table 1 of Attachment 2.

The soil borings were advanced to a depth of five feet below the ground surface to evaluate the level of ground disturbance at the specific location. If natural depositional layering was observed in the silt, the location was abandoned as the layering indicated the location had not previously been excavated for installation of the soil absorption system. Another soil boring was started a few feet away until evidence of disturbed silt (no layers) and/or buried foam insulation was observed in the soil boring indicating that the system had been found.

Each of the three systems was identified within less than 15 feet of the initial estimated location:

- Bunkhouse/LIDAR – approximately 20 feet north of former septic tank
- Transmitter Building – approximately 20 feet east of former septic tank
- Generator Building – approximately 20 feet west of former septic tank

During soil boring advancement, continuous soil cores were collected in five-foot intervals from the ground surface. Visual and olfactory inspections and photoionization detector (PID) field screening of soil cores were recorded on the soil borings logs presented in Attachment 4. The soil boring at each location was very similar, with foam insulation observed at approximately four to five feet below grade. The leach rock extended about ten feet, from the below the foam to 14-15 feet below grade. Native silt was observed below the leach rock with a thin layer (only a few inches thick) at the rock/silt interface showing evidence of previous impacts from the wastewater system. All soil was dry and no wastewater or groundwater was encountered.

Recovery of soil cores in the silt above and below the leach rock was good. Recovery within the leach rock was poor due to the tendency of a larger piece of rock to become lodged in the mouth of the sampler and push through the rock until the silt below was encountered. Up to two field screening samples were collected per five-foot interval with PID field screen results for all three locations less than three parts per million (ppm). No visible evidence of contamination or hydrocarbon odor was observed. One soil sample for each location and a field duplicate were collected for laboratory analysis at the leach field/native soil interface zone. The four samples were submitted to SGS North America, Inc. (SGS) laboratory for the PCB analysis by EPA Method 8082A.





Laboratory Results

Table 1 in Attachment 2 presents the results summary and Attachment 5 presents the laboratory data reports and ADEC Laboratory Data Quality Review checklist (LDQR). None of the seven PCB congeners were detected in the four samples collected and the individual limits of quantitation (LOQs) were more than an order of magnitude below the ADEC cleanup level of 1 mg/Kg for unrestricted land use. Review of the data in early January 2014 indicated that SVOC analysis specified in the 2013 WP was inadvertently left off the chain of custody and therefore not analyzed by the laboratory. Discussions with the laboratory confirmed the laboratory had disposed of the remaining samples after 30 days in accordance with their standard protocol and the analysis could not be performed. The only other potential data quality issue was that the samples were delivered to the lab slightly below the standard temperature range, but as no ice was observed in the samples this is not considered a significant concern.

Discussion

Visual and olfactory observations and field screening readings collected during soil boring advancement at each former soil absorption system indicated no evidence of chemical contamination of any kind. This was consistent with the results from the septic tank liquid and sludge inspection and sampling in 2012 that also showed no evidence of chemical or petroleum disposal. Although the SVOC analysis was not performed as specified in the work plan, the PCB analysis confirms that the former wastewater systems were not impacted by PCBs. Due to the available evidence indicating that PCB oils and other petroleum products were not disposed of in the on-site wastewater systems, remobilization to the Site to collect additional SVOC samples as outlined in the 2013 WP is not considered necessary. No additional investigation or cleanup activities are recommended at these former soil absorption systems.

Back Door, Transformer Pad, and LIDAR Staging Area Assessment

Field Activities

This task included hand excavation and/or soil borings at multiple locations across the site to evaluate the potential for inappropriate disposal of PCB containing oils at facilities that ADEC has observed at multiple military radar sites. The primary area of concern for ADEC was the back doors of buildings, which can become storage or disposal areas for waste materials. The second concern was the transformer pad area to evaluate the potential for PCB oil discharge directly to the ground surface from the installed electrical gear. The final area of concern was the staging area that was used to store capacitors and transformers prior to disposal after the buildings were decommissioned.

To assess these concerns, **NORTECH** identified suspect areas using building and aerial photographs and measurements from the remaining foundation elements to identify five suspect back door locations. The location of the transformers on the concrete transformer pad and the storage area near the LIDAR Building were identified from photographs. A total of eight suspect areas were identified and these are listed below (with laboratory sample IDs) and the locations are shown on Figure 4 of Attachment 1.





- PCB-1 LIDAR Garage
- PCB-2 LIDAR Building (and blind field duplicate PCB-9)
- PCB-3 Boneyard Trailers/Containers
- PCB-4 Generator Building
- PCB-5 Transformer Storage
- PCB-6 Transmitter Building
- PCB-7 Transmitter Pad west of the Transmitter Building
- PCB-8 Transmitter Pad west of the Transmitter Building

The ground surface of each suspect area was inspected and then the subsurface was inspected by hand excavating to a depth of two feet at three locations within the suspect area. Soil observations at most of the eight suspect locations showed a thin layer of disturbed surface material on top of naturally layered silt. The exceptions to this were subsample locations adjacent to foundations that had no layering due to disturbance during foundation construction. No visual and olfactory concerns about potential contamination were identified at the eight suspect locations.

Each of the three excavations at a suspect location was then sampled and the soil from these subsamples was mixed thoroughly into a single composite sample for each suspect location. A single representative sample from each of these composite samples was collected and placed into a laboratory supplied jar for PCB analysis by EPA Method 8082A.

Laboratory Results

Table 2 in Attachment 2 presents the results summary and Attachment 5 presents the laboratory data reports and ADEC QC checklists. The results at each of the eight suspect locations were non-detect for each of the seven PCB congeners. The LOQ for each PCB congener was at least an order of magnitude below the ADEC cleanup level of 1 mg/Kg for unrestricted land use. The only potential data quality issue was that the samples were delivered to the lab slightly below the standard temperature range, but as no ice was observed in the samples, this is not considered a significant concern.

Discussion

A total of eight locations were sampled to evaluate surface and shallow subsurface soils for PCB contamination associated with the improper disposal and storage of transformer oil and capacitors. Five of these were back door locations, two were adjacent to the transformer pad, and one was at the former LIDAR staging area. Visual and olfactory observations during soil sampling at each suspect indicated no evidence of chemical contamination of any kind. Laboratory results confirmed that PCBs were not present at the laboratory detection limit, well below the ADEC cleanup level, at each of these locations. This indicates that PCB oils and other petroleum products were not disposed of at these locations. No additional investigation or cleanup activities are recommended to assess these locations.





LIDAR Tower Mercury Assessment

The field work for this task included additional surface soil sampling around the perimeter of the former LIDAR tower and soil gas field screening and sampling within the footprint of the former LIDAR tower. This data was integrated with the 2012 soil data to provide an assessment of potential exposure for future residential and agricultural use.

Surface Sampling – Field Activities

The surface of the LIDAR tower area was inspected in October 2013 prior to snowfall to verify that no evidence of construction or demolition debris associated with the LIDAR Tower was visible within 20 feet of the former building. Surface sample locations were marked for sampling during the soil gas field sampling work and are shown in Figure 3, which also shows the 2012 surface sample locations. The additional surface samples were collected on December 8, 2013 from the following locations:

- LID-4 northwest corner of former excavation
- LID-5 northeast corner of former excavation
- LID-6 background sample west of former excavation
- LID-7 southeast of former excavation
- LID-40 blind duplicate of LID-4

The surface samples were collected from two to six inches below the existing ground surface using clean hand tools. No demolition debris or other potential concerns were observed in the gravel samples. QA/QC duplicates and trip blanks were collected in accordance with the May 2010 ADEC Draft Field Sampling Guide. Samples were submitted to SGS for analysis for Total Mercury by EPA Method SW6020.

Surface Sampling – Laboratory Results

Table 3 in Attachment 2 presents the surface sampling results summary and Attachment 5 presents the laboratory data report and ADEC QC checklist. Three of the four locations were non-detect for mercury at or above the LOQ (~ 0.04 mg/Kg), which was well below the ADEC cleanup level of 1.4 mg/Kg for inorganic mercury. At the fourth location, the primary sample was slightly above the LOQ (0.0423 mg/Kg) while the field duplicate was below the LOQ. Surface samples from 2012 are shown at the bottom of Table 3, but are not included in the quality control summary as this was presented in the 2013 Report.

A review of the laboratory data indicated that method SW6020 was used instead of 7471B as specified in the 2013 WP to maintain consistency with the historical analytical methodology at the Site. Limited staff and schedules for the holidays resulted the samples being analyzed one day past the hold time. In a January 9, 2014 electronic correspondence to **NORTECH** (attached to the LDQR), SGS stated that the samples were run less than 24 hours past hold time and the sample results should not have





been significantly different because of that short amount of time. An additional email from SGS discusses some of the differences between Method 6020 and Method 7471B for mercury analysis.

Surface Sampling – Discussion

Multiple surface inspections in 2012 and 2013 have confirmed that the debris from the demolition of the LIDAR Tower has been completely removed. The additional laboratory assessment of three locations in 2013 confirm the results of the 2012 perimeter results showing that mercury concentrations outside the footprint of the former LIDAR tower are at background levels and well below the ADEC cleanup level. Based on these observations and results, no further assessment or remediation of surface soils is necessary in the vicinity of the former LIDAR Tower.

Soil Gas Sampling – Field Activities

NORTECH and GeoTek Alaska mobilized to the Site on November 15, 2013 to advance six soil borings using the direct push method to be used as soil gas screening points. The locations are shown on Figure 3 and are identified in Table 4 using the 2012 coordinates and depths below the ground surface. Table 4 also includes the 2012 soil results. The soil borings were advanced to approximately one foot below the 2012 sample depth, but the interface between the 2012 backfill gravel and underlying gravel was not visible. The soil boring was backfilled with sand to the appropriate sampling depth and a stainless steel soil gas sampling port with Teflon tubing was installed into the annulus. Additional sand was added to approximately three inches above the top of the soil gas port and the remainder of the boring annulus was filled with hydrating bentonite. The tubing was capped and the soil gas sampling ports were left to equilibrate as required by ADEC guidance.

On November 22, 2013, **NORTECH** returned to the site to sample the six soil gas ports. The ports were initially screened using the Jerome 431X Analyzer. After initial sampling with the Jerome and follow-up testing with a low-flow pump, location 26-7 was found to have insufficient flow (probably due to frozen water in the tubing) for field screening or sampling. The Jerome was connected to the tubing and three readings were collected for approximately 60 seconds each. The results of the readings on the digital display were 0.00 ppm (general equivalent of mg/m³) recorded from each of the three readings at each of the six locations. These results are shown in Table 4 in Attachment 2.

Because all readings were 0.00 ppm, **NORTECH** selected the two locations with high mercury results from the 2012 closure sampling for confirmation laboratory air samples. The highest location (26-7) could not be sampled as discussed above, so locations 13-21 and 12.5-16.5 were selected for soil gas sampling. Before laboratory sampling, **NORTECH** completed a vacuum test on both tubes, and a helium test on location 13-21. The helium valve froze during testing on 12.5-16.5, so the helium test was discontinued for safety reasons. However, the helium test is expected to have passed due to the successful vacuum test, the frozen ground, and the layer of ice over the top of the ground limiting potential surface infiltration.





The laboratory air samples were collected on carulite sorbent tubes and analyzed by Wisconsin Occupational Health Laboratory (WOHL) in Madison WI. The sample collection flow rate for both wells was 0.200 liters per minute (L/min) with 13-21 sampled for 40 minutes and 12.5-16.5 sampled for 22 minutes following laboratory sampling methodology. **NORTECH** collected a duplicate at 13-21. The mercury samples were analyzed by WOHL in-house method EHD Metals Method 007.1 rev.0 based on the NIOSH Method 6009.

Soil Gas Sampling – Laboratory Results

Table 4 in Attachment 2 presents the results summary and Attachment 5 presents the laboratory data report and ADEC QC checklist. The elemental and particulate mercury results at the two highest 2012 locations were less than the 0.0024 mg/m³, the lowest accurately quantitated value (LOQ) by the method. The LOQs are less than the EPA mercury VISL of 0.003 mg/m³.

A review of the laboratory report indicates that the laboratory analysis was done as requested on the chain of custody. A copy of the ADEC LDRC for Air Samples is attached. Many of the internal laboratory procedures common in environmental sampling were not utilized because the laboratory method follows different protocols that do not require these specific quality control procedures. **NORTECH** has utilized WOHL for other specialty analyses in the past and found that they have adequate internal quality controls in place. The issues found in the LDRC are not considered significant concerns for the use of the data.

Soil Gas Sampling – Discussion

As stated above and provided in the 2013 Work Plan, the EPA VISL for mercury is 0.003 mg/m³. This also the lower limit of the Jerome 431X and non-detect on this instrument is commonly used to indicate that air in a given space is acceptable following a release and cleanup of mercury. Field screening with the Jerome 431X did not detect mercury in the six locations, suggesting that mercury was not present above the VISL in the soil gas. This field data was supported by laboratory results of non-detect at an LOQ less than 0.0024 mg/m³, below the VISL. Since both the field and laboratory results confirm the soil gas concentrations are below 0.003 mg/m³, the LIDAR Tower area meets the guidance levels for residential use. No further risk evaluation for this pathway is necessary.

Discussion of Agricultural Risk Factors

In addition to the potential use of the LIDAR Tower as a residential property, ADEC also expressed a potential concern about the use of the area for agricultural purposes based on the documented agricultural activities adjacent to the HIPAS property. Overall, this is considered a minimal concern due the complex chemistry of mercury in the environment and the difficulty of farming in Two Rivers, Alaska. A list of references is included in Attachment 7.





The mercury used at the LIDAR Tower was liquid elemental mercury which is expected to have reached the ground in that form through leaks/spills and infiltration through the foundation. Elemental mercury is absorbed relatively slowly when ingested, which would be difficult with the soil more than two feet below the surface. Most concerns related to mercury come from either mercury vapor (evaluated above) or the conversion of the elemental mercury to methylmercury, which is more toxic and bioaccumulative. Readily available research indicates that mercury solubility in soil water and mobility in soil systems is quite low, as is plant accumulation and phytotoxicity. Research of phytoremediation of mercury contaminated soil with “hyper-accumulators” suggests that the process is limited, while research with agricultural crops suggests that mercury accumulation from soil is not significant.

The more toxic methylmercury forms in anerobic sediments of aquatic ecosystems and can then bioaccumulate and biomagnify into fish and humans. The most common source of methylmercury in the environment is through sulfate-metabolizing bacteria that convert mercury in its inorganic form to methylmercury through metabolic processes. The shallow gravel soils are not near a surface water and are more than 20 feet above the groundwater at the Site. Based on these site conditions, the limited amount of mercury remaining at the LIDAR Tower is not expected to be transformed into methylmercury for potential biomagnification or bioaccumulation.

In addition to the limited quantity of mercury, agricultural use of the HIPAS Site is also unlikely in the future. Most commercial farming operations in the Two Rivers on either Alaska Department of Natural Resources (ADNR) leases or private property have not been able to maintain long-term viability. Gardening for personal use is common, but usually requires the importation of soil and/or fertilizer as the existing soil is relatively nutrient poor. Raised beds to extend the growing season are also common (and reduce the impacts from relatively low ground temperatures) which would further separate food plants from the remaining mercury. Crops grown successfully in Alaska, such as potatoes, do not appear to accumulate mercury within the edible portions of the plant. Overall, a scenario in which commercial or personal-use crops create a mercury exposure is considered remote.





CONCLUSIONS AND RECOMMENDATIONS

This Addendum documents the field activities addressing the specific ADEC concerns of potential exposure to PCB and mercury contamination during future residential or agricultural use scenarios for the HIPAS site. Based on the field observations, laboratory results, and site conditions, **NORTECH** has the following conclusions and recommendations regarding each of the three specific concerns:

Soil Absorption System Assessment

- Three soil absorption systems associated with former on-site wastewater disposal systems was assessed for PCBs and other evidence of contamination
- System locations were identified through photographs and surface inspections
- Soil borings were advanced at each location
 - The leach rock was encountered at each location after multiple attempts
 - Visual and olfactory inspections indicated no evidence of chemical contamination
 - PID field screen results for all three locations were 0 ppm
- Laboratory results at each locations were non-detect for PCBs at LOQs below the ADEC Cleanup level of 1 mg/kg
- No additional investigation or cleanup activities is considered necessary at these former wastewater systems

Back Door, Transformer Pad, and LIDAR Staging Area Assessment

- A total of eight locations were identified through photographs and site inspections as potential concerns for inappropriate PCB and oil disposal
 - Five backdoor areas (LIDAR Garage, LIDAR Tower, Boneyard Trailers, Generator Building, and Transmitter Building)
 - Two locations next to the former Transformer Pad
 - One location that was used to store transformers and capacitors prior to disposal
- Laboratory results at each location was non-detect for PCBs at LOQs below the ADEC Cleanup level of 1 mg/kg
- No additional investigation or cleanup activities is considered necessary at these suspected oil disposal locations

LIDAR Tower Mercury Assessment

- Surface soil testing was completed at four additional locations around the perimeter of the former LIDAR Towner footprint
 - Laboratory results and LOQs (for non-detect samples) were at background levels and well below the most stringent ADEC Method 2 Cleanup Level for inorganic mercury



- 2013 results were similar to and confirm 2012 results indicating that mercury contamination is not present on the surface
- No further evaluation of surface soils near the LIDAR Tower is considered necessary to evaluate risk
- Mercury soil gas was measured at six locations within the former LIDAR Tower footprint
 - Field screening with a Jerome 431X Analyzer were non-detect at a concentration of 0.003 ppm (mg/m³)
 - Laboratory soil gas samples were collected at two locations
 - The locations were selected based on the 2012 soil results
 - Sampling protocol followed ADEC soil gas sampling guidance
 - Laboratory results non-detect at 0.0024 mg/m³, the LOQ for the laboratory method.
 - Both field and laboratory methods indicate the soil gas concentrations are below the EPA mercury VISL (0.003 mg/m³) for residential use (the most conservative soil gas standard)
 - No further evaluation of the soil gas near the LIDAR Tower is considered necessary to evaluate potential residential risk
- Mercury soil chemistry and difficulty farming in Two Rivers limit agricultural and personal-use food exposures
 - Elemental mercury is absorbed relatively slowly when ingested and remaining soil is more than two feet below the surface
 - Mercury solubility in soil water and mobility in soil systems is quite low
 - Mercury accumulation in agricultural crops from soil is not significant
 - Conversion to the more toxic methylmercury:
 - Occurs under specific conditions in anaerobic sediments of aquatic ecosystems
 - Is not expected under conditions present at the HIPAS Site
 - Agricultural use of the HIPAS Site is also unlikely in the future due to financial and environmental constraints based on past observations
 - Gardening for personal may occur
 - Typically requires the importation of soil and/or fertilizer
 - Raised beds are also common
 - Crops grown successfully in Alaska, such as potatoes, do not appear to accumulate mercury within the edible portions of the plant
 - Overall, a scenario in which commercial or personal-use crops create a mercury exposure is considered remote
 - No additional sampling or future land-use restrictions are considered necessary based on potential commercial or personal-use agriculture



Based on the site conditions observed during these activities, **NORTECH** believes that the additional assessment requested by ADEC for issuing site closure with unrestricted land use has been completed adequately. This data confirms that PCBs and mercury will not pose a risk to future users of the site under residential or agricultural land-use scenarios. This letter should be sent to ADEC to document these results with a request for closure with unrestricted land use.

I trust that this information is sufficient for your needs at the present time. Please contact me at your earliest convenience if you have any questions or comments regarding this effort. I look forward to the opportunity to continue working with you on this project and appreciate your confidence in **NORTECH**.

Sincerely,
NORTECH

Peter Beardsley, PE
Environmental Engineer

Attachments:

- Attachment 1: Site Figures
Figure 1
Figure 2
Figure 3: LIDAR Tower Mercury Closure Sample Locations
Figure 4: Soil Sample Locations
- Attachment 2: Data Tables
Table 1: Soil Absorption System Results Summary
Table 2: Former Door and Storage Results Summary
Table 3: LIDAR Tower Soil Results Summary
Table 4: LIDAR Tower Soil Gas Results Summary
- Attachment 3: Photo Log
Attachment 4: Soil Boring Logs
Attachment 5: Laboratory Data Reports and Quality Control Checklists
Attachment 6: August 30, 2013 Proposed Work Plan and Cost Estimate letter and the October 4, 2013 electronic mail conditional approval from the Alaska Department of Environmental Conservation
- Attachment 7: References for Agricultural Risk Factors



Attachment 1

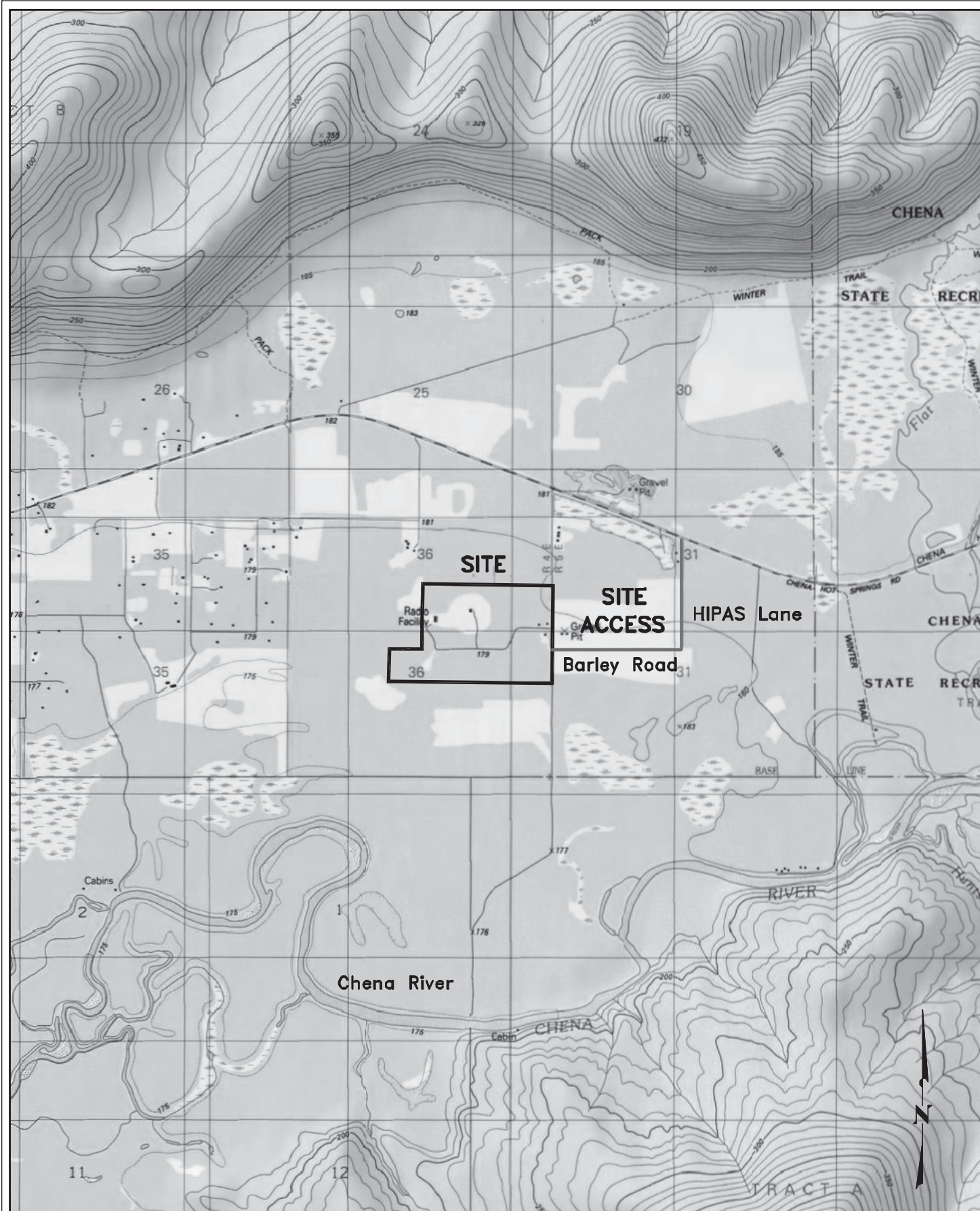


FIGURE 2A
Contour Vicinity Map

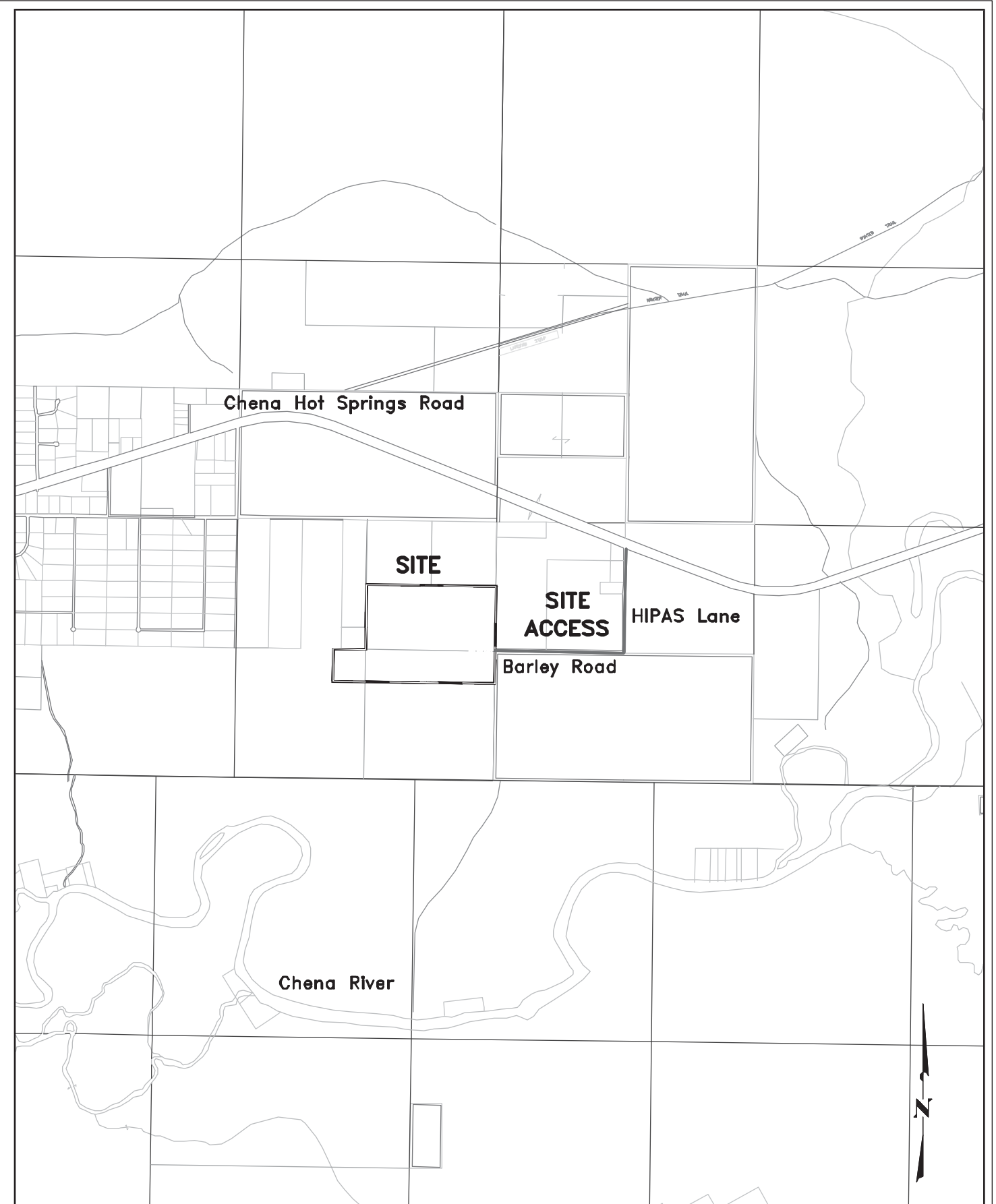
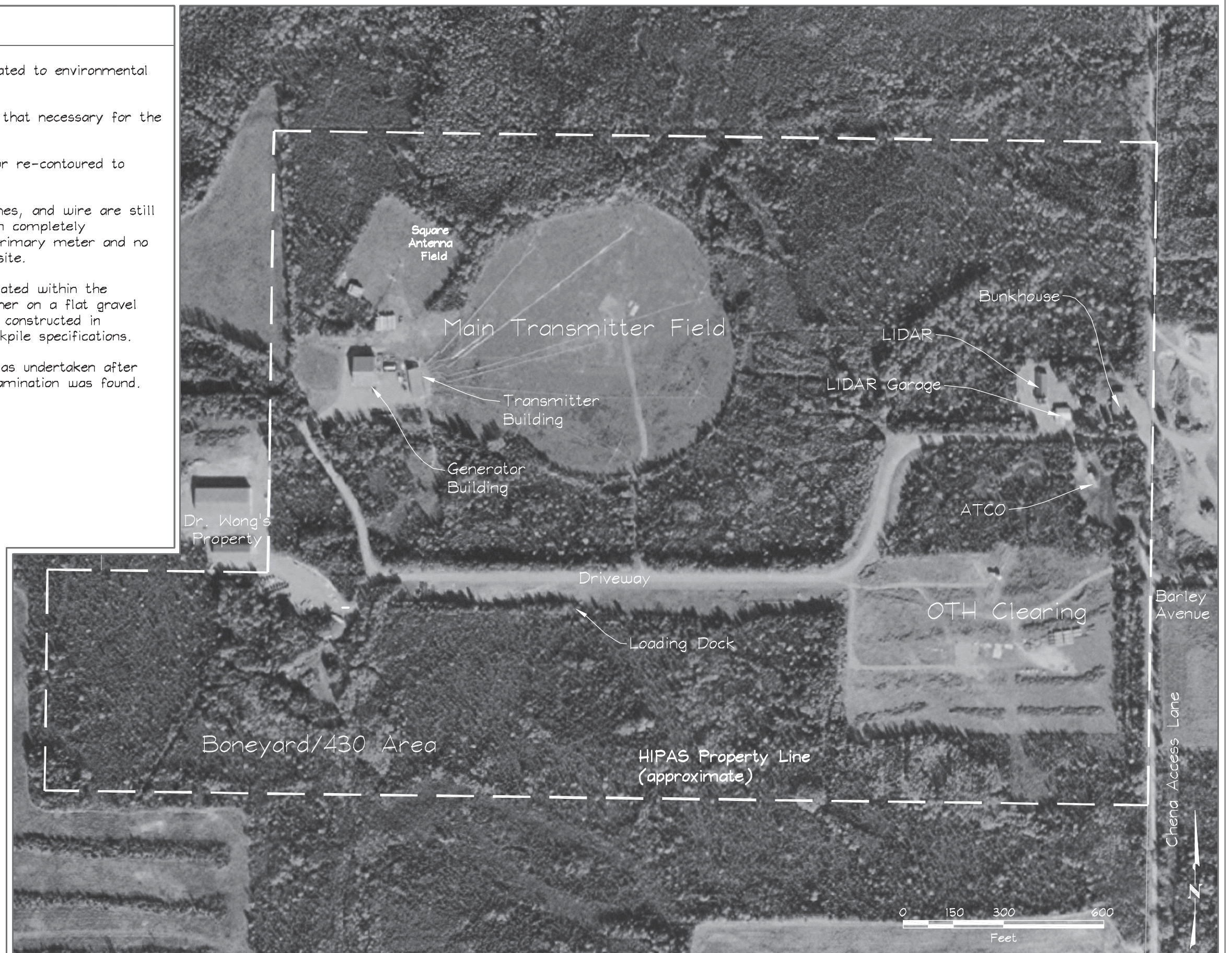


FIGURE 2B
Property Vicinity Map

GENERAL NOTES

1. General notes apply to all sheets related to environmental cleanup and remediation.
2. Foundation demolition was limited to that necessary for the removal of contaminated soil.
3. Remediation excavations were filled or re-contoured to match existing grade.
4. Buried communication lines, power lines, and wire are still present. Power to the facility has been completely disconnected by GVEA at the off-site primary meter and no line of any type remains active at the site.
5. Contaminated soil stockpiles were located within the equipment reach at each excavation, either on a flat gravel area or concrete slab. Stockpiles were constructed in accordance with ADEC Short-term Stockpile specifications.
6. Field inspection and field screening was undertaken after stockpile removal. No evidence of contamination was found.

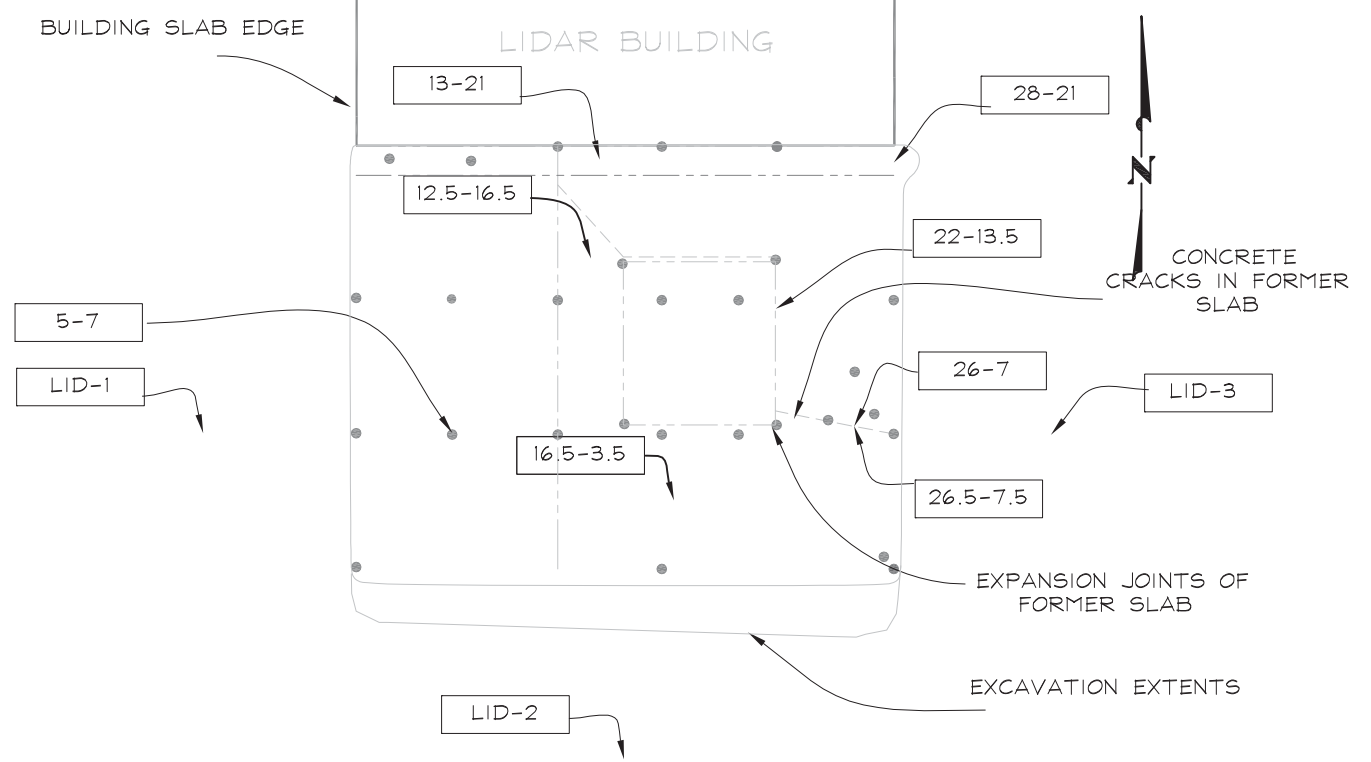


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Site Map (2007 Aerial Photo)
 Former HIPAS Observatory Decommissioning
 Fairbanks (Two Rivers), Alaska

DATE: 01/14/14	SCALE: 1" = 300'
PROJ MGR: PLB	PROJECT: 08-1091
DRAWN: PEF	DWG. NO.: 081091q(02)

FIGURE
 2

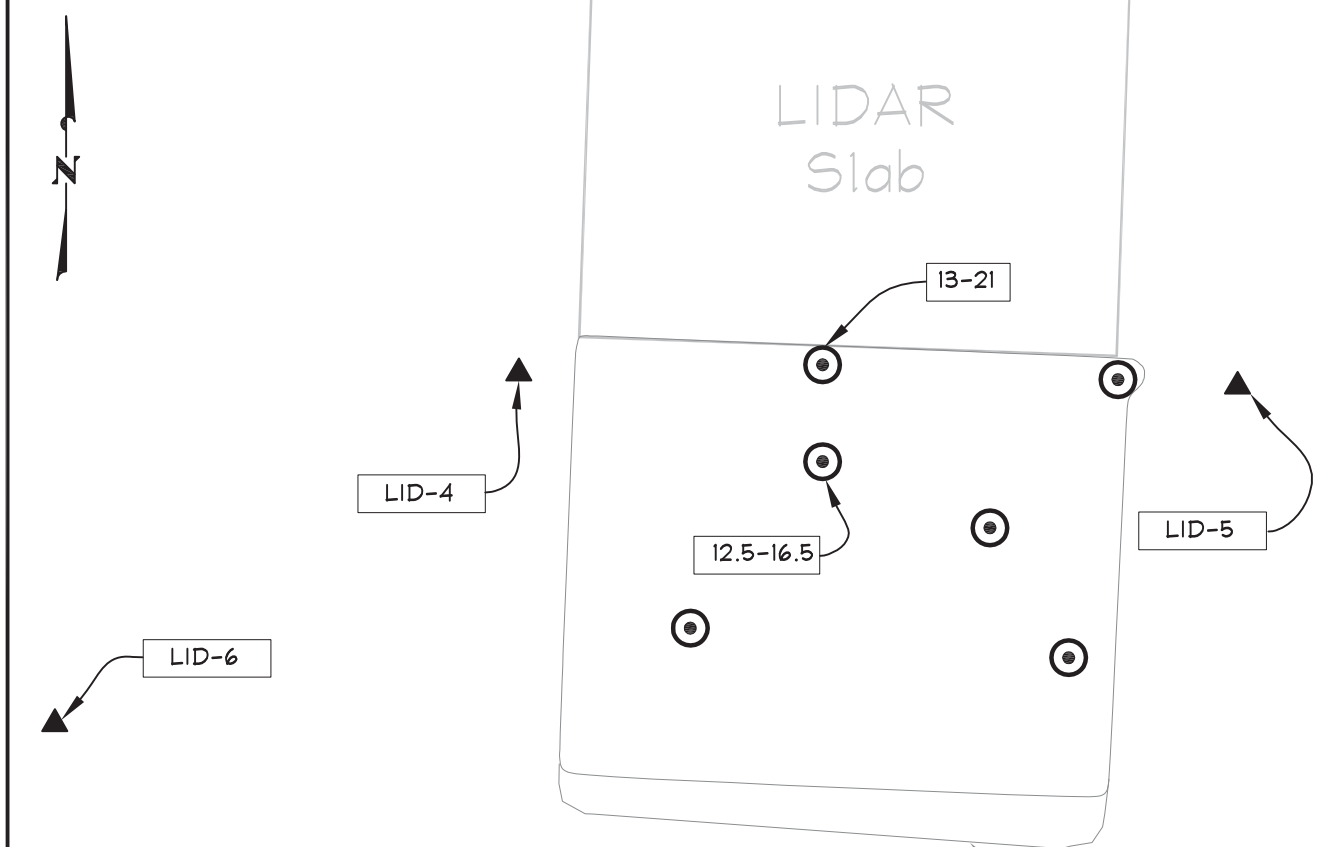


LIDAR Tower Laboratory Soil Sample Results Summary				
Sample ID	Date	Lab W.O.#	Field Screen	Mercury mg/kg
ADEC Cleanup Limit				
1.4				
Post-demolition Characterization Samples				
LID 01 ^{Dup10}	14-Dec-11	1119888	0.00	1.2
LID 02 ^{Dup10}	14-Dec-11	1119888	0.76	0.938
LID 03	14-Dec-11	1119888	1.33	7.13
LID 04	14-Dec-11	1119888	0.52	4.32
LID 05	14-Dec-11	1119888	0.00	0.882
Pre-excavation Characterization Samples				
26-7.5-6	23-Jul-12	1128246	1.30	4.28
26-7.5-12	23-Jul-12	1128246	0.00	0.606
10.5-14-6	23-Jul-12	1128246	0.00	0.448
10.5-14-12	23-Jul-12	1128246	0.00	0.206
10.5-22-6	23-Jul-12	1128246	0.00	0.788
10.5-22-12	23-Jul-12	1128246	0.00	0.0421U
5-7-6	23-Jul-12	1128246	0.00	0.426
5-7-12	23-Jul-12	1128246	0.00	0.0421U
Post-excavation Closure Samples				
26-7 ^{Dup1}	30-Aug-12	1128444	0.00	0.455
26.5-7.5 ^{Dup1}	30-Aug-12	1128444	0.00	0.391
16.5-3.5	30-Aug-12	1128444	0.00	0.0396U
28-21	30-Aug-12	1128444	0.00	0.0835
5-7	30-Aug-12	1128444	0.00	0.0405U
13-21	30-Aug-12	1128444	0.00	0.132
22-13.5	30-Aug-12	1128444	0.00	0.0433
12.5-16.5	30-Aug-12	1128444	0.00	0.126
Post-excavation Perimeter Closure Samples				
LID-1	18-Sep-12	1124506	NA	0.0409U
LID-2	18-Sep-12	1124506	NA	0.0409U
LID-3	18-Sep-12	1124506	NA	0.0424U

U Analyte not detected at the listed detection limit
 Shade Analyte detected in concentration below the ADEC Cleanup level
 Bold Analyte detected in concentration exceeding the ADEC Cleanup level
 NA Analyte not analyzed for
 NE No established cleanup limit for analyte
 #^{Dup} Denotes duplicate sample pair

- LEGEND
- LID 05 CHARACTERIZATION SAMPLES
 - FIELD SCREENING LOCATIONS
 - CONCRETE CRACKS
 - EXPANSION JOINTS
 - CONCRETE EDGE
- LEGEND
- LID 05 CLOSURE SAMPLES
 - FIELD SCREENING LOCATIONS *ALL CLOSURE SCREENING ZERO
 - CONCRETE CRACKS
 - EXPANSION JOINTS
 - CONCRETE EDGE

03a LIDAR Tower Closure - 2012



- Legend
- 2013 Soil Gas Field Screening Locations *All Closure Screening Zero
 - xx-xx 2013 Soil Gas Sample ID (Coordinates)
 - ▲ 2013 Hg Surface Sample Location and ID
 - LID-1
- Laboratory Results Summarized in Tables 3 and 4 of Attachment 2

03b LIDAR Tower Additional Assessment - 2013



ENVIRONMENT, ENERGY, HEALTH & SAFETY
 2400 College Road, Fairbanks, AK. 99709, 907-452-5688
 3105 Lakeshore Dr., Anchorage, AK. 99517 907-222-2445
 5438 Shaune Dr., Suite B, Juneau, AK. 99801, 907-586-6813

2013 LIDAR Tower Mercury Assessment
 Former HIPAS Observatory Decommissioning
 Fairbanks (Two Rivers), Alaska

DATE: 01/14/14	SCALE: 1" = 10'
PROJ MGR: PLB	PROJECT: 08-1091
DRAWN: PEF	DWG. NO.: 081091a(03)

2013 Backdoor PCB Sample Locations

- PCB-1 → LIDAR Garage
- PCB-2 → LIDAR
- PCB-3 → Boneyard
- PCB-4 → Generator Building
- PCB-5 → Transformer Storage
- PCB-6 → Transmitter Building
- PCB-7 → Transmitter Pad
- PCB-8 → Transmitter Pad
- PCB-9 → LIDAR Duplicate.

2013 Leachfield Sample Locations

- LF-1 → Bunkhouse/LIDAR Leachfield
- LF-2 → Transmitter Building Leachfield
- LF-3/4 → Generator Building Leachfield



ENVIRONMENT, ENERGY, HEALTH & SAFETY
 2400 College Road, Fairbanks, AK. 99709, 907-452-5688
 3105 Lakeshore Dr., Anchorage, AK. 99517 907-222-2445
 5438 Shaune Dr., Suite B, Juneau, AK. 99801, 907-586-6813

2013 Soil Absorption System and PCB Sampling Locations
 Former HIPAS Observatory Decommissioning
 Fairbanks (Two Rivers), Alaska

DATE: 01/13/2014	SCALE: 1" = 300'
PROJ MGR: PLB	PROJECT: 08-1091
DRAWN: PEF	DWG. NO.: 081091a(04)

FIGURE
04

Attachment 2

Table 1
Soil Absorption System Laboratory Sample Results Summary

Sample ID	ADEC	LF-1	LF-2	LF-3 ^{#Dup}	LF-4 ^{#Dup}
Location	Method 2 Limit	Lidar Building	Transmitter Building	Generator Building	Duplicate of LF-3
PID Result	ppm	2.1	2.3	1.8	1.8
Sample Depth	ft	14-15	14-15	15	15
Analyte	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Aroclor-1016	1.0	0.0502U	0.0521U	0.0547U	0.0551U
Aroclor-1221	1.0	0.0502U	0.0521U	0.0547U	0.0551U
Aroclor-1232	1.0	0.0502U	0.0521U	0.0547U	0.0551U
Aroclor-1242	1.0	0.0502U	0.0521U	0.0547U	0.0551U
Aroclor-1248	1.0	0.0502U	0.0521U	0.0547U	0.0551U
Aroclor-1254	1.0	0.0502U	0.0521U	0.0547U	0.0551U
Aroclor-1260	1.0	0.0502U	0.0521U	0.0547U	0.0551U

Notes:

- U Analyte not detected at the listed limit of quantitation (LOQ)
- ppm Part per million
- Shade** Analyte detected in concentration below the ADEC Cleanup level
- Bold** Analyte detected in concentration exceeding the ADEC Cleanup level
- ^{#Dup} Denotes duplicate sample pair

Quality Control Summary

Sample ID	LF-3	LF-4	Average	Difference	RPD
Analyte	mg/Kg	mg/Kg	mg/Kg	mg/Kg	%
PCBs	ND	ND	na	na	na

Notes:

- RPD Relative percent difference
- ND Analyte not detected
- na The calculation is not applicable.

Table 2
Former Doorways and Transformer Staging/Storage Areas Laboratory Sample Results Summary

Sample ID	ADEC	PCB-1	PCB-2	PCB-3	PCB-4	PCB-5	PCB-6	PCB-7	PCB-8	PCB-9
Location	Method 2 Limit	LIDAR Garage	LIDAR Building	Boneyard	Generator Building	LIDAR Area Storage	Transmitter Building	Transformer Pad	Transformer Pad	Duplicate of PCB-2
Sample Depth	ft	2	2	2	2	2	2	2	2	2
Analyte	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Aroclor-1016	1.0	0.0572U	0.0505U	0.0613U	0.0558U	0.0580U	0.0533U	0.0530U	0.0521U	0.0514U
Aroclor-1221	1.0	0.0572U	0.0505U	0.0613U	0.0558U	0.0580U	0.0533U	0.0530U	0.0521U	0.0514U
Aroclor-1232	1.0	0.0572U	0.0505U	0.0613U	0.0558U	0.0580U	0.0533U	0.0530U	0.0521U	0.0514U
Aroclor-1242	1.0	0.0572U	0.0505U	0.0613U	0.0558U	0.0580U	0.0533U	0.0530U	0.0521U	0.0514U
Aroclor-1248	1.0	0.0572U	0.0505U	0.0613U	0.0558U	0.0580U	0.0533U	0.0530U	0.0521U	0.0514U
Aroclor-1254	1.0	0.0572U	0.0505U	0.0613U	0.0558U	0.0580U	0.0533U	0.0530U	0.0521U	0.0514U
Aroclor-1260	1.0	0.0572U	0.0505U	0.0613U	0.0558U	0.0580U	0.0533U	0.0530U	0.0521U	0.0514U

Notes:

U Analyte not detected at the listed limit of quantitation (LOQ)

ppm Part per million

Shade Analyte detected in concentration below the ADEC Cleanup level

Bold Analyte detected in concentration exceeding the ADEC Cleanup level

#^{Dup} Denotes duplicate sample pair

Quality Control Summary

Sample ID	PCB-2	PCB-9	Average	Difference	RPD
Analyte	mg/Kg	mg/Kg	mg/Kg	mg/Kg	%
PCBs	ND	ND	na	na	na

Notes:

RPD Relative percent difference

ND Analyte not detected

na The calculation is not applicable.

Table 3
Former LIDAR Tower Laboratory Sample Results Summary

Sample ID	ADEC	LID-4 ^{#Dup}	LID-5	LID-6	LID-7	LID-40 ^{#Dup}
Location	Method 2 Limit	Northwest Corner	Northeast Corner	Background West	Southeast	Duplicate of LID-4
Depth	inches	2-6	2-6	2-6	2-6	2-6
Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Inorganic Mercury	1.4	0.0423	0.0427U	0.0404U	0.0418U	0.0417U

Notes:

U	Analyte not detected at the listed limit of quantitation (LOQ)
Shade	Analyte detected in concentration below the ADEC Cleanup level
Bold	Analyte detected in concentration exceeding the ADEC Cleanup level
^{#Dup}	Denotes duplicate sample pair

Quality Control Summary

Sample ID	LID-4	LID-40 ¹	Average	Difference	RPD
Analyte	mg/Kg	mg/Kg	mg/Kg	mg/Kg	%
Mercury	0.0423	0.0417	0.0420	0.0006	1%

Notes:

RPD	Relative percent difference
¹	The LOQ is used for the RPD calculation

2012 Perimeter Results (Presented Previously)

Sample ID	ADEC	LID-1	LID-2	LID-3
Location	Method 2 Limit	Northwest Corner	Northeast Corner	Background West
Depth	inches	2-6	2-6	2-6
Units	mg/kg	mg/kg	mg/kg	mg/kg
Inorganic Mercury	1.4	0.0409U	0.0409U	0.0424U

Notes:

U	Analyte not detected at the listed limit of quantitation (LOQ)
---	--

**Table 4
Mercury Air Sampling Field Work Summary**

Sample Location	2012 Coordinates		Sample Depth	2012 Soil Result	Fieldscreen Readings with Jerome 431X Meter			Soil Gas Well Condition	Lab Sample ID	Soil Gas Result
	x	y			First	Second	Third			
Units	feet	feet	feet	mg/Kg	ppm	ppm	ppm			mg/m ³
	5	7	2	0.0405U	0.00	0.00	0.00	Open		NT
	12.5	16.5	3	0.126	0.00	0.00	0.00	Open	12.5-16.5	< 0.0022
	13	21	3	0.132	0.00	0.00	0.00	Open	13-21	< 0.0024
	Soil Gas Field Duplicate				Soil Gas Field Duplicate				13-21D	< 0.0024
	22	13.5	3	0.0433	0.00	0.00	0.00	Open		NT
	26	7	3	0.455	Frozen, no air flow			Frozen, no air flow		
	28	21	4	0.0835	0.00	0.00	0.00	Open		NT
Cleanup Criteria	ADEC Method 2:			1.4				EPA VISL:	0.003	

Notes:

Soil Gas is WOHL EHD Metals Method 007.1 based on the NIOSH Method 6009
All samples were collected from soil gas ports installed to a depth of three feet below grade

U Analyte not detected at the listed limit of quantitation (LOQ)

ppm Part per million

Shade Analyte detected in concentration below the ADEC Cleanup level

VISL Vapor Intrusion Screening Level

1 The blank result was <10 nanograms/sample, not corrected for air volume

< Analyte not detected at the listed limit of quantitation (LOQ)

mg/m³ Milligrams per cubic meter

Quality Control Summary

Sample ID	13-21	13-21D	Average	RPD
Analyte	mg/m ³	mg/m ³	mg/m ³	%
Mercury	na	na	na	na

Notes:

RPD Relative percent difference

na The calculation is not applicable.

Attachment 3



Photo 1: LIDAR Garage slab, photo taken facing southeast. Collected composite samples for PCBs near the former backdoor (typical of other suspect area samples at this location)



Photo 2: Backfilled location of former septic tank serving Bunkhouse/LIDAR Building near location of abandoned soil absorption system

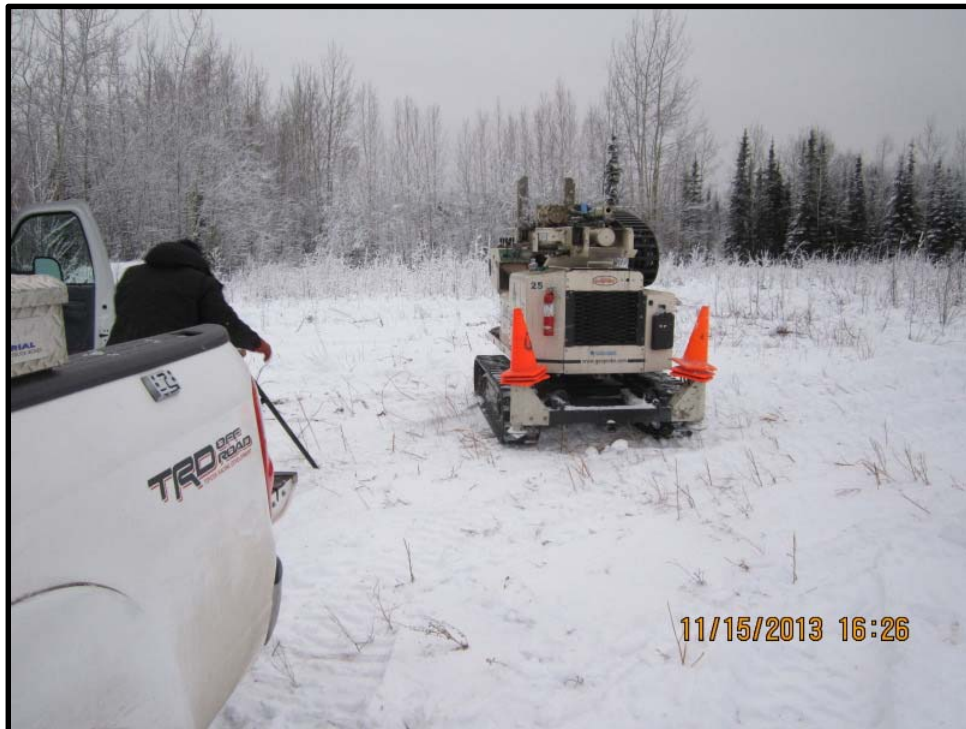


Photo 3: Preparing for advancement of soil boring at the soil absorption system for the Generator Building, located west of the remaining Generator Building foundation.



Photo 4: Former LIDAR Tower excavation area (no weeds present) on the south side of the remaining LIDAR Building slab. Additional perimeter mercury samples collected from perimeter and soil gas samples from within the former LIDAR Tower footprint



Photo 5: Looking southwest across former LIDAR Tower footprint with cones marking locations for installation of soil gas sampling ports with Geotek staff at decon station in background.



Photo 6: Soil gas sampling apparatus in use inside a heated portable ice fishing tent during the helium leak-test on the sampling train prior to sampling.

Attachment 4

NORTECH Environmental and Engineering Consultants Test Boring Log

PROJECT: **HIPAS Observatory Closure - Leachfield Testing**
 LOCATION: **HIPAS, Two Rivers, Alaska**

JOB NO.	08-1091
HOLE NO.	LIDAR Building
SHEET	1 of 1
START DATE	15-Nov-13
FINISH DATE	15-Nov-13
DRILLER	Geotek Alaska
HELPER	
INSPECTOR	Beardsley

TYPE	CASING	SAMPLE	CORE	GROUNDWATER		DEPTH TO		
				DATE	TIME	WATER	BOTTOM OF CASING	BOTTOM OF HOLE
SIZE (ID)				NA	NA	NA	NA	15.0
HAMMER WT								
HAMMER FALL								

DEPT H IN FEET	CASING BLOWS PER FOOT	SAMPLE NO	SAMPLE DEPTH (FT)	SAMPLE BLOWS PER 6 INCHES	RECOV-ERY (IN)
----------------	-----------------------	-----------	-------------------	---------------------------	----------------

SOIL DESCRIPTION AND OTHER DATA

DEPT H IN FEET	CASING BLOWS PER FOOT	SAMPLE NO	SAMPLE DEPTH (FT)	SAMPLE BLOWS PER 6 INCHES	RECOV-ERY (IN)	SOIL DESCRIPTION AND OTHER DATA	PID
0.0							
2.5					4.5 ft	Distrurbed sandy silt, no layers visible	
						Blue foam and fabric	1.3
5.0					1 ft	Rock bits	1.1
7.5						Angular rock chunks, pulverized during hammering	
10.0					2 ft	Angular rock chunks, pulverized during hammering	1.2
12.5							
15.0						Sandy silt with layers	1.1 2.1 LF-1 Lab Sample

NOTES:

Leachfield encountered at 4th soil boring attempt.
 First three attempts encountered naturally deposited material in top 5 feet and were not continued to further depth.

NORTECH Environmental and Engineering Consultants Test Boring Log

PROJECT: **HIPAS Observatory Closure - Leachfield Testing**
 LOCATION: **HIPAS, Two Rivers, Alaska**

JOB NO.	08-1091
HOLE NO.	Transmitter Building
SHEET	1 of 1
START DATE	15-Nov-13
FINISH DATE	15-Nov-13
DRILLER	Geotek Alaska
HELPER	
INSPECTOR	Beardsley

TYPE	CASING	SAMPLE	CORE	GROUNDWATER		DEPTH TO		
				DATE	TIME	WATER	BOTTOM OF CASING	BOTTOM OF HOLE
SIZE (ID)				NA	NA	NA	NA	15.0
HAMMER WT								
HAMMER FALL								

DEPT H IN FEET	CASING BLOWS PER FOOT	SAMPLE NO	SAMPLE DEPTH (FT)	SAMPLE BLOWS PER 6 INCHES	RECOVERY (IN)
----------------	-----------------------	-----------	-------------------	---------------------------	---------------

SOIL DESCRIPTION AND OTHER DATA

DEPT H IN FEET	CASING BLOWS PER FOOT	SAMPLE NO	SAMPLE DEPTH (FT)	SAMPLE BLOWS PER 6 INCHES	RECOVERY (IN)	SOIL DESCRIPTION AND OTHER DATA	PID
0.0							
2.5					4.5 ft	Disturbed sandy silt, no layers visible	1.7
5.0							2.4
7.5					1.5 ft	Angular rock chunks, pulverized during hammering	
10.0							1.1
12.5					1.5 ft	Angular rock chunks, pulverized during hammering	
15.0							2.1
						Sandy silt with layers	2.3 LF-2 Lab Sample

NOTES:

Leachfield encountered at 6th soil boring attempt.
 First five attempts encountered naturally deposited material in top 5 feet and were not continued to further depth.

NORTECH Environmental and Engineering Consultants Test Boring Log

PROJECT: **HIPAS Observatory Closure - Leachfield Testing**
 LOCATION: **HIPAS, Two Rivers, Alaska**

JOB NO.	08-1091
HOLE NO.	Generator Building
SHEET	1 of 1
START DATE	15-Nov-13
FINISH DATE	15-Nov-13
DRILLER	Geotek Alaska
HELPER	
INSPECTOR	Beardsley

TYPE	CASING	SAMPLE	CORE	GROUNDWATER		DEPTH TO		
				DATE	TIME	WATER	BOTTOM OF CASING	BOTTOM OF HOLE
SIZE (ID)				NA	NA	NA	NA	15.0
HAMMER WT								
HAMMER FALL								

DEPT H IN FEET	CASING BLOWS PER FOOT	SAMPLE NO	SAMPLE DEPTH (FT)	SAMPLE BLOWS PER 6 INCHES	RECOVERY (IN)
0.0					

SOIL DESCRIPTION AND OTHER DATA

DEPT H IN FEET	CASING BLOWS PER FOOT	SAMPLE NO	SAMPLE DEPTH (FT)	SAMPLE BLOWS PER 6 INCHES	RECOVERY (IN)	SOIL DESCRIPTION AND OTHER DATA	PID
2.5					4.5 ft	Disturbed sandy silt, no layers visible	1.8
5.0							
7.5					1 ft	Blue foam and fabric	
10.0						Angular rock chunks, pulverized during hammering	1.3
12.5					1 ft	Angular rock chunks, pulverized during hammering	
15.0						Sandy silt with layers	1.5 1.8 LF-3 and LF-4 Lab Samples

NOTES:

Leachfield encountered at 3rd soil boring attempt.
 First two attempts encountered naturally deposited material in top 5 feet and were not continued to further depth.

Attachment 5

Lab Report 1138736

PCB Analysis of Leachfields

Laboratory Report Follows Data Quality
Review Checklist

Laboratory Data Review Checklist

Completed by:

Title: Date:

CS Report Name: Report Date:

Consultant Firm:

Laboratory Name: Laboratory Report Number:

ADEC File Number: ADEC RecKey Number:

1. Laboratory

- a. Did an ADEC CS approved laboratory receive and perform all of the submitted sample analyses?
Yes No NA (Please explain.) Comments:

- b. If the samples were transferred to another "network" laboratory or sub-contracted to an alternate laboratory, was the laboratory performing the analyses ADEC CS approved?
Yes No **NA** (Please explain.) Comments:

2. Chain of Custody (COC)

- a. COC information completed, signed, and dated (including released/received by)?
Yes No NA (Please explain.) Comments:

- b. Correct analyses requested?
Yes **No** NA (Please explain.) Comments:

3. Laboratory Sample Receipt Documentation

- a. Sample/cooler temperature documented and within range at receipt ($4^{\circ} \pm 2^{\circ} \text{C}$)?
Yes **No** NA (Please explain.) Comments:

b. Sample preservation acceptable – acidified waters, Methanol preserved VOC soil (GRO, BTEX, Volatile Chlorinated Solvents, etc.)?

Yes No NA (Please explain.) Comments:

No sample preservation necessary

c. Sample condition documented – broken, leaking (Methanol), zero headspace (VOC vials)?

Yes No NA (Please explain.) Comments:

d. If there were any discrepancies, were they documented? For example, incorrect sample containers/preservation, sample temperature outside of acceptable range, insufficient or missing samples, etc.?

Yes No NA (Please explain.) Comments:

Sample temperature noted

e. Data quality or usability affected? (Please explain.)

Comments:

NA

4. Case Narrative

a. Present and understandable?

Yes No NA (Please explain.) Comments:

b. Discrepancies, errors or QC failures identified by the lab?

Yes No NA (Please explain.) Comments:

None noted

c. Were all corrective actions documented?

Yes No NA (Please explain.) Comments:

No errors, discrepancies or QC failures identified.

d. What is the effect on data quality/usability according to the case narrative?

Comments:

NA

5. Samples Results

a. Correct analyses performed/reported as requested on COC?

Yes No NA (Please explain.) Comments:

b. All applicable holding times met?

Yes No NA (Please explain.)

Comments:

c. All soils reported on a dry weight basis?

Yes No NA (Please explain.)

Comments:

d. Are the reported PQLs less than the Cleanup Level or the minimum required detection level for the project?

Yes No NA (Please explain.)

Comments:

e. Data quality or usability affected?

Comments:

6. QC Samples

a. Method Blank

i. One method blank reported per matrix, analysis and 20 samples?

Yes No NA (Please explain.)

Comments:

ii. All method blank results less than PQL?

Yes No NA (Please explain.)

Comments:

iii. If above PQL, what samples are affected?

Comments:

iv. Do the affected sample(s) have data flags and if so, are the data flags clearly defined?

Yes No NA (Please explain.)

Comments:

v. Data quality or usability affected? (Please explain.)

Comments:

b. Laboratory Control Sample/Duplicate (LCS/LCSD)

i. Organics – One LCS/LCSD reported per matrix, analysis and 20 samples? (LCS/LCSD required per AK methods, LCS required per SW846)

Yes No NA (Please explain.) Comments:

ii. Metals/Inorganics – one LCS and one sample duplicate reported per matrix, analysis and 20 samples?

Yes No NA (Please explain.) Comments:

No metals analysis

iii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs, if applicable. (AK Petroleum methods: AK101 60%-120%, AK102 75%-125%, AK103 60%-120%; all other analyses see the laboratory QC pages)

Yes No NA (Please explain.) Comments:

iv. Precision – All relative percent differences (RPD) reported and less than method or laboratory limits? And project specified DQOs, if applicable. RPD reported from LCS/LCSD, MS/MSD, and or sample/sample duplicate. (AK Petroleum methods 20%; all other analyses see the laboratory QC pages)

Yes No NA (Please explain.) Comments:

v. If %R or RPD is outside of acceptable limits, what samples are affected?

Comments:

NA

vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

Yes No NA (Please explain.) Comments:

No samples affected

vii. Data quality or usability affected? (Use comment box to explain.)

Comments:

NA

c. Surrogates – Organics Only

i. Are surrogate recoveries reported for organic analyses – field, QC and laboratory samples?

Yes No NA (Please explain.) Comments:

- ii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs, if applicable. (AK Petroleum methods 50-150 %R; all other analyses see the laboratory report pages)

Yes No NA (Please explain.) Comments:

- iii. Do the sample results with failed surrogate recoveries have data flags? If so, are the data flags clearly defined?

Yes No NA (Please explain.) Comments:

None failed

- iv. Data quality or usability affected? (Use the comment box to explain.)

Comments:

NA

- d. Trip blank – Volatile analyses only (GRO, BTEX, Volatile Chlorinated Solvents, etc.): Water and Soil

- i. One trip blank reported per matrix, analysis and for each cooler containing volatile samples? (If not, enter explanation below.)

Yes No NA (Please explain.) Comments:

No volatile samples, trip blank not needed

- ii. Is the cooler used to transport the trip blank and VOA samples clearly indicated on the COC? (If not, a comment explaining why must be entered below)

Yes No NA (Please explain.) Comments:

See answer to 6d above

- iii. All results less than PQL?

Yes No NA (Please explain.) For water Comments:

See answer to 6d above

- iv. If above PQL, what samples are affected?

Comments:

- v. Data quality or usability affected? (Please explain.)

Comments:

e. Field Duplicate

i. One field duplicate submitted per matrix, analysis and 10 project samples?

Yes No NA (Please explain.) Comments:

ii. Submitted blind to lab?

Yes No NA (Please explain.) Comments:

iii. Precision – All relative percent differences (RPD) less than specified DQOs?
(Recommended: 30% water, 50% soil)

$$\text{RPD (\%)} = \text{Absolute value of: } \frac{(R_1 - R_2)}{((R_1 + R_2)/2)} \times 100$$

Where R_1 = Sample Concentration
 R_2 = Field Duplicate Concentration

Yes No NA (Please explain.) Comments:

Analytes not detected at or above the LOQ.

iv. Data quality or usability affected? (Use the comment box to explain why or why not.)

Comments:

f. Decontamination or Equipment Blank (If not used explain why).

Yes No NA (Please explain.) Comments:

Used disposable gloves for sampling

i. All results less than PQL?

Yes No NA (Please explain.) Comments:

See 6f above

ii. If above PQL, what samples are affected?

Comments:

iii. Data quality or usability affected? (Please explain.)

Comments:

--

7. Other Data Flags/Qualifiers (ACOE, AFCEE, Lab Specific, etc.)

a. Defined and appropriate?

Yes **No** **NA (Please explain.)**

Comments:

All flags/qualifiers defined



Laboratory Report of Analysis

To: Nortech
2400 College Rd
Fairbanks, AK 99709
(907)452-5688

Report Number: **1138736**

Client Project: **HIPAS Leach Fields**

Dear Pauline Fusco,

Enclosed are the results of the analytical services performed under the referenced project for the received samples and associated QC as applicable. The samples are certified to meet the requirements of the National Environmental Laboratory Accreditation Conference Standards. Copies of this report and supporting data will be retained in our files for a period of five years in the event they are required for future reference. All results are intended to be used in their entirety and SGS is not responsible for use of less than the complete report. Any samples submitted to our laboratory will be retained for a maximum of fourteen (14) days from the date of this report unless other archiving requirements were included in the quote.

If there are any questions about the report or services performed during this project, please call Jennifer at (907) 562-2343. We will be happy to answer any questions or concerns which you may have.

Thank you for using SGS North America Inc. for your analytical services. We look forward to working with you again on any additional analytical needs.

Sincerely,
SGS North America Inc.

Alaska Division Technical Director

Stephen Ede

2013.11.27

09:13:18 -09'00'

Jennifer Dawkins
Project Manager

Date

Print Date: 11/27/2013 8:45:01AM

SGS North America Inc.

200 West Potter Drive, Anchorage, AK 99518
t 907.562.2343 f 907.561.5301 www.us.sgs.com

Member of SGS Group

Case Narrative

SGS Client: **Nortech**
SGS Project: **1138736**
Project Name/Site: **HIPAS Leach Fields**
Project Contact: **Pauline Fusco**

Refer to sample receipt form for information on sample condition.

*QC comments may be associated with the field samples found in this report. When applicable, comments will be applied to associated field samples.

Print Date: 11/27/2013 8:45:02AM

Laboratory Qualifiers

Enclosed are the analytical results associated with the above work order. All results are intended to be used in their entirety and SGS is not responsible for use of less than the complete report. If you have any questions regarding this report, or if we can be of any other assistance, please contact your SGS Project Manager at 907-562-2343. All work is provided under SGS general terms and conditions (<http://www.sgs.com/terms_and_conditions.htm>), unless other written agreements have been accepted by both parties.

SGS maintains a formal Quality Assurance/Quality Control (QA/QC) program. A copy of our Quality Assurance Plan (QAP), which outlines this program, is available at your request. The laboratory certification numbers are AK00971 (DW Chemistry & Microbiology) & UST-005 (CS) for ADEC and 2944.01 for DOD ELAP/ISO17025 (RCRA methods: 1020A, 1311, 3010A, 3050B, 3520C, 3550C, 5030B, 5035B, 6020, 7470A, 7471B, 8021B, 8082A, 8260B, 8270D, 8270D-SIM, 9040B, 9045C, 9056A, 9060A, AK101 and AK102/103). Except as specifically noted, all statements and data in this report are in conformance to the provisions set forth by the SGS QAP and, when applicable, other regulatory authorities.

The following descriptors or qualifiers may be found in your report:

*	The analyte has exceeded allowable regulatory or control limits.
!	Surrogate out of control limits.
B	Indicates the analyte is found in a blank associated with the sample.
CCV	Continuing Calibration Verification
CL	Control Limit
D	The analyte concentration is the result of a dilution.
DF	Dilution Factor
DL	Detection Limit (i.e., maximum method detection limit)
E	The analyte result is above the calibrated range.
F	Indicates value that is greater than or equal to the DL
GT	Greater Than
IB	Instrument Blank
ICV	Initial Calibration Verification
J	The quantitation is an estimation.
JL	The analyte was positively identified, but the quantitation is a low estimation.
LCS(D)	Laboratory Control Spike (Duplicate)
LOD	Limit of Detection (i.e., 1/2 of the LOQ)
LOQ	Limit of Quantitation (i.e., reporting or practical quantitation limit)
LT	Less Than
M	A matrix effect was present.
MB	Method Blank
MS(D)	Matrix Spike (Duplicate)
ND	Indicates the analyte is not detected.
Q	QC parameter out of acceptance range.
R	Rejected
RPD	Relative Percent Difference
U	Indicates the analyte was analyzed for but not detected.

Note: Sample summaries which include a result for "Total Solids" have already been adjusted for moisture content. All DRO/RRO analyses are integrated per SOP.

Sample Summary

<u>Client Sample ID</u>	<u>Lab Sample ID</u>	<u>Collected</u>	<u>Received</u>	<u>Matrix</u>
LF-1	1138736001	11/15/2013	11/20/2013	Soil/Solid (dry weight)
LF-2	1138736002	11/15/2013	11/20/2013	Soil/Solid (dry weight)
LF-3	1138736003	11/15/2013	11/20/2013	Soil/Solid (dry weight)
LF-4	1138736004	11/15/2013	11/20/2013	Soil/Solid (dry weight)

<u>Method</u>	<u>Method Description</u>
SM21 2540G	Percent Solids SM2540G
SW8082A	SW8082 PCB's

Print Date: 11/27/2013 8:45:03AM

Results of LF-1

Client Sample ID: **LF-1**
 Client Project ID: **HIPAS Leach Fields**
 Lab Sample ID: 1138736001
 Lab Project ID: 1138736

Collection Date: 11/15/13 09:45
 Received Date: 11/20/13 09:43
 Matrix: Soil/Solid (dry weight)
 Solids (%): 98.3

Results by Polychlorinated Biphenyls

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Aroclor-1016	50.2 U	50.2	15.0	ug/Kg	1		11/22/13 03:09
Aroclor-1221	50.2 U	50.2	15.0	ug/Kg	1		11/22/13 03:09
Aroclor-1232	50.2 U	50.2	15.0	ug/Kg	1		11/22/13 03:09
Aroclor-1242	50.2 U	50.2	15.0	ug/Kg	1		11/22/13 03:09
Aroclor-1248	50.2 U	50.2	15.0	ug/Kg	1		11/22/13 03:09
Aroclor-1254	50.2 U	50.2	15.0	ug/Kg	1		11/22/13 03:09
Aroclor-1260	50.2 U	50.2	15.0	ug/Kg	1		11/22/13 03:09
Surrogates							
Decachlorobiphenyl	81	60-125		%	1		11/22/13 03:09

Batch Information

Analytical Batch: XGC8666
 Analytical Method: SW8082A
 Analyst: RTS
 Analytical Date/Time: 11/22/13 03:09
 Container ID: 1138736001-A

Prep Batch: XXX30399
 Prep Method: SW3550C
 Prep Date/Time: 11/21/13 10:15
 Prep Initial Wt./Vol.: 22.82 g
 Prep Extract Vol: 5 mL

Results of LF-2

Client Sample ID: **LF-2**
 Client Project ID: **HIPAS Leach Fields**
 Lab Sample ID: 1138736002
 Lab Project ID: 1138736

Collection Date: 11/15/13 14:30
 Received Date: 11/20/13 09:43
 Matrix: Soil/Solid (dry weight)
 Solids (%): 95.2

Results by Polychlorinated Biphenyls

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Aroclor-1016	52.1 U	52.1	15.6	ug/Kg	1		11/22/13 03:20
Aroclor-1221	52.1 U	52.1	15.6	ug/Kg	1		11/22/13 03:20
Aroclor-1232	52.1 U	52.1	15.6	ug/Kg	1		11/22/13 03:20
Aroclor-1242	52.1 U	52.1	15.6	ug/Kg	1		11/22/13 03:20
Aroclor-1248	52.1 U	52.1	15.6	ug/Kg	1		11/22/13 03:20
Aroclor-1254	52.1 U	52.1	15.6	ug/Kg	1		11/22/13 03:20
Aroclor-1260	52.1 U	52.1	15.6	ug/Kg	1		11/22/13 03:20
Surrogates							
Decachlorobiphenyl	80	60-125		%	1		11/22/13 03:20

Batch Information

Analytical Batch: XGC8666
 Analytical Method: SW8082A
 Analyst: RTS
 Analytical Date/Time: 11/22/13 03:20
 Container ID: 1138736002-A

Prep Batch: XXX30399
 Prep Method: SW3550C
 Prep Date/Time: 11/21/13 10:15
 Prep Initial Wt./Vol.: 22.709 g
 Prep Extract Vol: 5 mL

Results of LF-3

Client Sample ID: **LF-3**
 Client Project ID: **HIPAS Leach Fields**
 Lab Sample ID: 1138736003
 Lab Project ID: 1138736

Collection Date: 11/15/13 16:10
 Received Date: 11/20/13 09:43
 Matrix: Soil/Solid (dry weight)
 Solids (%): 89.1

Results by Polychlorinated Biphenyls

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Aroclor-1016	54.7 U	54.7	16.4	ug/Kg	1		11/22/13 04:38
Aroclor-1221	54.7 U	54.7	16.4	ug/Kg	1		11/22/13 04:38
Aroclor-1232	54.7 U	54.7	16.4	ug/Kg	1		11/22/13 04:38
Aroclor-1242	54.7 U	54.7	16.4	ug/Kg	1		11/22/13 04:38
Aroclor-1248	54.7 U	54.7	16.4	ug/Kg	1		11/22/13 04:38
Aroclor-1254	54.7 U	54.7	16.4	ug/Kg	1		11/22/13 04:38
Aroclor-1260	54.7 U	54.7	16.4	ug/Kg	1		11/22/13 04:38
Surrogates							
Decachlorobiphenyl	82	60-125		%	1		11/22/13 04:38

Batch Information

Analytical Batch: XGC8666
 Analytical Method: SW8082A
 Analyst: RTS
 Analytical Date/Time: 11/22/13 04:38
 Container ID: 1138736003-A

Prep Batch: XXX30399
 Prep Method: SW3550C
 Prep Date/Time: 11/21/13 10:15
 Prep Initial Wt./Vol.: 23.08 g
 Prep Extract Vol: 5 mL

Results of LF-4

Client Sample ID: **LF-4**
 Client Project ID: **HIPAS Leach Fields**
 Lab Sample ID: 1138736004
 Lab Project ID: 1138736

Collection Date: 11/15/13 16:30
 Received Date: 11/20/13 09:43
 Matrix: Soil/Solid (dry weight)
 Solids (%): 88.9

Results by Polychlorinated Biphenyls

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Aroclor-1016	55.1 U	55.1	16.5	ug/Kg	1		11/22/13 04:49
Aroclor-1221	55.1 U	55.1	16.5	ug/Kg	1		11/22/13 04:49
Aroclor-1232	55.1 U	55.1	16.5	ug/Kg	1		11/22/13 04:49
Aroclor-1242	55.1 U	55.1	16.5	ug/Kg	1		11/22/13 04:49
Aroclor-1248	55.1 U	55.1	16.5	ug/Kg	1		11/22/13 04:49
Aroclor-1254	55.1 U	55.1	16.5	ug/Kg	1		11/22/13 04:49
Aroclor-1260	55.1 U	55.1	16.5	ug/Kg	1		11/22/13 04:49
Surrogates							
Decachlorobiphenyl	80	60-125		%	1		11/22/13 04:49

Batch Information

Analytical Batch: XGC8666
 Analytical Method: SW8082A
 Analyst: RTS
 Analytical Date/Time: 11/22/13 04:49
 Container ID: 1138736004-A

Prep Batch: XXX30399
 Prep Method: SW3550C
 Prep Date/Time: 11/21/13 10:15
 Prep Initial Wt./Vol.: 22.95 g
 Prep Extract Vol: 5 mL

Method Blank

Blank ID: MB for HBN 1492970 [SPT/9210]

Blank Lab ID: 1192088

QC for Samples:

1138736001, 1138736002, 1138736003, 1138736004

Matrix: Soil/Solid (dry weight)

Results by SM21 2540G

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Total Solids	100			%

Batch Information

Analytical Batch: SPT9210

Analytical Method: SM21 2540G

Instrument:

Analyst: KRL

Analytical Date/Time: 11/20/2013 5:15:00PM

Duplicate Sample Summary

Original Sample ID: 1135656001

Duplicate Sample ID: 1192089

QC for Samples:

1138736001, 1138736002, 1138736003, 1138736004

Analysis Date: 11/20/2013 17:15

Matrix: Soil/Solid (dry weight)

Results by SM21 2540G

<u>NAME</u>	<u>Original ()</u>	<u>Duplicate ()</u>	<u>RPD (%)</u>	<u>RPD CL</u>
Total Solids	64.4	66.8	3.70	15.00

Batch Information

Analytical Batch: SPT9210

Analytical Method: SM21 2540G

Instrument:

Analyst: KRL

Print Date: 11/27/2013 8:45:05AM

Method Blank

Blank ID: MB for HBN 1492976 [XXX/30399]
 Blank Lab ID: 1192114

Matrix: Soil/Solid (dry weight)

QC for Samples:
 1138736001, 1138736002, 1138736003, 1138736004

Results by SW8082A

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Aroclor-1016	25.0U	50.0	15.0	ug/Kg
Aroclor-1221	25.0U	50.0	15.0	ug/Kg
Aroclor-1232	25.0U	50.0	15.0	ug/Kg
Aroclor-1242	25.0U	50.0	15.0	ug/Kg
Aroclor-1248	25.0U	50.0	15.0	ug/Kg
Aroclor-1254	25.0U	50.0	15.0	ug/Kg
Aroclor-1260	25.0U	50.0	15.0	ug/Kg

Surrogates

Decachlorobiphenyl	80	60-125		%
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Batch Information

Analytical Batch: XGC8666
 Analytical Method: SW8082A
 Instrument: HP 6890 Series II ECD SV L R
 Analyst: RTS
 Analytical Date/Time: 11/22/2013 2:46:00AM

Prep Batch: XXX30399
 Prep Method: SW3550C
 Prep Date/Time: 11/21/2013 10:15:00AM
 Prep Initial Wt./Vol.: 22.5 g
 Prep Extract Vol: 5 mL

Print Date: 11/27/2013 8:45:07AM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1138736 [XXX30399]
Blank Spike Lab ID: 1192115
Date Analyzed: 11/22/2013 02:58

Matrix: Soil/Solid (dry weight)

QC for Samples: 1138736001, 1138736002, 1138736003, 1138736004

Results by SW8082A

<u>Parameter</u>	Blank Spike (ug/Kg)			<u>CL</u>
	<u>Spike</u>	<u>Result</u>	<u>Rec (%)</u>	
Aroclor-1016	222	147	66	(40-140)
Aroclor-1260	222	193	87	(60-130)
Surrogates				
Decachlorobiphenyl	222	81	81	(60-125)

Batch Information

Analytical Batch: **XGC8666**
Analytical Method: **SW8082A**
Instrument: **HP 6890 Series II ECD SV L R**
Analyst: **RTS**

Prep Batch: **XXX30399**
Prep Method: **SW3550C**
Prep Date/Time: **11/21/2013 10:15**
Spike Init Wt./Vol.: 222 ug/Kg Extract Vol: 5 mL
Dupe Init Wt./Vol.: Extract Vol:

Print Date: 11/27/2013 8:45:07AM

Matrix Spike Summary

Original Sample ID: 1138736002
 MS Sample ID: 1192116 MS
 MSD Sample ID: 1192117 MSD

Analysis Date: 11/22/2013 3:20
 Analysis Date: 11/22/2013 3:53
 Analysis Date: 11/22/2013 4:05
 Matrix: Soil/Solid (dry weight)

QC for Samples: 1138736001, 1138736002, 1138736003, 1138736004

Results by SW8082A

Parameter	Sample	Matrix Spike (ug/Kg)			Spike Duplicate (ug/Kg)			CL	RPD (%)	RPD CL
		Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Aroclor-1016	52.1U	230	165	72	231	167	72	40-140	0.74	(< 30)
Aroclor-1260	52.1U	230	207	90	231	213	92	60-130	2.94	(< 30)
Surrogates										
Decachlorobiphenyl		230	186	81	231	187	81	60-125	0.74	

Batch Information

Analytical Batch: XGC8666
 Analytical Method: SW8082A
 Instrument: HP 6890 Series II ECD SV L R
 Analyst: RTS
 Analytical Date/Time: 11/22/2013 3:53:00AM

Prep Batch: XXX30399
 Prep Method: Sonication Extraction Soil SW8080 PCB
 Prep Date/Time: 11/21/2013 10:15:00AM
 Prep Initial Wt./Vol.: 22.86g
 Prep Extract Vol: 5.00mL



SGS CHAIN

1138736



Locations Nationwide
Alaska
Maryland
New Jersey
New York
North Carolina
Indiana
West Virginia
Kentucky
www.us.sgs.com

Instructions: Sections 1 - 5 must be filled out. Omissions may delay the onset of analysis.

Page 1 of 1

CLIENT: NORTECH CONTACT: Pauline Fusco PROJECT NAME: HIPAS learn fields REPORTS TO: Pauline Fusco INVOICE TO: NORTECH PHONE NO.: (907) 466-6429 PROJECT PWSID/ PERMIT#: 08-1091 E-MAIL: pfusco@nortecheng.com QUOTE #: P.O. #: 08-1091		Section 3 Type C = COMP G = GRAB MI = Multi-Incremental S = Soils # C O N T A I N E R S None PCB by 6270		Section 4 DOD Project? Yes <input checked="" type="checkbox"/> No Cooler ID: Requested Turnaround Time and/or Special Instructions:		Section 5 Data Deliverable Requirements: Chain of Custody Seal: (Circle) Temp Blank °C: <u>5.7</u> or Ambient [] INTACT <input checked="" type="checkbox"/> BROKEN <input checked="" type="checkbox"/> ABSENT (See attached Sample Receipt Form)	
Section 2 RESERVED for lab use SAMPLE IDENTIFICATION DATE mm/dd/yy TIME HH:MM MATRIX/MATRIX CODE ① A LF-1 11/15/13 0945 S ② A LF-2 1430 ③ A LF-3 1616 ④ A LF-4 1630		REMARKS/LOC ID LIDAR 12' Antenna Bldg Pavechase 1B Pavechase 1C					
Section 5 Relinquished By: (1) Pauline Fusco Relinquished By: (2) Relinquished By: (3) Relinquished By: (4)		Date 11/19/13 Time 915 Received By: [Signature]		Date 11-19-13 Time 915 Received By: [Signature]		Date 11/20/13 Time 9:43 Received By: [Signature]	



1138736



SAMPLE RECEIPT FORM

Review Criteria:	Condition:	Comments/Action Taken:
Were custody seals intact? Note # & location, if applicable. COC accompanied samples?	Yes No <u>N/A</u> <u>Yes</u> No <u>N/A</u>	
Temperature blank compliant* (i.e., 0-6°C after correction factor)? * Note: Exemption permitted for chilled samples collected less than 8 hours ago. Cooler ID: <u>1</u> @ <u>5-7</u> w/ Therm.ID: <u>35</u> Cooler ID: _____ @ _____ w/ Therm.ID: _____ Cooler ID: _____ @ _____ w/ Therm.ID: _____ Cooler ID: _____ @ _____ w/ Therm.ID: _____ Cooler ID: _____ @ _____ w/ Therm.ID: _____ Note: If non-compliant, use form FS-0029 to document affected samples/analyses. If samples are received without a temperature blank, the "cooler temperature" will be documented in lieu of the temperature blank & "COOLER TEMP" will be noted to the right. In cases where neither a temp blank nor cooler temp can be obtained, note "ambient" or "chilled." If temperature(s) <0°C, were all sample containers ice free?	Yes No <u>N/A</u> <u>Yes</u> No <u>N/A</u> Yes No <u>N/A</u>	
Delivery method (specify all that apply): <u>Client</u> USPS Alert Courier C&D Delivery AK Air Lynden Carlile ERA PenAir FedEx UPS NAC Other: → For WO# with airbills, was the WO# & airbill info recorded in the Front Counter eLog?	Note ABN/tracking # See Attached or N/A Yes No <u>N/A</u>	
→ For samples received with payment, note amount (\$) and cash / check / CC (circle one) or note: → For samples received in FBKS , ANCH staff will verify all criteria are reviewed.		SRF Initiated by: <u>JP</u> <u>N/A</u> <u>N/A</u>
Were samples received within hold time? Note: Refer to form F-083 "Sample Guide" for hold time information. Do samples match COC * (i.e., sample IDs, dates/times collected)? * Note: Exemption permitted if times differ <1hr; in which case, use times on COC. Were analyses requested unambiguous?	<u>Yes</u> No <u>N/A</u> <u>Yes</u> No <u>N/A</u> <u>Yes</u> No <u>N/A</u>	
Were samples in good condition (no leaks/cracks/breakage)? Packing material used (specify all that apply): <u>Bubble Wrap</u> Separate plastic bags Vermiculite Other:	<u>Yes</u> No <u>N/A</u>	
Were all VOA vials free of headspace (i.e., bubbles ≤6 mm)? Were all soil VOAs field extracted with MeOH+BFB?	Yes No <u>N/A</u> Yes No <u>N/A</u>	
Were proper containers (type/mass/volume/preservative*) used? * Note: Exemption permitted for waters to be analyzed for metals. Were Trip Blanks (i.e., VOAs, LL-Hg) in cooler with samples?	<u>Yes</u> No <u>N/A</u> Yes No <u>N/A</u>	
For special handling (e.g., "MI" or foreign soils, lab filter, limited volume, Ref Lab), were bottles/paperwork flagged (e.g., sticker)?	Yes No <u>N/A</u>	
For preserved waters (other than VOA vials, LL-Mercury or microbiological analyses), was pH verified and compliant ? If pH was adjusted, were bottles flagged (i.e., stickers)?	Yes No <u>N/A</u> Yes No <u>N/A</u>	
For RUSH/SHORT Hold Time , were COC/Bottles flagged accordingly? Was Rush/Short HT email sent, if applicable?	Yes No <u>N/A</u>	
For SITE-SPECIFIC QC , e.g. BMS/BMSD/BDUP, were containers / paperwork flagged accordingly?	Yes No <u>N/A</u>	
For any question answered "No," has the PM been notified and the problem resolved (or paperwork put in their bin)?	<u>Yes</u> No <u>N/A</u>	SLC 11/20/13 SRF Completed by: SLC 11/20/13 PM = <u>JD</u> N/A
Was PEER REVIEW of sample numbering/labeling completed?	Yes No <u>N/A</u>	Peer Reviewed by: N/A
Additional notes (if applicable): Samples arrived with a temp of -0.8. SLC 11/20/13 No ice was present. No ice in sample bottles; run samples. JABD-		

Note to Client: Any "no" circled above indicates non-compliance with standard procedures and may impact data quality.





1138736



SAMPLE RECEIPT FORM FOR TRANSFERS

Note: This form is to be completed by **Anchorage Sample Receiving staff** for all shipments received at SGS-Anchorage from SGS-Fairbanks.

Were samples received numbered with all criteria on Sample Receipt Form F0004 documented by Fairbanks Sample Receiving staff? If "No," <i>Anchorage Sample Receiving staff must complete the receiving process & document pH verification, sample condition, etc. on the SRF initiated by Fairbanks staff</i> (attached).	Yes <input type="radio"/> <input checked="" type="radio"/> No N/A	Use space below for additional notes...
Review Criteria:	Condition:	Comments/Action Taken:
Were custody seals intact?	<input checked="" type="radio"/> Yes No N/A	i F I B
Note # & location:		
COC accompanied samples?	<input checked="" type="radio"/> Yes No N/A	
Temperature blank compliant (i.e., 0-6°C after correction factor)?	Yes <input checked="" type="radio"/> No N/A	
Cooler ID: <u>1</u> @ <u>-0.8</u> w/ Therm.ID: <u>241</u>		
Cooler ID: _____ @ _____ w/ Therm.ID: _____		
Cooler ID: _____ @ _____ w/ Therm.ID: _____		
Cooler ID: _____ @ _____ w/ Therm.ID: _____		
Cooler ID: _____ @ _____ w/ Therm.ID: _____		
<i>Note: If non-compliant, use form FS-0029 to document affected samples/analyses.</i>		
If samples are received <u>without</u> a temperature blank, the "cooler temperature" will be documented in lieu of the temperature blank &		
"COOLER TEMP" will be noted to the right. In cases where neither a temp blank <u>nor</u> cooler temp can be obtained, note "ambient" or "chilled."		
If temperature(s) <0°C, were all containers ice free?	<input checked="" type="radio"/> Yes No N/A	
Delivery method: <input checked="" type="radio"/> Lynden		
Other: _____		
Completed by:		
 		

<u>Container Id</u>	<u>Preservative</u>	<u>Container Condition</u>	<u>Container Id</u>	<u>Preservative</u>	<u>Container Condition</u>
1138736001-A	No Preservative Required	OK			
1138736002-A	No Preservative Required	OK			
1138736003-A	No Preservative Required	OK			
1138736004-A	No Preservative Required	OK			

Container Condition Glossary

OK - The container was received at an acceptable pH for the analysis requested.

PA - The container was received outside of the acceptable pH for the analysis requested. Preservative was added upon receipt and the container is now at the correct pH. See the Sample Receipt Form for details on the amount and lot # of the preservative added.

PH - The container was received outside of the acceptable pH for the analysis requested. Preservative was added upon receipt, but was insufficient to bring the container to the correct pH for the analysis requested. See the Sample Receipt Form for details on the amount and lot # of the preservative added.

BU - The container was received with headspace greater than 6mm.

Lab Report 1138738

PCB Analysis of Backdoors and
Other Suspect Locations

Laboratory Report Follows Data Quality
Review Checklist

Laboratory Data Review Checklist

Completed by:

Title: Date:

CS Report Name: Report Date:

Consultant Firm:

Laboratory Name: Laboratory Report Number:

ADEC File Number: ADEC RecKey Number:

1. Laboratory

- a. Did an ADEC CS approved laboratory receive and perform all of the submitted sample analyses?
Yes No NA (Please explain.) Comments:

- b. If the samples were transferred to another "network" laboratory or sub-contracted to an alternate laboratory, was the laboratory performing the analyses ADEC CS approved?
Yes No NA (Please explain.) XX Comments:

2. Chain of Custody (COC)

- a. COC information completed, signed, and dated (including released/received by)?
Yes No NA (Please explain.) Comments:

- b. Correct analyses requested?
Yes No NA (Please explain.) Comments:

3. Laboratory Sample Receipt Documentation

- a. Sample/cooler temperature documented and within range at receipt ($4^{\circ} \pm 2^{\circ} \text{C}$)?
Yes No NA (Please explain.) Comments:

b. Sample preservation acceptable – acidified waters, Methanol preserved VOC soil (GRO, BTEX, Volatile Chlorinated Solvents, etc.)?

Yes No NA (Please explain.) Comments:

No sample preservation necessary

c. Sample condition documented – broken, leaking (Methanol), zero headspace (VOC vials)?

Yes No NA (Please explain.) Comments:

d. If there were any discrepancies, were they documented? For example, incorrect sample containers/preservation, sample temperature outside of acceptable range, insufficient or missing samples, etc.?

Yes No NA (Please explain.) Comments:

Sample temperature noted

e. Data quality or usability affected? (Please explain.)

Comments:

Not affected

4. Case Narrative

a. Present and understandable?

Yes No NA (Please explain.) Comments:

b. Discrepancies, errors or QC failures identified by the lab?

Yes No NA (Please explain.) Comments:

None noted

c. Were all corrective actions documented?

Yes No NA (Please explain.) Comments:

No errors, discrepancies or QC failures identified.

d. What is the effect on data quality/usability according to the case narrative?

Comments:

NA

5. Samples Results

a. Correct analyses performed/reported as requested on COC?

Yes No NA (Please explain.) Comments:

b. All applicable holding times met?

Yes No NA (Please explain.)

Comments:

c. All soils reported on a dry weight basis?

Yes No NA (Please explain.)

Comments:

d. Are the reported PQLs less than the Cleanup Level or the minimum required detection level for the project?

Yes No NA (Please explain.)

Comments:

e. Data quality or usability affected?

Comments:

NA

6. QC Samples

a. Method Blank

i. One method blank reported per matrix, analysis and 20 samples?

Yes No NA (Please explain.)

Comments:

ii. All method blank results less than PQL?

Yes No NA (Please explain.)

Comments:

iii. If above PQL, what samples are affected?

Comments:

NA

iv. Do the affected sample(s) have data flags and if so, are the data flags clearly defined?

Yes No NA (Please explain.)

Comments:

None noted

v. Data quality or usability affected? (Please explain.)

Comments:

NA

b. Laboratory Control Sample/Duplicate (LCS/LCSD)

i. Organics – One LCS/LCSD reported per matrix, analysis and 20 samples? (LCS/LCSD required per AK methods, LCS required per SW846)

Yes No NA (Please explain.) Comments:

ii. Metals/Inorganics – one LCS and one sample duplicate reported per matrix, analysis and 20 samples?

Yes No NA (Please explain.) Comments:

No metals analysis

iii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs, if applicable. (AK Petroleum methods: AK101 60%-120%, AK102 75%-125%, AK103 60%-120%; all other analyses see the laboratory QC pages)

Yes No NA (Please explain.) Comments:

iv. Precision – All relative percent differences (RPD) reported and less than method or laboratory limits? And project specified DQOs, if applicable. RPD reported from LCS/LCSD, MS/MSD, and or sample/sample duplicate. (AK Petroleum methods 20%; all other analyses see the laboratory QC pages)

Yes No NA (Please explain.) Comments:

v. If %R or RPD is outside of acceptable limits, what samples are affected?

Comments:

NA

vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

Yes No NA (Please explain.) Comments:

No affected samples

vii. Data quality or usability affected? (Use comment box to explain.)

Comments:

NA

c. Surrogates – Organics Only

i. Are surrogate recoveries reported for organic analyses – field, QC and laboratory samples?

Yes No NA (Please explain.) Comments:

- ii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs, if applicable. (AK Petroleum methods 50-150 %R; all other analyses see the laboratory report pages)

Yes No NA (Please explain.) Comments:

- iii. Do the sample results with failed surrogate recoveries have data flags? If so, are the data flags clearly defined?

Yes No NA (Please explain.) Comments:

None failed

- iv. Data quality or usability affected? (Use the comment box to explain.)

Comments:

NA

- d. Trip blank – Volatile analyses only (GRO, BTEX, Volatile Chlorinated Solvents, etc.): Water and Soil

- i. One trip blank reported per matrix, analysis and for each cooler containing volatile samples? (If not, enter explanation below.)

Yes No NA (Please explain.) Comments:

No volatile samples, trip blank not needed

- ii. Is the cooler used to transport the trip blank and VOA samples clearly indicated on the COC? (If not, a comment explaining why must be entered below)

Yes No NA (Please explain.) Comments:

See answer to 6d above

- iii. All results less than PQL?

Yes No NA (Please explain.) For water Comments:

See answer to 6d above

- iv. If above PQL, what samples are affected?

Comments:

- v. Data quality or usability affected? (Please explain.)

Comments:

e. Field Duplicate

i. One field duplicate submitted per matrix, analysis and 10 project samples?

Yes No NA (Please explain.) Comments:

ii. Submitted blind to lab?

Yes No NA (Please explain.) Comments:

iii. Precision – All relative percent differences (RPD) less than specified DQOs?
(Recommended: 30% water, 50% soil)

$$\text{RPD (\%)} = \text{Absolute value of: } \frac{(R_1 - R_2)}{((R_1 + R_2)/2)} \times 100$$

Where R_1 = Sample Concentration
 R_2 = Field Duplicate Concentration

Yes No NA (Please explain.) Comments:

Analytes not detected at or above the LOQ.

iv. Data quality or usability affected? (Use the comment box to explain why or why not.)

Comments:

f. Decontamination or Equipment Blank (If not used explain why).

Yes No NA (Please explain.) Comments:

Used disposable gloves for sampling

i. All results less than PQL?

Yes No NA (Please explain.) Comments:

See 6f above

ii. If above PQL, what samples are affected?

Comments:

NA

iii. Data quality or usability affected? (Please explain.)

Comments:

NA

7. Other Data Flags/Qualifiers (ACOE, AFCEE, Lab Specific, etc.)

a. Defined and appropriate?

Yes No NA (Please explain.)

Comments:

All flags/qualifiers defined



Laboratory Report of Analysis

To: Nortech
2400 College Rd
Fairbanks, AK 99709
(907)452-5688

Report Number: **1138738**

Client Project: **HIPAS Backdoor**

Dear Pauline Fusco,

Enclosed are the results of the analytical services performed under the referenced project for the received samples and associated QC as applicable. The samples are certified to meet the requirements of the National Environmental Laboratory Accreditation Conference Standards. Copies of this report and supporting data will be retained in our files for a period of five years in the event they are required for future reference. All results are intended to be used in their entirety and SGS is not responsible for use of less than the complete report. Any samples submitted to our laboratory will be retained for a maximum of fourteen (14) days from the date of this report unless other archiving requirements were included in the quote.

If there are any questions about the report or services performed during this project, please call Jennifer at (907) 562-2343. We will be happy to answer any questions or concerns which you may have.

Thank you for using SGS North America Inc. for your analytical services. We look forward to working with you again on any additional analytical needs.

Sincerely,
SGS North America Inc.

Alaska Division Technical Director

Stephen Ede

2013.11.27

11:46:45 -09'00'

Jennifer Dawkins
Project Manager

Date

Print Date: 11/27/2013 11:22:17AM

SGS North America Inc.

200 West Potter Drive, Anchorage, AK 99518
t 907.562.2343 f 907.561.5301 www.us.sgs.com

Member of SGS Group

Case Narrative

SGS Client: **Nortech**
SGS Project: **1138738**
Project Name/Site: **HIPAS Backdoor**
Project Contact: **Pauline Fusco**

Refer to sample receipt form for information on sample condition.

*QC comments may be associated with the field samples found in this report. When applicable, comments will be applied to associated field samples.

Print Date: 11/27/2013 11:22:17AM

Laboratory Qualifiers

Enclosed are the analytical results associated with the above work order. All results are intended to be used in their entirety and SGS is not responsible for use of less than the complete report. If you have any questions regarding this report, or if we can be of any other assistance, please contact your SGS Project Manager at 907-562-2343. All work is provided under SGS general terms and conditions (<http://www.sgs.com/terms_and_conditions.htm>), unless other written agreements have been accepted by both parties.

SGS maintains a formal Quality Assurance/Quality Control (QA/QC) program. A copy of our Quality Assurance Plan (QAP), which outlines this program, is available at your request. The laboratory certification numbers are AK00971 (DW Chemistry & Microbiology) & UST-005 (CS) for ADEC and 2944.01 for DOD ELAP/ISO17025 (RCRA methods: 1020A, 1311, 3010A, 3050B, 3520C, 3550C, 5030B, 5035B, 6020, 7470A, 7471B, 8021B, 8082A, 8260B, 8270D, 8270D-SIM, 9040B, 9045C, 9056A, 9060A, AK101 and AK102/103). Except as specifically noted, all statements and data in this report are in conformance to the provisions set forth by the SGS QAP and, when applicable, other regulatory authorities.

The following descriptors or qualifiers may be found in your report:

*	The analyte has exceeded allowable regulatory or control limits.
!	Surrogate out of control limits.
B	Indicates the analyte is found in a blank associated with the sample.
CCV	Continuing Calibration Verification
CL	Control Limit
D	The analyte concentration is the result of a dilution.
DF	Dilution Factor
DL	Detection Limit (i.e., maximum method detection limit)
E	The analyte result is above the calibrated range.
F	Indicates value that is greater than or equal to the DL
GT	Greater Than
IB	Instrument Blank
ICV	Initial Calibration Verification
J	The quantitation is an estimation.
JL	The analyte was positively identified, but the quantitation is a low estimation.
LCS(D)	Laboratory Control Spike (Duplicate)
LOD	Limit of Detection (i.e., 1/2 of the LOQ)
LOQ	Limit of Quantitation (i.e., reporting or practical quantitation limit)
LT	Less Than
M	A matrix effect was present.
MB	Method Blank
MS(D)	Matrix Spike (Duplicate)
ND	Indicates the analyte is not detected.
Q	QC parameter out of acceptance range.
R	Rejected
RPD	Relative Percent Difference
U	Indicates the analyte was analyzed for but not detected.

Note: Sample summaries which include a result for "Total Solids" have already been adjusted for moisture content. All DRO/RRO analyses are integrated per SOP.

Sample Summary

<u>Client Sample ID</u>	<u>Lab Sample ID</u>	<u>Collected</u>	<u>Received</u>	<u>Matrix</u>
PCB1	1138738001	10/23/2013	11/20/2013	Soil/Solid (dry weight)
PCB2	1138738002	10/23/2013	11/20/2013	Soil/Solid (dry weight)
PCB3	1138738003	10/23/2013	11/20/2013	Soil/Solid (dry weight)
PCB4	1138738004	10/23/2013	11/20/2013	Soil/Solid (dry weight)
PCB5	1138738005	10/23/2013	11/20/2013	Soil/Solid (dry weight)
PCB6	1138738006	10/23/2013	11/20/2013	Soil/Solid (dry weight)
PCB7	1138738007	10/23/2013	11/20/2013	Soil/Solid (dry weight)
PCB8	1138738008	10/23/2013	11/20/2013	Soil/Solid (dry weight)
PCB9	1138738009	10/23/2013	11/20/2013	Soil/Solid (dry weight)

Method

SM21 2540G

SW8082A

Method Description

Percent Solids SM2540G

SW8082 PCB's



Results of PCB1

Client Sample ID: **PCB1**
Client Project ID: **HIPAS Backdoor**
Lab Sample ID: 1138738001
Lab Project ID: 1138738

Collection Date: 10/23/13 12:30
Received Date: 11/20/13 09:43
Matrix: Soil/Solid (dry weight)
Solids (%): 85.9

Results by Polychlorinated Biphenyls

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Aroclor-1016	57.2 U	57.2	17.2	ug/Kg	1		11/21/13 23:14
Aroclor-1221	57.2 U	57.2	17.2	ug/Kg	1		11/21/13 23:14
Aroclor-1232	57.2 U	57.2	17.2	ug/Kg	1		11/21/13 23:14
Aroclor-1242	57.2 U	57.2	17.2	ug/Kg	1		11/21/13 23:14
Aroclor-1248	57.2 U	57.2	17.2	ug/Kg	1		11/21/13 23:14
Aroclor-1254	57.2 U	57.2	17.2	ug/Kg	1		11/21/13 23:14
Aroclor-1260	57.2 U	57.2	17.2	ug/Kg	1		11/21/13 23:14
Surrogates							
Decachlorobiphenyl	75	60-125		%	1		11/21/13 23:14

Batch Information

Analytical Batch: XGC8666
Analytical Method: SW8082A
Analyst: RTS
Analytical Date/Time: 11/21/13 23:14
Container ID: 1138738001-A

Prep Batch: XXX30398
Prep Method: SW3550C
Prep Date/Time: 11/21/13 08:30
Prep Initial Wt./Vol.: 22.897 g
Prep Extract Vol: 5 mL

Print Date: 11/27/2013 11:22:20AM



Results of PCB2

Client Sample ID: **PCB2**
 Client Project ID: **HIPAS Backdoor**
 Lab Sample ID: 1138738002
 Lab Project ID: 1138738

Collection Date: 10/23/13 12:45
 Received Date: 11/20/13 09:43
 Matrix: Soil/Solid (dry weight)
 Solids (%): 95.7

Results by Polychlorinated Biphenyls

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Aroclor-1016	50.5 U	50.5	15.2	ug/Kg	1		11/21/13 23:26
Aroclor-1221	50.5 U	50.5	15.2	ug/Kg	1		11/21/13 23:26
Aroclor-1232	50.5 U	50.5	15.2	ug/Kg	1		11/21/13 23:26
Aroclor-1242	50.5 U	50.5	15.2	ug/Kg	1		11/21/13 23:26
Aroclor-1248	50.5 U	50.5	15.2	ug/Kg	1		11/21/13 23:26
Aroclor-1254	50.5 U	50.5	15.2	ug/Kg	1		11/21/13 23:26
Aroclor-1260	50.5 U	50.5	15.2	ug/Kg	1		11/21/13 23:26
Surrogates							
Decachlorobiphenyl	75	60-125		%	1		11/21/13 23:26

Batch Information

Analytical Batch: XGC8666
 Analytical Method: SW8082A
 Analyst: RTS
 Analytical Date/Time: 11/21/13 23:26
 Container ID: 1138738002-A

Prep Batch: XXX30398
 Prep Method: SW3550C
 Prep Date/Time: 11/21/13 08:30
 Prep Initial Wt./Vol.: 23.28 g
 Prep Extract Vol: 5 mL

Print Date: 11/27/2013 11:22:20AM



Results of PCB3

Client Sample ID: **PCB3**
Client Project ID: **HIPAS Backdoor**
Lab Sample ID: 1138738003
Lab Project ID: 1138738

Collection Date: 10/23/13 13:00
Received Date: 11/20/13 09:43
Matrix: Soil/Solid (dry weight)
Solids (%): 81.1

Results by Polychlorinated Biphenyls

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Aroclor-1016	61.3 U	61.3	18.4	ug/Kg	1		11/21/13 23:59
Aroclor-1221	61.3 U	61.3	18.4	ug/Kg	1		11/21/13 23:59
Aroclor-1232	61.3 U	61.3	18.4	ug/Kg	1		11/21/13 23:59
Aroclor-1242	61.3 U	61.3	18.4	ug/Kg	1		11/21/13 23:59
Aroclor-1248	61.3 U	61.3	18.4	ug/Kg	1		11/21/13 23:59
Aroclor-1254	61.3 U	61.3	18.4	ug/Kg	1		11/21/13 23:59
Aroclor-1260	61.3 U	61.3	18.4	ug/Kg	1		11/21/13 23:59
Surrogates							
Decachlorobiphenyl	79	60-125		%	1		11/21/13 23:59

Batch Information

Analytical Batch: XGC8666
Analytical Method: SW8082A
Analyst: RTS
Analytical Date/Time: 11/21/13 23:59
Container ID: 1138738003-A

Prep Batch: XXX30398
Prep Method: SW3550C
Prep Date/Time: 11/21/13 08:30
Prep Initial Wt./Vol.: 22.635 g
Prep Extract Vol: 5 mL

Print Date: 11/27/2013 11:22:20AM



Results of PCB4

Client Sample ID: **PCB4**
Client Project ID: **HIPAS Backdoor**
Lab Sample ID: 1138738004
Lab Project ID: 1138738

Collection Date: 10/23/13 13:15
Received Date: 11/20/13 09:43
Matrix: Soil/Solid (dry weight)
Solids (%): 87.5

Results by Polychlorinated Biphenyls

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Aroclor-1016	55.8 U	55.8	16.7	ug/Kg	1		11/22/13 00:10
Aroclor-1221	55.8 U	55.8	16.7	ug/Kg	1		11/22/13 00:10
Aroclor-1232	55.8 U	55.8	16.7	ug/Kg	1		11/22/13 00:10
Aroclor-1242	55.8 U	55.8	16.7	ug/Kg	1		11/22/13 00:10
Aroclor-1248	55.8 U	55.8	16.7	ug/Kg	1		11/22/13 00:10
Aroclor-1254	55.8 U	55.8	16.7	ug/Kg	1		11/22/13 00:10
Aroclor-1260	55.8 U	55.8	16.7	ug/Kg	1		11/22/13 00:10
Surrogates							
Decachlorobiphenyl	78	60-125		%	1		11/22/13 00:10

Batch Information

Analytical Batch: XGC8666
Analytical Method: SW8082A
Analyst: RTS
Analytical Date/Time: 11/22/13 00:10
Container ID: 1138738004-A

Prep Batch: XXX30398
Prep Method: SW3550C
Prep Date/Time: 11/21/13 08:30
Prep Initial Wt./Vol.: 23.048 g
Prep Extract Vol: 5 mL

Print Date: 11/27/2013 11:22:20AM



Results of PCB5

Client Sample ID: **PCB5**
Client Project ID: **HIPAS Backdoor**
Lab Sample ID: 1138738005
Lab Project ID: 1138738

Collection Date: 10/23/13 13:30
Received Date: 11/20/13 09:43
Matrix: Soil/Solid (dry weight)
Solids (%): 85.7

Results by Polychlorinated Biphenyls

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Aroclor-1016	58.0 U	58.0	17.4	ug/Kg	1		11/22/13 00:44
Aroclor-1221	58.0 U	58.0	17.4	ug/Kg	1		11/22/13 00:44
Aroclor-1232	58.0 U	58.0	17.4	ug/Kg	1		11/22/13 00:44
Aroclor-1242	58.0 U	58.0	17.4	ug/Kg	1		11/22/13 00:44
Aroclor-1248	58.0 U	58.0	17.4	ug/Kg	1		11/22/13 00:44
Aroclor-1254	58.0 U	58.0	17.4	ug/Kg	1		11/22/13 00:44
Aroclor-1260	58.0 U	58.0	17.4	ug/Kg	1		11/22/13 00:44
Surrogates							
Decachlorobiphenyl	79	60-125		%	1		11/22/13 00:44

Batch Information

Analytical Batch: XGC8666
Analytical Method: SW8082A
Analyst: RTS
Analytical Date/Time: 11/22/13 00:44
Container ID: 1138738005-A

Prep Batch: XXX30398
Prep Method: SW3550C
Prep Date/Time: 11/21/13 08:30
Prep Initial Wt./Vol.: 22.632 g
Prep Extract Vol: 5 mL

Print Date: 11/27/2013 11:22:20AM



Results of PCB6

Client Sample ID: **PCB6**
 Client Project ID: **HIPAS Backdoor**
 Lab Sample ID: 1138738006
 Lab Project ID: 1138738

Collection Date: 10/23/13 13:45
 Received Date: 11/20/13 09:43
 Matrix: Soil/Solid (dry weight)
 Solids (%): 91.8

Results by Polychlorinated Biphenyls

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Aroclor-1016	53.3 U	53.3	16.0	ug/Kg	1		11/22/13 00:55
Aroclor-1221	53.3 U	53.3	16.0	ug/Kg	1		11/22/13 00:55
Aroclor-1232	53.3 U	53.3	16.0	ug/Kg	1		11/22/13 00:55
Aroclor-1242	53.3 U	53.3	16.0	ug/Kg	1		11/22/13 00:55
Aroclor-1248	53.3 U	53.3	16.0	ug/Kg	1		11/22/13 00:55
Aroclor-1254	53.3 U	53.3	16.0	ug/Kg	1		11/22/13 00:55
Aroclor-1260	53.3 U	53.3	16.0	ug/Kg	1		11/22/13 00:55
Surrogates							
Decachlorobiphenyl	77	60-125		%	1		11/22/13 00:55

Batch Information

Analytical Batch: XGC8666
 Analytical Method: SW8082A
 Analyst: RTS
 Analytical Date/Time: 11/22/13 00:55
 Container ID: 1138738006-A

Prep Batch: XXX30398
 Prep Method: SW3550C
 Prep Date/Time: 11/21/13 08:30
 Prep Initial Wt./Vol.: 22.99 g
 Prep Extract Vol: 5 mL

Print Date: 11/27/2013 11:22:20AM

Results of PCB7

Client Sample ID: **PCB7**
 Client Project ID: **HIPAS Backdoor**
 Lab Sample ID: 1138738007
 Lab Project ID: 1138738

Collection Date: 10/23/13 16:00
 Received Date: 11/20/13 09:43
 Matrix: Soil/Solid (dry weight)
 Solids (%): 93.2

Results by Polychlorinated Biphenyls

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Aroclor-1016	53.0 U	53.0	15.9	ug/Kg	1		11/22/13 01:28
Aroclor-1221	53.0 U	53.0	15.9	ug/Kg	1		11/22/13 01:28
Aroclor-1232	53.0 U	53.0	15.9	ug/Kg	1		11/22/13 01:28
Aroclor-1242	53.0 U	53.0	15.9	ug/Kg	1		11/22/13 01:28
Aroclor-1248	53.0 U	53.0	15.9	ug/Kg	1		11/22/13 01:28
Aroclor-1254	53.0 U	53.0	15.9	ug/Kg	1		11/22/13 01:28
Aroclor-1260	53.0 U	53.0	15.9	ug/Kg	1		11/22/13 01:28
Surrogates							
Decachlorobiphenyl	79	60-125		%	1		11/22/13 01:28

Batch Information

Analytical Batch: XGC8666
 Analytical Method: SW8082A
 Analyst: RTS
 Analytical Date/Time: 11/22/13 01:28
 Container ID: 1138738007-A

Prep Batch: XXX30398
 Prep Method: SW3550C
 Prep Date/Time: 11/21/13 08:30
 Prep Initial Wt./Vol.: 22.753 g
 Prep Extract Vol: 5 mL



Results of PCB8

Client Sample ID: **PCB8**
 Client Project ID: **HIPAS Backdoor**
 Lab Sample ID: 1138738008
 Lab Project ID: 1138738

Collection Date: 10/23/13 16:30
 Received Date: 11/20/13 09:43
 Matrix: Soil/Solid (dry weight)
 Solids (%): 93.7

Results by Polychlorinated Biphenyls

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Aroclor-1016	52.1 U	52.1	15.6	ug/Kg	1		11/22/13 01:39
Aroclor-1221	52.1 U	52.1	15.6	ug/Kg	1		11/22/13 01:39
Aroclor-1232	52.1 U	52.1	15.6	ug/Kg	1		11/22/13 01:39
Aroclor-1242	52.1 U	52.1	15.6	ug/Kg	1		11/22/13 01:39
Aroclor-1248	52.1 U	52.1	15.6	ug/Kg	1		11/22/13 01:39
Aroclor-1254	52.1 U	52.1	15.6	ug/Kg	1		11/22/13 01:39
Aroclor-1260	52.1 U	52.1	15.6	ug/Kg	1		11/22/13 01:39
Surrogates							
Decachlorobiphenyl	80	60-125		%	1		11/22/13 01:39

Batch Information

Analytical Batch: XGC8666
 Analytical Method: SW8082A
 Analyst: RTS
 Analytical Date/Time: 11/22/13 01:39
 Container ID: 1138738008-A

Prep Batch: XXX30398
 Prep Method: SW3550C
 Prep Date/Time: 11/21/13 08:30
 Prep Initial Wt./Vol.: 23.012 g
 Prep Extract Vol: 5 mL

Print Date: 11/27/2013 11:22:20AM

Results of PCB9

Client Sample ID: **PCB9**
 Client Project ID: **HIPAS Backdoor**
 Lab Sample ID: 1138738009
 Lab Project ID: 1138738

Collection Date: 10/23/13 14:00
 Received Date: 11/20/13 09:43
 Matrix: Soil/Solid (dry weight)
 Solids (%): 95.5

Results by Polychlorinated Biphenyls

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Aroclor-1016	51.4 U	51.4	15.4	ug/Kg	1		11/22/13 01:51
Aroclor-1221	51.4 U	51.4	15.4	ug/Kg	1		11/22/13 01:51
Aroclor-1232	51.4 U	51.4	15.4	ug/Kg	1		11/22/13 01:51
Aroclor-1242	51.4 U	51.4	15.4	ug/Kg	1		11/22/13 01:51
Aroclor-1248	51.4 U	51.4	15.4	ug/Kg	1		11/22/13 01:51
Aroclor-1254	51.4 U	51.4	15.4	ug/Kg	1		11/22/13 01:51
Aroclor-1260	51.4 U	51.4	15.4	ug/Kg	1		11/22/13 01:51
Surrogates							
Decachlorobiphenyl	79	60-125		%	1		11/22/13 01:51

Batch Information

Analytical Batch: XGC8666
 Analytical Method: SW8082A
 Analyst: RTS
 Analytical Date/Time: 11/22/13 01:51
 Container ID: 1138738009-A

Prep Batch: XXX30398
 Prep Method: SW3550C
 Prep Date/Time: 11/21/13 08:30
 Prep Initial Wt./Vol.: 22.897 g
 Prep Extract Vol: 5 mL

Method Blank

Blank ID: MB for HBN 1492970 [SPT/9210]

Blank Lab ID: 1192088

Matrix: Soil/Solid (dry weight)

QC for Samples:

1138738001, 1138738002, 1138738003, 1138738004, 1138738005, 1138738006, 1138738007, 1138738008, 1138738009

Results by SM21 2540G

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Total Solids	100			%

Batch Information

Analytical Batch: SPT9210

Analytical Method: SM21 2540G

Instrument:

Analyst: KRL

Analytical Date/Time: 11/20/2013 5:15:00PM

Print Date: 11/27/2013 11:22:21AM

Duplicate Sample Summary

Original Sample ID: 1135656001

Duplicate Sample ID: 1192089

QC for Samples:

1138738001, 1138738002, 1138738003, 1138738004, 1138738005, 1138738006, 1138738007, 1138738008, 1138738009

Analysis Date: 11/20/2013 17:15

Matrix: Soil/Solid (dry weight)

Results by SM21 2540G

<u>NAME</u>	<u>Original ()</u>	<u>Duplicate ()</u>	<u>RPD (%)</u>	<u>RPD CL</u>
Total Solids	64.4	66.8	3.70	15.00

Batch Information

Analytical Batch: SPT9210

Analytical Method: SM21 2540G

Instrument:

Analyst: KRL

Print Date: 11/27/2013 11:22:21AM

Method Blank

Blank ID: MB for HBN 1492969 [XXX/30398]
 Blank Lab ID: 1192084

Matrix: Soil/Solid (dry weight)

QC for Samples:

1138738001, 1138738002, 1138738003, 1138738004, 1138738005, 1138738006, 1138738007, 1138738008, 1138738009

Results by SW8082A

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Aroclor-1016	25.0U	50.0	15.0	ug/Kg
Aroclor-1221	25.0U	50.0	15.0	ug/Kg
Aroclor-1232	25.0U	50.0	15.0	ug/Kg
Aroclor-1242	25.0U	50.0	15.0	ug/Kg
Aroclor-1248	25.0U	50.0	15.0	ug/Kg
Aroclor-1254	25.0U	50.0	15.0	ug/Kg
Aroclor-1260	25.0U	50.0	15.0	ug/Kg

Surrogates

Decachlorobiphenyl	92	60-125	%
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Batch Information

Analytical Batch: XGC8666
 Analytical Method: SW8082A
 Instrument: HP 6890 Series II ECD SV L R
 Analyst: RTS
 Analytical Date/Time: 11/21/2013 6:02:00PM

Prep Batch: XXX30398
 Prep Method: SW3550C
 Prep Date/Time: 11/21/2013 8:30:00AM
 Prep Initial Wt./Vol.: 22.5 g
 Prep Extract Vol: 5 mL

Print Date: 11/27/2013 11:22:23AM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1138738 [XXX30398]
Blank Spike Lab ID: 1192085
Date Analyzed: 11/21/2013 18:13

Matrix: Soil/Solid (dry weight)

QC for Samples: 1138738001, 1138738002, 1138738003, 1138738004, 1138738005, 1138738006, 1138738007,
1138738008, 1138738009

Results by SW8082A

<u>Parameter</u>	Blank Spike (ug/Kg)			<u>CL</u>
	<u>Spike</u>	<u>Result</u>	<u>Rec (%)</u>	
Aroclor-1016	222	120	54	(40-140)
Aroclor-1260	222	191	86	(60-130)
Surrogates				
Decachlorobiphenyl	222	80	80	(60-125)

Batch Information

Analytical Batch: **XGC8666**
Analytical Method: **SW8082A**
Instrument: **HP 6890 Series II ECD SV L R**
Analyst: **RTS**

Prep Batch: **XXX30398**
Prep Method: **SW3550C**
Prep Date/Time: **11/21/2013 08:30**
Spike Init Wt./Vol.: 222 ug/Kg Extract Vol: 5 mL
Dupe Init Wt./Vol.: Extract Vol:

Print Date: 11/27/2013 11:22:23AM

Matrix Spike Summary

Original Sample ID: 1135656002
 MS Sample ID: 1192086 MS
 MSD Sample ID: 1192087 MSD

Analysis Date: 11/21/2013 18:35
 Analysis Date: 11/21/2013 19:09
 Analysis Date: 11/21/2013 19:20
 Matrix: Soil/Solid (dry weight)

QC for Samples: 1138738001, 1138738002, 1138738003, 1138738004, 1138738005, 1138738006, 1138738007, 1138738008, 1138738009

Results by SW8082A

Parameter	Sample	Matrix Spike (ug/Kg)			Spike Duplicate (ug/Kg)			CL	RPD (%)	RPD CL
		Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Aroclor-1016	59.9U	260	169	65	262	162	62	40-140	4.40	(< 30)
Aroclor-1260	59.9U	260	224	86	262	229	88	60-130	2.63	(< 30)
Surrogates										
Decachlorobiphenyl		260	203	78	262	206	79	60-125	1.60	

Batch Information

Analytical Batch: XGC8666
 Analytical Method: SW8082A
 Instrument: HP 6890 Series II ECD SV L R
 Analyst: RTS
 Analytical Date/Time: 11/21/2013 7:09:00PM

Prep Batch: XXX30398
 Prep Method: Sonication Extraction Soil SW8080 PCB
 Prep Date/Time: 11/21/2013 8:30:00AM
 Prep Initial Wt./Vol.: 22.84g
 Prep Extract Vol: 5.00mL

1138738

S/ CHAI

- Locations Nationwide
- Alaska
- Maryland
- New Jersey
- North Carolina
- West Virginia
- Indiana
- Kentucky

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Instructions: Sections 1 - 5 must be filled out. Omissions may delay the onset of analysis.

Page 1 of 2

Section 1		Section 3		Section 4		Section 5							
CLIENT:	CONTACT:	PROJECT NAME:	REPORTS TO:	INVOICE TO:	RESERVED for lab use	SAMPLE IDENTIFICATION	DATE	TIME	MATRIX/MATRIX CODE	#	Type	REMARKS/LOC ID	
NORTECH	Pauline Fusco	BACKDOOR	Pauline Fusco	NORTECH		PCB1	10/23/13	12:30	S	1	C	L6	
		HIPAS	Pauline Fusco			PCB2		12:45				L1D	
						PCB3		13:00				BY	
						PCB4		13:15				Gen B/PH	
						PCB5		13:30				Tran S	
						PCB6		13:45				Tran Bby	
						PCB7		16:00				Tran Pad	
						PCB8		16:30				Tran Pad	
						PCB9		14:00				L1D	
Relinquished By: (1)		Pauline Fusco				Date		Time		Received By:		11-19-13	
Relinquished By: (2)						Date		Time		Received By:		9:15	
Relinquished By: (3)						Date		Time		Received By:			
Relinquished By: (4)						Date		Time		Received For Laboratory By:		9:43	

Section 2

Section 4

Section 5

Requested Turnaround Time and/or Special Instructions:

Chain of Custody Seal: (Circle) **INTACT** **BROKEN** **ABSENT**

Temp Blank-c: 1.0 or Ambient []

COOLER temp. 1.0

(See attached Sample Receipt Form)



SAMPLE RECEIPT FORM

Review Criteria:	Condition:	Comments/Action Taken:
Were custody seals intact? Note # & location, if applicable. COC accompanied samples?	Yes No <u>N/A</u> <u>Yes</u> No N/A	
Temperature blank compliant* (i.e., 0-6°C after correction factor)? <i>* Note: Exemption permitted for chilled samples collected less than 8 hours ago.</i> Cooler ID: <u>1</u> @ <u>1.0</u> w/ Therm.ID: <u>203</u> Cooler ID: _____ @ _____ w/ Therm.ID: _____ Cooler ID: _____ @ _____ w/ Therm.ID: _____ Cooler ID: _____ @ _____ w/ Therm.ID: _____ <i>Note: If non-compliant, use form FS-0029 to document affected samples/analyses.</i> If samples are received <u>without</u> a temperature blank, the "cooler temperature" will be documented in lieu of the temperature blank & " COOLER TEMP " will be noted to the right. In cases where neither a temp blank <u>nor</u> cooler temp can be obtained, note "ambient" or "chilled." If temperature(s) <0°C, were all sample containers ice free?	<u>Yes</u> No <u>N/A</u> <u>Yes</u> No <u>N/A</u> <u>Yes</u> No <u>N/A</u> cooler temp.	
Delivery method (specify all that apply): <u>Client</u> USPS Alert Courier C&D Delivery <u>AK Air</u> Lynden Carlile ERA PenAir FedEx UPS NAC Other: → For WO# with airbills, was the WO# & airbill info recorded in the Front Counter eLog?	Note ABN/tracking # See Attached or N/A Yes No <u>N/A</u>	
→ For samples received with payment, note amount (\$) and cash / check / CC (circle one) or note: → For samples received in FBKS , ANCH staff will verify all criteria are reviewed.		SRF Initiated by: <u>[Signature]</u> <u>N/A</u>
Were samples received within hold time? <i>Note: Refer to form F-083 "Sample Guide" for hold time information.</i> Do samples match COC* (i.e., sample IDs, dates/times collected)? <i>* Note: Exemption permitted if times differ <1hr; in which case, use times on COC.</i> Were analyses requested unambiguous?	<u>Yes</u> No <u>N/A</u> <u>Yes</u> No <u>N/A</u> <u>Yes</u> No <u>N/A</u>	
Were samples in good condition (no leaks/cracks/breakage)? Packing material used (specify all that apply): <u>Bubble Wrap</u> Separate plastic bags Vermiculite Other:	<u>Yes</u> No <u>N/A</u>	
Were all VOA vials free of headspace (i.e., bubbles ≤6 mm)? Were all soil VOAs field extracted with MeOH+BFB?	Yes No <u>N/A</u> Yes No <u>N/A</u>	
Were proper containers (type/mass/volume/preservative*) used? <i>* Note: Exemption permitted for waters to be analyzed for metals.</i> Were Trip Blanks (i.e., VOAs, LL-Hg) in cooler with samples?	<u>Yes</u> No <u>N/A</u> Yes No <u>N/A</u>	
For special handling (e.g., "MI" or foreign soils, lab filter, limited volume, Ref Lab), were bottles/paperwork flagged (e.g., sticker)?	Yes No <u>N/A</u>	
For preserved waters (other than VOA vials, LL-Mercury or microbiological analyses), was pH verified and compliant ? If pH was adjusted, were bottles flagged (i.e., stickers)?	Yes No <u>N/A</u> Yes No <u>N/A</u>	
For RUSH/SHORT Hold Time , were COC/Bottles flagged accordingly? Was Rush/Short HT email sent, if applicable?	Yes No <u>N/A</u>	
For SITE-SPECIFIC QC , e.g. BMS/BMSD/BDUP, were containers / paperwork flagged accordingly?	Yes No <u>N/A</u>	
For any question answered " No ," has the PM been notified and the problem resolved (or paperwork put in their bin)?	<u>Yes</u> No <u>N/A</u>	SLC 11/20/13 SRF Completed by: <u>SLC 11/20/13</u> PM = <u>N/A</u>
Was PEER REVIEW of <i>sample numbering/labeling completed</i> ?	Yes No <u>N/A</u>	Peer Reviewed by: <u>N/A</u>
Additional notes (if applicable): Samples arrived with a temp of -0.8. SLC 11/20/13 No ice was present Run samples; no ice in sample bottles. -JABD- <i>Note to Client: Any "no" circled above indicates non-compliance with standard procedures and may impact data quality.</i>		



SAMPLE RECEIPT FORM FOR TRANSFERS

Note: This form is to be completed by **Anchorage Sample Receiving staff** for all shipments received at SGS-Anchorage from SGS-Fairbanks.

Were samples received numbered with all criteria on Sample Receipt Form F0004 documented by Fairbanks Sample Receiving staff? If "No," <i>Anchorage Sample Receiving staff must complete the receiving process & document pH verification, sample condition, etc. on the SRF initiated by Fairbanks staff</i> (attached).	Yes <input type="radio"/> No <input checked="" type="radio"/> N/A	Use space below for additional notes...
(Empty space for additional notes)		
<p align="center">Review Criteria:</p>	<p align="center">Condition:</p>	<p align="center">Comments/Action Taken:</p>
Were custody seals intact? Note # & location: COC accompanied samples?	Yes <input checked="" type="radio"/> No <input type="radio"/> N/A Yes <input checked="" type="radio"/> No <input type="radio"/> N/A	IF IB
Temperature blank compliant (i.e., 0-6°C after correction factor)? Cooler ID: <u>21</u> @ <u>-0.8</u> w/ Therm.ID: <u>241</u> Cooler ID: <u>52c/11/20/13</u> @ _____ w/ Therm.ID: _____ Cooler ID: _____ @ _____ w/ Therm.ID: _____ Cooler ID: _____ @ _____ w/ Therm.ID: _____ Cooler ID: _____ @ _____ w/ Therm.ID: _____ <i>Note: If non-compliant, use form FS-0029 to document affected samples/analyses.</i> If samples are received <u>without</u> a temperature blank, the "cooler temperature" will be documented in lieu of the temperature blank & "COOLER TEMP" will be noted to the right. In cases where neither a temp blank <u>nor</u> cooler temp can be obtained, note "ambient" or "chilled." If temperature(s) <0°C, were all containers ice free?	Yes <input type="radio"/> No <input checked="" type="radio"/> N/A Yes <input checked="" type="radio"/> No <input type="radio"/> N/A	(Empty space for comments)
Delivery method: <u>Lynden</u> Other:		
Completed by: <u>[Signature]</u>		

<u>Container Id</u>	<u>Preservative</u>	<u>Container Condition</u>	<u>Container Id</u>	<u>Preservative</u>	<u>Container Condition</u>
1138738001-A	No Preservative Required	OK			
1138738002-A	No Preservative Required	OK			
1138738003-A	No Preservative Required	OK			
1138738004-A	No Preservative Required	OK			
1138738005-A	No Preservative Required	OK			
1138738006-A	No Preservative Required	OK			
1138738007-A	No Preservative Required	OK			
1138738008-A	No Preservative Required	OK			
1138738009-A	No Preservative Required	OK			

Container Condition Glossary

OK - The container was received at an acceptable pH for the analysis requested.

PA - The container was received outside of the acceptable pH for the analysis requested. Preservative was added upon receipt and the container is now at the correct pH. See the Sample Receipt Form for details on the amount and lot # of the preservative added.

PH - The container was received outside of the acceptable pH for the analysis requested. Preservative was added upon receipt, but was insufficient to bring the container to the correct pH for the analysis requested. See the Sample Receipt Form for details on the amount and lot # of the preservative added.

BU - The container was received with headspace greater than 6mm.

Lab Report 1138810

LIDAR Tower Surface Mercury Samples

Laboratory Report Follows Data Quality
Review Checklist

Laboratory Data Review Checklist

Completed by:

Title: Date:

CS Report Name: Report Date:

Consultant Firm:

Laboratory Name: Laboratory Report Number:

ADEC File Number: ADEC RecKey Number:

1. Laboratory

- a. Did an ADEC CS approved laboratory receive and perform all of the submitted sample analyses?
Yes No NA (Please explain.) Comments:

- b. If the samples were transferred to another "network" laboratory or sub-contracted to an alternate laboratory, was the laboratory performing the analyses ADEC CS approved?
Yes No **NA** (Please explain.) Comments:

2. Chain of Custody (COC)

- a. COC information completed, signed, and dated (including released/received by)?
Yes No NA (Please explain.) Comments:

- b. Correct analyses requested?
Yes **No** NA (Please explain.) Comments:

3. Laboratory Sample Receipt Documentation

- a. Sample/cooler temperature documented and within range at receipt ($4^{\circ} \pm 2^{\circ} \text{C}$)?
Yes No NA (Please explain.) Comments:

- b. Sample preservation acceptable – acidified waters, Methanol preserved VOC soil (GRO, BTEX, Volatile Chlorinated Solvents, etc.)?
Yes No NA (Please explain.) Comments:

No sample preservation necessary

- c. Sample condition documented – broken, leaking (Methanol), zero headspace (VOC vials)?
Yes No NA (Please explain.) Comments:

- d. If there were any discrepancies, were they documented? For example, incorrect sample containers/preservation, sample temperature outside of acceptable range, insufficient or missing samples, etc.?
Yes No NA (Please explain.) Comments:

None noted

- e. Data quality or usability affected? (Please explain.) Comments:

NA

4. Case Narrative

- a. Present and understandable?
Yes No NA (Please explain.) Comments:

- b. Discrepancies, errors or QC failures identified by the lab?
Yes No NA (Please explain.) Comments:

For all laboratory samples:

1) 2540G - Percent Solids - Sample received and analyzed outside of hold time per client's request.

2) 6020 - Metals - Sample analyzed outside of hold time per client's request.

The samples were collected on December 8, 2013 and hand delivered to the SGS Fairbanks field office on December 20. They were received by the SGS Anchorage lab on December 27, 2013 but not analyzed until January 7, 2014. The lag times were due to holiday schedules and staffing shortages.

- c. Were all corrective actions documented?
Yes No NA (Please explain.) Comments:

None taken

d. What is the effect on data quality/usability according to the case narrative?

Comments:

Case narrative does not specify an effect.

In a follow-up email the lab stated the following:

“*Per the method 6020 for Mercury, we technically have to mark samples as being run past hold time on WO 1138810. However, the samples were run less than 24 hours past hold time. The sample results should not have been significantly different because of that short amount of time.”

NORTECH agrees with this assessment as neither the water (% solids) nor any mercury present are expected to volatilize under refrigeration at the laboratory sample holding location.

5. Samples Results

a. Correct analyses performed/reported as requested on COC?

Yes No NA (Please explain.)

Comments:

b. All applicable holding times met?

Yes No NA (Please explain.)

Comments:

See 4b and 4d above.

c. All soils reported on a dry weight basis?

Yes No NA (Please explain.)

Comments:

d. Are the reported PQLs less than the Cleanup Level or the minimum required detection level for the project?

Yes No NA (Please explain.)

Comments:

e. Data quality or usability affected?

Comments:

No, see discussion above

6. QC Samples

a. Method Blank

i. One method blank reported per matrix, analysis and 20 samples?

Yes No NA (Please explain.)

Comments:

ii. All method blank results less than PQL?

Yes No NA (Please explain.)

Comments:

iii. If above PQL, what samples are affected?

Comments:

iv. Do the affected sample(s) have data flags and if so, are the data flags clearly defined?

Yes No NA (Please explain.)

Comments:

v. Data quality or usability affected? (Please explain.)

Comments:

b. Laboratory Control Sample/Duplicate (LCS/LCSD)

i. Organics – One LCS/LCSD reported per matrix, analysis and 20 samples? (LCS/LCSD required per AK methods, LCS required per SW846)

Yes No NA (Please explain.)

Comments:

ii. Metals/Inorganics – one LCS and one sample duplicate reported per matrix, analysis and 20 samples?

Yes No NA (Please explain.)

Comments:

iii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs, if applicable. (AK Petroleum methods: AK101 60%-120%, AK102 75%-125%, AK103 60%-120%; all other analyses see the laboratory QC pages)

Yes No NA (Please explain.)

Comments:

iv. Precision – All relative percent differences (RPD) reported and less than method or laboratory limits? And project specified DQOs, if applicable. RPD reported from LCS/LCSD, MS/MSD, and or sample/sample duplicate. (AK Petroleum methods 20%; all other analyses see the laboratory QC pages)

Yes No NA (Please explain.)

Comments:

v. If %R or RPD is outside of acceptable limits, what samples are affected?

Comments:

NA

vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

Yes No NA (Please explain.)

Comments:

None affected

vii. Data quality or usability affected? (Use comment box to explain.)

Comments:

NA

c. Surrogates – Organics Only

i. Are surrogate recoveries reported for organic analyses – field, QC and laboratory samples?

Yes No NA (Please explain.)

Comments:

No organics

ii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs, if applicable. (AK Petroleum methods 50-150 %R; all other analyses see the laboratory report pages)

Yes No NA (Please explain.)

Comments:

iii. Do the sample results with failed surrogate recoveries have data flags? If so, are the data flags clearly defined?

Yes No NA (Please explain.)

Comments:

iv. Data quality or usability affected? (Use the comment box to explain.)

Comments:

NA

d. Trip blank – Volatile analyses only (GRO, BTEX, Volatile Chlorinated Solvents, etc.): Water and Soil

i. One trip blank reported per matrix, analysis and for each cooler containing volatile samples? (If not, enter explanation below.)

Yes No NA (Please explain.)

Comments:

No volatile samples, trip blank not needed

- ii. Is the cooler used to transport the trip blank and VOA samples clearly indicated on the COC?
 (If not, a comment explaining why must be entered below)
 Yes No NA (Please explain.) Comments:

See answer to 6d above

- iii. All results less than PQL?
 Yes No NA (Please explain.) For water Comments:

See answer to 6d above

- iv. If above PQL, what samples are affected?
 Comments:

NA

- v. Data quality or usability affected? (Please explain.)
 Comments:

NA

e. Field Duplicate

- i. One field duplicate submitted per matrix, analysis and 10 project samples?
 Yes No NA (Please explain.) Comments:

- ii. Submitted blind to lab?
 Yes No NA (Please explain.) Comments:

- iii. Precision – All relative percent differences (RPD) less than specified DQOs?
 (Recommended: 30% water, 50% soil)

$$\text{RPD (\%)} = \text{Absolute value of: } \frac{(R_1 - R_2)}{((R_1 + R_2)/2)} \times 100$$

Where R_1 = Sample Concentration
 R_2 = Field Duplicate Concentration

- Yes No NA (Please explain.) Comments:

One of the samples not detected at or above the LOQ; used the LOQ for the non-detect sample; RPD acceptable.

iv. Data quality or usability affected? (Use the comment box to explain why or why not.)

Comments:

NA

f. Decontamination or Equipment Blank (If not used explain why).

Yes No NA (Please explain.)

Comments:

Used disposable gloves for sampling

i. All results less than PQL?

Yes No NA (Please explain.)

Comments:

See 6f above

ii. If above PQL, what samples are affected?

Comments:

NA

iii. Data quality or usability affected? (Please explain.)

Comments:

NA

7. Other Data Flags/Qualifiers (ACOE, AFCEE, Lab Specific, etc.)

a. Defined and appropriate?

Yes No NA (Please explain.)

Comments:

None used



Laboratory Report of Analysis

To: Nortech
2400 College Rd
Fairbanks, AK 99709
(907)452-5688

Report Number: **1138810**

Client Project: **HIPAS 08-1091**

Dear Pauline Fusco,

Enclosed are the results of the analytical services performed under the referenced project for the received samples and associated QC as applicable. The samples are certified to meet the requirements of the National Environmental Laboratory Accreditation Conference Standards. Copies of this report and supporting data will be retained in our files for a period of five years in the event they are required for future reference. All results are intended to be used in their entirety and SGS is not responsible for use of less than the complete report. Any samples submitted to our laboratory will be retained for a maximum of fourteen (14) days from the date of this report unless other archiving requirements were included in the quote.

If there are any questions about the report or services performed during this project, please call Jennifer at (907) 562-2343. We will be happy to answer any questions or concerns which you may have.

Thank you for using SGS North America Inc. for your analytical services. We look forward to working with you again on any additional analytical needs.

Sincerely,
SGS North America Inc.

Alaska Division Technical Director

Stephen Ede

2014.01.08

11:24:02 -09'00'

Jennifer Dawkins
Project Manager

Date

Print Date: 01/08/2014 9:28:47AM

SGS North America Inc.

200 West Potter Drive, Anchorage, AK 99518
t 907.562.2343 f 907.561.5301 www.us.sgs.com

Member of SGS Group

Case Narrative

SGS Client: **Nortech**
SGS Project: **1138810**
Project Name/Site: **HIPAS 08-1091**
Project Contact: **Pauline Fusco**

Refer to sample receipt form for information on sample condition.

LID-4 (1138810001) PS

2540G - Percent Solids - Sample received and analyzed outside of hold time per client's request.
6020 - Metals - Sample analyzed outside of hold time per client's request.

LID-5 (1138810002) PS

2540G - Percent Solids - Sample received and analyzed outside of hold time per client's request.
6020 - Metals - Sample analyzed outside of hold time per client's request.

LID-6 (1138810003) PS

2540G - Percent Solids - Sample received and analyzed outside of hold time per client's request.
6020 - Metals - Sample analyzed outside of hold time per client's request.

LID-7 (1138810004) PS

2540G - Percent Solids - Sample received and analyzed outside of hold time per client's request.
6020 - Metals - Sample analyzed outside of hold time per client's request.

LID-40 (1138810005) PS

2540G - Percent Solids - Sample received and analyzed outside of hold time per client's request.
6020 - Metals - Sample analyzed outside of hold time per client's request.

1138810001BND (1195645) BND

6020 - Metals - Sample analyzed outside of hold time per client's request.

1138810001DUP (1195642) DUP

6020 - Metals - Sample analyzed outside of hold time per client's request.

1138810001DUP (1195687) DUP

2540G - Percent Solids - Sample received and analyzed outside of hold time per client's request.

1138810001MS (1195643) MS

6020 - Metals - Sample analyzed outside of hold time per client's request.

1138810001MSD (1195644) MSD

6020 - Metals - Sample analyzed outside of hold time per client's request.

*QC comments may be associated with the field samples found in this report. When applicable, comments will be applied to associated field samples.

Laboratory Qualifiers

Enclosed are the analytical results associated with the above work order. All results are intended to be used in their entirety and SGS is not responsible for use of less than the complete report. If you have any questions regarding this report, or if we can be of any other assistance, please contact your SGS Project Manager at 907-562-2343. All work is provided under SGS general terms and conditions (<http://www.sgs.com/terms_and_conditions.htm>), unless other written agreements have been accepted by both parties.

SGS maintains a formal Quality Assurance/Quality Control (QA/QC) program. A copy of our Quality Assurance Plan (QAP), which outlines this program, is available at your request. The laboratory certification numbers are AK00971 (DW Chemistry & Microbiology) & UST-005 (CS) for ADEC and 2944.01 for DOD ELAP/ISO17025 (RCRA methods: 1020A, 1311, 3010A, 3050B, 3520C, 3550C, 5030B, 5035B, 6020, 7470A, 7471B, 8021B, 8082A, 8260B, 8270D, 8270D-SIM, 9040B, 9045C, 9056A, 9060A, AK101 and AK102/103). Except as specifically noted, all statements and data in this report are in conformance to the provisions set forth by the SGS QAP and, when applicable, other regulatory authorities.

The following descriptors or qualifiers may be found in your report:

*	The analyte has exceeded allowable regulatory or control limits.
!	Surrogate out of control limits.
B	Indicates the analyte is found in a blank associated with the sample.
CCV	Continuing Calibration Verification
CL	Control Limit
D	The analyte concentration is the result of a dilution.
DF	Dilution Factor
DL	Detection Limit (i.e., maximum method detection limit)
E	The analyte result is above the calibrated range.
F	Indicates value that is greater than or equal to the DL
GT	Greater Than
IB	Instrument Blank
ICV	Initial Calibration Verification
J	The quantitation is an estimation.
JL	The analyte was positively identified, but the quantitation is a low estimation.
LCS(D)	Laboratory Control Spike (Duplicate)
LOD	Limit of Detection (i.e., 1/2 of the LOQ)
LOQ	Limit of Quantitation (i.e., reporting or practical quantitation limit)
LT	Less Than
M	A matrix effect was present.
MB	Method Blank
MS(D)	Matrix Spike (Duplicate)
ND	Indicates the analyte is not detected.
Q	QC parameter out of acceptance range.
R	Rejected
RPD	Relative Percent Difference
U	Indicates the analyte was analyzed for but not detected.

Note: Sample summaries which include a result for "Total Solids" have already been adjusted for moisture content. All DRO/RRO analyses are integrated per SOP.

Sample Summary

<u>Client Sample ID</u>	<u>Lab Sample ID</u>	<u>Collected</u>	<u>Received</u>	<u>Matrix</u>
LID-4	1138810001	12/08/2013	12/27/2013	Soil/Solid (dry weight)
LID-5	1138810002	12/08/2013	12/27/2013	Soil/Solid (dry weight)
LID-6	1138810003	12/08/2013	12/27/2013	Soil/Solid (dry weight)
LID-7	1138810004	12/08/2013	12/27/2013	Soil/Solid (dry weight)
LID-40	1138810005	12/08/2013	12/27/2013	Soil/Solid (dry weight)

<u>Method</u>	<u>Method Description</u>
SW6020A	Metals by ICP-MS (S)
SM21 2540G	Percent Solids SM2540G

Print Date: 01/08/2014 9:28:48AM

Detectable Results Summary

Client Sample ID: **LID-4**
Lab Sample ID: 1138810001
Metals by ICP/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Mercury	0.0423	mg/Kg

Results of LID-4

Client Sample ID: **LID-4**
 Client Project ID: **HIPAS 08-1091**
 Lab Sample ID: 1138810001
 Lab Project ID: 1138810

Collection Date: 12/08/13 19:00
 Received Date: 12/27/13 09:00
 Matrix: Soil/Solid (dry weight)
 Solids (%): 91.6
 Location:

Results by Metals by ICP/MS

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Mercury	0.0423	0.0411	0.0123	mg/Kg	10		01/07/14 12:49

Batch Information

Analytical Batch: MMS8400
 Analytical Method: SW6020A
 Analyst: ACF
 Analytical Date/Time: 01/07/14 12:49
 Container ID: 1138810001-A

Prep Batch: MX27393
 Prep Method: SW3050B
 Prep Date/Time: 01/03/14 12:15
 Prep Initial Wt./Vol.: 1.062 g
 Prep Extract Vol: 50 mL

Results of LID-5

Client Sample ID: **LID-5**
 Client Project ID: **HIPAS 08-1091**
 Lab Sample ID: 1138810002
 Lab Project ID: 1138810

Collection Date: 12/08/13 19:10
 Received Date: 12/27/13 09:00
 Matrix: Soil/Solid (dry weight)
 Solids (%): 88.9
 Location:

Results by Metals by ICP/MS

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Mercury	0.0427 U	0.0427	0.0128	mg/Kg	10		01/07/14 13:03

Batch Information

Analytical Batch: MMS8400
 Analytical Method: SW6020A
 Analyst: ACF
 Analytical Date/Time: 01/07/14 13:03
 Container ID: 1138810002-A

Prep Batch: MX27393
 Prep Method: SW3050B
 Prep Date/Time: 01/03/14 12:15
 Prep Initial Wt./Vol.: 1.053 g
 Prep Extract Vol: 50 mL

Results of LID-6

Client Sample ID: **LID-6**
 Client Project ID: **HIPAS 08-1091**
 Lab Sample ID: 1138810003
 Lab Project ID: 1138810

Collection Date: 12/08/13 19:20
 Received Date: 12/27/13 09:00
 Matrix: Soil/Solid (dry weight)
 Solids (%): 94.8
 Location:

Results by Metals by ICP/MS

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Mercury	0.0404 U	0.0404	0.0121	mg/Kg	10		01/07/14 13:05

Batch Information

Analytical Batch: MMS8400
 Analytical Method: SW6020A
 Analyst: ACF
 Analytical Date/Time: 01/07/14 13:05
 Container ID: 1138810003-A

Prep Batch: MX27393
 Prep Method: SW3050B
 Prep Date/Time: 01/03/14 12:15
 Prep Initial Wt./Vol.: 1.044 g
 Prep Extract Vol: 50 mL

Print Date: 01/08/2014 9:28:50AM

Results of LID-7

Client Sample ID: **LID-7**
Client Project ID: **HIPAS 08-1091**
Lab Sample ID: 1138810004
Lab Project ID: 1138810

Collection Date: 12/08/13 19:30
Received Date: 12/27/13 09:00
Matrix: Soil/Solid (dry weight)
Solids (%): 91.3
Location:

Results by Metals by ICP/MS

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Mercury	0.0418 U	0.0418	0.0125	mg/Kg	10		01/07/14 13:22

Batch Information

Analytical Batch: MMS8400
Analytical Method: SW6020A
Analyst: ACF
Analytical Date/Time: 01/07/14 13:22
Container ID: 1138810004-A

Prep Batch: MX27393
Prep Method: SW3050B
Prep Date/Time: 01/03/14 12:15
Prep Initial Wt./Vol.: 1.048 g
Prep Extract Vol: 50 mL

Results of LID-40

Client Sample ID: **LID-40**
 Client Project ID: **HIPAS 08-1091**
 Lab Sample ID: 1138810005
 Lab Project ID: 1138810

Collection Date: 12/08/13 19:40
 Received Date: 12/27/13 09:00
 Matrix: Soil/Solid (dry weight)
 Solids (%): 91.9
 Location:

Results by Metals by ICP/MS

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Mercury	0.0417 U	0.0417	0.0125	mg/Kg	10		01/07/14 13:24

Batch Information

Analytical Batch: MMS8400
 Analytical Method: SW6020A
 Analyst: ACF
 Analytical Date/Time: 01/07/14 13:24
 Container ID: 1138810005-A

Prep Batch: MX27393
 Prep Method: SW3050B
 Prep Date/Time: 01/03/14 12:15
 Prep Initial Wt./Vol.: 1.044 g
 Prep Extract Vol: 50 mL

Print Date: 01/08/2014 9:28:50AM

Method Blank

Blank ID: MB for HBN 1497575 [MXX/27393]
Blank Lab ID: 1195640

Matrix: Soil/Solid (dry weight)

QC for Samples:
1138810001, 1138810002, 1138810003, 1138810004, 1138810005

Results by SW6020A

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Mercury	0.0200U	0.0400	0.0120	mg/Kg

Batch Information

Analytical Batch: MMS8400
Analytical Method: SW6020A
Instrument: Perkin Elmer Sciex ICP-MS P3
Analyst: ACF
Analytical Date/Time: 1/7/2014 12:44:18PM

Prep Batch: MXX27393
Prep Method: SW3050B
Prep Date/Time: 1/3/2014 12:15:00PM
Prep Initial Wt./Vol.: 1 g
Prep Extract Vol: 50 mL

Print Date: 01/08/2014 9:28:51AM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1138810 [MXX27393]

Blank Spike Lab ID: 1195641

Date Analyzed: 01/07/2014 12:46

Matrix: Soil/Solid (dry weight)

QC for Samples: 1138810001, 1138810002, 1138810003, 1138810004, 1138810005

Results by SW6020A

Parameter	Blank Spike (mg/Kg)			CL
	Spike	Result	Rec (%)	
Mercury	0.5	0.532	106	(80-120)

Batch Information

Analytical Batch: **MMS8400**

Analytical Method: **SW6020A**

Instrument: **Perkin Elmer Sciex ICP-MS P3**

Analyst: **ACF**

Prep Batch: **MXX27393**

Prep Method: **SW3050B**

Prep Date/Time: **01/03/2014 12:15**

Spike Init Wt./Vol.: 0.5 mg/Kg Extract Vol: 50 mL

Dupe Init Wt./Vol.: Extract Vol:

Matrix Spike Summary

Original Sample ID: 1138810001
 MS Sample ID: 1195643 MS
 MSD Sample ID: 1195644 MSD

Analysis Date: 01/07/2014 12:49
 Analysis Date: 01/07/2014 12:53
 Analysis Date: 01/07/2014 12:56
 Matrix: Soil/Solid (dry weight)

QC for Samples: 1138810001, 1138810002, 1138810003, 1138810004, 1138810005

Results by SW6020A

Parameter	Sample	Matrix Spike (mg/Kg)			Spike Duplicate (mg/Kg)			CL	RPD (%)	RPD CL
		Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Mercury	0.0423	0.546	0.574	98	0.498	0.535	99	80-120	7.01	(< 20)

Batch Information

Analytical Batch: MMS8400
 Analytical Method: SW6020A
 Instrument: Perkin Elmer Sciex ICP-MS P3
 Analyst: ACF
 Analytical Date/Time: 1/7/2014 12:53:45PM

Prep Batch: MXX27393
 Prep Method: Soils/Solids Digest for Metals by ICP-MS
 Prep Date/Time: 1/3/2014 12:15:00PM
 Prep Initial Wt./Vol.: 1.00g
 Prep Extract Vol: 50.00mL

Method Blank

Blank ID: MB for HBN 1497663 [SPT/9228]

Blank Lab ID: 1195686

QC for Samples:

1138810001, 1138810002, 1138810003, 1138810004, 1138810005

Matrix: Soil/Solid (dry weight)

Results by SM21 2540G

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Total Solids	100			%

Batch Information

Analytical Batch: SPT9228

Analytical Method: SM21 2540G

Instrument:

Analyst: MEV

Analytical Date/Time: 1/3/2014 12:05:00PM

Print Date: 01/08/2014 9:28:53AM

Duplicate Sample Summary

Original Sample ID: 1138810001

Duplicate Sample ID: 1195687

QC for Samples:

1138810001, 1138810002, 1138810003, 1138810004, 1138810005

Analysis Date: 01/03/2014 12:05

Matrix: Soil/Solid (dry weight)

Results by SM21 2540G

<u>NAME</u>	<u>Original ()</u>	<u>Duplicate ()</u>	<u>RPD (%)</u>	<u>RPD CL</u>
Total Solids	91.6	91.0	0.60	15.00

Batch Information

Analytical Batch: SPT9228

Analytical Method: SM21 2540G

Instrument:

Analyst: MEV

Print Date: 01/08/2014 9:28:53AM

1138810



- Locations Nationwide
- Alaska
- Maryland
- New Jersey
- New York
- North Carolina
- Indiana
- West Virginia
- Kentucky

www.us.sgs.com

Instructions: Sections 1 - 5 must be filled out. Omissions may delay the onset of analysis.

Page 1 of 1

CLIENT: <i>NARTECT Pauline Fusco. No Receipt</i> CONTACT: <i>Pauline Fusco</i> PHONE NO: <i>(907) 460-6429</i> PROJECT NAME: <i>HIPAS</i> PWSID/ PERMIT#: <i>OS-1091</i> REPORTS TO: <i>Pauline Fusco</i> E-MAIL: <i>pfusco@nartech.com</i> INVOICE TO: <i>NARTECT Pauline Fusco</i> QUOTE #: <i>OS-1091</i> <i>Pauline Fusco</i> P.O. #: <i>OS-1091</i>		Section 3 # CONTAINERS Type C = COMP G = GRAB M = Multi I = Incremental S = Soils		Section 4 DOD Project? Yes/No Cooler ID: Requested Turnaround Time and/or Special Instructions: <i>DATA TOTAL PROJECT DUE ON JAN 5TH</i>		Data Deliverable Requirements: Chain of Custody Seal: (Circle) INTACT <input checked="" type="radio"/> BROKEN <input type="radio"/> ABSENT <input type="radio"/> Temp Blank °C: <i>1.9</i> or Ambient [] (See attached Sample Receipt Form) (See attached Sample Receipt Form)	
Section 2 RESERVED for lab use SAMPLE IDENTIFICATION DATE mm/dd/yy TIME HH:MM MATRIX/ MATRIX CODE RECEIVED By:		Section 5 Relinquished By: (1) Relinquished By: (2) Relinquished By: (3) Relinquished By: (4)		Section 1 Section 2 Section 3 Section 4 Section 5		REMARKS/ LOC ID	
① A L10-4 12/8/13 1910 S <i>17-2013</i> ② A L10-5 1910 <i>17-2013</i> ③ A L10-6 1930 <i>17-2013</i> ④ A L10-7 1930 <i>17-2013</i> ⑤ A L10-40 1940 <i>17-2013</i>		Received By: <i>Pauline Fusco</i> Received By: <i>Pauline Fusco</i> Received By: <i>Pauline Fusco</i> Received For Laboratory By: <i>Pauline Fusco</i>		X 6209 6209 6209 6209 6209		X X X X X	

<u>Container Id</u>	<u>Preservative</u>	<u>Container Condition</u>	<u>Container Id</u>	<u>Preservative</u>	<u>Container Condition</u>
1138810001-A	No Preservative Required	OK			
1138810002-A	No Preservative Required	OK			
1138810003-A	No Preservative Required	OK			
1138810004-A	No Preservative Required	OK			
1138810005-A	No Preservative Required	OK			

Container Condition Glossary

OK - The container was received at an acceptable pH for the analysis requested.

PA - The container was received outside of the acceptable pH for the analysis requested. Preservative was added upon receipt and the container is now at the correct pH. See the Sample Receipt Form for details on the amount and lot # of the preservative added.

PH - The container was received outside of the acceptable pH for the analysis requested. Preservative was added upon receipt, but was insufficient to bring the container to the correct pH for the analysis requested. See the Sample Receipt Form for details on the amount and lot # of the preservative added.

BU - The container was received with headspace greater than 6mm.

Lab Report 9564108

LIDAR Tower Mercury Soil Gas Samples

Laboratory Report Follows Data Quality
Review Checklist

Contaminated Sites Program
Spill Prevention and Response Division
Alaska Department of Environmental Conservation

Laboratory Data Review Checklist for Air Samples

Completed by:

Title: Date:

CS Report Name: Report Date:

Consultant Firm:

Laboratory Name: Laboratory Report Number:

DEC File Number: DEC Haz ID:

1. Laboratory

- a. Did a NELAP-certified laboratory receive and perform all of the submitted sample analyses?
Yes No N/A (Please explain.)

Comments:

- b. If the samples were transferred to another "network" laboratory or sub-contracted to an alternate laboratory, was the laboratory performing the analyses NELAP-approved?
Yes No N/A (Please explain.)

Comments:

2. Chain of Custody (COC)

- a. Was the COC information completed, signed and dated (including released/received by)?
Yes No N/A (Please explain.)

Comments:

- b. Was the correct analyses requested?
Yes No N/A (Please explain.)

Comments:

3. Laboratory Sample Receipt Documentation

- a. Was the sample condition documented? Were samples collected in gas-tight, opaque/dark Summa canisters or other DEC-approved containers? Was the canister vacuum/pressure checked, recorded upon receipt and were there no open valves?

Yes No N/A (Please explain.)

Comments:

Sample condition checked "ok".

- b. If there were any discrepancies, were they documented? Examples include incorrect sample containers/preservation, sample temperature outside of acceptable range, insufficient or missing samples, canister not holding a vacuum, etc.

Yes No N/A (Please explain.)

Comments:

No discrepancies.

- c. Was the data quality or usability affected? (Please explain.)

Comments:

4. Case Narrative

- a. Is there a case narrative and is it understandable?

Yes **No** N/A (Please explain.)

Comments:

No case narrative noted. The lab stated they do not perform a case narrative for reports.

- b. Were there any discrepancies, errors or QC failures identified by the lab?

Yes **No** N/A (Please explain.)

Comments:

- c. Were all corrective actions documented?

Yes No **N/A** (Please explain.)

Comments:

None noted

- d. What is the effect on data quality/usability according to the case narrative?

Comments:

See 4a above.

5. Samples Results

a. Was the correct analyses performed/reported as requested on COC?

Yes No N/A (Please explain.)

Comments:

b. Were the samples analyzed within 30 days of collection or within the time required by the method?

Yes No N/A (Please explain.)

Comments:

c. Are the reported PQLs less than the Target Screening Level or the minimum required detection level for the project?

Yes No N/A (Please explain.)

Comments:

d. Was the data quality or usability affected?

Comments:

6. QC Samples

a. Method Blank

i. Was one method blank reported per analysis and 20 samples?

Yes No N/A (Please explain.)

Comments:

ii. Were all method blank results less than PQL?

Yes No N/A (Please explain.)

Comments:

iii. If above PQL, what samples are affected?

Comments:

- iv. Do the affected sample(s) have data flags and, if so, are the data flags clearly defined?
Yes No N/A (Please explain.)

Comments:

NA

- v. Was the data quality or usability affected? (Please explain.)

Comments:

NA

b. Laboratory Control Sample/Duplicate (LCS/LCSD)

- i. Was there one LCS/LCSD or one LCS and a sample/sample duplicate pair reported per analysis and 20 samples?
Yes No N/A (Please explain.)

Comments:

- ii. Accuracy – Were all percent recoveries (%R) reported and within method or laboratory limits? What were the project specified DQOs, if applicable?
Yes No N/A (Please explain.)

Comments:

None included

- iii. Precision – Were all relative percent differences (RPD) reported and were they less than method or laboratory limits? What were the project-specified DQOs, if applicable.
Yes No N/A (Please explain.)

Comments:

None included

- iv. If the %R or RPD is outside of acceptable limits, what samples are affected?

Comments:

NA

- v. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?
Yes No N/A (Please explain.)

Comments:

None included

vi. Is the data quality or usability affected? (Please explain.)

Comments:

NA

c. Surrogates

i. Are surrogate recoveries reported for field, QC and laboratory samples?

Yes No N/A (Please explain.)

Comments:

No surrogates for mercury.

ii. Accuracy – Are all percent recoveries (%R) reported and within method or laboratory limits?
What were the project-specified DQOs, if applicable?

Yes No N/A (Please explain.)

Comments:

See above

iii. Do the sample results with failed surrogate recoveries have data flags? If so, are the data flags clearly defined?

Yes No N/A (Please explain.)

Comments:

See above

iv. Was the data quality or usability affected? (Please explain.)

Comments:

NA

d. Field Duplicate

i. Was one field duplicate submitted per analysis and 10 type (soil gas, indoor air, etc.) samples?

Yes No N/A (Please explain.)

Comments:

ii. Were they or was it submitted blind to the lab?

Yes No N/A (Please explain.)

Comments:

- iii. Precision – Were all relative percent differences (RPD) less than the specified DQOs?
(Recommended: 25 %)

$$\text{RPD (\%)} = \text{Absolute value of: } \frac{(R_1 - R_2)}{((R_1 + R_2)/2)} \times 100$$

Where R_1 = Sample Concentration
 R_2 = Field Duplicate Concentration

Yes **No** **N/A (Please explain.)**

Comments:

Both were not detected at the limit of quantitation

- iv. Was the data quality or usability affected? (Please explain.)

Comments:

NA

- e. Field Blank (If not used, explain why.)

Yes **No** **N/A (Please explain.)**

Comments:

- i. Were all results less than the PQL?

Yes **No** **N/A (Please explain.)**

Comments:

- ii. If above PQL, what samples are affected?

Comments:

NA

- iii. Was the data quality or usability affected? (Please explain.)

Comments:

NA

7. Other Data Flags/Qualifiers

- a. Were other data flags/qualifiers defined and appropriate?

Yes **No** **N/A (Please explain.)**

Comments:

No data flags noted.

Analytical Laboratory Report

January 10, 2014

Report ID: 9564932

PAULINE FUSCO
NORTECH ENVIRONMENTAL
2400 COLLEGE RD
FAIRBANKS AK 99709

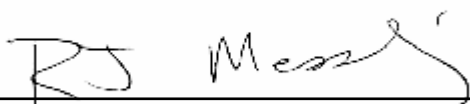
Company Number: 31547

PROJ HIPAS 08-1091

PO #08-1091

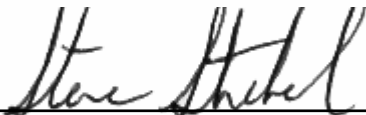
Date Collected: 11/22/2013
Date Received: 12/5/2013
Date of Analysis: 12/12/2013
Original Report Date: 12/13/2013
Date Revised: 1/10/2014
Original Report ID: 9564108

Analyst:



RUSSELL MESSLING, Analyst
messlirj@mail.slh.wisc.edu

Reviewer:



STEVE STREBEL, WOHL Director
ss@mail.slh.wisc.edu

WOHL uses only verified, secured electronic signatures on reports.

These signatures are as valid as original handwritten signatures.

If you have any questions regarding this report please feel free to contact the laboratory via email (as listed above) or via telephone at 800-446-0403

Analytical Results

LAB NUMBER FIELD NUMBER	DESCRIPTION			AIR VOLUME
1610814	MERCURY			4.2 liters
13-21				
Mercury, Particulate		<10 ng/sample	<2.4 µg/m ³	
Mercury, Vapor		<10 ng/sample	<2.4 µg/m ³	
1610815	MERCURY			4.2 liters
13-21D				
Mercury, Particulate		<10 ng/sample	<2.4 µg/m ³	
Mercury, Vapor		<10 ng/sample	<2.4 µg/m ³	
1610816	MERCURY			4.62 liters
12.5-16.5				
Mercury, Particulate		<10 ng/sample	<2.2 µg/m ³	
Mercury, Vapor		<10 ng/sample	<2.2 µg/m ³	
1610817	MERCURY			
BLANK				
Mercury, Particulate		<10 ng/sample		
Mercury, Vapor		<10 ng/sample		

Displayed values on report have been rounded; however all calculations are performed using raw, unrounded intermediate results. Please contact the laboratory if you have any questions regarding our result calculation or rounding. All samples were received by the laboratory in acceptable condition unless otherwise noted.

< : Less Than. The analyte, if present, is at a level too low to be accurately quantitated by the method used.
The actual amount is less than the reported value.

Analytical Methodology

FIMS MERCURY SKC CARULITE BADGE OR TUBE RESULTS:

Samples were analyzed by WOHL in-house method EHD METALS METHOD 007.1 rev.0 based on NIOSH 6009.

Samples are collected using dosimeter badges or glass tubes filled with carulite or hopcolite. The badges are opened and the sorbent material is placed into a digestion tube. For the carulite or hopcolite tubes, the spun glass is placed in a separate digestion vessel from the sorbent material. The spun glass result is from particulate mercury only. The sorbent material result is from vapor mercury only. Appropriate amounts of concentrated acids are added and the samples are left at room temperature for one hour. An aliquot of the sample is analyzed for Mercury by Atomic Absorption Cold Vapor Spectroscopy using a flow injection system.

The results are expressed as micrograms per cubic meter of air if the air collection volume was provided; otherwise, as nanograms per sample. Results are not blank corrected.

REPORTING LIMITS:

This table contains the WOHL determined reporting limits for the compounds specified in this report.

<u>Analyte</u>	<u>Reporting Limit</u>
Mercury, Particulate on MERCURY	10 ng/sample
Mercury, Particulate on MERCURY	10 ng/sample
Mercury, Vapor on MERCURY	10 ng/sample
Mercury, Vapor on MERCURY	10 ng/sample

Analytical Quality Control

Laboratory prepared quality control (QC) samples were analyzed along with the samples included in the analytical report. The analysis results for these QC samples are listed below.

Instrument Used for Analysis: Perkin Elmer FIMS

Laboratory Control Sample: 154755

QC Sample Media: Carulite (hydrar)

<u>Analyte</u>	<u>Target Value</u>	<u>Recovery (%)</u>	<u>Acceptable Recovery (%)</u>	<u>Pass/Fail</u>
Mercury by FIMS	12.09 µg/sample	103.8	76 - 124	PASS

Laboratory Control Sample: 154756

QC Sample Media: Carulite (hydrar)

<u>Analyte</u>	<u>Target Value</u>	<u>Recovery (%)</u>	<u>Acceptable Recovery (%)</u>	<u>Pass/Fail</u>
Mercury by FIMS	18.14 µg/sample	102.4	76 - 124	PASS

The acceptable range for an analyte is based on the standard deviation of each analyte, which has been determined from statistical evaluation of the historical performance of the assay. The acceptable range includes up to 3 standard deviations, so a result within 3 standard deviations is considered to have passed the QC requirements. A result outside of the acceptable range is considered to have failed QC and may indicate the direction of possible bias for the samples included in the analytical report. The analytes used for QC determination will not always be the same analytes that appear in the samples for the report, however they are representative of the compounds found in the samples and indicative of overall assay performance.

End of Analytical Report

The results in this report apply only to the samples, specifically listed above, tested at the
Wisconsin Occupational Health Laboratory,
2601 Agriculture Drive,
Madison WI 53718
608-224-6210.

This report is not to be reproduced except in full.

WISCONSIN OCCUPATIONAL HEALTH LABORATORY (WOHL) SAMPLE SUBMISSION FORM

Form 4109

Bill To NIRTECH

2400 College Rd
Fairbanks, Alaska 99709

WOHL COMP # 315479

Phone # (907) 452-5688
FAX # (907) 452-5694

Send Results To ATTN: Pauline Fusco

(907) 460-6429
pfusco@nortechengr.com

Project HIPAS 08-1091

Email Address pfusco@nortechengr.com

SPECIAL INSTRUCTIONS

P.O. # 08-1091

Date Sampled 11/22/2013

Turnaround: RUSH PRIORITY NORMAL
{ Must be prearranged }

PLEASE GROUP SAMPLES BY MEDIA USED AND ANALYSIS REQUESTED.

CUSTOMER FIELD #	LAB USE ONLY		SAMPLE MEDIA	WIPE SAMPLES		FOR AIR SAMPLES ONLY					ANALYSIS REQUEST
	WOHL SAMPLE #			SIZE OF AREA WIPED EX: 2 IN x 2 IN	TIME ON	TIME OFF	TOTAL TIME (MINS)	FLOW RATE (L/MIN)	VOLUME (LITERS)		
13-21	1610814					1430	1510	40	0.105	4.2	H910
13-21D	1610815					1430	1510	40	0.105	4.2	H910
12.5-18	1610816					1625	1647	22	0.210	4.62	NIOSH 6009
Blowby	1610817										

CHAIN OF CUSTODY: Relinquished Pauline Fusco Date 11/26/13 Received [Signature] **DEC 5 2013**

UPS, Fed-Ex & Other Shippers
 Wisconsin Occupational Health Lab
 2601 Agriculture Drive
 Madison, WI 53718

US Postal Service
 Wisconsin Occupational Health Lab
 PO Box 7996
 Madison, WI 53707-7996

Phone (608) 224-6210
Fax (608) 224-6213

Sampling Questions
 WOHL.sampling@mail.slh.wisc.edu
Web Page/Order Media
<http://www.slh.wisc.edu/wohl>

SAMPLE CONDITION OK NOT OK
 See Sample Receipt Record

Attachment 6

Peter Beardsley

From: Fish, James T (DEC) <james.fish@alaska.gov>
Sent: Friday, October 04, 2013 1:30 PM
To: Peter Beardsley
Subject: RE: HIPAS

Peter,

DEC approves this work plan for additional limited site assessment work at the HIPAS facility, with following conditions:

- 1) At the PCB sampling locations, please use composite sampling by collecting more than one soil sample at each sampling location. This is the preferred Toxic Substances Control Act (TSCA) method of sampling for PCBs. Additionally, please collect samples for PCB analysis down to 2-feet below ground surface (bgs), and not just 1-foot bgs.
- 2) Please include the staging area used to store transformers for disposal (clearing south of the Lidar building) as an additional PCB sampling location.
- 3) Please follow DEC's Vapor intrusion Guidance for collecting soil gas data, i.e., :
 - a. Allow for sufficient equilibration after soil gas probe installation
 - b. Ensure soil gas samples are collected from depths greater than 18 inches below ground surface to avoid dilution of samples with ambient air.
 - c. Conduct a shut-in test to check for leaks in the above-ground fittings.
 - d. Include tracer leak detection.
 - e. Minimize purge volumes and sample flow rates during sampling.

DEC acknowledges that if more PCBs are indeed found, or mercury exceeds the screening level, additional site assessment and/or cleanup may be necessary. However, if the data collected from the proposed work plan suggests additional assessment or cleanup is not necessary, DEC will work to close the site with the proposed NEC in the property records.

Let me know if you have any questions.

Jim

From: Peter Beardsley [mailto:peter@nortechengr.com]
Sent: Thursday, September 19, 2013 6:20 AM
To: Fish, James T (DEC)
Subject: HIPAS

Jim-

Please give me a call about HIPAS when you get in. I attached our proposed work plan, but UCLA would like some conceptual feedback on the process before you do your review.

Thanks
Peter

Peter Beardsley, PE

Principal, Fairbanks Technical Manager

NORTECH *Environment, Energy, Health & Safety*

2400 College Road, Fairbanks, AK 99709

907-452-5688 Ext 222, 907-452-5694 - fax

peter@nortechengr.com

<http://www.nortechengr.com/>

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Juneau: 5438 Shaune Dr., Ste B, 99801 907.586.6813 Fax: 586.6819
info@nortechengr.com www.nortechengr.com

August 30, 2013

University of California, Los Angeles
RE Asset Management Department
10920 Wilshire Boulevard, Suite 815
Los Angeles, CA 90024

Sent via email to:

Loreilly-Rosenblatt@re.ucla.edu

ATTN: Loana O'Reilly-Rosenblatt, Director, UCLA Asset Management

**RE: 2013 Proposed Work Plan and Cost Estimate
Former HIPAS Observatory, Fairbanks (Two Rivers), Alaska**

Loana:

NORTECH is pleased to present University of California, Los Angeles (UCLA) with this proposed Work Plan (WP), and cost estimate for environmental services at the former High Power Aurora Stimulation (HIPAS) Observatory near Fairbanks, Alaska (the Site). The proposed WP is based ongoing negotiations with the Alaska Department of Environmental Conservation (ADEC) for unconditional closure of the former HIPAS site.

ADEC reviewed the March 5, 2013 Site Characterization, Corrective Action and Decommissioning Report (2013 Report) and held a June 21, 2013 meeting with **NORTECH**, UCLA and landowner University of Alaska (UA) to discuss report results and the potential for future environmental concerns. On July 24, 2013, ADEC verbally requested additional site data from three areas to confirm the absence of polychlorinated biphenyls (PCBs), mercury and/or semi-volatile organic compounds (SVOCs).

This proposed WP summarizes characterization and corrective action activities detailed in the 2013 Report and provides details about the tasks requested by ADEC. The tasks are additional specific assessment items discussed by ADEC on July 24, 2013 that will achieve the June 21, 2013 objective of "unrestricted land use" for the property. The specific issues are:

- Testing the leachfield for SVOCs and PCBs at the interface between the leach rock and native soil
- Testing former "back doorway" areas for PCBs in the top few inches of soil
- Testing around the former LIDAR Tower for mercury in the top few inches of soil
- Completing a risk analysis of mercury exposure at the former LIDAR Tower related to potential vapor intrusion in the event of future residential or agricultural activity

This proposal provides a brief summary of the site conditions and details the final activities requested by ADEC.





BACKGROUND

The former HIPAS Observatory is located on approximately 130 acres about 25 miles east of Fairbanks in Two Rivers, Alaska. Initial Site development occurred in the 1960s as Chena Valley Radio. This was operated by the University of Alaska, Fairbanks (UAF) Geophysical Institute (GI) and included several structures, the main road, and several groups of antennas. HIPAS began operation as a joint venture of the UAF GI and UCLA in the early 1980s. UCLA leased the Site in 1985 and HIPAS expanded to approximately 10 primary structures and more than a dozen antennas performing a variety of grant-funded research related to energy in the atmosphere. Research funding for HIPAS was decreasing by 2006 and final research was completed in October 2008.

UA Land Management provided UCLA with requirements for lease termination in 2008. With the HIPAS closure, UCLA began facilitating lease termination. A Phase I Environmental Site Assessment (ESA) in late 2008 confirmed potential environmental concerns. Most drums and other containerized waste materials were disposed in 2009. UCLA completed an inventory of physical assets in 2009 and conducted auctions to dispose of most structures, antennas, research equipment, and scrap materials in 2010 and 2011.

Following the 2010 auction, a detailed site-wide environmental characterization was undertaken. This included identification, delineation, and corrective action at multiple areas with potential petroleum contamination and collection and disposal of potential hazardous wastes. This also included cleaning and disposal of mercury-contaminated items related to the Liquid Mirror Telescope (LMT) in the LIDAR Tower. The results were incorporated into the 2010 conceptual decommissioning and closure plan. This document was provided to UA and ADEC and the feedback was incorporated into the final decommissioning plan.

The final decommissioning of the facility was completed in 2012. This involved collection and removal of remaining visible surface debris, including the few remaining capacitors and transformers. The former drinking water wells and wastewater disposal systems were decommissioned. Environmental cleanup included remediation of petroleum contaminated soil from multiple areas and remediation of mercury contaminated soil from the former LIDAR Tower. Laboratory testing confirmed corrective actions resulted in clean closure using ADEC Method 2 cleanup levels at each location. The only Site features remaining are gravel pads, several building foundations, and some buried utilities.

ADEC reviewed the site assessment report and provided feedback in a meeting on June 21, 2013. ADEC indicated that they concurred that the site cleanup activities were adequate to address the petroleum related concerns. ADEC was comfortable using the existing data to close the site with a commercial/industrial designation, but not for unrestricted future use that might include potential residential or agricultural use. UCLA and UA agreed that unrestricted land use was needed and requested that ADEC



identify specific assessment activities that could be completed to achieve this goal. After further discussions, ADEC indicated the specific additional concerns were related to PCBs in the leachfields left in place, potential PCB soil contamination associated with inappropriate disposal near backdoors of this type of facility, and potential mercury exposure under a residential scenario at the former LIDAR Tower location.

SCOPE OF WORK

The purpose of the proposed scope of work (SOW) is to address the specific ADEC concerns of potential exposure to mercury or PCB contamination during future residential or agricultural scenarios at the Site. ADEC indicated that satisfactorily addressing the concerns identified above would facilitate issuing site closure with unrestricted land use. This SOW has been grouped into five tasks:

- Task 1 Work Plan and ADEC Coordination
- Task 2 Testing the leachfields for SVOCs and PCBs
- Task 3 Testing former doorway areas for PCBs
- Task 4 LIDAR Tower Testing
 - Testing the surface around the former LIDAR Tower for total mercury
 - Completing a soil gas survey around the former LIDAR Tower
 - Evaluate the future vapor intrusion risk to residential development
 - Discuss the risk associated potential agricultural activity
- Task 5 Reporting

An initial site inspection will be completed before field activities begin to identify and flag former building locations and associated leach fields. Landmarks identified from previous work will be used with measurements and photos to identify areas outlined in this work plan for further investigation. The three field tasks (2 through 4) are to be completed by the end of the 2013 field season (mid-October). Task 5 is contingent on the fieldwork schedule, but is estimated 2-3 months after fieldwork completion.

Task 1 – Work Plan and ADEC Coordination

This task includes preparing and submitting this work plan to ADEC for approval. Since this work is at the direct request of ADEC, ADEC comments are expected to be minimal. After receiving ADEC comments, **NORTECH** will respond and initiate the field Tasks 2 through 5 discussed below.

Task 2: Testing Leachfields for SVOC and PCB Contamination

Five wastewater disposal systems were originally identified during the site assessment and initial site characterization phases. The systems were at the 1) Generator building, 2) Transmitter building, 3) LIDAR Building, 4) Bunkhouse and 5) ATCO unit. The 2013 Report stated there were four septic tanks and the fifth location, near the ATCO, was a buried wooden crib without a septic tank; but Figure 10 of that report incorrectly indicated a tank was present. The actual number of septic tanks removed and potential



leachfields remaining is three, not four because the Bunkhouse and LIDAR building shared a tank as correctly shown on the drawing and the ATCO did not have a tank or leach field.

The 2013 Report noted no sludge was found in any tank. Liquids were sampled for metals in two septic tanks, the third had no liquids. Liquids appeared consistent with human waste with no chemical or petroleum evidence and results were below cleanup levels or within the accepted background levels for metals in the Fairbanks area. In September 2012, the three septic tanks were exposed, pumped empty, and removed. These locations were backfilled with pit-run fill. At the ATCO system, no evidence of human waste or other use was present on the soil surface within the crib, suggesting the crib had never been connected to a building. The crib structure was removed and lime spread on the ground surface and as a precaution. After a few days, this location was backfilled with the excavated material and pit-run gravel.

To assess the leachfields, **NORTECH** proposes to subcontract GeoTek Alaska (GTA), to complete one direct push soil boring at each leachfield associated with the three former tanks:

- Between the former Bunkhouse and LIDAR building
- West of the Generator building
- Southeast of the former Transmitter building.

The specific locations are shown on Figure 10 from the 2013 Report. During soil boring advancement, continuous soil cores will be collected in five-foot intervals from the ground surface, through the top of the leachfield (assumed at approximately five feet below ground surface (bgs), and to the leachfield/native soil interface encountered (assumed between 10 and 15 feet bgs). Visual and olfactory inspections and photoionization detector (PID) field screening of soil cores will be done to evaluate petroleum impacts. Up to two field screening samples will be collected per five-foot interval and one soil sample and a field duplicate will be collected for laboratory analysis at the leach field/native soil interface zone.

A total of four soil samples (three primary and one field duplicate) will be collected for:

- SVOC by Environmental Protection Agency (EPA) Method 8270C (PAH SIMS)
- PCBs by EPA Method 8082A

Quality assurance and quality control (QA/QC) duplicates and trip blanks will be collected in accordance with the May 2010 ADEC Draft Field Sampling Guide. Samples will be submitted to SGS North America, Inc. (SGS) laboratory for analysis.





Task 3: Testing Former Doorway Areas Transformer Locations for PCBs

During decommissioning, PCBs were suspected contaminants of concern due to the quantity of electrical equipment present at the research facility. Hundreds of sealed capacitors (the total exceeded 8,000 pounds) were assumed to have PCBs because a “non-PCB” label was not present. Items with a “non-PCB” marking were assumed PCB free and disposed. No leaking capacitors were observed during packaging. All sealed units were disposed of by Emerald Alaska based on the labelling and no laboratory samples were collected from these sealed units.

Analytical results from dielectric oil present at the site (located in drums and custom electric gear) and six individual, larger, refillable transformers indicated only three transformers contained PCBs with concentrations less than 25.3 parts per million (ppm). All oil was disposed of by Emerald Alaska. Four transformer storage locations shows no evidence of contamination, but stained soil was observed at two other locations with abandoned transformers near the LIDAR Garage and Boneyard. Excavated petroleum contaminated soil at transformer release locations did not contain PCBs.

Based on the presence of PCBs in some of the transformer oil, ADEC expressed concern that PCB containing oil may have been disposed of inappropriately by former maintenance workers fixing or replacing transformers and/or capacitors. The most common inappropriate disposal practices include dumping oil down the drain into the wastewater disposal system, dumping on the ground at external transformer installations, and dumping it out the backdoor of a shop for internal transformer installation. Task 2, above, will address the wastewater disposal system. This task addresses the backdoor and transformer installation locations.

To confirm the absence of soil contaminated PCBs at common inappropriate oil disposal locations, **NORTECH** proposes to collect soil samples by hand digging to approximately one foot bgs at the six locations listed below and shown on Figure 13 from the 2013 Report. A visual and olfactory inspection will be completed to identify any specific areas of concern, but no field screening will be undertaken.

Backdoors (one sample at each location):

- LIDAR Building
- LIDAR Garage
- Transmitter Building
- Generator Building
- Boneyard Trailers/Containers

The perimeter of the Switch/Transformer Pad located on west of Transmitter Building (two samples).





The seven soil samples will be tested for:

- PCBs by EPA Method 8082A

The samples will be collected and submitted to SGS on the same chain of custody as the leachfield samples. No additional field duplicates or additional specific QA/QC are expected.

Task 4: LIDAR Tower Testing

The LIDAR Tower had a mercury vapor monitoring system, and was sealed and isolated from the laser control room and northern portion(s) of the building. During the 2008 ESA I inspection, the monitoring system was not operational and the LMT room was locked and sealed. In 2009, elemental mercury, dyes, and other liquid materials inside the LIDAR Tower were characterized and disposed. In 2010, **NORTECH** completed LIDAR Tower assessment and cleaning. The Tower was mechanically demolished in December 2011 and disposed at the FNSB Landfill. The building floor was a poured "mono-slab" with a concrete thickness ranging from 18-24 inches. A hydraulic hammer was needed to break the concrete for disposal. Following building demolition, the soil beneath the footprint was assessed visually and more than 15 samples were field screened using a mercury vapor analyzer in December 2011. Five laboratory samples showed mercury above the ADEC mercury cleanup level of 1.4 mg/kg below the edge of remaining LIDAR Building slab and a crack in the slab near the southeast corner.

In May 2012, a site inspection identified dust and rubble from the hydraulic hammering remaining on the ground surface within the building footprint as a potential mercury source in soil. Site characterization samples were collected in July 2012 from below the visible surface debris to confirm the December 2011 sampling. These results confirmed the dust and debris contained mercury and also suggested mercury had penetrated a few inches into the soil beneath the cracks and joints in the concrete.

In August 2012, the concrete dust and debris and soil beneath the expansion joints and cracks were hand excavated to allow assessment of deeper soils. Mercury headspace field screening with the vapor analyzer was conducted of the post excavation surface with results indicating detectable mercury vapor concentrations were lower but remained at several locations. Suspect soil was removed until no mercury vapors were detected and six samples (including one field duplicate) were collected to characterize the remaining soil surface. Mercury was detected below the ADEC mercury cleanup level of 1.4 mg/kg. In addition, visual inspection and three laboratory samples were collected around the exterior of the building footprint to verify demolition dust had not impacted those areas. No mercury was detected, confirming mercury contamination was limited to beneath the building footprint.



Following review of this data, ADEC expressed concern that the existing three exterior soil samples were not adequate to characterize the area of concern outside the former building footprint. In addition, the remaining mercury concentrations were below the ADEC soil cleanup level, but the presence of mercury above background required additional assessment to verify the remaining mercury is not expected to pose a potential risk to future inhabitants under future residential or agricultural use scenarios. To address these concerns, **NORTECH** has divided Task 4 into the following subtasks:

- Testing the surface soils for mercury
- Completing a mercury soil gas survey
- LIDAR Tower Risk Analysis
 - Vapor intrusion risk quantification for residential use
 - Discussion of agricultural use risk factors

Former LIDAR Tower Surface Soil Testing

Figure 9 from the 2013 Report showed the locations of the 2012 closure samples on the building exterior within the former building footprint. This data has been reproduced in the attached Figure 3, which also shows the three locations **NORTECH** proposes to collect additional surface samples to confirm mercury is not present outside the former building footprint. **NORTECH** also proposes to sample a fourth location as a background soil sample where shown on Figure 3. The surface samples will be collected from two to six inches below the existing ground surface using clean hand tools. A total of five samples (the four locations and a field duplicate) will be analyzed by:

- Total Mercury by EPA Method SW7471B.

QA/QC duplicates and trip blanks will be collected in accordance with the May 2010 ADEC Draft Field Sampling Guide. Samples will be submitted to SGS for analysis.

Former LIDAR Tower Soil Gas Survey for Mercury

To evaluate a future risk to the indoor air of a residence from subsurface mercury vapor intrusion, **NORTECH** proposes to complete a soil gas survey using a mercury vapor analyzer with follow-up laboratory sampling to confirm the vapor analyzer results. **NORTECH** proposes to use a Jerome 431X Analyzer to measure mercury to the sensitivity of 0.003 mg/m³ Hg. This is the mercury vapor intrusion screening level as stated in the Environmental Protection Agency (EPA) Vapor Intrusion Screening Level (VISL) Assessment Calculator presented in the attached Table 1. The Jerome 431X uses a gold film sensor which is inherently stable and selective to mercury. The instrument is approved by EPA to clear living spaces and other interior spaces following a mercury release. The brochure for the instrument is attached with relevant sections highlighted.



NORTECH proposes to measure mercury soil gas at the former LIDAR Tower at six locations within the former LIDAR Tower footprint and a seventh control point outside the building footprint. This will be completed using typical soil gas monitoring methodology. The locations are shown on Figure 3 and will be installed using the following techniques:

- Hand auger to appropriate depth
- Insert tygon type plastic tubing into the auger hole
- Backfill the first (bottom) six inches with sand
- Plug the remainder of the hole with hydrating bentonite

Once sampling ports are installed, the instrument will be connected to tubing and readings will be taken for 60 seconds. The readings on the digital display will be recorded at approximately 5 second intervals and any specific spikes or dips will also be noted. After reading all six locations, the two locations with the highest measured results will be identified for confirmation with laboratory air samples. In the event all soil gas readings are below the detection limit, the ports at the two highest total mercury concentrations from the 2012 close samples will be selected for laboratory air samples. The laboratory air samples will be collected on sorbent trap tubes and analyzed by Frontier Global Sciences laboratory in Washington using US EPA Method 30B.

Vapor Intrusion Risk Quantification for Residential Use

As shown in the attached table, the EPA Vapor Intrusion Screening Level (VISL) for mercury is 0.003 mg/m³. This is the lower limit of the Jerome 431X, so a non-detect on this instrument is commonly used to indicate that air in a given space is acceptable. This field data will be supported by laboratory data that will be compared to the same criteria. If both laboratory results confirm the soil gas concentrations are below 0.003 mg/m³, the site will be considered suitable for future residential use.

In the event the laboratory results exceed this level, additional assessment may be necessary to further evaluate the risk associated with this pathway. The need for additional remediation or land use restrictions will also be evaluated at this time.

Discussion of Agricultural Risk Factors

Based on a quick review of chemistry data and other literature, **NORTECH** and ADEC both believe the potential for residential vapor intrusion represents the most significant future risk at the site. However, the location and size of the overall property suggest that agricultural uses could reasonably be expected on the parcel, including the former LIDAR Tower. Under this subtask, **NORTECH** will complete additional literature review and provide documentation related to the existing data (including both soil and soil gas data) and the relationship between this data and the potential risk associated with agricultural use of the property. The rationale for this will be documented and made using published documents, data from other sites, and professional judgment.





Task 5: Reporting

NORTECH will prepare an Addendum to the January 2013 Report that will include a description of Task field activities, drawings showing field screening and laboratory sampling locations, summaries of laboratory results, copies of all laboratory reports, and laboratory data review checklists. A Report will be provided to UCLA and ADEC after field work completion. The report will include data and results for each task as to maintain a clear summary of work completed at the Site. The report will be provided electronically in PDF format. Hard copies of the report will only be provided upon request.

Proposed Staff

Peter Beardsley, PE, Environmental Engineer of **NORTECH** will remain the Contract and Project Manager for the project. He will have contractual responsibility for the project as well as oversee the input of technical staff to complete the required activities.

Cost Estimate and General Conditions

NORTECH is prepared to complete all the tasks outlined in this Work Plan and Proposal on a T&M basis using the unit rates in the attached spreadsheet and an extension of the existing Professional Services Agreement between UCLA and **NORTECH**. Any changes to work described above will be discussed with UCLA before implementing the work or exceeding projected costs for the tasks above. The SOW and estimate were made with the information available. Price and availability are firm pending your acceptance within 30 days, after which we reserve the right to review them.

I trust that this information is sufficient for your needs at the present time. Please contact me at your earliest convenience if you have any questions or comments regarding this effort. I look forward to the opportunity to continue working with you on this project and appreciate your confidence in **NORTECH**.

Sincerely,
NORTECH

Peter Beardsley, PE
Environmental Engineer

Attachments:	Attachment 1:	Site Figures
	Attachment 2:	Table 1 (EPA VISL Calculator Version 3.1, June 2013)
	Attachment 3:	Cost Estimate








KEYED NOTES

-REMOVED OR DECOMMISSIONED-

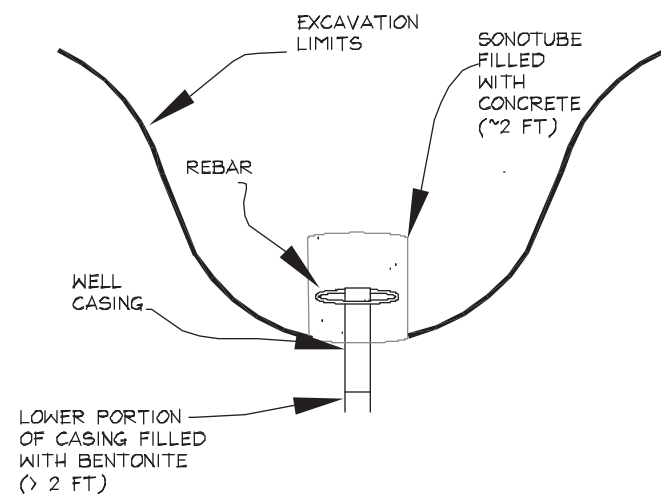
W1 Water Well
-Decommissioned in accordance with applicable guidance.

W2 Septic tank and associated components
-Based on clean sampling results, the septic tanks were removed, the soil absorption systems and piping were abandoned in place.
-Soil absorption systems were approximately 10-15 feet past septic tanks. Inspection pipes were removed.

LEGEND

-  Copper Lines
-  Septic Lines
-  Well
-  Septic Tank
-  Leachfield Sample Location

DECOMMISSIONING WELL
DETAIL



Well Location	Stickup	Depth to Static Water Level	Total Depth
LIDAR	2.20 ft	21.89 ft	28.09 ft
Burkhead	1.20 ft	21.81 ft	22.01 ft
ATCO	0.77 ft	19.91 ft	40.84 ft
Generator Bldg	1.18 ft	28.20 ft	33.00 ft
Transmitter	1.05 ft	27.26 ft	43.33 ft

Well Location	Stickup	Depth to Static Water Level	Total Depth
LIDAR	2.20 ft	21.89 ft	28.09 ft
Burkhead	1.20 ft	21.81 ft	22.01 ft
ATCO	0.77 ft	19.91 ft	40.84 ft
Generator Bldg	1.18 ft	28.20 ft	33.00 ft
Transmitter	1.05 ft	27.26 ft	43.33 ft



KEYED NOTES

All keyed notes appearing on this sheet referring to the foundations and antenna anchors at this site begin with "F".

F1 Structures no longer present

-REMOVED and DISPOSED-

F3 Antenna components, wires, rebar stakes, anchors, and trash

F6 Switch Gear Shed

ATCO:

F7 -350 sqft X 6-12" thick slab and footing
-200 sqft adjacent pad

LIDAR Building:

F8 -1,800 sqft North slab and footing (see Detail 01)
-350 sqft X 48" thick concrete pad

LIDAR Towers:

F9 -Two-story, 850 sqft structure with restricted acces; refer to specifications for demolition details
-Foundation: 850 sqft X 8" concrete slab and footing (see Detail 01)

LIDAR Garage:

F10 -350 sqft X 8" concrete slab and footing
-400 sqft adjacent pad

Transmitter Building:

F13 -2,200 sqft slab and footing (see Detail 01)
-500 sqft basement X 8' deep (8"ICF on 8"pad) at South end

Generator Building:

F14 -5,200 sqft slab and footing (see Detail 01)
-1,700 sqft of adjacent pads
-(3) 300 sqft X 48" thick concrete pads

LEGEND

 5' x 5' Aluminum wire grounding grid

 Fiberglass antenna

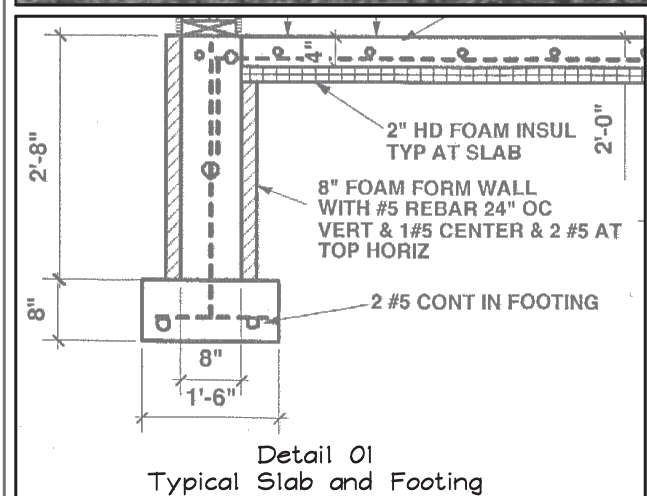
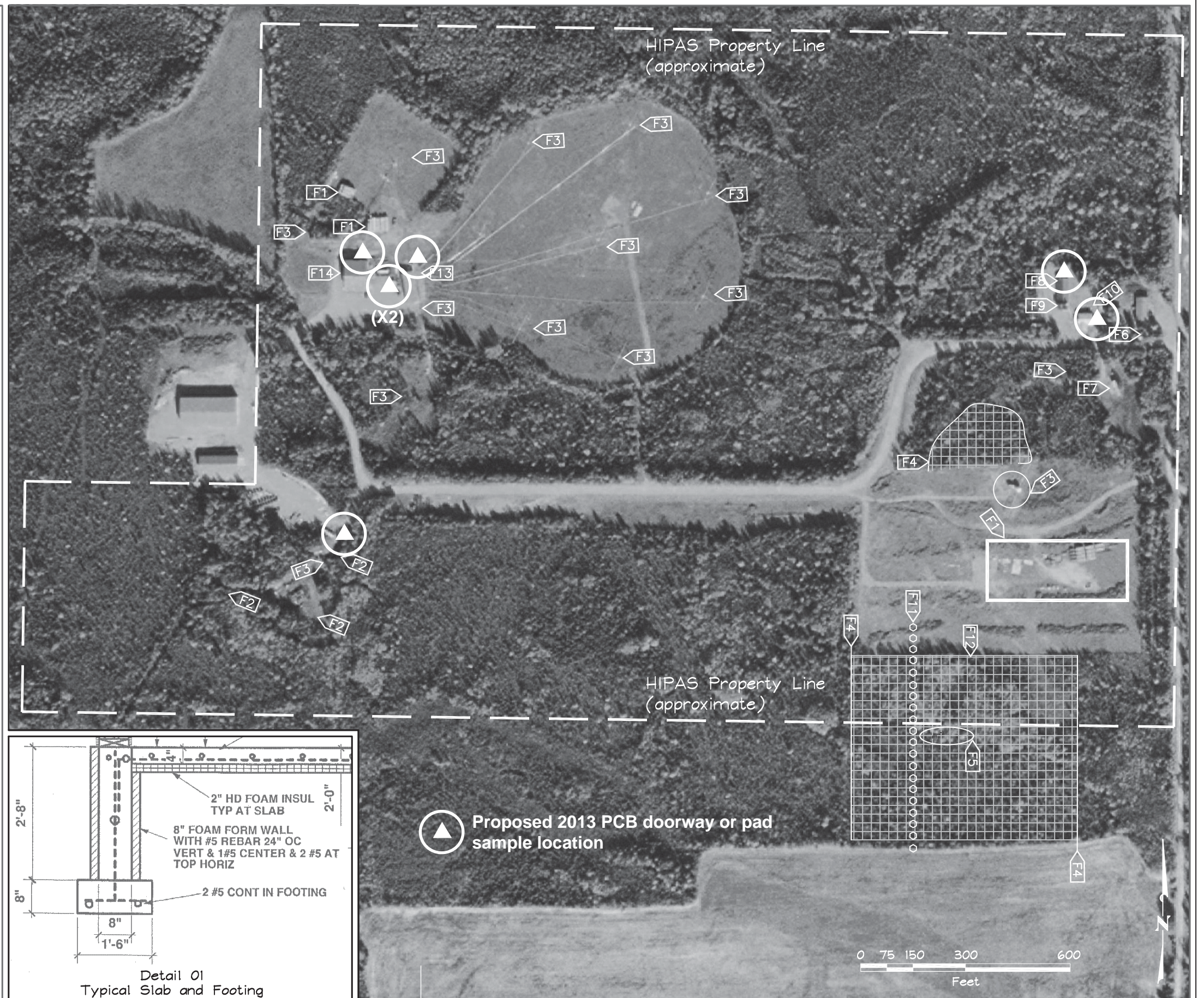
F2 Standing or collapsed structures, antenna components, wires, rebar stakes, anchors and trash

F4 Steel perimeter wire on surface edge of aluminum grounding grid

F5 Steel tower debris, wooden shed and debris

F11 Fiberglass antennas within HIPAS property boundaries

F12 Aluminum grounding grid and all visible aluminum to 2" below grade



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3105 Lakeshore Dr., Anchorage, AK. 99517 907-222-2445
4402 Thane Road, Juneau, AK. 99801, 907-586-6813

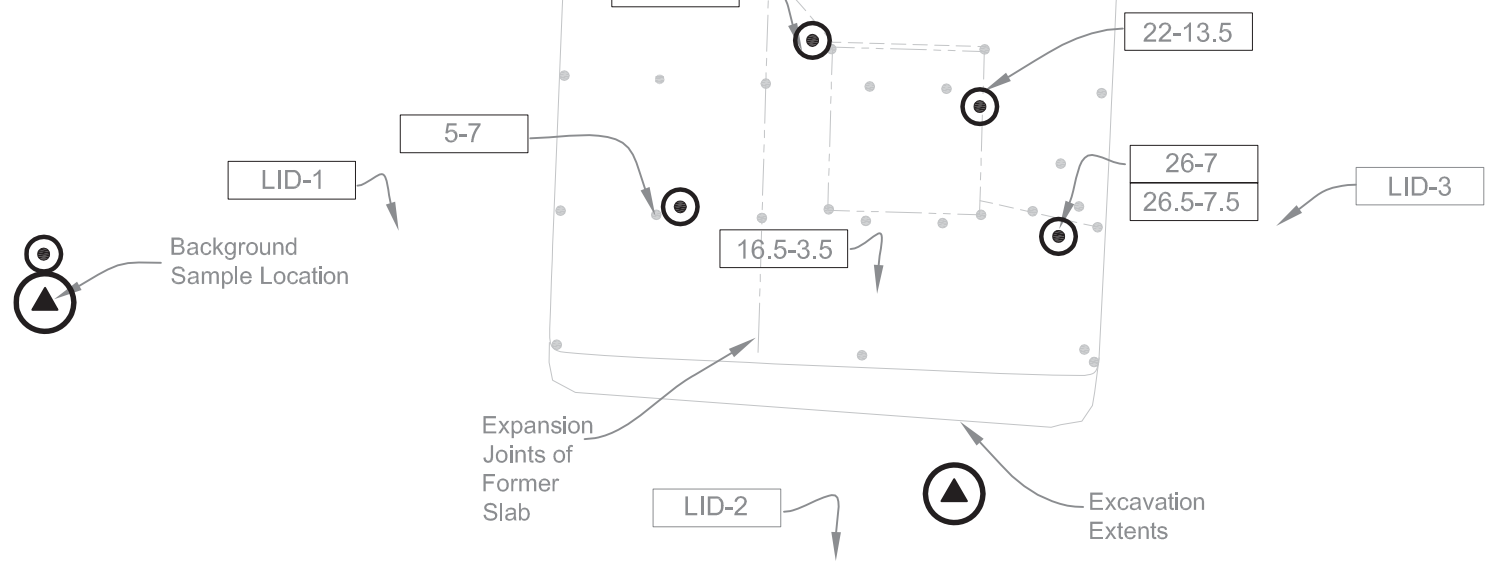
Buildings, Antenna Anchors and Structural Components-Removed
Former HIPAS Observatory Decommissioning
Fairbanks (Two Rivers), Alaska

DATE: 11/12/2012	SCALE: 1" = 300'
PROJ MGR: PLB	PROJECT: 08-1091
DRAWN: PEF	DWG. NO.: 081091p(13)

FIGURE
13

LIDAR Tower Laboratory Soil Sample Results Summary				
Sample ID	Date	Lab W.O.#	Field Screen	Mercury mg/kg
ADEC Cleanup Limit				1.4
Post-demolition Characterization Samples				
LID 01 ^{Dup10}	14-Dec-11	1119888	0.00	1.2
LID 02 ^{Dup10}	14-Dec-11	1119888	0.76	0.938
LID 03	14-Dec-11	1119888	1.33	7.13
LID 04	14-Dec-11	1119888	0.52	4.32
LID 05	14-Dec-11	1119888	0.00	0.882
Pre-excavation Characterization Samples				
26-7.5-6	23-Jul-12	1128246	1.30	4.28
26-7.5-12	23-Jul-12	1128246	0.00	0.606
10.5-14-6	23-Jul-12	1128246	0.00	0.448
10.5-14-12	23-Jul-12	1128246	0.00	0.206
10.5-22-6	23-Jul-12	1128246	0.00	0.788
10.5-22-12	23-Jul-12	1128246	0.00	0.0421U
5-7-6	23-Jul-12	1128246	0.00	0.426
5-7-12	23-Jul-12	1128246	0.00	0.0421U
Post-excavation Closure Samples				
26-7 ^{Dup1}	30-Aug-12	1128444	0.00	0.455
26.5-7.5 ^{Dup1}	30-Aug-12	1128444	0.00	0.391
16.5-3.5	30-Aug-12	1128444	0.00	0.0396U
28-21	30-Aug-12	1128444	0.00	0.0835
5-7	30-Aug-12	1128444	0.00	0.0405U
13-21	30-Aug-12	1128444	0.00	0.132
22-13.5	30-Aug-12	1128444	0.00	0.0433
12.5-16.5	30-Aug-12	1128444	0.00	0.126
Post-excavation Perimeter Closure Samples				
LID-1	18-Sep-12	1124506	NA	0.0409U
LID-2	18-Sep-12	1124506	NA	0.0409U
LID-3	18-Sep-12	1124506	NA	0.0424U

U Analyte not detected at the listed detection limit
 Shade Analyte detected in concentration below the ADEC Cleanup level
 Bold Analyte detected in concentration exceeding the ADEC Cleanup level
 NA Analyte not analyzed for
 NE No established cleanup limit for analyte
 #^{Dup} Denotes duplicate sample pair



Legend

- LID-1 2012 Closure Samples
- 2012 Field Screening Locations
*All Closure Screening Zero
- Concrete Cracks
- Expansion Joints
- Concrete Edge
- ⊙ 2013 Proposed Field Screening Locations
- ⊙ 2013 Proposed Hg Surface Sample Location



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2013 LIDAR Hg Sampling
 HIPAS Observatory
 Fairbanks (Two Rivers), Alaska

SCALE:	1" = 10 ft	FIGURE: 3
DESIGN:	PLB	
DRAWN:	PEF	
PROJECT NO:	08-1091	
DWG:	081091q(3)	
DATE:	08/21/2013	

OSWER VAPOR INTRUSION ASSESSMENT
Vapor Intrusion Screening Level (VISL) Calculator Version 3.1, June 2013 RSLs

Parameter	Symbol	Value	Instructions
Exposure Scenario	Scenario	Residential	Select residential or commercial scenario from pull down list
Target Risk for Carcinogens	TCR	1.00E-06	Enter target risk for carcinogens
Target Hazard Quotient for Non-Carcinogens	THQ	1	Enter target hazard quotient for non-carcinogens
Average Groundwater Temperature (°C)	Tgw	25	Enter average of the stabilized groundwater temperature to correct Henry's Law Constant for groundwater target concentrations

CAS	Chemical Name	Is Chemical Sufficiently Volatile and Toxic to Pose Inhalation Risk Via Vapor Intrusion from Soil Source?	Is Chemical Sufficiently Volatile and Toxic to Pose Inhalation Risk Via Vapor Intrusion from Groundwater Source?	Target Indoor Air Conc. @ TCR = 1E-06 or THQ = 1	Toxicity Basis	Target Sub-Slab and Exterior Soil Gas Conc. @ TCR = 1E-06 or THQ = 1	Target Ground Water Conc. @ TCR = 1E-06 or THQ = 1	Is Target Ground Water Conc. < MCL?	Pure Phase Vapor Conc. @ 25°C	Groundwater Vapor Conc.	Temperature for Groundwater Vapor Conc.	Lower Explosive Limit**	LEL Source	Inhalation Unit Risk	IUR Source*	Reference Concentration	RFC Source*	Mutagenic Indicator	Target Indoor Air Conc. for Carcinogens @ TCR = 1E-06	Target Indoor Air Conc. for Non-Carcinogens @ THQ = 1
		Cvp > Cia,target?	Chc > Cia,target?	MIN(Cia,c;Cia,nc)	Csg	Cgw	Cgw<MCL? Yes/No	Cvp	Chc	Tgw or 25	C	(% by vol)		IUR			i	Cia,c	Cia,nc	
7439-97-6	Mercury (elemental)	Yes/No	Yes/No	(ug/m ³)	C/NC	(ug/m ³)	(ug/L)	(MCL ug/L)	(ug/m ³)	(ug/m ³)	C	(% by vol)		(ug/m ³) ⁻¹		(mg/m ³)	I		(ug/m ³)	(ug/m ³)

Notes:

(1) Inhalation Pathway Exposure Parameters (RME):	Units	Residential	Commercial	Selected (based on scenario in cell E5)
Exposure Scenario		Symbol	Value	Symbol
Averaging time for carcinogens	(yrs)	ATc_R	70	ATc
Averaging time for non-carcinogens	(yrs)	ATnc_R	30	ATnc
Exposure duration	(yrs)	ED_R	30	ED
Exposure frequency	(days/yr)	EF_R	350	EF
Exposure time	(hr/day)	ET_R	24	ET
(2) Generic Attenuation Factors:		Residential	Commercial	Selected (based on scenario in cell E5)
Source Medium of Vapors		Symbol	Value	Symbol
Groundwater	(-)	AFgw_R	0.001	AFgw
Sub-Slab and Exterior Soil Gas	(-)	AFss_R	0.1	AFss
(3) Formulas		Residential	Commercial	Selected (based on scenario in cell E5)
Cia, target = MIN(Cia,c; Cia,nc)		Symbol	Value	Symbol
Cia,c (ug/m ³) = TCR x ATc x (365 days/yr) x (24 hrs/day) / (ED x EF x ET x IUR)		mIURTCE_R	1.00E-06	mIURTCE
Cia,nc (ug/m ³) = THQ x ATnc x (365 days/yr) x (24 hrs/day) x RFC x (1000 ug/mg) / (ED x EF x ET)		IURTCE_R	3.10E-06	IURTCE
(4) Special Case Chemicals		Residential	Commercial	Selected (based on scenario in cell E5)
Trichloroethylene		Symbol	Value	Symbol
		mIURTCE_R	1.00E-06	mIURTCE
		IURTCE_R	3.10E-06	IURTCE

0.0031 mg/m³

Mutagenic Chemicals The exposure durations and age-dependent adjustment factors for mutagenic-mode-of-action are listed in the table below:

Note: This section applies to trichloroethylene and other mutagenic chemicals, but not to vinyl chloride.	Age Cohort	Exposure Duration (years)	Age-dependent adjustment factor
	0 - 2 years	2	10
	2 - 6 years	4	3
	6 - 16 years	10	3
	16 - 30 years	14	1

Mutagenic-mode-of-action (MMOA) adjustment factor 76 This factor is used in the equations for mutagenic chemicals.

Vinyl Chloride See the Navigation Guide equation for Cia,c for vinyl chloride.

Notation:

NVT = Not sufficiently volatile and/or toxic to pose inhalation risk in selected exposure scenario for the indicated medium
 C = Carcinogenic
 NC = Non-carcinogenic
 I = IRIS: EPA Integrated Risk Information System (IRIS). Available online at: <http://www.epa.gov/iris/subst/index.html>
 P = PPRTV: EPA Provisional Peer Reviewed Toxicity Values (PPRTVs). Available online at: <http://hhpprtv.nlm.nih.gov/pprtv.shtml>
 A = Agency for Toxic Substances and Disease Registry (ATSDR) Minimum Risk Levels (MRLs). Available online at: <http://www.atsdr.cdc.gov/mrls/index.html>
 CA = California Environmental Protection Agency/Office of Environmental Health Hazard Assessment assessments. Available online at: <http://www.oehha.ca.gov/risk/ChemicalDB/index.asp>
 H = HEAST: EPA Superfund Health Effects Assessment Summary Tables (HEAST) database. Available online at: <http://epa-heast.nlm.nih.gov/heast.shtml>
 S = See RSL User Guide, Section 5
 X = PPRTV Appendix
 E = The Engineering ToolBox. Available online at http://www.engineeringtoolbox.com/explosive-concentration-limits-d_423.html
 N = Centers for Disease Control and Prevention (CDC) National Institute for Occupational Safety and Health (NIOSH). Pocket Guide to Chemical Hazards. Available online at: <http://www.cdc.gov/niosh/hpg/default.html> <http://www.cdc.gov/niosh/npg/default.html>
 M = Chemical-specific MSDS
 Mut = Chemical acts according to the mutagenic-mode-of-action, special exposure parameters apply (see footnote (4) above).
 VC = Special exposure equation for vinyl chloride applies (see Navigation Guide for equation).
 TCE = Special mutagenic and non-mutagenic IURs for trichloroethylene apply (see footnote (4) above).
 Yellow highlighting indicates site-specific parameters that may be edited by the user.
 Blue highlighting indicates exposure factors that are based on Risk Assessment Guidance for Superfund (RAGS) or EPA vapor intrusion guidance, which generally should not be changed.
 **Lower explosive limit is the minimum concentration of the compound in air (% by volume) that is needed for the gas to ignite and explode.

Attachment 7



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