BGES, INC.

ENVIRONMENTAL CONSULTANTS

2013 LAND-FARM MONITORING ACTIVITIES

FEBRUARY 2015

Submitted to:

Icicle Seafoods, Inc.
4019-21st Avenue West
Seattle, Washington 98199

Submitted by:

BGES, INC.
1042 East 6th Avenue
Anchorage, Alaska 99501
Ph: (907) 644-2900
Fax: (907) 644-2901

WWW.BGESINC.COM

TABLE OF CONTENTS

FIGURES (Located at End of report)

TABLES (Located at End of Report)

APPENDICES (Located at End of Report)

ACRONYMS

AAC	-	Alaska Administrative Code
ADEC	-	Alaska Department of Environmental Conservation
AK	-	Alaska
AST	-	Aboveground Storage Tank
bg	-	Below Grade
BGES	-	Braunstein Geological and Environmental Services
BTEX	-	Benzene, Toluene, Ethylbenzene, and Total Xylenes
C	-	Celsius
CSM	-	Conceptual Site Model
CSP	-	Contaminated Sites Program
DRO	-	Diesel Range Organics
DU	-	Decision Unit
EPA	-	Environmental Protection Agency
ESA	-	Environmental Site Assessment
FE	-	Fundamental Error
GRO	-	Gasoline Range Organics
Icicle	-	Icicle Seafoods, Inc.
mg/Kg	-	Milligrams per Kilogram
mg/L	-	Milligrams per Liter
MI	-	Multi-Incremental
MRLs	-	Method Reporting Limits
PAHs	-	Polynuclear Aromatic Hydrocarbons
PID	-	Photoionization Detector
ppm	-	Parts per Million
QC	-	Quality Control
QP	-	Qualified Person
RRO	-	Residual Range Organics
RSD	-	Relative Standard Deviation
SGS	-	SGS North America, Inc.
UCL	-	Upper Confidence Level
VOCs	-	Volatile Organic Compounds
WAFCO	-	Woodbine Alaska Fish Company

1.0 INTRODUCTION

BGES, Inc. (BGES) was retained by Icicle Seafoods, Inc. (Icicle) to perform site assessment and remediation activities at their seafood processing plant, located at 1 Cannery Road in Egegik, Alaska, hereafter referred to as the subject property (Figure 1). The subject property is located in the northeastern portion of Egegik, Alaska; adjacent to, and south of the Egegik River. The subject property contains an operational fish processing facility and covers approximately 84 acres.

The site assessment and remediation activities performed during August of 2013 included the collection of multi-incremental (MI) soil samples from the land-farmed soils and analysis of the MI soil samples. Additionally, Icicle personnel performed the maintenance activities on the land-farmed soils. This site islisted in the Alaska Department of Environmental Conservation (ADEC) Contaminated Sites database, File Number 2543.38.002, and has now been combined with the project for the former owner, Woodbine Alaska Fish Company (WAFCO), which has been the subject of separate reporting.

Site History. In 1895, an Alaska Packers Association salmon saltery was established at the mouth of Egegik River, presumably at the location of the current Icicle facility, and a town developed around the fish camp. Egegik, which currently has a strong year-round Alutiiq culture, was incorporated as a second-class city in 1995. The Icicle facility obtains its drinking water from the City water supply system, and its processing water from School Lake.

Prior owners/operators of the subject property included the Alaska Packers Association, Diamond E. Fisheries, and just prior to Icicle's ownership, WAFCO, who owned the cannery at the subject property from 1989 through 2005, when Icicle purchased the subject property. Based on a review of historical aerial photographs of the subject property, the facility has been operational with much the same configuration as today since at least 1963.

Legal Description. The legal description of the subject property includes the following parcels:

Parcel 1 – United States Survey No. 485, records of the Kvichak Recording District, third Judicial District, State of Alaska, excepting therefrom that portion deeded to Homer L. Leonard, Jr. by Judgement recorded August 28, 1992 in Book 24 at Page 586.

Parcel 2 – United States Survey No. 551, records of the Kvichak Recording District, third Judicial District, State of Alaska, excepting therefrom that portion of said premises, the private residence and

underlying land identified as E. Deigh's residence, as reserved in Deed recorded April 22, 1975 in Book 10 at Page 467; excepting therefrom that portion of said premises as conveyed by deed recorded on July 21, 1975 in Book 10 at Page 499, being more particularly described as follows: Commencing at W.C.M.C. 1, U.S. Survey 551, identical with W.C.M.C. 4, U.S. Survey 2366; thence S 13° 56'00" W 233.96 feet along a line common to U.S. Surveys 551 and 2366; thence S 73° 45'20" E 17.42 feet to the True Point of Beginning; (1) Thence S 73°45'20" E 122.00 feet; (2) thence S 16°14'40" W 80.00 feet; (3) thence N 73°45'20" W 122.00 feet; (4) thence N 16°14"40" E 80.00 feet to the Point of Beginning; and excepting therefrom that portion deeded to Homer L. Leonard, Jr. by Judgment recorded August 28, 1992 in Book 24 at Page 586.

Parcel 3 – United States Survey No. 2366, records of the Kvichak Recording District, third Judicial District, State of Alaska, excepting therefrom that portion of said premises, the private residence and underlying land identified as Winterman's residence, as reserved in Deed recorded April 22, 1975 in Book 10 at Page 467.

Parcel 4 - United States Survey No. 2367, records of the Kvichak Recording District, third Judicial District, State of Alaska, excepting therefrom that portion deeded to Morgan Chmiel by Deed recorded February 2, 1993 in Book 25 at Page 7.

Parcel 5 – Lot One (1) of United States Survey No. 4941, records of the Kvichak Recording District, Third Judicial District, State of Alaska; excepting therefrom Lot One "A" of Fuel Farm Subdivision, according to Plat 99-5.

Parcel 6 – Alaska Tidelands Survey No. 67, records of the Kvichak Recording District, Third Judicial District, State of Alaska.

The property is located in the North Quarter of Section 1, Township 23S, Range 50W, Naknek A-5 Quadrangle, Seward Meridian, Alaska. Egegik lies at approximately 58.215560° North Latitude and -157.37583° West Longitude. Egegik is in the Kvichak Recording District.

This Land-Farm Monitoring Activities Report presents the activities completed in accordance with BGES' Work Plan for Collection of Land-Farm Samples dated March 2013 and approved by the ADEC on June 10, 2013. Field work was performed in accordance with the work plan. Additional information is provided below in Section 3.0. The assumptions made while performing the site assessment and remediation activities and the limitations of our scope of work are included in Section 8.0 (Exclusions,

Considerations, and Qualifications) of this report.

2.0 BACKGROUND

Four reported spills have occurred at the Egegik Icicle facility since June 30, 2005; the date when the property was purchased by Icicle. These spills occurred at the Freezer Plant day tank; the tank farm secondary containment system; the Generator Building day tank; and the Mechanics' Bunkhouse day tank (Figure 2).

Freezer Plant Day Tank. In the area of the former Freezer Plant day tank, which was located at the top of the bluff near the Freezer Plant, the day tank was accidentally overfilled with heating fuel in June of 2005. The fuel release contributed to contamination that was already present in the bluff and beach area. The quantity of the release was estimated to be between 50 and 100 gallons. It was estimated that approximately 58 gallons of fuel were recovered immediately following the release by using the average concentration of diesel range organics (DRO) measured in the stockpiled soil recovered from the release. Approximately 15 cubic yards of soil were excavated from this area and stockpiled temporarily in 2005, and transported to the Icicle land-farming area during 2006. The day tank was removed in the spring of 2007 and approximately 7.5 cubic yards of soil were excavated from beneath the former day tank location during August of 2007.

The new tank used for the Freezer Plant is double-walled and stores diesel fuel. In addition, the subsurface pipeline from the tank farm to the former day tank located adjacent to the Freezer Plant was disconnected, drained, and capped at both ends. The excavated soils were placed in the Icicle land-farm area. The stockpiled soils were subsequently sampled and calculations based on the sample results indicated that an additional amount of approximately 48 gallons of fuel was recovered, for an estimated total of 106 gallons of fuel recovered since 2005. In the 2008 Petroleum Hydrocarbon Remediation Report, BGES recommended the status of "Cleanup Complete" for this Icicle spill area of the subject property since approximately 106 gallons of fuel have been recovered from this Icicle spill area, while the original release was reported to be up to 100 gallons. In correspondence from the ADEC dated May 19, 2009, the Contaminated Sites Program (CSP) stated that they have determined that cleanup is complete for Icicle's 2005 Freezer Plant day tank spill; therefore, no activities have been performed since the 2007 field activities for this spill area.

Tank Farm Area. During the 2006 field season, seeps, staining, and stressed vegetation were observed

in the immediate vicinity of the diesel tank farm. The secondary containment itself held a significant quantity of rainwater and floating product. Breaches in the bladder and concrete secondary containment allowed product and contaminated water to be released to surface and near-surface soils. The contamination appeared to be diesel fuel, which is consistent with fuel stored in the tank farm, but the identity of the contamination had not been confirmed with analytical data. Monitoring well MW-12 that is located 30 feet northeast of the greatest area of staining indicated that groundwater had been impacted by hydrocarbons, but hydrocarbon concentrations in groundwater from this well did not exceed ADEC cleanup standards during the 2006 sampling event.

To further characterize the sources and extent of contamination in the vicinity of the tank farm and to attempt the removal of some of the impacted soils, hand tools were used to dig out stained soils surrounding the outside of the concrete secondary containment, as well as stained soils underneath the diesel manifold in 2006. Field screening measurements indicated that contamination was neither widespread nor deep, but field observations indicated that there was a continuous slow leak of contaminated rainwater and product from the secondary containment. It was estimated that approximately 13 cubic yards of soil were impacted at the tank farm. A new bladder was scheduled to be installed by Icicle within the concrete secondary containment area beneath the diesel tanks in 2008; however, instead of replacing the secondary containment bladder at the tank farm, Icicle replaced four diesel aboveground storage tanks (ASTs), formerly Numbered 1 through 4, with two, 20,000-gallon, double-walled tanks prior to the 2008 field season. Because the two new diesel ASTs are double-walled, the bladder was removed from the cement containment, and no other containment was placed underneath these ASTs. During the replacement of the ASTs, the centrifuge house was also removed. The southwest side of the tank farm secondary containment area was partially removed to place the large ASTs into the tank farm area with a crane. In the southern portion of the diesel tank containment, two new ASTs (Numbered 5 and 6) were temporarily raised with a crane, and a felt-like impermeable liner was placed beneath these tanks. A new gasoline AST was also placed at the southernmost end of the tank farm. During these activities, the AST that had formerly stored gasoline in the gasoline tank farm area was relocated to the land-farm area.

Prior to excavating the impacted soils, borings were advanced with a hand-auger to determine the approximate depth of the impacted soils. Observations indicated that the majority of the impacted soils extended to approximately 6 to 12 inches below grade (bg), except in the former location of a drum, where the contamination appeared to extend approximately 2.5 feet bg. After the tank farm was

reconfigured, Icicle assisted BGES with excavating visibly stained and impacted soils from the northeast side of the diesel tank farm (these impacted soils were identified during the 2006 and 2007 site visits). Also, impacted soils beneath the stairway that were not previously visible were removed. The 55-gallon drum that appeared to have overflowed was also present in this area, adjacent to the tank farm secondary containment. Icicle employees indicated that the drum was used for storing the standing liquid that accumulated within the bladder prior to the tank farm reconfiguration. This drum was sealed and relocated to the drum storage area of the facility.

Approximately eight cubic yards of stained soils were excavated in 2008 and transferred to the Icicle land-farm area. The excavation was then backfilled with "clean soils". After completion of the excavation activities (130 square feet), three discrete soil samples were collected from various depths and locations across the base of the excavation. All three soil samples exhibited concentrations below the cleanup criteria for gasoline range organics (GRO); benzene, toluene, ethylbenzene, and xylenes (BTEX); and DRO. An unknown quantity of impacted soils was not removed from beneath the tank farm secondary containment because of a concern that it would compromise the integrity of the secondary containment. These adversely impacted soils beneath the cement pad are likely contributing to the groundwater quality impacts in this area.

Monitoring Well MW-12 is located between the "new" tank farm and the Egegik River, and was installed in 2005 to evaluate if contamination was migrating from the tank farm, and when contamination was not detected, it was left in place to serve as a "sentry" well should the tank farm develop a release of fuel. It is located northwest of the "Japanese House" and northeast of the tank farm (Figure 2). Concentrations of benzene, xylenes, DRO, and residual range organics (RRO) in Monitoring Well MW-12 increased in 2006 when compared to the 2005 data, but were below the ADEC cleanup criteria. In 2008, a groundwater concentration of DRO was detected that slightly exceeded the ADEC cleanup criterion, while the remaining constituents, GRO, RRO, and BTEX, were not detected above the laboratory's method reporting limits (MRLs).

In the 2008 Petroleum Hydrocarbon Remediation Report, BGES recommended that a closure status of "Cleanup Complete" be considered for this portion of the subject property. In correspondence from the ADEC dated May 19, 2009; CSP stated that because a concentration of DRO in the 2008 groundwater samples collected from MW-12, which is downgradient from the tank farm, exceeds the groundwater cleanup criteria, the presence of DRO in groundwater suggests that the excavation activities at the tank farm area have not removed all contaminated soil and that there is still likely contamination present

beneath the secondary containment system. The CSP requested the collection and analysis of a groundwater sample from Monitoring Well MW-12 during the 2009 field season and the development of a long-term monitoring program for this well. The sample collected in 2009 indicated that DRO concentrations decreased from 2008 to 2009 and the results were less than the ADEC cleanup criterion in 2009. During the latest sampling event, conducted in 2010, the water sample collected from Monitoring Well MW-12 exhibited non-detectable concentrations of contaminants below the laboratory's MRLs and below ADEC cleanup criteria. Based on historical analytical results being below the ADEC cleanup criteria, Monitoring Well MW-12 has not been sampled since 2010.

Generator Building. In 2006, Icicle reported a release of approximately 200 gallons of diesel fuel at the Generator Building, of which a portion of the fuel was recovered with sorbent materials and hand-digging immediately after the release. The fuel recovered was mainly in liquid form after the release, partially because of a long history of fuel releases in the immediate vicinity of the Generator Building making the soils saturated and somewhat impermeable. A brief characterization of the remaining soils beneath the Generator Building, near the southwest portion of the building, as well as soils below a small leak from a valve underneath the northwest side of the building, was performed in 2006. Screening samples determined that the greatest impacted area is beneath the stairs, located near the southwest side of the building, almost directly under the tank valve. Approximately 4 to 7 inches of accessible impacted soils were removed by hand shoveling from underneath, and adjacent to the Generator Building in August of 2007, for a total removal of approximately 6.8 cubic yards of soil, which were subsequently transported to the Icicle land-farm area.

It was estimated that soils with approximately 121 gallons of fuel were recovered in 2007. Although the lateral and vertical extent of the contamination had not been reached at the Generator Building during the hand-digging effort, two confirmation samples were collected to characterize a portion of the remaining soils. A sample collected underneath the valve of the original fuel release indicated that the soils were greatly impacted 7 inches bg with DRO at 43,700 milligrams per kilogram (mg/Kg). Another sample, which was collected approximately 8 feet south of the first sample in soils that bordered the fresh diesel release and the old Bunker C contamination, indicated that these soils were also greatly impacted with DRO at 104,000 mg/Kg. After removing these soils to 4 inches bg (excluding the areas of the apparent Bunker C contamination), the remaining soils appeared dark black, and it was apparent that the Bunker C contamination (previously identified and discussed in the BGES Icicle Seafoods 2007 Site Remediation and Monitoring Report) extended further northeast than originally anticipated. Bunker

C contamination was observed underneath the stairs of the Generator Building, at a depth of 5 inches bg, as well. It appeared that the Bunker C contamination extended approximately 41 feet northwest from the Bunker C secondary containment tank.

During 2008, a groundwater sample was collected from Monitoring Well MW-8, located downgradient of the generator building's contamination, and analyzed for volatile organic compounds (VOCs) and polynuclear aromatic hydrocarbons (PAHs). None of these constituents were detected above the laboratory's MRLs. In the 2008 Petroleum Hydrocarbon Remediation Report, BGES recommended the status of "Cleanup Complete" for this Icicle spill area of the subject property since approximately 271 gallons of fuel have been recovered from this Icicle spill area. In correspondence from the ADEC dated May 19, 2009; the CSP stated that they have determined that cleanup is complete for Icicle's 2006 spill in the area of the generator building. Based on historic analytical results being below the ADEC cleanup criteria, MW-8 will not be sampled again for this project.

Mechanics Bunkhouse Area. On June 10, 2008, approximately 127 gallons of heating fuel were released from a day tank located adjacent to the Mechanics' Bunkhouse due to human error by allowing fuel to overflow during refilling of the 500-gallon tank. The ADEC was immediately notified and Icicle was granted permission to remove and transport impacted soils to the Icicle land-farm area. Absorbent pads and pellets were immediately placed over the soils that were impacted, and impacted soils were excavated by hand-digging until the soils exhibited no more obvious visual or olfactory indications of impact. Approximately 20 cubic yards of impacted soils were removed by Icicle personnel after the spill. The used absorbent pads were burned in the City's smart ash burner. Upon BGES' arrival at the site, soil screening samples were collected to verify whether or not all of the impacted soils had been removed. The photoionization detector (PID) measurements indicated that some of the remaining soils were still impacted.

The released fuel had migrated deeper in three distinct areas that were previously excavated, because these areas were more sandy and gravelly, or the fuel had followed a conduit, such as the water pipe at the southwest corner of the Mechanics' Bunkhouse. A small portion of this new spill area overlapped the area where previous Icicle/WAFCO remedial activities were conducted in 2006/2007 to the southwest of the Mechanics' Bunkhouse. Approximately 23 additional cubic yards of soils were excavated and transported to the land-farm. Six discrete confirmation samples were collected from the resulting excavation; the base of the excavation was approximately 960 square feet. All soil sample analytical results were less than the cleanup criteria except for benzene in Soil Sample TMSP-06. The

benzene concentration for this sample was 0.0874 mg/Kg, which exceeds the cleanup criterion of 0.025 mg/Kg.

During the excavation activities conducted north of the Mechanics' Bunkhouse near the Patricia Ann release, an area that exhibited PID readings of 65 parts per million (ppm) at 1 foot bg was encountered. The soils exhibited odors similar to the odors encountered during the Patricia Ann excavation activities. Authorization was granted by the ADEC to excavate the impacted soil in 2008, but because of the lateness in the field season, a liner was placed in the excavation to mark its location and the area was backfilled. In correspondence dated May 19, 2009, CSP stated that they concurred with BGES' conclusion that the presence of benzene in the vicinity of the Mechanics' Bunkhouse was attributed to the previous Patricia Ann spill and the CSP determined that cleanup is complete for the 2008 Icicle spill in the vicinity of the Mechanics' Bunkhouse area. Therefore, no activities were performed during 2009 for this spill area of the Icicle facility. Monitoring activities in this area of the subject property have continued in conjunction with the groundwater monitoring activities for the WAFCO project.

Land-Farm Area for Icicle Seafoods. Approximately 90 cubic yards of impacted soil have been spread at the Icicle land-farm. In 2007, the soils excavated from the bluff and the generator building areas were placed in the Icicle land-farm area. These stockpiles were incorporated with the previously excavated and land-farmed soils generated by Icicle from 2005 through 2007.

In 2008, approximately 51 cubic yards of excavated soils from the tank farm and the Mechanics Bunkhouse areas were placed in a separate land-farm area, located southwest of the previously stockpiled soils (Figure 3). A berm of "clean" soils was constructed around the new perimeter of the Icicle land-farm by pushing up native soils to prevent or minimize the potential for runoff from the land-farm area. Discrete soil samples were collected from the land-farmed soils in 2008. DRO was the primary contaminant above the ADEC cleanup criteria with a maximum concentration of 6,180 mg/Kg. Concentrations of BTEX, GRO, and RRO were all below the ADEC cleanup criteria. In the 2008 Petroleum Hydrocarbon Remediation Report, BGES recommended tilling the soils at least twice during the 2009 season to promote aeration of the soils and enhance biodegradation, and collection of another round of soil samples to monitor the progress of biodegradation of the contaminants in soils at the land-farm. In correspondence dated May 19, 2009, the CSP concurred with BGES' recommendations for the collection of discrete soil samples from the land-farm area in 2009. The collection of MI sampling was originally to be performed during the summer of 2010, but a modification to the work plan resulted in a plan for the collection of MI sampling during the summer of 2013. The CSP also requested that a long-

term monitoring plan and soil treatment work plan for the Icicle land-farmed soils be prepared.

Three discrete soil samples collected in 2009 indicated that DRO and GRO exceeded the ADEC cleanup criteria. The maximum DRO and GRO concentrations were 3,970 mg/Kg and 520 mg/Kg, respectively. The land-farm soils were tilled once during 2009 to promote aeration of the soils and enhance biodegradation with assistance from Icicle's personnel. Signs were replaced during 2009 field activities so that the land-farm area continues to be clearly marked with warning signs during 2013.

Land-farm soils are reportedly tilled twice during each summer, and nutrients are applied to the land far soils at least once between the first and second round of tilling each summer. In the 2009 Site Assessment and Remediation Activities Report (dated April 2010), BGES recommended that each Icicle land-farm area be considered separate decision units (DUs) and that these two decision units be sampled utilizing the MI sampling methodology. BGES' Work Plan for Collection of Land-Farm Samples dated March 2013 was prepared and submitted to the ADEC for their approval prior to implementing this MI sampling; and was approved by the ADEC on June 10, 2013.

3.0 2013 FIELD ACTIVITIES

The land-farm monitoring activities were performed during August of 2013 and included maintenance of the land-farm areas, which entailed mixing and turning over the soils and adding nutrients at least twice each summer season (completed by Icicle Seafoods personnel); and collection and analysis of MI soil samples from two land-farm areas to evaluate the degradation of contaminant concentrations. The results of these activities are the subject of this report.

The field work was performed by two BGES representatives, which were Qualified Persons (QPs), as defined by the ADEC. Field work was performed in accordance with the above-mentioned work plan for this project.

Collection of Multi-Incremental Soil Samples from Land-Farm Areas.

As mentioned above, approximately 90 cubic yards of soil have been excavated, stockpiled, and spread at the Icicle land-farm area (Figure 3). The Icicle land-farm area has been separated into two areas or DUs. One Icicle land-farm area includes approximately 38 cubic yards of contaminated soils which were excavated during 2005, 2006, and 2007, and placed in the northern land-farm area in 2007. This area has been designated as one of the Icicle land-farm area DUs and is identified as ICLF-DU1. In

2008, approximately 51 cubic yards of contaminated soils were excavated and placed in a separate land-farm area; this area has been designated as a separate DU and is identified as ICLF-DU2. The approximate size of each DU is less than 0.11 acre in size (Figure 3).

A MI sample is a representative sample for a given DU. To monitor the degradation of contaminants and to determine if ADEC cleanup levels have been achieved, MI samples were collected from ICLF-DU1 and ICLF-DU2. Two MI samples plus a duplicate and triplicate sample set were collected from these DUs during the 2013 field season (Figure 3).

Systematic random MI sampling was conducted to characterize the contaminated soils present in each of the DUs. The first sampling location and sampling depth in each DU were randomly determined, so that each "cell" within each DU grid had an equal probability of being sampled. The MI samples were collected in general accordance with the ADEC Guidance on Multi Increment Soil Sampling (March, 2009). Photographs 1 through 5 for the field sampling activities and the project site are presented in Appendix A.

The MI sample from each DU consisted of at least 37 aliquots of soil collected from depths that spanned from the top of the DU to approximately 8 inches bg (approximate thickness of each DU). A grid created for each DU was marked with pin flags, to produce at least 110 equal, but separate cells (Photographs 1 through 3 in Appendix A). The first sampling location within each DU was randomly determined. Then a sample aliquot was collected from every third cell throughout each DU. Each aliquot was collected from 3-inch depth intervals. The depths from which the aliquots were collected were also randomly determined. The random sampling order and depth interval for each DU was chosen utilizing a coin flip. For example, for ICLF-DU1, the first aliquot was collected from the first cell and from a sample depth of 2 to 5 inches below the top of the land-farm surface. The second aliquot was collected from the fourth cell and from a sample depth of 5 to 8 inches below the top of the land-farm surface. The collection of samples from this order of sampling depths was completed throughout the entire DU. Then, the sample location and depth were determined randomly for each separate DU. The sample aliquots from each DU were collected using a stainless steel probe as described below. At least 37 aliquots of soil were collected from different cells and depths throughout each DU.

As a quality control measure, a triplicate sample set (three samples) was collected from ICLF-DU2, and was submitted to the analytical laboratory "blindly" in order to evaluate the precision of the MI

sampling process. The triplicate sample set was collected to verify that the MI samples truly represent the DU by allowing for the calculation of relative standard deviation (RSD).

Soil sample aliquots were collected from each DU from the pre-measured grid, as shown below in an example grid.

P	D	T	P	D	T	P	D	T	P	D
T	P	D	T	P	D	T	P	D	T	P
D	T	P	D	T	P	D	T	P	D	T

The letter "P" represents the cells from which the primary sample was collected. As for the triplicate sample set that was collected from the ICLF-DU2, the duplicate was collected from the cells marked "D", and the third sample was collected from the cells labeled "T". The grid shown above has been abbreviated for brevity in this report. Thus, as mentioned above, the MI samples collected during the 2013 field season were submitted to the laboratory to characterize specific DUs within the land-farm area.

MI Soil Samples ICLF-DU1 and ICLF-DU2 (and its associated duplicate and triplicate; ICLF-DU3 and ICLF-DU4, respectively) were analyzed for GRO, BTEX, DRO, and RRO. The samples for analysis of volatile constituents (GRO and BTEX) were collected prior to the non-volatile samples (DRO and RRO), as discussed below.

Volatile Sample Collection. The portion of each sample scheduled to be analyzed for GRO and BTEX were collected first. Each soil sample aliquot was collected utilizing a clean stainless steel sampling probe, which was 0.75-inch in diameter by 12-inches long (Photograph 4 in Appendix A). Approximately 2 to 5 grams of soil were collected from each aliquot and immediately placed into a 4-ounce amber glass jar, which had the methanol added prior to sample collection. To minimize volatilization of the contaminants, sieving was not performed for any volatile analyses (GRO or BTEX) after collection of the sample. The soil probe was decontaminated with an Alconox detergent solution, followed by a tap water rinse, between sampling each DU.

Each aliquot was carefully collected so that sufficient sample mass (more than 50 grams) was obtained to adequately address the compositional heterogeneity of the soils. The sample aliquots were collected randomly (systematically) and in enough locations (at least 37) to capture spatial variability, to minimize grouping and segregation error. Collection of the aliquots also consisted of obtaining all particle sizes,

as practical, in the population less than the 2-millimeter fraction, which aids in minimizing fundamental error (FE). Large rocks or clumps of soil were not collected as part of the sampling of volatiles, as this would increase FE. A separate 4-ounce amber, glass container of soil associated with the volatile soil sample was collected and analyzed for percent moisture.

For each aliquot collected, the sample container lid was briefly opened, the soil was added directly from the probe with the stainless steel spoon into the sample container, and the lid was replaced onto the sample container; this sampling process was repeated at each aliquot sample location. The volatile sampling procedure was accomplished as quickly as possible to reduce the loss of soil contaminants and methanol due to volatilization. Care was also taken to prevent the loss of methanol caused by splashing during the addition of soil increments and/or spillage during the entire sampling procedure.

Non-Volatile Sample Collection. MI samples to be analyzed for DRO and RRO were collected after the volatile samples were collected. The sampling procedures for the non-volatiles were generally the same as the procedures for collecting the volatile samples, except that the soil aliquots were placed directly into one-gallon Ziploc bags after collection. Approximately 30 to 60 grams of soil were collected for each sample aliquot. The entire volume (approximately 900 to 1,800 grams) of soil sample collected was submitted to SGS North America, Inc. (SGS) for sieving and sub-sampling in a controlled laboratory environment. SGS performed the sieving and sub-sampling for each non-volatile MI sample in accordance with the ADEC Guidance on Multi Incremental Soil Sampling (March 2009).

A field screening sample was also collected for each DU. Each field screening sample was placed into a sealable plastic bag using a clean, stainless steel spoon and labeled with a unique sample number and the time of collection. Soils in the plastic bag were screened with a PID that was calibrated prior to use with 100 ppm isobutylene calibration gas. The field screening sample was allowed to warm to approximately 40 degrees Fahrenheit, and then the plastic bag was agitated for approximately 15 seconds within one hour of collection, at which point the probe of the PID was inserted into the bag and the greatest reading was recorded. All PID readings for all MI samples were 0.0 ppm. It is noted that the PID readings were not documented in the field notebook.

After collection, the MI samples were labeled, placed in ice-filled coolers, and shipped via Pen Air to Anchorage. Prior to shipment of samples from Egegik to Anchorage, custody seals were placed on the coolers. BGES personnel picked up the samples at Pen Air and delivered the samples under chain of custody protocol to SGS, an ADEC-approved laboratory. Analytical results are presented in Table 1 and

on Figure 3.

The land-farmed soils were reportedly tilled and moved around with a tractor and a tiller attachment twice during the 2013 summer season by Icicle personnel to promote biodegradation of the contaminants, and nutrients were applied between the tilling activities during 2013. Documentation of these activities was reportedly submitted to the ADEC in a report prepared by Icicle personnel.

The signs marking the land-farmed soils were inspected during the 2013 field season, and the signs appeared to be in good condition. These signs warn people to stay out of the area because contaminated soils are present (Photograph 5 in Appendix A).

A copy of the field notes associated with these field activities is included in Appendix B.

4.0 EVALUATION OF LABORATORY DATA

Laboratory analysis of MI soil samples collected during the 2013 field season was performed by SGS, an ADEC-approved laboratory. Analytical results for the MI soil samples are summarized in Table 1. A copy of the laboratory analytical report is included in Appendix C.

The soil sample results are compared to the ADEC Method 2 Cleanup Criteria listed in 18 Alaska Administrative Code (AAC) 75.341 – Tables B1 and B2 (under 40-inch zone) for soils, as revised October 1, 2014. The cleanup concentrations were obtained from these tables listed in the "under 40-inch zone" for soils, from the migration to groundwater values, except for RRO, which was obtained from the more conservative ingestion value.

Soil Samples ICLF-DU1 and ICLF-DU2 (and its associated duplicate and triplicate samples; ICLF-DU3, AND ICLF-DU4) were analyzed for BTEX by Environmental Protection Agency (EPA) Method 8021B; GRO by Alaska (AK) Method 101; DRO by AK 102; and RRO by AK 103.

Trip blanks accompanied all soil samples scheduled for volatile analyses at all times during sample container handling until submission to the laboratory. The trip blanks were analyzed for GRO and BTEX by the same methods described above, to determine if cross-contamination of the samples had occurred.

The soil samples collected from the land-farm at the subject property were numbered ICLF-DU1, where the prefix ICLF is an acronym for Icicle Land-Farm; and the –DU1 indicates which DU the sample was

collected from.

Two MI soil samples, ICLF-DU1 and ICLF-DU2 (and its associated duplicate and triplicate samples, ICLF-DU3 and ICLF-DU4, respectively), were collected from the DUs located within the Icicle land-farm areas as described above. Soil Samples ICLF-DU1 and ICLF-DU2 (and its associated duplicate and triplicate samples, ICLF-DU3 and ICLF-DU4, respectively) exhibited DRO concentrations that ranged from 254 mg/Kg to 869 mg/Kg; all of which exceeded the ADEC cleanup criterion of 250 mg/Kg for DRO. Soil Sample ICLF-DU2, exhibited the maximum DRO concentration of 869 mg/Kg. Soil Samples ICLF-DU1 and ICLF-DU2 (and its associated duplicate and triplicate, ICLF-DU3 and ICLF-DU4, respectively) exhibited RRO concentrations that were below the ADEC cleanup criterion. These MI soil samples also exhibited non-detectable concentrations of GRO and BTEX.

Analytical results for the soil samples are summarized in Table 1 and on Figure 3, and a copy of the laboratory data package is included in Appendix C.

Statistical Analysis of the Triplicate Samples

The RSDs for the triplicate samples collected were calculated following ADEC guidance and are included in Table A below. Samples that were collected from the land-farm in triplicate, originated from weathered soils placed in the land-farm during 2008. The MI sample, the duplicate MI sample, and the triplicate MI sample were collected from ICLF-DU2. Analytes reported above the MRLs are tabulated below for statistical analysis, as recommended by the ADEC.

Table A. Land-Farm Triplicate Calculation

Analyte (mg/Kg)	ICLF-DU2	ICLF-DU3	ICLF-DU4	Mean	Standard Deviation	RSD (%)	95 Percent UCL
DRO	869	772	776	806	55	7	898
RRO	2,140	436	912	1,163	879	76	1,482

Notes:
mg/Kg = milligrams per kilogram; RSD = relative standard deviation; UCL = upper confidence limit (one-sided)

The ADEC guidance requires a RSD of 30 percent or less in order for a data set to be considered normally distributed. The calculated RSD for DRO from ICLF-DU2 met the ADEC acceptable limit of less than 30 percent, indicating that the data set was normally distributed, and the precision of the MI sampling data was acceptable. The calculated RSD value for RRO from ICLF-DU2 exceeded the ADEC acceptable limit of less than 30 percent. The increased RSD value may indicate that the data

distribution started to become non-homogenous, and the confidence in the representativeness of the MI sample results is diminished. However, the 95 percent upper confidence limit (UCL) for RRO is one order of magnitude below the ADEC cleanup criterion, and thus the sampling may provide an indication that the soils are not impacted with concentrations of RRO exceeding ADEC cleanup criteria. The RSD for the remainder of the analytes could not be calculated because the analytes in the triplicate sample set exhibited non-detectable concentrations. All of the sample results were below the ADEC Method 2 Cleanup Criteria except for DRO in MI Samples ICLF-DU2, ICLF-DU3, and ICLF-DU4.

The 95-percent UCLs, a variable associated with the uncertainty of estimating the true average contaminant concentration of the DU, were also calculated for the triplicate sample set. The 95-percent UCLs, in comparison to the ADEC cleanup criteria, indicated that only DRO was above the cleanup criterion at 898 mg/Kg. The UCL in comparison to the ADEC cleanup criteria indicated that RRO was below the ADEC cleanup criteria at 1,482 mg/Kg. The UCLs for the remainder of the parameters could not be calculated because the soil samples exhibited non-detectable concentrations for the remaining analytes.

Analytical results for the soil samples are summarized in Table 1 and on Figure 3. A copy of the laboratory data package is included in Appendix C.

5.0 LABORATORY DATA QUALITY REVIEW

Data quality was reviewed in accordance with ADEC guidance and standard industry practices. An ADEC laboratory data review checklist completed for the laboratory work order provides an overview of the quality of the laboratory data, and the checklist is attached in Appendix D. The following is a discussion of our evaluation of sample conditions and laboratory procedures during these field activities.

The analyses were conducted by SGS of Anchorage, which is an ADEC-approved laboratory. Coolers were shipped by BGES personnel from Egegik to Anchorage by air and picked up in Anchorage by BGES personnel and hand-delivered to the laboratory under chain of custody protocol.

Work Order 1133806

The samples contained the proper preservatives for the requested analyses and no unusual sample conditions were noted by the laboratory. A trip blank accompanied the samples through the entirety of the sampling process and delivery to the laboratory, and the analysis of the soil samples were performed

within the required holding times. The case narrative for Work Order Number 1133806 noted that there were no Quality Control (QC) failures identified by SGS.

The temperature of the cooler with the soil samples was measured at the laboratory at the time of receipt to be 1.9 degrees Celsius (C). This temperature is slightly below the prescribed optimal temperature range of 4 degrees +/- 2 degrees C. Because the temperature of the cooler is slightly below the optimal temperature, it is our opinion that there is a reduced potential for biological degradation of the analytes and this QC failure does not affect the acceptability of the data for their intended use.

The laboratory data quality control review checklist is provided in Appendix D.

6.0 CONCEPTUAL SITE MODEL

Details of past releases and remedial actions were previously discussed in Section 2.0 above and in the following reports prepared by BGES:

- Phase I Environmental Site Assessment (ESA), October 2005;
- Phase II ESA report (March 2006);
- Additional Assessment/Remediation Report (February 2007);
- 2007 Site Remediation And Monitoring Report (March 2008);
- 2007 Hydrocarbon Remediation Report (no date);
- 2008 Petroleum Hydrocarbon Remediation Report (no date); and,
- 2009 Site Assessment and Remediation Activities Report (April 2010).

Because no significant changes to the site have taken place since the previous reporting period (2009), the previously created conceptual site model (CSM), as described in detail in the 2009 Site Assessment and Remediation Activities Report, is considered to be applicable. As described above and in previous reports, contamination at the Icicle facility originated from a variety of recent and historical sources, and several locations at the subject property are impacted to various degrees by releases of petroleum hydrocarbons, thus risks have been evaluated separately by geographical region above. Although portions of the impacted soils have been removed from the subject property, in some areas, surface and subsurface soils and groundwater, surface water, and sediments continue to exhibit petroleum hydrocarbon contaminants above ADEC cleanup criteria.

The remaining contaminants may be transported by the uptake of plants, animals, volatilization to

outdoor or indoor air, transport and deposition from fugitive dust, or migration through groundwater and surface water flow. As stated above, complete and incomplete current and future ecological and human pathways for exposures to these contaminants are described in detail in the 2009 Site Assessment and Remediation Activities Report.

7.0 CONCLUSIONS AND RECOMMENDATIONS

Monitoring activities were performed during August of 2013 in response to previous petroleum spills that occurred between 2005 and 2008 during operations by Icicle at the subject property. The results of these activities and recommendations for continued monitoring and remedial actions are discussed below by geographical area for only the Icicle operations. This discussion does not include any of the areas of the subject property where on-going assessment and remediation activities are being performed for the former WAFCO operations. The background of each geographical area was previously presented in Section 2.0 above.

7.1 Land-Farmed Soils

As mentioned above, approximately 90 cubic yards of impacted soil have been spread at the Icicle land-farm. Discrete soil samples collected from the land-farmed soils in 2008 indicated that DRO was the primary contaminant above the ADEC cleanup criteria with a maximum concentration of 6,180 mg/Kg. Concentrations of BTEX, GRO, and RRO were all below the ADEC cleanup criteria.

Discrete soil samples collected in 2009 indicated that DRO and GRO exceeded the ADEC cleanup criteria. The maximum DRO and GRO concentrations were 3,970 mg/Kg and 520 mg/Kg, respectively.

MI soil samples collected from the land-farmed soils in 2013 indicated that DRO was the primary contaminant above the ADEC cleanup criteria with a maximum concentration of 869 mg/Kg. Concentrations of RRO were below the ADEC cleanup criterion; and soil samples exhibited non-detectable concentrations for all remaining anayltes. The 95-percent UCLs, a variable associated with the uncertainty of estimating the true average contaminant concentration of the DU, were also calculated for the triplicate sample set. The 95-percent UCLs, in comparison to the ADEC cleanup criteria, indicated that only DRO exceeded the cleanup criterion at 898 mg/Kg.

The land-farm soils were reportedly tilled twice during 2013 by Icicle personnel to promote aeration of the soils and enhance biodegradation of the petroleum-contaminated soils.

BGES recommends that the land-farm soils continue to be tilled at least twice every the summer and that nutrients be applied to the land-farm soils between the first and second rounds of tilling. It is recommended that the land-farm soils be sampled utilizing the MI sampling method every 3 to 5 years to monitor the degradation of petroleum contamination within the land-farm soils. A work plan should be prepared and submitted to the ADEC for their approval prior to implementation of the MI sampling.

7.2 Freezer Plant Day Tank

During 2005, the day tank in the area of the Freezer Plant was accidentally overfilled with heating fuel, which was located at the top of the bluff. The fuel release contributed to contamination that was already present in the bluff and beach area from previous spills. It was estimated that between 50 and 100 gallons of heating fuel were spilled during this incident in 2005. It has been calculated that an estimated total of 106 gallons of fuel were recovered from this area since the 2005 spill. Therefore, BGES recommended the status of "Cleanup Complete" for this Icicle spill area in the 2008 Petroleum Hydrocarbon Remediation Report. In ADEC correspondence dated May 19, 2009, the CSP states that they have determined that cleanup is complete for Icicle's 2005 Freezer Plant day tank spill. There were no activities performed in 2013 for this area and no future activities are planned for the Freezer Plant day tank area.

7.3 Tank Farm Area

The bulk fuel tank farm is located upgradient of the central and inter-tidal region of the beach areas. Details of the site characterization and remediation activities are presented above in Section 2.

During the 2008 assessment activities, the former gasoline tank farm soils were assessed. There were two gasoline tanks formerly located to the northwest of the diesel tanks that had a secondary containment with a heavily damaged bladder overlying native soils. The gasoline tanks were decommissioned in 2006 and removed prior to the 2008 field event. An unknown quantity of impacted soils remains beneath the concrete pad of the tank farm and these soils are not accessible for removal. The presence of these impacted soils may be contributing to the impacted groundwater quality in this area.

Monitoring Well MW-12, which is located 30 feet northeast and downgradient of the tank farm, was sampled in 2005, 2006, 2007, 2008, 2009, and 2010. Since contamination was not evident during drilling in this area, this monitoring well was installed as a "sentry" well to evaluate potential future

releases at the tank farm. The groundwater concentrations of DRO, RRO, benzene, and total xylenes increased slightly in 2006 as compared to 2005, and the concentrations decreased in 2007. The sample collected in 2008 indicated that the DRO concentration increased in 2008 as compared to the previous year, and exceeded the ADEC cleanup criterion. The sample collected in 2009 indicated that DRO concentrations decreased from 2008 to 2009 and the results were below the ADEC cleanup criterion in 2009. During the latest sampling event, conducted in 2010, the water sample collected from Monitoring Well MW-12 exhibited non-detectable concentrations of contaminants below the laboratory's MRLs and below ADEC cleanup criteria. Based on historical analytical results being below the ADEC cleanup criteria, Monitoring Well MW-12 has not been sampled since 2010 for this project. The historical analytical results from 2005 through 2010 for MW-12 are presented below in Table B.

TABLE B. TANK FARM AREA MONITORING WELL MW-12 ANALYTICAL RESULTS 2005-2010

Parameter	2005 Results (mg/L)	2006 Results (mg/L)	2007 Results (mg/L)	2008 Results (mg/L)	2009 Results (mg/L)	2010 Results (mg/L)	ADEC Cleanup Criteria[1]
Benzene	< 0.000500	0.000719	< 0.000500	< 0.000500	< 0.000500	< 0.000500	0.005
Toluene	< 0.002	0.000728 J	< 0.000500	< 0.000500	< 0.0010	< 0.000500	1.0
Ethylbenzene	< 0.002	0.000741 J	< 0.000500	< 0.000500	< 0.0010	< 0.000500	0.7
Total Xylenes	< 0.002	0.002350	< 0.00150	< 0.00150	< 0.0030	< 0.00150	10.0
GRO	< 0.090	0.0145 J	< 0.0500	< 0.0500	< 0.0500	< 0.0500	2.2
DRO	0.776	1.33	0.727	**1.60**	1.200	< 0.400	1.5
RRO	0.625	1.04	0.579	< 0.551	0.425	< 0.400	1.1

Notes:
[1] = Groundwater cleanup criteria based on 18 AAC 75.345, Table C (dated October 1, 2014).
DRO = diesel range organics; GRO = gasoline range organics; RRO = residual range organics
J = sample results is estimated; mg/L = milligrams per liter
Analytical results that are **bold** exceed the ADEC cleanup criterion

Because all of the observably impacted soils that were accessible were successfully removed, we recommend that a closure status of "Cleanup Complete" be considered for the tank farm area of the subject property, and that if in the future the tank farm is relocated, impacted soils from beneath the secondary containment be excavated and transported to the land-farm.

If future petroleum spills/releases occur from the tank farm area, a groundwater monitoring program can be implemented for MW-12 to evaluate groundwater conditions downgradient from the tank farm area.

7.4 Mechanics' Housing Area

On June 10, 2008, approximately 127.5 gallons of heating fuel were released from a day tank located adjacent to the Mechanics' Bunkhouse due to human error by allowing fuel to overflow during refilling of the 500-gallon tank. Details of the site characterization and remediation activities are presented above in Section 2.

In correspondence dated May 19, 2009 from the ADEC; CSP stated that they concur with BGES' conclusion that the presence of benzene in the vicinity of the Mechanics' Bunkhouse was attributed to the previous Patricia Ann spill and has determined that cleanup is complete for the 2008 Icicle spill in the vicinity of the Mechanics' Bunkhouse area. Monitoring activities in this area of the subject property have continued in conjunction with the groundwater monitoring activities for the WAFCO project.

7.5 Generator Building

In 2006, Icicle reported a release of approximately 200 gallons of diesel fuel at the Generator Building, of which a portion of the fuel was recovered with sorbent materials and hand-digging immediately after the release. Details of the site characterization and remediation activities are presented above in Section 2.

In the 2008 Petroleum Hydrocarbon Remediation Report, BGES recommended the status of "Cleanup Complete" for the Generator Building spill area since approximately 271 gallons of fuel have been recovered from this Icicle spill area. In correspondence from the ADEC dated May 19, 2009; CSP stated that they have determined that cleanup is complete for Icicle's 2006 spill in the area of the generator building. Therefore, no activities were performed in this area during 2013 related to the 2006 Icicle spill and no future activities are planned.

8.0 EXCLUSIONS AND CONSIDERATIONS

This report was prepared for our client, Icicle Seafoods, Inc. The scope of work and level of effort were agreed to by Icicle Seafoods. It is not intended for third parties to rely on the information provided in this report, except at their own risk. This report presents facts, observations, and inferences based on conditions observed during the period of our project activities, and only those conditions that were evaluated as part of our scope of work. Our conclusions and recommendations are based on our observations and the results of our research, and as such, rely on the accuracy of the information that

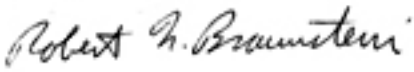
was reviewed. In addition, changes to site conditions may have occurred since we completed our latest project activities. These changes may be from the actions of man or nature. Changes in regulations may also impact the interpretation of site conditions. BGES will not disclose our findings to any parties other than our client as listed above, and the ADEC, except as directed by our client, or as required by law.

The soil sampling activities conducted during August of 2013 were performed by Joshua Barsis and Katy Latimer, BGES Environmental Scientists and QPs as defined by the ADEC. This report was prepared by Katy Latimer and Jayne Martin, Senior Environmental Scientist of BGES. Ms. Martin is a QP as defined by the ADEC and has more than 25 years of environmental consulting experience. Ms. Martin has conducted and managed numerous site characterization and remediation efforts throughout Alaska and the lower 48 states, which have included, but are not limited to, field activities such as the advancement of soil borings, performance of groundwater monitoring, excavation supervision and soil sampling, and the installation of monitoring wells. The report was reviewed and approved by Robert N. Braunstein, Principal Geologist of BGES. Mr. Braunstein is thoroughly familiar with site conditions, since he completed the Phase I ESA during the 2005 season, and led the field team during the 2005 Phase II ESA. Mr. Braunstein, a Certified Professional Geologist, has over 30 years of professional geologic and environmental consulting experience, and has conducted or managed thousands of Phase I and Phase II ESAs throughout Alaska and the lower 48 states. He has extensive experience with contaminated site assessments and remediation programs.

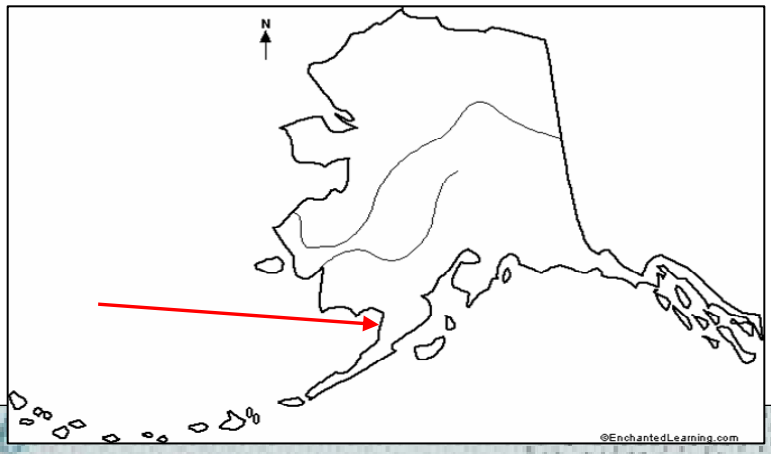
Prepared By:

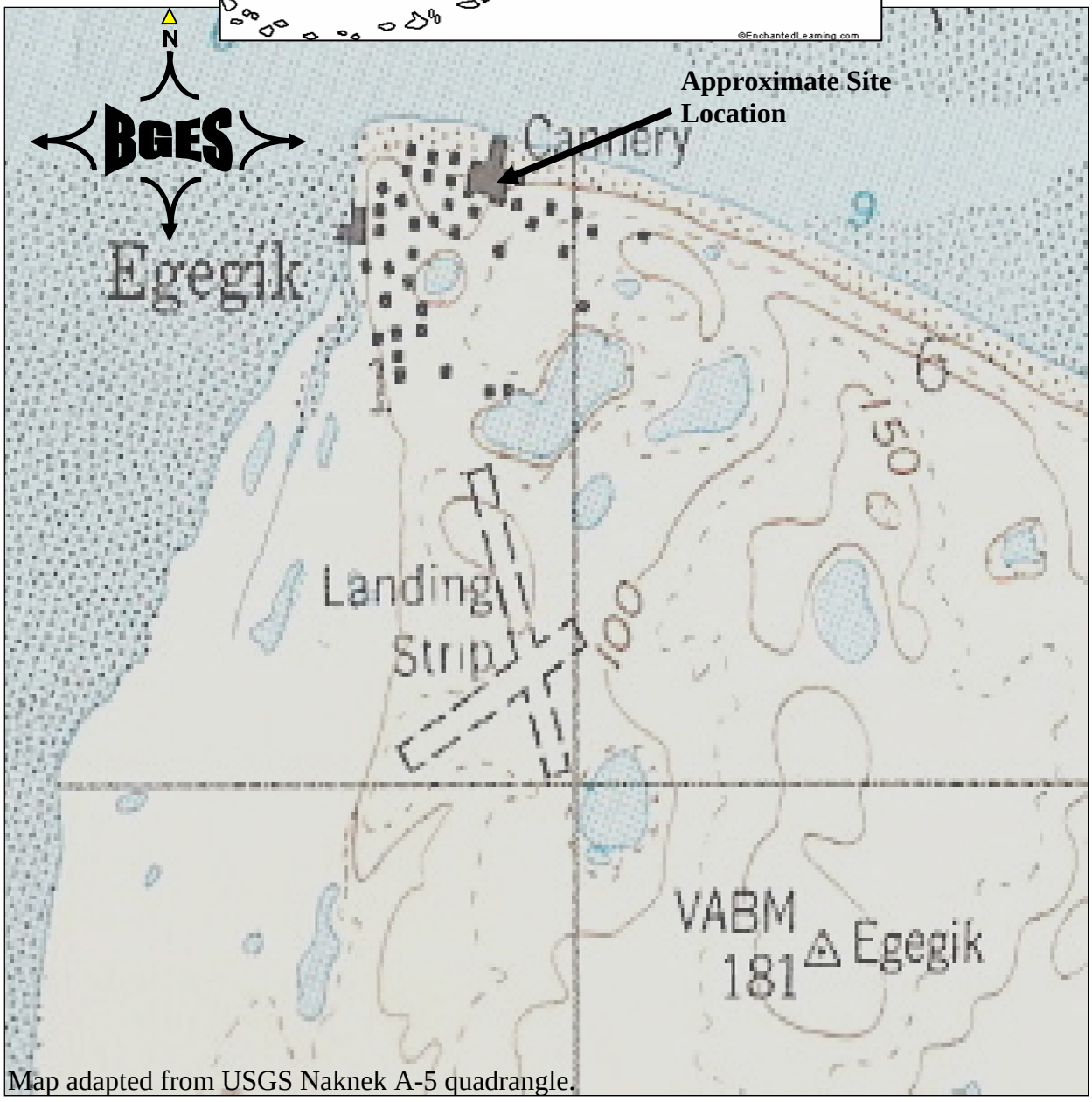
Jayne Martin
Senior Environmental Scientist

Reviewed By:



Robert N. Braunstein, C.P.G.
Principal



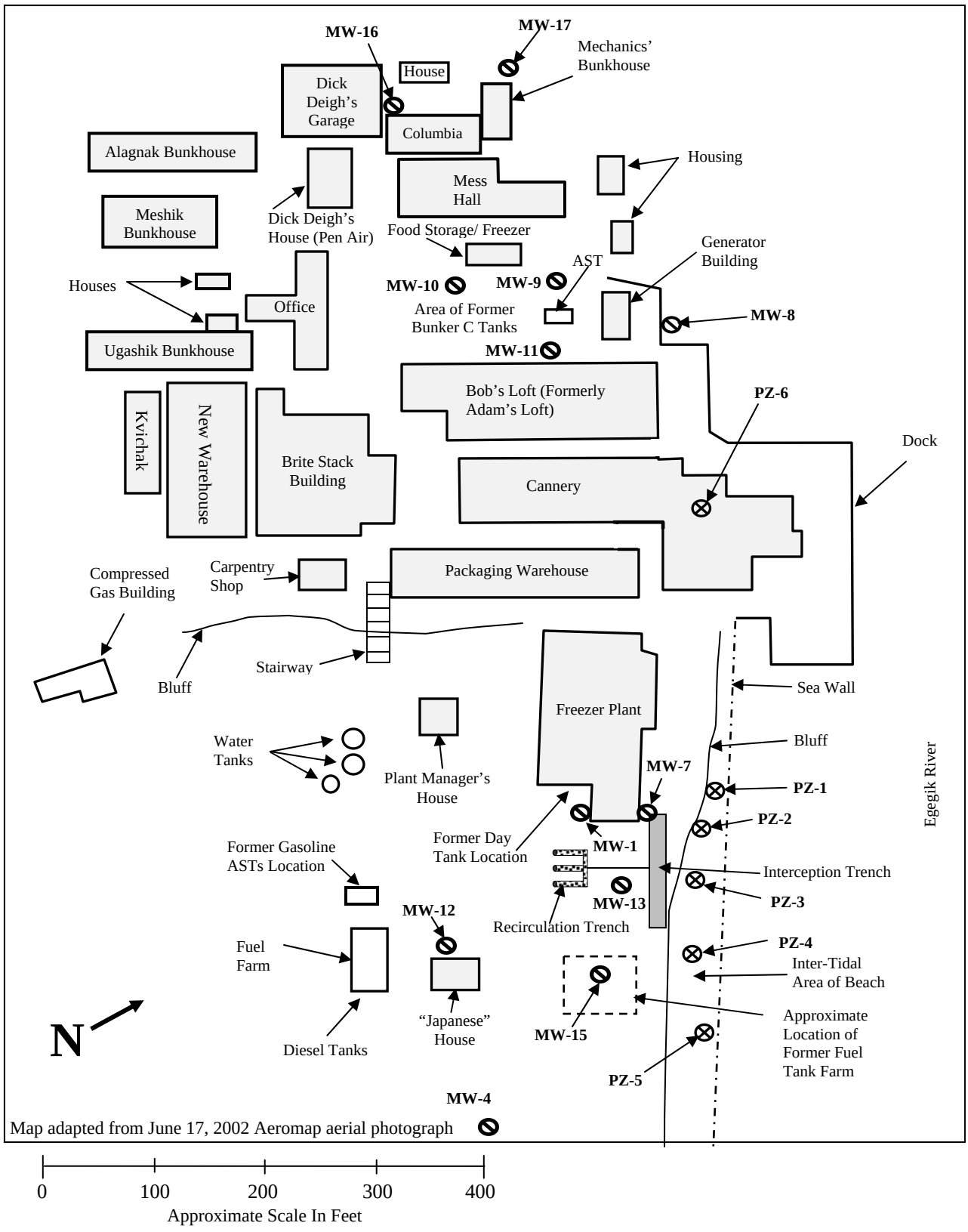


Map adapted from USGS Naknek A-5 quadrangle.

0 ¼ ½

Approximate Scale in Miles

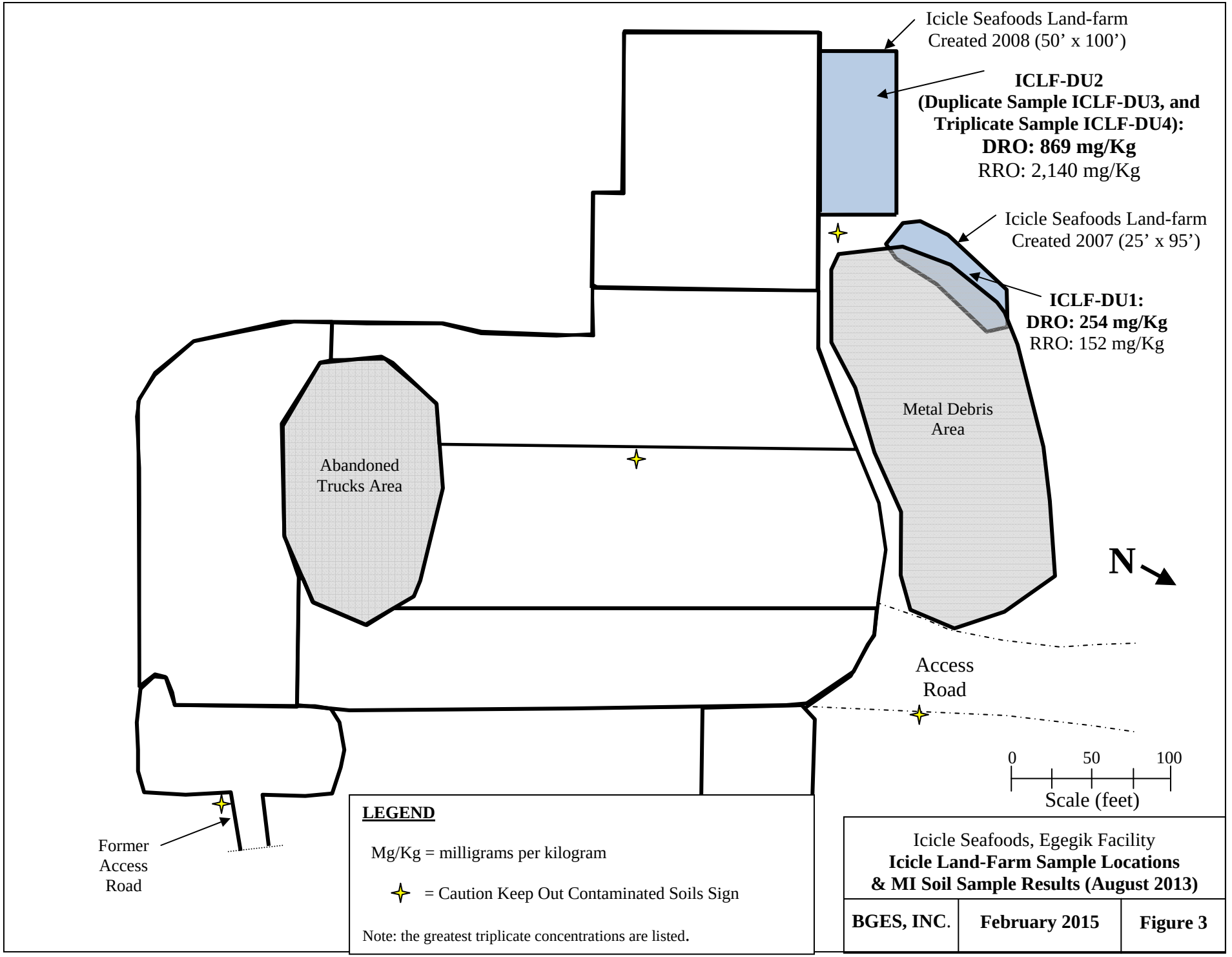
Icicle Seafoods, Egegik Facility **Property Vicinity Map**		
BGES, INC.	**February 2015**	**Figure 1**



Legend:
⊘ = Monitoring Well Location
⊗ = Piezometer Location

Icicle Seafoods, Egegik Facility
Facility Site Map

BGES, INC.	February 2015	Figure 2



Icicle Seafoods, Egegik Facility
Icicle Land-Farm Sample Locations
& MI Soil Sample Results (August 2013)

BGES, INC.	February 2015	Figure 3

Table 1
Icicle Seafoods, Egegik, Alaska
Analytical Results - Soils (August 2013)

BGES, INC.

Soil Sample No.	Parameter	Results (mg/Kg)	LOQ (mg/Kg)	ADEC Soil Cleanup Criterion (mg/Kg)[1]	Analytical Method
	Benzene	ND	0.0130	0.025	EPA 8021B
	Toluene	ND	0.0259	6.5	EPA 8021B
ICLF-DU1	Ethylbenzene	ND	0.0259	6.9	EPA 8021B
	Xylenes (total)	ND	0.0777	63	EPA 8021B
PID = 0 ppm	Gasoline Range Organics	ND	2.59	300	AK101
	Diesel Range Organics	**254**	21.4	250	AK102
	Residual Range Organics	152	21.4	10,000	AK103
	Benzene	ND	0.0143	0.025	EPA 8021B
	Toluene	ND	0.0287	6.5	EPA 8021B
ICLF-DU2	Ethylbenzene	ND	0.0287	6.9	EPA 8021B
	Xylenes (total)	ND	0.0861	63	EPA 8021B
PID = 0 ppm	Gasoline Range Organics	ND	2.87	300	AK101
	Diesel Range Organics	**869**	107	250	AK102
	Residual Range Organics	2,140	107	10,000	AK103
	Benzene	ND	0.0156	0.025	EPA 8021B
	Toluene	ND	0.0313	6.5	EPA 8021B
ICLF-DU3	Ethylbenzene	ND	0.0313	6.9	EPA 8021B
(Duplicate of ICLF-DU2)	Xylenes (total)	ND	0.0939	63	EPA 8021B
	Gasoline Range Organics	ND	3.13	300	AK101
	Diesel Range Organics	**772**	84.3	250	AK102
	Residual Range Organics	436	21.1	10,000	AK103
	Benzene	ND	0.0127	0.025	EPA 8021B
	Toluene	ND	0.0253	6.5	EPA 8021B
ICLF-DU4	Ethylbenzene	ND	0.0253	6.9	EPA 8021B
Triplicate of ICLF-DU2)	Xylenes (total)	ND	0.0760	63	EPA 8021B
	Gasoline Range Organics	ND	2.53	300	AK101
	Diesel Range Organics	**776**	86.3	250	AK102
	Residual Range Organics	912	86.3	10,000	AK103

[1] Soil criteria from Alaska Department of Environmental Conservation (ADEC) 18 AAC 75.341, Tables B1 and B2, Method 2, Under 40-Inch Zone, Migration to Groundwater except for RRO, which is based on the Ingestion Pathway (October 1, 2014).

Bold results = Concentration exceeds the corresponding ADEC Method 2 cleanup criterion.

LOQ = limit of quantitation; mg/Kg = milligrams per kilogram; PID = photoionization detector; ppm = parts per million

APPENDIX A
SITE PHOTOGRAPHS

Photo 1. Establishing Grid for MI Sampling

Photo 2. Establishing Grid for MI Sampling

Photo 3. Establishing Grid for MI Sampling

Photo 4. Collecting MI Sample Aliquot

Photo 5. Sign for Land-Farm Areas

Icicle Seafoods, Egegik Facility Egegik, Alaska **Site Photographs**		
BGES, INC.	**February 2015**	**Figure A-1**

APPENDIX B
FIELD NOTES

8-10-13 Icicle J. Borsis, K. Latimer

700 BGES onsite to sample ICLF-DU2 & ICLF-DU1, Duplicate & Triplicate Samples will be collected from DU2.

A coin Flip decided the order of sampling & depths. Depths are from 2" to 5" & 5" to 8", Stockpile depth is only 8" total.

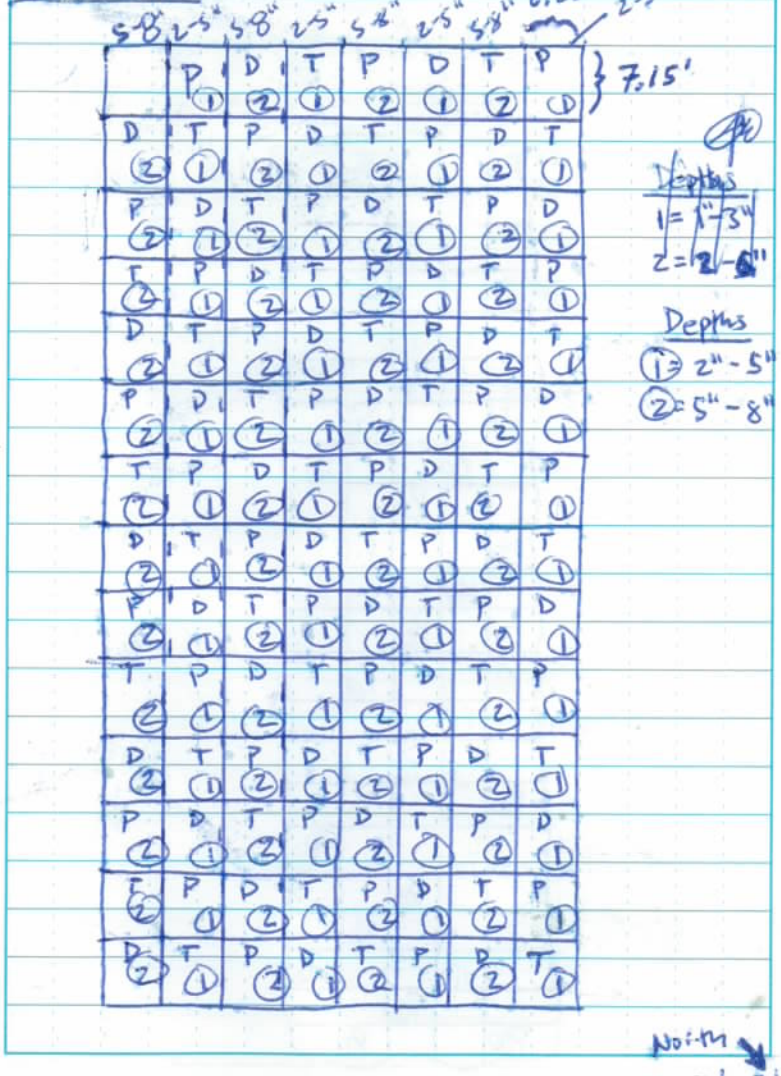
A Significant amount of debris was added in the vicinity of ICLF-DU2 since the previous Sampling event, Many aliquots were positioned around various Metal debris; such as dilapidated vehicles & parts, engines, & other Metal Scraps.

Scale: 1 square=_____

8-10-13 Icicle S. Borsis, K. Latimer

Sample collection Time: 1330

ICLF-DU2 (50'x100')

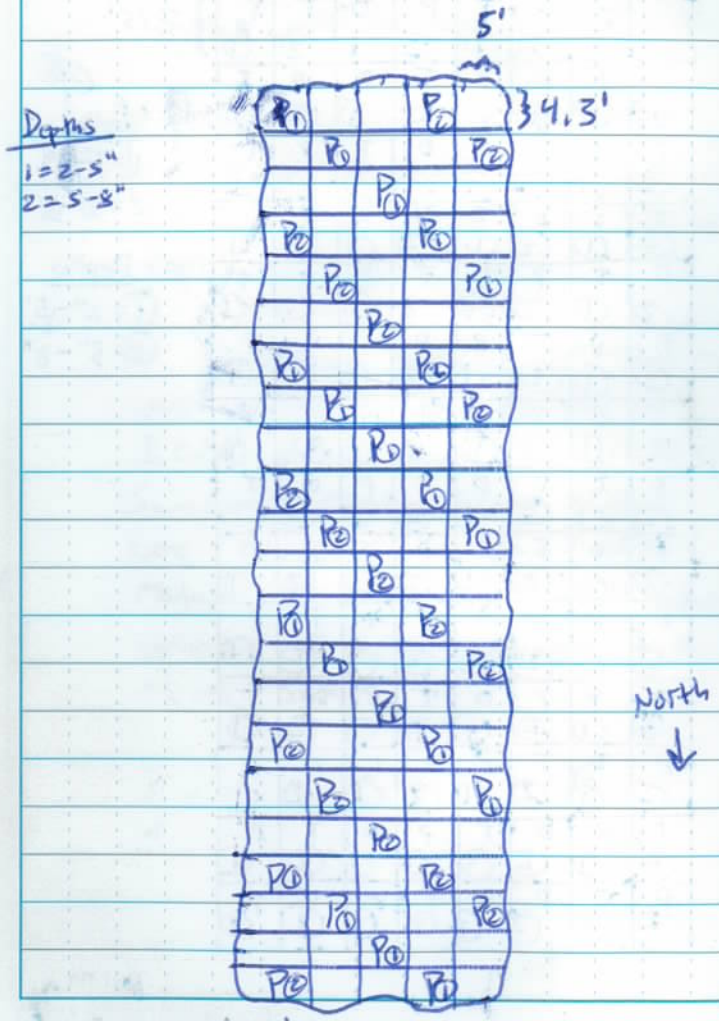


Scale: 1 square= 5' x 5'

8-10-13 Icicle J. Bass; K. Latimer.

Sample collection Time: 1530

ICLF-DU1 (25' x 95')

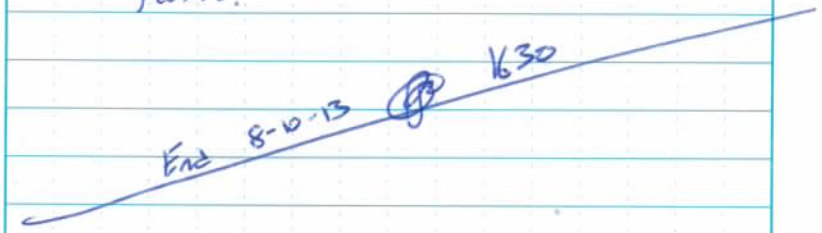


Scale: 1 square= 5' x 5'

8-10-13 Icicle J. Bass; K. Latimer

ST(1) Landform ICLF-DU1 was not a ~~Straight(2) rectangle~~ (3) a perfect rectangle, It was curved.

1630 BGES finishes Icicle land farms.



Scale: 1 square= _____

APPENDIX C
LABORATORY ANALYTICAL DATA

Laboratory Report of Analysis

To: BGES Inc.
1042 E 6th Ave
Anchorage, AK 99501
(907)644-2900

Report Number: **1133806**

Client Project: **Icicle**

Dear Jayne Martin,

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 Victoria 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.

Victoria Pennick
2013.08.21
16:59:50 -08'00'

Victoria Pennick Date
Project Manager
Victoria.Pennick@sgs.com

Print Date: 08/21/2013 4:21:41PM

Case Narrative

SGS Client: **BGES Inc.**
SGS Project: **1133806**
Project Name/Site: **Icicle**
Project Contact: **Jayne Martin**

Refer to sample receipt form for information on sample condition.

ICLF-DU1 (1133806006) PS

AK102 - The pattern is consistent with a weathered middle distillate.
AK103 - Unknown hydrocarbon with several peaks is present.

ICLF-DU2 (1133806007) PS

AK102 - The pattern is consistent with a weathered middle distillate.
AK103 - Unknown hydrocarbon with several peaks is present.

ICLF-DU3 (1133806008) PS

AK103 - Unknown hydrocarbon with several peaks is present.
AK102 - The pattern is consistent with a weathered middle distillate.

ICLF-DU4 (1133806009) PS

AK102 - The pattern is consistent with a weathered middle distillate.
AK103 - Unknown hydrocarbon with several peaks is present.

* Multi-Incremental (MI) preparation for DRO/RRO was performed by SGS, Anchorage, AK.

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

SGS North America Inc.
200 West Potter Drive, Anchorage, AK 99518
t 907.562.2343 **f** 907.561.5301 www.us.sgs.com

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., 2xDL)
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.

SGS North America Inc.
200 West Potter Drive, Anchorage, AK 99518
t 907.562.2343 **f** 907.561.5301 www.us.sgs.com

Sample Summary

Client Sample ID	Lab Sample ID	Collected	Received	Matrix
ICLF-DU1	1133806001	08/10/2013	08/14/2013	Soil/Solid (dry weight)
ICLF-DU2	1133806002	08/10/2013	08/14/2013	Soil/Solid (dry weight)
ICLF-DU3	1133806003	08/10/2013	08/14/2013	Soil/Solid (dry weight)
ICLF-DU4	1133806004	08/10/2013	08/14/2013	Soil/Solid (dry weight)
TB1	1133806005	08/10/2013	08/14/2013	Soil/Solid (dry weight)
ICLF-DU1	1133806006	08/10/2013	08/14/2013	Soil/Solid (dry weight)
ICLF-DU2	1133806007	08/10/2013	08/14/2013	Soil/Solid (dry weight)
ICLF-DU3	1133806008	08/10/2013	08/14/2013	Soil/Solid (dry weight)
ICLF-DU4	1133806009	08/10/2013	08/14/2013	Soil/Solid (dry weight)

Method	Method Description
AK101	AK101/8021 Combo. (S)
SW8021B	AK101/8021 Combo. (S)
AK102	Diesel/Residual Range Organics
AK103	Diesel/Residual Range Organics
SM21 2540G	Percent Solids SM2540G

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

Detectable Results Summary

Client Sample ID: **ICLF-DU1**
Lab Sample ID: 1133806006
Semivolatile Organic Fuels

Parameter	Result	Units
Diesel Range Organics	254	mg/Kg
Residual Range Organics	152	mg/Kg

Client Sample ID: **ICLF-DU2**
Lab Sample ID: 1133806007
Semivolatile Organic Fuels

Parameter	Result	Units
Diesel Range Organics	869	mg/Kg
Residual Range Organics	2140	mg/Kg

Client Sample ID: **ICLF-DU3**
Lab Sample ID: 1133806008
Semivolatile Organic Fuels

Parameter	Result	Units
Diesel Range Organics	772	mg/Kg
Residual Range Organics	436	mg/Kg

Client Sample ID: **ICLF-DU4**
Lab Sample ID: 1133806009
Semivolatile Organic Fuels

Parameter	Result	Units
Diesel Range Organics	776	mg/Kg
Residual Range Organics	912	mg/Kg

SGS North America Inc.
200 West Potter Drive, Anchorage, AK 99518
t 907.562.2343 **f** 907.561.5301 www.us.sgs.com

Results of **ICLF-DU1**

Client Sample ID: **ICLF-DU1**
Client Project ID: **Icicle**
Lab Sample ID: 1133806001
Lab Project ID: 1133806

Collection Date: 08/10/13 15:30
Received Date: 08/14/13 09:59
Matrix: Soil/Solid (dry weight)
Solids (%): 84.8

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Date Analyzed
Gasoline Range Organics	2.59	U	2.59	0.777	mg/Kg	1	08/16/13 03:42
Surrogates							
4-Bromofluorobenzene	74.8		50-150		%	1	08/16/13 03:42

Batch Information

Analytical Batch: VFC11569
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 08/16/13 03:42
Container ID: 1133806001-B

Prep Batch: VXX25065
Prep Method: SW5035A
Prep Date/Time: 08/10/13 15:30
Prep Initial Wt./Vol.: 87.184 g
Prep Extract Vol: 38.2817 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Date Analyzed
Benzene	13.0	U	13.0	4.14	ug/Kg	1	08/16/13 03:42
Ethylbenzene	25.9	U	25.9	8.08	ug/Kg	1	08/16/13 03:42
o-Xylene	25.9	U	25.9	8.08	ug/Kg	1	08/16/13 03:42
P & M -Xylene	51.8	U	51.8	15.5	ug/Kg	1	08/16/13 03:42
Toluene	25.9	U	25.9	8.08	ug/Kg	1	08/16/13 03:42
Surrogates							
1,4-Difluorobenzene	94.9		72-119		%	1	08/16/13 03:42

Batch Information

Analytical Batch: VFC11569
Analytical Method: SW8021B
Analyst: ST
Analytical Date/Time: 08/16/13 03:42
Container ID: 1133806001-B

Prep Batch: VXX25065
Prep Method: SW5035A
Prep Date/Time: 08/10/13 15:30
Prep Initial Wt./Vol.: 87.184 g
Prep Extract Vol: 38.2817 mL

SGS North America Inc.
200 West Potter Drive Anchorage, AK 95518
t 907.562.2343 **f** 907.561.5301 www.us.sgs.com

Results of **ICLF-DU2**

Client Sample ID: **ICLF-DU2**
Client Project ID: **Icicle**
Lab Sample ID: 1133806002
Lab Project ID: 1133806

Collection Date: 08/10/13 13:30
Received Date: 08/14/13 09:59
Matrix: Soil/Solid (dry weight)
Solids (%): 81.9

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Date Analyzed
Gasoline Range Organics	2.87	U	2.87	0.860	mg/Kg	1	08/16/13 04:00
Surrogates							
4-Bromofluorobenzene	78.4		50-150		%	1	08/16/13 04:00

Batch Information

Analytical Batch: VFC11569
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 08/16/13 04:00
Container ID: 1133806002-B

Prep Batch: VXX25065
Prep Method: SW5035A
Prep Date/Time: 08/10/13 13:30
Prep Initial Wt./Vol.: 86.552 g
Prep Extract Vol: 40.6619 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Date Analyzed
Benzene	14.3	U	14.3	4.59	ug/Kg	1	08/16/13 04:00
Ethylbenzene	28.7	U	28.7	8.95	ug/Kg	1	08/16/13 04:00
o-Xylene	28.7	U	28.7	8.95	ug/Kg	1	08/16/13 04:00
P & M -Xylene	57.4	U	57.4	17.2	ug/Kg	1	08/16/13 04:00
Toluene	28.7	U	28.7	8.95	ug/Kg	1	08/16/13 04:00
Surrogates							
1,4-Difluorobenzene	94.8		72-119		%	1	08/16/13 04:00

Batch Information

Analytical Batch: VFC11569
Analytical Method: SW8021B
Analyst: ST
Analytical Date/Time: 08/16/13 04:00
Container ID: 1133806002-B

Prep Batch: VXX25065
Prep Method: SW5035A
Prep Date/Time: 08/10/13 13:30
Prep Initial Wt./Vol.: 86.552 g
Prep Extract Vol: 40.6619 mL

SGS North America Inc.
200 West Potter Drive Anchorage, AK 95518
t 907.562.2343 **f** 907.561.5301 www.us.sgs.com

Results of **ICLF-DU3**

Client Sample ID: **ICLF-DU3**
Client Project ID: **Icicle**
Lab Sample ID: 1133806003
Lab Project ID: 1133806

Collection Date: 08/10/13 13:30
Received Date: 08/14/13 09:59
Matrix: Soil/Solid (dry weight)
Solids (%): 82.0

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Date Analyzed
Gasoline Range Organics	3.13	U	3.13	0.939	mg/Kg	1	08/16/13 04:19
Surrogates							
4-Bromofluorobenzene	72.7		50-150		%	1	08/16/13 04:19

Batch Information

Analytical Batch: VFC11569
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 08/16/13 04:19
Container ID: 1133806003-B

Prep Batch: VXX25065
Prep Method: SW5035A
Prep Date/Time: 08/10/13 13:30
Prep Initial Wt./Vol.: 75.053 g
Prep Extract Vol: 38.5139 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Date Analyzed
Benzene	15.6	U	15.6	5.01	ug/Kg	1	08/16/13 04:19
Ethylbenzene	31.3	U	31.3	9.76	ug/Kg	1	08/16/13 04:19
o-Xylene	31.3	U	31.3	9.76	ug/Kg	1	08/16/13 04:19
P & M -Xylene	62.6	U	62.6	18.8	ug/Kg	1	08/16/13 04:19
Toluene	31.3	U	31.3	9.76	ug/Kg	1	08/16/13 04:19
Surrogates							
1,4-Difluorobenzene	94.6		72-119		%	1	08/16/13 04:19

Batch Information

Analytical Batch: VFC11569
Analytical Method: SW8021B
Analyst: ST
Analytical Date/Time: 08/16/13 04:19
Container ID: 1133806003-B

Prep Batch: VXX25065
Prep Method: SW5035A
Prep Date/Time: 08/10/13 13:30
Prep Initial Wt./Vol.: 75.053 g
Prep Extract Vol: 38.5139 mL

SGS North America Inc.
200 West Potter Drive Anchorage, AK 95518
t 907.562.2343 **f** 907.561.5301 www.us.sgs.com

Results of **ICLF-DU4**

Client Sample ID: **ICLF-DU4**
Client Project ID: **Icicle**
Lab Sample ID: 1133806004
Lab Project ID: 1133806

Collection Date: 08/10/13 13:30
Received Date: 08/14/13 09:59
Matrix: Soil/Solid (dry weight)
Solids (%): 84.7

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Date Analyzed
Gasoline Range Organics	2.53	U	2.53	0.760	mg/Kg	1	08/16/13 04:37
Surrogates							
4-Bromofluorobenzene	54.5		50-150		%	1	08/16/13 04:37

Batch Information

Analytical Batch: VFC11569
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 08/16/13 04:37
Container ID: 1133806004-B

Prep Batch: VXX25065
Prep Method: SW5035A
Prep Date/Time: 08/10/13 13:30
Prep Initial Wt./Vol.: 90.589 g
Prep Extract Vol: 38.8769 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Date Analyzed
Benzene	12.7	U	12.7	4.05	ug/Kg	1	08/16/13 04:37
Ethylbenzene	25.3	U	25.3	7.91	ug/Kg	1	08/16/13 04:37
o-Xylene	25.3	U	25.3	7.91	ug/Kg	1	08/16/13 04:37
P & M -Xylene	50.7	U	50.7	15.2	ug/Kg	1	08/16/13 04:37
Toluene	25.3	U	25.3	7.91	ug/Kg	1	08/16/13 04:37
Surrogates							
1,4-Difluorobenzene	95.1		72-119		%	1	08/16/13 04:37

Batch Information

Analytical Batch: VFC11569
Analytical Method: SW8021B
Analyst: ST
Analytical Date/Time: 08/16/13 04:37
Container ID: 1133806004-B

Prep Batch: VXX25065
Prep Method: SW5035A
Prep Date/Time: 08/10/13 13:30
Prep Initial Wt./Vol.: 90.589 g
Prep Extract Vol: 38.8769 mL

SGS North America Inc.
200 West Potter Drive Anchorage, AK 95518
t 907.562.2343 **f** 907.561.5301 www.us.sgs.com

Results of **TB1**

Client Sample ID: **TB1**
Client Project ID: **Icicle**
Lab Sample ID: 1133806005
Lab Project ID: 1133806

Collection Date: 08/10/13 13:30
Received Date: 08/14/13 09:59
Matrix: Soil/Solid (dry weight)
Solids (%):

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Date Analyzed
Gasoline Range Organics	2.51	U	2.51	0.754	mg/Kg	1	08/16/13 00:39
Surrogates							
4-Bromofluorobenzene	99.8		50-150		%	1	08/16/13 00:39

Batch Information

Analytical Batch: VFC11569
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 08/16/13 00:39
Container ID: 1133806005-A

Prep Batch: VXX25065
Prep Method: SW5035A
Prep Date/Time: 08/10/13 13:30
Prep Initial Wt./Vol.: 49.741 g
Prep Extract Vol: 25 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Date Analyzed
Benzene	12.6	U	12.6	4.02	ug/Kg	1	08/16/13 00:39
Ethylbenzene	25.1	U	25.1	7.84	ug/Kg	1	08/16/13 00:39
o-Xylene	25.1	U	25.1	7.84	ug/Kg	1	08/16/13 00:39
P & M -Xylene	50.3	U	50.3	15.1	ug/Kg	1	08/16/13 00:39
Toluene	25.1	U	25.1	7.84	ug/Kg	1	08/16/13 00:39
Surrogates							
1,4-Difluorobenzene	94.9		72-119		%	1	08/16/13 00:39

Batch Information

Analytical Batch: VFC11569
Analytical Method: SW8021B
Analyst: ST
Analytical Date/Time: 08/16/13 00:39
Container ID: 1133806005-A

Prep Batch: VXX25065
Prep Method: SW5035A
Prep Date/Time: 08/10/13 13:30
Prep Initial Wt./Vol.: 49.741 g
Prep Extract Vol: 25 mL

Results of **ICLF-DU1**

Client Sample ID: **ICLF-DU1**
Client Project ID: **Icicle**
Lab Sample ID: 1133806006
Lab Project ID: 1133806

Collection Date: 08/10/13 15:30
Received Date: 08/14/13 09:59
Matrix: Soil/Solid (dry weight)
Solids (%): 92.9

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Date Analyzed
Diesel Range Organics	254		21.4	6.64	mg/Kg	1	08/20/13 02:26
Surrogates							
5a Androstane	85.2		50-150		%	1	08/20/13 02:26

Batch Information

Analytical Batch: XFC11023
Analytical Method: AK102
Analyst: EAB
Analytical Date/Time: 08/20/13 02:26
Container ID: 1133806006-B

Prep Batch: XXX29682
Prep Method: SW3550C
Prep Date/Time: 08/18/13 20:30
Prep Initial Wt./Vol.: 30.169 g
Prep Extract Vol: 1 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Date Analyzed
Residual Range Organics	152		21.4	6.64	mg/Kg	1	08/20/13 02:26
Surrogates							
n-Triacontane-d62	75.4		50-150		%	1	08/20/13 02:26

Batch Information

Analytical Batch: XFC11023
Analytical Method: AK103
Analyst: EAB
Analytical Date/Time: 08/20/13 02:26
Container ID: 1133806006-B

Prep Batch: XXX29682
Prep Method: SW3550C
Prep Date/Time: 08/18/13 20:30
Prep Initial Wt./Vol.: 30.169 g
Prep Extract Vol: 1 mL

SGS North America Inc.
200 West Potter Drive Anchorage, AK 95518
t 907.562.2343 f 907.561.5301 www.us.sgs.com

Results of **ICLF-DU2**

Client Sample ID: **ICLF-DU2**
Client Project ID: **Icicle**
Lab Sample ID: 1133806007
Lab Project ID: 1133806

Collection Date: 08/10/13 13:30
Received Date: 08/14/13 09:59
Matrix: Soil/Solid (dry weight)
Solids (%): 93.5

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Date Analyzed
Diesel Range Organics	869		107	33.1	mg/Kg	5	08/21/13 03:23
Surrogates							
5a Androstane	84		50-150		%	5	08/21/13 03:23

Batch Information

Analytical Batch: XFC11025
Analytical Method: AK102
Analyst: EAB
Analytical Date/Time: 08/21/13 03:23
Container ID: 1133806007-B

Prep Batch: XXX29682
Prep Method: SW3550C
Prep Date/Time: 08/18/13 20:30
Prep Initial Wt./Vol.: 30.079 g
Prep Extract Vol: 1 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Date Analyzed
Residual Range Organics	2140		107	33.1	mg/Kg	5	08/21/13 03:23
Surrogates							
n-Triacontane-d62	80		50-150		%	5	08/21/13 03:23

Batch Information

Analytical Batch: XFC11025
Analytical Method: AK103
Analyst: EAB
Analytical Date/Time: 08/21/13 03:23
Container ID: 1133806007-B

Prep Batch: XXX29682
Prep Method: SW3550C
Prep Date/Time: 08/18/13 20:30
Prep Initial Wt./Vol.: 30.079 g
Prep Extract Vol: 1 mL

Print Date: 08/21/2013 4:21:45PM

Results of **ICLF-DU3**

Client Sample ID: **ICLF-DU3**
Client Project ID: **Icicle**
Lab Sample ID: 1133806008
Lab Project ID: 1133806

Collection Date: 08/10/13 13:30
Received Date: 08/14/13 09:59
Matrix: Soil/Solid (dry weight)
Solids (%): 94.2

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Date Analyzed
Diesel Range Organics	772		84.3	26.1	mg/Kg	4	08/21/13 01:42
Surrogates							
5a Androstane	79.4		50-150		%	4	08/21/13 01:42

Batch Information

Analytical Batch: XFC11025
Analytical Method: AK102
Analyst: EAB
Analytical Date/Time: 08/21/13 01:42
Container ID: 1133806008-B

Prep Batch: XXX29682
Prep Method: SW3550C
Prep Date/Time: 08/18/13 20:30
Prep Initial Wt./Vol.: 30.225 g
Prep Extract Vol: 1 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Date Analyzed
Residual Range Organics	436		21.1	6.53	mg/Kg	1	08/20/13 03:07
Surrogates							
n-Triacontane-d62	74.3		50-150		%	1	08/20/13 03:07

Batch Information

Analytical Batch: XFC11023
Analytical Method: AK103
Analyst: EAB
Analytical Date/Time: 08/20/13 03:07
Container ID: 1133806008-B

Prep Batch: XXX29682
Prep Method: SW3550C
Prep Date/Time: 08/18/13 20:30
Prep Initial Wt./Vol.: 30.225 g
Prep Extract Vol: 1 mL

SGS North America Inc.
200 West Potter Drive Anchorage, AK 95518
t 907.562.2343 f 907.561.5301 www.us.sgs.com

Results of **ICLF-DU4**

Client Sample ID: **ICLF-DU4**
Client Project ID: **Icicle**
Lab Sample ID: 1133806009
Lab Project ID: 1133806

Collection Date: 08/10/13 13:30
Received Date: 08/14/13 09:59
Matrix: Soil/Solid (dry weight)
Solids (%): 92.5

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Date Analyzed
Diesel Range Organics	776		86.3	26.8	mg/Kg	4	08/21/13 02:02
Surrogates							
5a Androstane	77.6		50-150		%	4	08/21/13 02:02

Batch Information

Analytical Batch: XFC11025
Analytical Method: AK102
Analyst: EAB
Analytical Date/Time: 08/21/13 02:02
Container ID: 1133806009-B

Prep Batch: XXX29682
Prep Method: SW3550C
Prep Date/Time: 08/18/13 20:30
Prep Initial Wt./Vol.: 30.061 g
Prep Extract Vol: 1 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Date Analyzed
Residual Range Organics	912		86.3	26.8	mg/Kg	4	08/21/13 02:02
Surrogates							
n-Triacontane-d62	80.4		50-150		%	4	08/21/13 02:02

Batch Information

Analytical Batch: XFC11025
Analytical Method: AK103
Analyst: EAB
Analytical Date/Time: 08/21/13 02:02
Container ID: 1133806009-B

Prep Batch: XXX29682
Prep Method: SW3550C
Prep Date/Time: 08/18/13 20:30
Prep Initial Wt./Vol.: 30.061 g
Prep Extract Vol: 1 mL

Method Blank

Blank ID: MB for HBN 1475070 [SPT/9111]
Blank Lab ID: 1168873

Matrix: Soil/Solid (dry weight)

QC for Samples:
1133806001, 1133806002, 1133806003, 1133806004

Results by **SM21 2540G**

Parameter	Results	LOQ/CL	DL	Units
Total Solids	100			%

Batch Information

Analytical Batch: SPT9111
Analytical Method: SM21 2540G
Instrument:
Analyst: KRL
Analytical Date/Time: 8/15/2013 5:50:00PM

SGS North America Inc.
200 West Potter Drive Anchorage, AK 95518
t 907.562.2343 **f** 907.561.5301 www.us.sgs.com

Duplicate Sample Summary

Original Sample ID: 1133802001
Duplicate Sample ID: 1168874
QC for Samples:
1133806001, 1133806002, 1133806003, 1133806004

Analysis Date: 08/15/2013 17:50
Matrix: Soil/Solid (dry weight)

Results by **SM21 2540G**

NAME	Original	Duplicate	RPD (%)	RPD CL
Total Solids	95.4	95.5	0.12	15.00

Batch Information

Analytical Batch: SPT9111
Analytical Method: SM21 2540G
Instrument:
Analyst: KRL

Print Date: 08/21/2013 4:21:47PM

Method Blank

Blank ID: MB for HBN 1476014 [SPT/9115]
Blank Lab ID: 1169479

Matrix: Soil/Solid (dry weight)

QC for Samples:
1133806006, 1133806007, 1133806008, 1133806009

Results by **SM21 2540G**

Parameter	Results	LOQ/CL	DL	Units
Total Solids	100			%

Batch Information

Analytical Batch: SPT9115
Analytical Method: SM21 2540G
Instrument:
Analyst: KRL
Analytical Date/Time: 8/18/2013 3:00:00PM

SGS North America Inc.
200 West Potter Drive Anchorage, AK 95518
t 907.562.2343 **f** 907.561.5301 www.us.sgs.com

Duplicate Sample Summary

Original Sample ID: 1169478
Duplicate Sample ID: 1169480
QC for Samples:
1133806006, 1133806007, 1133806008, 1133806009

Analysis Date: 08/18/2013 15:00
Matrix: Soil/Solid (dry weight)

Results by **SM21 2540G**

NAME	Original	Duplicate	RPD (%)	RPD CL
Total Solids	82.7	82.9	0.24	15.00

Batch Information

Analytical Batch: SPT9115
Analytical Method: SM21 2540G
Instrument:
Analyst: KRL

Print Date: 08/21/2013 4:21:48PM

Method Blank

Blank ID: MB for HBN 1475090 [VXX/25065]
Blank Lab ID: 1169000

Matrix: Soil/Solid (dry weight)

QC for Samples:
1133806001, 1133806002, 1133806003, 1133806004, 1133806005

Results by **AK101**

Parameter	Results	LOQ/CL	DL	Units
Gasoline Range Organics	1.50U	2.50	0.750	mg/Kg
Surrogates				
4-Bromofluorobenzene	93.7	50-150		%

Batch Information

Analytical Batch: VFC11569
Analytical Method: AK101
Instrument: Agilent 7890 PID/FID
Analyst: ST
Analytical Date/Time: 8/15/2013 9:54:00PM

Prep Batch: VXX25065
Prep Method: SW5035A
Prep Date/Time: 8/15/2013 8:00:00AM
Prep Initial Wt./Vol.: 50 g
Prep Extract Vol: 25 mL

SGS North America Inc.
200 West Potter Drive Anchorage, AK 95518
t 907.562.2343 **f** 907.561.5301 www.us.sgs.com

Blank Spike Summary

Blank Spike ID: LCS for HBN 1133806 [VXX25065]
Blank Spike Lab ID: 1169003
Date Analyzed: 08/15/2013 22:49

Spike Duplicate ID: LCSD for HBN 1133806 [VXX25065]
Spike Duplicate Lab ID: 1169004
Matrix: Soil/Solid (dry weight)

QC for Samples: 1133806001, 1133806002, 1133806003, 1133806004, 1133806005

Results by **AK101**

	Blank Spike (mg/Kg)			Spike Duplicate (mg/Kg)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Gasoline Range Organics	10.0	9.90	99	10.0	9.89	99	(60-120)	0.09	(< 20)
Surrogates									
4-Bromofluorobenzene			90	1.25	91.7	92	(50-150)	1.40	

Batch Information

Analytical Batch: **VFC11569**
Analytical Method: **AK101**
Instrument: **Agilent 7890 PID/FID**
Analyst: **ST**

Prep Batch: **VXX25065**
Prep Method: **SW5035A**
Prep Date/Time: **08/15/2013 08:00**
Spike Init Wt./Vol.: 10.0 mg/Kg Extract Vol: 25 mL
Dupe Init Wt./Vol.: 10.0 mg/Kg Extract Vol: 25 mL

SGS North America Inc.
200 West Potter Drive Anchorage, AK 95518
t 907.562.2343 f 907.561.5301 www.us.sgs.com

Method Blank

Blank ID: MB for HBN 1475090 [VXX/25065]
Blank Lab ID: 1169000

Matrix: Soil/Solid (dry weight)

QC for Samples:
1133806001, 1133806002, 1133806003, 1133806004, 1133806005

Results by **SW8021B**

Parameter	Results	LOQ/CL	DL	Units
Benzene	8.00U	12.5	4.00	ug/Kg
Ethylbenzene	15.6U	25.0	7.80	ug/Kg
o-Xylene	15.6U	25.0	7.80	ug/Kg
P & M -Xylene	30.0U	50.0	15.0	ug/Kg
Toluene	15.6U	25.0	7.80	ug/Kg
Surrogates				
1,4-Difluorobenzene	94.8	72-119		%

Batch Information

Analytical Batch: VFC11569
Analytical Method: SW8021B
Instrument: Agilent 7890 PID/FID
Analyst: ST
Analytical Date/Time: 8/15/2013 9:54:00PM

Prep Batch: VXX25065
Prep Method: SW5035A
Prep Date/Time: 8/15/2013 8:00:00AM
Prep Initial Wt./Vol.: 50 g
Prep Extract Vol: 25 mL

SGS North America Inc.
200 West Potter Drive Anchorage, AK 95518
t 907.562.2343 **f** 907.561.5301 www.us.sgs.com

Blank Spike Summary

Blank Spike ID: LCS for HBN 1133806 [VXX25065]
Blank Spike Lab ID: 1169001
Date Analyzed: 08/15/2013 22:12

Spike Duplicate ID: LCSD for HBN 1133806 [VXX25065]
Spike Duplicate Lab ID: 1169002
Matrix: Soil/Solid (dry weight)

QC for Samples: 1133806001, 1133806002, 1133806003, 1133806004, 1133806005

Results by **SW8021B**

	Blank Spike (ug/Kg)			Spike Duplicate (ug/Kg)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Benzene	1250	1380	111	1250	1340	108	(75-125)	2.80	(< 20)
Ethylbenzene	1250	1340	108	1250	1310	105	(75-125)	2.60	(< 20)
o-Xylene	1250	1330	106	1250	1290	103	(75-125)	2.90	(< 20)
P & M -Xylene	2500	2720	109	2500	2640	106	(80-125)	2.90	(< 20)
Toluene	1250	1360	109	1250	1330	106	(70-125)	2.60	(< 20)
Surrogates									
1,4-Difluorobenzene			100	1250	99.7	100	(72-119)	0.30	

Batch Information

Analytical Batch: **VFC11569**
Analytical Method: **SW8021B**
Instrument: **Agilent 7890 PID/FID**
Analyst: **ST**

Prep Batch: **VXX25065**
Prep Method: **SW5035A**
Prep Date/Time: **08/15/2013 08:00**
Spike Init Wt./Vol.: 1250 ug/Kg Extract Vol: 25 mL
Dupe Init Wt./Vol.: 1250 ug/Kg Extract Vol: 25 mL

SGS North America Inc.
200 West Potter Drive Anchorage, AK 95518
t 907.562.2343 f 907.561.5301 www.us.sgs.com

Matrix Spike Summary

Original Sample ID: 1133799002
MS Sample ID: 1169005 MS
MSD Sample ID: 1169006 MSD

Analysis Date: 08/15/2013 23:26
Analysis Date: 08/15/2013 23:44
Analysis Date: 08/16/2013 0:03
Matrix: Soil/Solid (dry weight)

QC for Samples: 1133806001, 1133806002, 1133806003, 1133806004, 1133806005

Results by **SW8021B**

		Matrix Spike (ug/Kg)			Spike Duplicate (ug/Kg)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Benzene	134	768	905	100	768	870	96	75-125	3.90	(< 20)
Ethylbenzene	364	768	1070	92	768	1028	87	75-125	4.10	(< 20)
o-Xylene	235	768	959	94	768	923	90	75-125	3.90	(< 20)
P & M -Xylene	465	1540	1925	95	1540	1848	90	80-125	4.10	(< 20)
Toluene	81.3	768	899	106	768	832	98	70-125	7.80	(< 20)
Surrogates										
1,4-Difluorobenzene		768	714	93	768	715	93	72-119	0.19	

Batch Information

Analytical Batch: VFC11569
Analytical Method: SW8021B
Instrument: Agilent 7890 PID/FID
Analyst: ST
Analytical Date/Time: 8/15/2013 11:44:00PM

Prep Batch: VXX25065
Prep Method: AK101 Extraction (S)
Prep Date/Time: 8/15/2013 8:00:00AM
Prep Initial Wt./Vol.: 89.55g
Prep Extract Vol: 25.00mL

Print Date: 08/21/2013 4:21:51PM

Method Blank

Blank ID: MB for HBN 1475864 [XXX/29682]
Blank Lab ID: 1169237

Matrix: Soil/Solid (dry weight)

QC for Samples:
1133806006, 1133806007, 1133806008, 1133806009

Results by **AK102**

Parameter	Results	LOQ/CL	DL	Units
Diesel Range Organics	12.4U	20.0	6.20	mg/Kg
Surrogates				
5a Androstane	89.5	60-120		%

Batch Information

Analytical Batch: XFC11023
Analytical Method: AK102
Instrument: HP 7890A FID SV E R
Analyst: EAB
Analytical Date/Time: 8/19/2013 10:23:00PM

Prep Batch: XXX29682
Prep Method: SW3550C
Prep Date/Time: 8/18/2013 8:30:00PM
Prep Initial Wt./Vol.: 30 g
Prep Extract Vol: 1 mL

SGS North America Inc.
200 West Potter Drive Anchorage, AK 95518
t 907.562.2343 **f** 907.561.5301 www.us.sgs.com

Blank Spike Summary

Blank Spike ID: LCS for HBN 1133806 [XXX29682]
Blank Spike Lab ID: 1169238
Date Analyzed: 08/19/2013 22:43

Spike Duplicate ID: LCSD for HBN 1133806 [XXX29682]
Spike Duplicate Lab ID: 1169239
Matrix: Soil/Solid (dry weight)

QC for Samples: 1133806006, 1133806007, 1133806008, 1133806009

Results by **AK102**

	Blank Spike (mg/Kg)			Spike Duplicate (mg/Kg)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Diesel Range Organics	167	160	96	167	173	104	(75-125)	7.50	(< 20)
Surrogates									
5a Androstane			85	3.33	91.2	91	(60-120)	6.60	

Batch Information

Analytical Batch: **XFC11023**
Analytical Method: **AK102**
Instrument: **HP 7890A FID SV E R**
Analyst: **EAB**

Prep Batch: **XXX29682**
Prep Method: **SW3550C**
Prep Date/Time: **08/18/2013 20:30**
Spike Init Wt./Vol.: 167 mg/Kg Extract Vol: 1 mL
Dupe Init Wt./Vol.: 167 mg/Kg Extract Vol: 1 mL

SGS North America Inc.
200 West Potter Drive Anchorage, AK 95518
t 907.562.2343 f 907.561.5301 www.us.sgs.com

Method Blank

Blank ID: MB for HBN 1475864 [XXX/29682]
Blank Lab ID: 1169237

Matrix: Soil/Solid (dry weight)

QC for Samples:
1133806006, 1133806007, 1133806008, 1133806009

Results by **AK103**

Parameter	Results	LOQ/CL	DL	Units
Residual Range Organics	12.4U	20.0	6.20	mg/Kg
Surrogates				
n-Triacontane-d62	91	60-120		%

Batch Information

Analytical Batch: XFC11023
Analytical Method: AK103
Instrument: HP 7890A FID SV E R
Analyst: EAB
Analytical Date/Time: 8/19/2013 10:23:00PM

Prep Batch: XXX29682
Prep Method: SW3550C
Prep Date/Time: 8/18/2013 8:30:00PM
Prep Initial Wt./Vol.: 30 g
Prep Extract Vol: 1 mL

SGS North America Inc.
200 West Potter Drive Anchorage, AK 95518
t 907.562.2343 **f** 907.561.5301 www.us.sgs.com

Blank Spike Summary

Blank Spike ID: LCS for HBN 1133806 [XXX29682]
Blank Spike Lab ID: 1169238
Date Analyzed: 08/19/2013 22:43

Spike Duplicate ID: LCSD for HBN 1133806 [XXX29682]
Spike Duplicate Lab ID: 1169239
Matrix: Soil/Solid (dry weight)

QC for Samples: 1133806006, 1133806007, 1133806008, 1133806009

Results by **AK103**

	Blank Spike (mg/Kg)			Spike Duplicate (mg/Kg)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Residual Range Organics	167	157	94	167	168	101	(60-120)	6.80	(< 20)
Surrogates									
n-Triacontane-d62			83	3.33	90.1	90	(60-120)	8.00	

Batch Information

Analytical Batch: **XFC11023**
Analytical Method: **AK103**
Instrument: **HP 7890A FID SV E R**
Analyst: **EAB**

Prep Batch: **XXX29682**
Prep Method: **SW3550C**
Prep Date/Time: **08/18/2013 20:30**
Spike Init Wt./Vol.: 167 mg/Kg Extract Vol: 1 mL
Dupe Init Wt./Vol.: 167 mg/Kg Extract Vol: 1 mL

SGS North America Inc.
200 West Potter Drive Anchorage, AK 95518
t 907.562.2343 f 907.561.5301 www.us.sgs.com

SGS

SGS North America Inc.
CHAIN OF CUSTODY RECORD

1133806

www.us.sgs.com

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

Page 1 of 1

Section 1

CLIENT: BGES

CONTACT: J. Barsis PHONE NO: 644 2900

PROJECT NAME: Icicle/~~Tatitlek~~ (TB) PROJECT/ PWSID/ PERMIT#:

REPORTS TO: J. Martin E-MAIL: josh@bgesinc.com

INVOICE TO: BGES QUOTE #: P.O. #:

Section 3

Section 2	RESERVED for lab use	SAMPLE IDENTIFICATION	DATE mm/dd/yy	TIME HH:MM	MATRIX/ MATRIX CODE	# CONTAINERS	Type C = COMP G = GRAB MI = Multi Incremental Soils	Preservative: MeOH	MeOH								REMARKS/ LOC ID
								GRO AK101	BTEX 8021	DRO AK102	RRO AK103	Moisture					
A-D (6)	(1) A-C[B]	ICLF-DU1	8-10-13	1530	S	3	MI	X	X	X	X	X					
A-D (7)	(2) A-C[B]	ICLF-DU2	8-10-13	1330	S	3	↓	X	X	X	X	X					
A-D (8)	(3) A-C[B]	ICLF-DU3	8-10-13	1330	S	3	↓	X	X	X	X	X					
A-D (9)	(4) A-C[B]	ICLF-DU4	8-10-13	1330	S	3	↓	X	X	X	X	X					
	(5) A	TBI	-	-	S	1	-	X	X								

Section 5

	Date	Time	
Relinquished By: (1)	8-11-13	2100	Received By:
Relinquished By: (2)			Received By:
Relinquished By: (3)			Received By:
Relinquished By: (4)	8/14/13	9:59	Received For Laboratory By:

Section 4

DOD Project? Yes (No)

Cooler ID:

Data Deliverable Requirements: Level 2

Requested Turnaround Time and/or Special Instructions:
Standard
TBI trip blank is for Icicle & WAFCO

Temp Blank °C: 1.9/2.05 or Ambient [ ]
(See attached Sample Receipt Form)

Chain of Custody Seal: (Circle)
INTACT BROKEN ABSENT
(See attached Sample Receipt Form)

[ ] 200 W. Potter Drive Anchorage, AK 99518 Tel: (907) 562-2343 Fax: (907) 561-5301
[ ] 5500 Business Drive Wilmington, NC 28405 Tel: (910) 350-1903 Fax: (910) 350-1557

SGS

1133806
SGS WO#

SAMPLE RECEIPT FORM

Review Criteria:	Condition:	Comments/Action Taken:
Were **custody seals** intact? Note # & location, if applicable. COC accompanied samples?	Yes No (N/A) (Yes) No N/A	
Temperature blank compliant* (i.e., 0-6°C after CF)? * *Note: Exemption permitted for chilled samples collected less than 8 hours ago.* Cooler ID: _____ @ _____ w/ Therm.ID: _____ 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 N/A Yes No (N/A)	
Delivery method (specify all that apply): (Client) 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 (N/A)	
→ For samples received with payment, note amount ($) and cash / check / CC **(circle one)** or note: (N/A) → For samples **received in FBKS**, ANCH staff will verify all criteria are reviewed.		SRF Initiated by: ES N/A
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 that case, use times on COC.* Were analyses requested unambiguous?	(Yes) No N/A (Yes) No N/A (Yes) No N/A	
Were samples in **good condition** (no leaks/cracks/breakage)? Packing material used (specify all that apply): Bubble Wrap Separate plastic bags Vermiculite Other:	(Yes) No N/A	
Were all VOA vials **free of headspace** (i.e., bubbles ≤6 mm)? Were all soil VOAs **field extracted** with MeOH+BFB?	Yes No (N/A) (Yes) No N/A	
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?	(Yes) No N/A (Yes) No N/A	
For **special handling** (e.g., "MI" or foreign soils, lab filter, limited volume, Ref Lab), were bottles/paperwork flagged (e.g., sticker)?	(Yes) No N/A	MI
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 (N/A) Yes No (N/A)	
For **RUSH/SHORT Hold Time**, were COC/Bottles flagged accordingly? Was Rush/Short HT email sent, if applicable?	Yes No (N/A)	
For **SITE-SPECIFIC QC, e.g. BMS/BMSD/BDUP**, were containers / paperwork flagged accordingly?	Yes No (N/A)	
For any question answered "No," has the PM been notified and the problem resolved (or paperwork put in their bin)?	Yes No (N/A)	SRF Completed by: ES PM = VLP N/A
Was **PEER REVIEW** of ***sample numbering/labeling completed?***	Yes No (N/A)	Peer Reviewed by: N/A
Additional notes (if applicable):		

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

APPENDIX D

LABORATORY ANALYTICAL DATA QUALITY CONTROL CHECKLIST

Laboratory Data Review Checklist

Completed by: Katy Latimer

Title: Environmental Scientist Date: February 27, 2014

CS Report Name: 2013 Land-Farm Monitoring Activities Report Report Date: March 2014

Consultant Firm: BGES, Inc.

Laboratory Name: SGS North America, Inc. Laboratory Report Number: 1133806

ADEC File Number: 2543.38.002 ADEC Hazard Number: 4378

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:

      The samples were not transferred to a network laboratory.

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° ± 2° C)?
      Yes (No) NA (Please explain.) Comments:

      The temperature of the soil sample cooler was measured at the laboratory at the time of receipt to be 1.9 degrees Celsius (C). This temperature is slightly below the prescribed optimal temperature range of 4 degrees +/- 2 degrees C. Because the temperature of the cooler was below the optimal temperature, it is our opinion that there is a reduced potential for biological degradation of the analytes and this quality control (QC) failure does not affect the acceptability of the data for their intended use.

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

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

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

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

The samples contained the proper preservatives for the requested analyses and no unusual sample conditions were noted by the laboratory.

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:

See 3a and 3c, above.

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

Comments:

N/A

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:

The case narrative for Work Order Number 1133806 noted that there were no QC failures identified by SGS.

c. Were all corrective actions documented?

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

See 4b, above.

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

Comments:

N/A

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:

      N/A

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:

      N/A

      iv. Do the affected sample(s) have data flags and if so, are the data flags clearly defined?
      Yes No (NA) (Please explain.) Comments:

      There were no data QC failures noted by the laboratory.

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

N/A

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:

Analysis of soil samples for metals/inorganic compounds were not part of the approved scope of work.

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:

N/A

vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?
Yes No (NA) (Please explain.) Comments:

There were not QC failures noted by the laboratory.

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

N/A

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:

There were no data QC failures noted by the laboratory.

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

N/A

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:

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:

All soil samples were contained within one cooler, which was submitted to the laboratory

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

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

N/A

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

Comments:

N/A

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)

RPD (%) = 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:

Relative standard deviation (RSD) was calculated for the set of triplicate samples instead of RPD. The calculated RSD for DRO from ICLF-DU2 met the ADEC acceptable limit of less than 30 percent, indicating that the data distribution set was normal, and the precision of the MI sampling data was acceptable. The calculated RSD value for RRO from ICLF-DU2 exceeded the ADEC acceptable limit of less than 30 percent. The increased RSD value may indicate that the data distribution started to become non-homogenous, and the confidence in the representativeness of the MI sample results diminished. The remainder of the analytes could not be calculated because the analytes in the triplicate sample set exhibited non-detectable concentrations.

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

Comments:

N/A

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

Yes No NA (Please explain.) Comments:

Not applicable. A decontamination or equipment blank was not part of our approved scope of work.

i. All results less than PQL?

Yes No NA (Please explain.) Comments:

Not applicable. A decontamination or equipment blank was not part of our approved scope of work.

ii. If above PQL, what samples are affected?

Comments:

N/A

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

Comments:

N/A

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

a. Defined and appropriate?

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