

BGES, INC.

ENVIRONMENTAL CONSULTANTS

**FORMER FISH PROCESSING PLANT
GOLOVIN, ALASKA**

ANALYSIS OF BROWNFIELDS CLEANUP ALTERNATIVES

APRIL 2019

Submitted to:

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ACRONYMS

| | |
|--------------------|--|
| AAC | Alaska Administrative Code |
| ABCA | Analysis of Brownfields Cleanup Alternatives |
| ACM | Asbestos-Containing Material |
| ADEC | Alaska Department of Environmental Conservation |
| AST | Aboveground Storage Tank |
| BGES | Braunstein Geological and Environmental Services, Inc. |
| BLM | Bureau of Land Management |
| DNR | Department of Natural Resources |
| DOT&PF | Department of Transportation and Public Facilities |
| DRO | Diesel Range Organics |
| E&E | Ecology and Environment, Inc. |
| EHSI | EHS International, Inc. |
| EPA | Environmental Protection Agency |
| ESA | Environmental Site Assessment |
| f/cc | fiber per cubic centimeter |
| HAZWOPER | Hazardous Waste Operations and Emergency Response |
| HBMI | Hazardous Building Materials Inventory |
| LBP | Lead-Based Paint |
| mg/cm ² | Milligrams per square centimeter |
| mg/Kg | Milligrams per kilogram |
| NESHAP | National Emissions Standard for Hazardous Air Pollutants |
| OSHA | Occupational Safety and Health Administration |
| PCBs | Polychlorinated Biphenyls |
| PEL | Permissible Exposure Limit |
| QEP | Qualified Environmental Professional |
| RACM | Regulated Asbestos-Containing Material |
| TBA | Targeted Brownfields Analysis |
| TCLP | Toxicity Characteristics Leaching Procedure |
| TWA | Time-Weighted Average |
| US | United States |
| VOC | Volatile Organic Compound |

1.0 BACKGROUND

BGES, Inc. (BGES) was retained by Shawn Olsen of the Alaska Department of Environmental Conservation (ADEC) to conduct an Analysis of Brownfields Cleanup Alternatives (ABCA) of the former fish processing plant located in the northwestern portion of Golovin, Alaska (hereafter referred to as the subject property).

1.a Site Location

The subject property consists of Lot 2, Tract C of United States (US) Survey 5038 (owned by Chinik Enterprises, Inc.), Tract B of US Survey 2251 (owned by the Golovin Native Corporation), and a portion of Tract B of US Survey 5038 (owned by the City of Golovin). Lot 2 currently contains a former fish processing plant and bunkhouse, and Tract B of US Survey 5038 contains an outboard/motor repair shop. The City of Golovin is currently in the process of acquiring Lot 2 from Chinik Enterprises, Inc.

The subject property is located in the Southeast Quarter of the Southeast Quarter, Section 10, Township 11 South, Range 22 West, Kateel River Meridian, Alaska. The area surrounding the subject property consists primarily of undeveloped land. The subject property is bordered by Amaktoolik Street to the southeast, Golovnin Lagoon to the northwest, and undeveloped land to the northeast and southwest.

1.b Previous Site Use(s) and Previous Cleanup/Remediation

The subject property was utilized as a fish processing plant between the 1960s and 1980s, and is currently vacant. The subject property is easily accessible, and persons may inadvertently come into contact with contaminants. According to the Alaska Department of Natural Resources (DNR) Recorder's Office Records Database, Tract B of US Survey 5038 was transferred from the Bureau of Land Management (BLM) to the Townsite of Golovin in 1976, and the City of Golovin leased the property to the Department of Transportation and Public Facilities (DOT&PF) in 1992. In 1977, the Townsite of Golovin entrusted Lot 2, Tract C of US Survey 5038 to the Golovin Fish Processing Cooperative, who then entrusted the property to the Community Enterprise Development Corporation of Alaska in 1979. The property was quit-claimed to Chinik Enterprises, Inc. in 1989. Tract B of US Survey 2251 was transferred from the BLM to Bering Straits Native Corporation in 1984, and then to the Golovin Native Corporation in 1989. No earlier records of ownership of the subject property were identified during our research.

Lot 2 is identified in the ADEC Contaminated Sites database as an active contaminated site with Hazard ID 26861, and Tract B of US Survey 5038 is identified in the ADEC Contaminated Sites database as an

active contaminated site with Hazard ID 26866. The ADEC Contaminated Sites files regarding the subject property pertain to the contamination that was identified during a Targeted Brownfields Assessment (TBA) conducted by Ecology and Environment, Inc. (E&E) on behalf of the US Environmental Protection Agency (EPA), dated January 2018 (discussed in Section 1.c below).

Thirteen light ballasts identified during the TBA were assumed to contain polychlorinated biphenyls (PCBs). After the TBA was completed, these light ballasts were reportedly removed from the subject property by Curt; a resident of Golovin and a former employee of the fish processing plant. Curt also reportedly removed one of two aboveground storage tanks (ASTs), a fork lift, and generators that were formerly present on the subject property at the time of the TBA.

1.c Site Assessment Findings

E&E conducted a TBA, dated January 2018, which identified three areas of soil contamination on the subject property. Two distinct areas of soil contamination were identified on Lot 2, including up to 2,700 milligrams per kilogram (mg/Kg) lead, 4.8 mg/Kg antimony, 510 mg/Kg copper, 2,800 mg/Kg diesel range organics (DRO), 2.2 mg/Kg benzo[a]anthracene, and 0.081 mg/Kg n-nitrosoid-n-propylamine. The soil contamination on Tract B includes up to 0.034 mg/Kg 2,4-dinitrotoluene and 0.110 mg/Kg naphthalene. Arsenic was detected in soil samples collected from both parcels at concentrations up to 6.4 mg/Kg, which exceeds the ADEC cleanup criterion of 0.2 mg/Kg for this analyte. However, the concentrations of arsenic are consistent with naturally-occurring background concentrations of this analyte and are therefore not considered to be a contaminant of concern for this site. Based on the assumptions in the TBA, there are approximately 6 cubic yards of petroleum-contaminated soil (3 cubic yards in each of the locations with petroleum contamination) and 4 cubic yards of lead-contaminated soil. Based on the lead concentrations in soil (up to 2,700 mg/Kg), this soil is assumed to be classified as hazardous.

During the TBA, EHS-International, Inc. (EHSI) conducted a Hazardous Building Materials Inventory (HBMI) of the three buildings on the subject property and identified asbestos-containing materials (ACMs) in each of the buildings. The HBMI is included in Appendix C of the TBA. The ACM includes various sealants, gaskets, electrical switches, and flanges. Additionally, a refrigerator, a freezer, a space heater, a cooling tower, and four generators are assumed to consist of internal components that contain ACM. Lead-based paint (LBP) was identified on a structural I-beam, an AST, and a wooden staircase. In addition, nine fluorescent light tubes in the processing plant were assumed to contain mercury and 13 light ballasts in the processing plant and outboard motor repair shop were assumed to contain PCBs. As discussed in Section 1.b above, the light ballasts and an AST (the one containing LBP) have reportedly

been removed from the subject property.

It was also noted in the TBA that the shoreline is quickly eroding by approximately 3 feet per year. High tide submerges portions of the buildings and debris on the subject property, and sea ice encroaches on the buildings during winter. The proximity of the buildings to the ocean presents risks of further damaging the buildings, and of debris and contaminated soil being washed out to sea. Erosion also presents a threat to aquatic life, to the local subsistence consumers, and to the commercial fishing industry conducted in the Golovnin Lagoon.

BGES prepared a Phase I Environmental Site Assessment (ESA) of the subject property, dated January 2019. Based on the conditions observed during our site activities and research, recognized environmental conditions were identified with respect to the subject property, stemming from the three areas of soil contamination identified in the TBA, and the potential for metallic contamination to be present in the vicinity of battery parts that were observed in a closet in the outboard/motor repair shop.

Data gaps identified during the Phase I ESA included snow cover, which inhibited our ability to view the ground surface; and the lack of an environmental questionnaire completed by a representative of Chinik Enterprises, Inc.; the owner of Lot 2, Tract C, US Survey 5038. BGES mailed environmental questionnaires to representatives of Chinik Enterprises, Inc.; but we have not received responses at the time of preparation of this report. This property owner may have knowledge regarding the subject property that could result in additional recognized environmental conditions, and if responses are received that materially affect our conclusions, then BGES will issue an addendum to the Phase I ESA and ABCA.

1.d Project Goal

Upon acquiring Lot 2 from Chinik Enterprises, Inc. and upon removal of all hazardous building materials, contaminated soil, and the buildings currently present on the subject property; the City of Golovin intends to redevelop the subject property into a boat harbor. In order to accomplish this objective, this ABCA presents several options for removal and disposal of the hazardous building materials and contaminated soil from the subject property.

2.0 APPLICABLE REGULATIONS & CLEANUP STANDARDS

2.a Cleanup Oversight Responsibility

Remediation of the subject property will be regulated by the ADEC. The ADEC Project Manager for this project is Lisa Griswold. Prior to commencing remediation activities, a work plan will be prepared and

submitted to Ms. Griswold for approval, and copies of all documents pertaining to remediation of the subject property will be provided to Ms. Griswold. Upon completion of project activities, a comprehensive report will be prepared. The report will include a discussion of field activities, tabulated analytical results of soil samples, figures showing sampling locations, and conclusions and recommendations as necessary. Field notes, site photographs, complete laboratory data packages, data quality checklists, a conceptual site model, and disposal receipts will be included in appendices to the report.

The US EPA oversees handling and disposal of hazardous building materials, including LBP and ACM. If the building materials are analyzed for toxicity characteristics leaching procedure (TCLP) for lead and the results indicate that the materials leach less than 5 milligrams of lead per liter (mg/L), then the LBP does not need to be treated as hazardous waste with regard to disposal. In this instance, demolition personnel still must comply with all appropriate health and safety precautions and follow all applicable Occupational Safety and Health Administration (OSHA) regulations. However, if the TCLP indicates that the materials leach 5 mg/L of lead or more, or if the materials are assumed to be hazardous, then any waste containing LBP must be handled and disposed of as Resource Conservation and Recovery Act (RCRA) hazardous waste in accordance with EPA regulations. Friable ACM and some categories of non-friable ACM must be properly encapsulated or abated prior to demolition or renovation activities. The US EPA must be notified prior to demolition or abatement. The OSHA stipulates that personnel conducting demolition or abatement of ACM must be properly certified. Additionally, personnel must not be exposed to more than 0.1 fiber per cubic centimeter (f/cc) of air as an 8-hour time-weighted average (TWA).

2.b Cleanup Standards for Major Contaminants

The contaminants of concern in the soil at the subject property include DRO, benzo(a)anthracene, n-nitrosodi-n-propylamine, 2,4-dinitrotoluene, naphthalene, lead, antimony, and copper. It is noted that the samples collected during the TBA were not analyzed for volatile organic compounds (VOCs). It is anticipated that the cleanup standards for this project will be obtained from ADEC 18 Alaska Administrative Code (AAC) 75.345, Table B1, migration to groundwater values and Table B2, “under 40-inch zone” (referring to annual precipitation), migration to groundwater values (except for the cleanup criterion for lead, which is obtained from the pathway protective of human health); as published on October 27, 2018. The current cleanup criteria for the contaminants of concern are presented in the following table.

Table 1. ADEC Cleanup Criteria for Contaminants of Concern

| Contaminant of Concern | ADEC Cleanup Criterion (mg/Kg) |
|---------------------------|--------------------------------|
| DRO | 250 |
| Benzo(a)anthracene | 0.70 |
| n-nitrosodi-n-propylamine | 0.00068 |
| 2,4-dinitrotoluene | 0.024 |
| Naphthalene | 0.038 |
| Lead | 400 |
| Antimony | 4.6 |
| Copper | 370 |

In accordance with the EPA regulatory limit, any materials containing 1.0 milligram (mg) or more of lead per square centimeter (cm²), or 1.0 mg/cm², is considered to contain LBP. Based on the results of the TBA conducted by E&E, all materials containing 1.0 mg/cm² or more will be removed from the subject property.

According to the National Emissions Standard for Hazardous Air Pollutants (NESHAP), ACM is defined as containing at least 1 percent asbestos; including but not limited to chrysotile, amosite, tremolite, actinolite, and crocidolite asbestos. Based on the results of the TBA conducted by E&E, all materials that meet this definition will be removed from the subject property.

2.c Laws & Regulations Applicable to the Cleanup

This project will be conducted in accordance with all regulations included in 18 AAC 75 “Oil and Other Hazardous Substances Pollution Control”. These regulations are designed to protect human health and the environment. In addition, all field soil sampling conducted at the subject property will be performed by a Qualified Environmental Professional (QEP) in accordance with the ADEC Field Sampling Guidance dated August 2017.

All work involving abatement or demolition of ACM will be conducted in accordance with the NESHAP established by the US EPA. As such, friable ACM and some categories of non-friable ACM must be properly encapsulated or abated before general demolition or renovation activities may occur. Both friable and non-friable ACM exists on the subject property and the project therefore involves Regulated ACM (RACM). Demolition or renovation of buildings containing RACM requires prior notification to the US EPA.

According to the OSHA, the permissible exposure limit (PEL) for asbestos is 0.1 f/cc of air as an 8-hour TWA. The Excursion Limit is 1.0 f/cc averaged over a 30-minute period. Because the ACM at the subject property includes surfacing, the demolition or abatement of the ACM constitutes Class I work; presenting the greatest potential risk to the personnel handling the ACM. The demolition or abatement activities must be conducted by properly certified personnel, taking appropriate safety precautions.

3.0 EVALUATION OF CLEANUP ALTERNATIVES

In addition to the alternatives listed below, BGES evaluated some options that were ultimately omitted from the analysis for various reasons. BGES considered disposal of contaminated soil and hazardous building materials at the Golovin Landfill; however, the landfill currently prohibits disposal of these items. In some circumstances, a landfill can accept items that are not permitted if a demonstration project is conducted and if those items are determined to not pose a risk of contaminant migration. According to the ADEC Solid Waste Program Manager, Trisha Bower, a demonstration project would not be feasible for the Golovin Landfill because this landfill was constructed atop a large drain that directs leachate toward the Golovnin Lagoon, making contaminant migration inevitable. BGES also considered disposal of contaminated soil and hazardous building materials at the Nome Landfill; however, based on consultation with the Nome City Clerk, Bryant Hammond, the Nome Landfill cannot accept the wastes associated with this project. BGES evaluated the potential to dispose of lead-contaminated soil in Golovin (including in the Golovin Landfill, in a land-farm, and in a bio-cell); however, no feasible options were identified. The Golovin Landfill is not permitted to accept contaminated soil, and remediation by land-farming is not effective for lead contamination. Some contaminants in soil were detected at concentrations that only slightly exceed the ADEC cleanup criteria. However, because of the ongoing erosion in the vicinity of the subject property, and because of the community's desire to redevelop the property; it is our opinion that institutional controls such as restricted site access or paving the ground surface to cap the contamination would be ineffective for this site.

BGES evaluated the potential to include materials with LBP in a monofill under alternatives e and g below; however, according to Ms. Bower, LBP is prohibited from a monofill. BGES evaluated the potential to dispose of ACM at the Anchorage Regional Landfill; however, shipment of the materials to Anchorage would be more expensive than shipment to Oregon, as the containers would be shipped to Seattle first, and subsequently shipped back to Anchorage. BGES also evaluated the potential to remove the LBP from an I-beam such that this material could be reused by the local community; however, this would not reduce the number of containers required for offsite transportation of LBP-containing materials and the additional labor costs associated with abatement exceed the potential savings associated with disposal of the I-beam.

The following alternatives were considered as options for remediating the subject property. Each alternative was evaluated for effectiveness, implementability, and cost.

3.a No Action

Under this alternative, the ACM and LBP on the subject property would not be abated; the buildings would not be demolished; and the contaminated soil would not be remediated. This alternative is not desirable to the local community. No Action would not be effective in controlling or preventing the exposure of receptors to contamination or hazardous materials at the site. If this action were selected, the building materials would likely eventually be washed into the ocean, creating a hazard for marine wildlife, local subsistence consumers, and the commercial fishing industry operating in the Golovnin Lagoon. No action requires no effort and is thus easy to implement.

There are no costs associated with taking no action.

3.b Excavation and off-site disposal of soil (out of Golovin)

Under this alternative, the environmental consultant would collect a characterization soil sample in the vicinity of battery parts observed in the outboard/motor repair shop during the Phase I ESA. For cost-estimation purposes, it is assumed that the soil in this vicinity will not contain contaminants at concentrations exceeding the ADEC cleanup criteria, or that the contamination would be considered de minimis. The other areas of identified contaminated soil would be excavated, packaged in supersacks, and shipped to the Columbia Ridge Landfill in Arlington, Oregon for disposal. The local community is agreeable to this alternative. Excavation and off-site disposal of soil would be an effective method to prevent receptors from coming into contact with contaminated soil. Excavation and disposal of soil in the Columbia Ridge Landfill in Arlington, Oregon would be somewhat difficult to accomplish, as the packaging and transportation of soil would require significant coordination with the transportation contractor. The soil would be placed directly into supersacks, which must be packaged in approximately three shipping containers. The shipping containers would be transported to Seattle, Washington by barge and then transported to Arlington, Oregon by truck. Because of the remote location of Golovin, it is difficult to deliver empty shipping containers to the subject property as barges visit Golovin somewhat infrequently. In addition, it may be necessary to ship an additional container(s) to Golovin to make sure there is sufficient capacity to load and transport the contaminated soils, in order to prevent a project delay and second mobilization effort.

The estimated cost of excavation and transportation of the contaminated soil to the Columbia Ridge Landfill in Arlington, Oregon is summarized in the following table.

Table 2. Cost of excavation and off-site disposal of soil

| Item | Work Plan | Excavation of Contaminated Soil | Transportation & Disposal | Reporting |
|--|-----------|---------------------------------|-------------------------------|------------------|
| Professional Labor | \$3,150 | \$5,695 | \$920 | \$2,730 |
| Local Site Labor & Equipment | | \$24,717 | | |
| Materials | | \$14,655 | | |
| Transport | | | \$136,478 | |
| Treatment Cost | | | \$3,685 | |
| Analytical Cost | | \$11,187 | | |
| Other Direct Costs | | \$1,880 | | |
| Task Totals | \$3,150 | \$58,134 | \$141,083 | \$2,730 |
| Project Total | | | | \$205,097 |
| Contingency (-30% / +50%) | | | \$143,568 to \$307,645 | |
| Items for Potential Cost Savings | | | Potential Cost Savings | |
| Local Operator (Paid \$30/hour for 96 hours) | | | \$12,108* | |

* Employing a local operator at a rate of \$30 per hour would eliminate the need for out of town operators, airfare, lodging, per diem, and local transportation.

These costs are based on the following assumptions:

- The soil in the vicinity of the battery parts in the outboard/motor repair shop will not be contaminated or will contain de minimis contamination and therefore will not require disposal;
- The contaminated soil will be transported to Columbia Ridge Landfill in Arlington, Oregon for disposal;
- Up to 15 cubic yards of contaminated soil will be excavated;
- Confirmation soil samples will meet ADEC cleanup criteria;
- The soil will fit in three containers (provisions for one extra container have been included as a contingency);
- Contamination near the AST occupies approximately 100 square feet to a depth of up to 1 foot;
- Contamination near the outboard motor repair shop occupies approximately 80 square feet to a depth of up to 1 foot;
- Contamination near the abandoned forklift occupies approximately 40 square feet to a depth of up to 2 feet;
- Lead-contaminated soils are considered hazardous, and will be transported and disposed of as such; and
- No significant delays will be experienced.

3.c Excavation and disposal of soil at a landfill (including the Golovin landfill)

The environmental consultant would collect a characterization soil sample in the vicinity of battery parts observed in the outboard/motor repair shop during the Phase I ESA. For cost-estimation purposes, it is assumed that the soil in this vicinity will not contain contaminants at concentrations exceeding the ADEC cleanup criteria, or that the contamination would be considered de minimis. Because there are no local landfills that are permitted to dispose of contaminated soil, the previously-identified petroleum-contaminated soil would be excavated and placed in a land-farm adjacent to the Golovin Landfill for remediation. The land-farm would be tilled on a biweekly schedule (when temperatures are above freezing) for approximately three years. The soil would be tilled by a local Hazardous Waste Operations and Emergency Response (HAZWOPER)-trained person. The soil in the land-farm may be reused after the soil samples meet ADEC cleanup criteria after obtaining ADEC prior approval. Treated soils acceptable for reuse may not be used in areas that contact surface water or in any sensitive environments. For cost-estimation purposes for this alternative, it is assumed that only one sampling event would be required. Because land-farming is not an effective method of remediating lead-contaminated soil, and because the Golovin Landfill is not permitted to dispose of contaminated soil, the lead-contaminated soil would be transported to the Columbia Ridge Landfill in Arlington, Oregon. The local community has concerns regarding the impact of the land-farm on the surrounding environment. For this reason, it is recommended that the land-farm be constructed in a location that is not in the vicinity of any areas used for recreation or berry-picking.

Excavation and disposal of lead-contaminated soil in the Columbia Ridge Landfill in Arlington, Oregon and land-farming of petroleum-contaminated soil in Golovin would be effective in preventing receptors from coming into contact with the contaminated soil (assuming access to the land-farm is restricted by adequate fencing or another security measure). Tilling of the land-farm would increase the effectiveness of this alternative.

Excavation and disposal of lead-contaminated soil in the Columbia Ridge Landfill in Arlington, Oregon and land-farming of petroleum-contaminated soil would be somewhat difficult to accomplish, as the packaging and transportation of lead-contaminated soil would require significant coordination with the transportation contractor. The lead-contaminated soil would be placed directly into supersacks, which must be packaged in a shipping container. The shipping containers would be transported to Seattle, Washington by barge and then transported to Arlington, Oregon by truck. Because of the remote location of Golovin, it is difficult to deliver empty shipping containers to the subject property as barges visit Golovin somewhat infrequently. In addition, it may be necessary to ship an additional container(s) to Former Fish Processing Plant
Golovin, AK; ABCA

Golovin to make sure there is sufficient capacity to load and transport the contaminated soils, in order to prevent a project delay and second mobilization effort. Placing the petroleum-contaminated soil in a land-farm would be easy to accomplish, assuming the City of Golovin and the Golovin Native Corporation provide permission to use a small area for this task. In consultation with project stakeholders and owners of the subject property, BGES understands that HAZWOPER-trained individuals reside in Golovin. This alternative would involve biweekly tilling of the land-farm by a local HAZWOPER-trained individual. The land-farm area should be clearly marked and secured to prevent unauthorized entry. The environmental consultant would need to remobilize to the site of the land-farm to collect soil samples after approximately three years. Those samples would need to exhibit contaminant concentrations less than the ADEC cleanup criteria, and approval would need to be obtained from the ADEC Project Manager prior to reuse of these soils. Treated soils acceptable for reuse may not be used in areas that contact surface water or in any sensitive environments.

The estimated cost of excavation and transportation of lead-contaminated soil to the Columbia Ridge Landfill in Arlington, Oregon; and land-farming the petroleum-contaminated soil adjacent to the Golovin Landfill is summarized in the following table.

Table 3. Cost of excavation and disposal of soil at a landfill

| Item | Work Plan | Excavation of Contaminated Soil | Land-Farm Maintenance & Sampling | Transportation & Disposal | Reporting |
|--|-----------|---------------------------------|----------------------------------|-------------------------------|------------------|
| Professional Labor | \$4,830 | \$4,515 | \$4,274 | \$1,260 | \$3,570 |
| Local Site Labor & Equipment | | \$26,490 | \$5,517 | | |
| Materials | | \$14,340 | \$40 | | |
| Transport | | | | \$99,426 | |
| Treatment Cost | | | | \$4,862 | |
| Analytical Cost | | \$11,090 | \$1,162 | | |
| Other Direct Costs | | \$2,520 | | | |
| Task Totals | \$4,830 | \$58,954 | \$10,992 | \$105,548 | \$3,570 |
| Project Total | | | | | \$183,895 |
| Contingency (-30% / +50%) | | | | \$128,726 to \$275,842 | |
| Items for Potential Cost Savings | | | | Potential Cost Savings | |
| Operator (Paid \$30/hour for 96 hours) | | | | \$12,108* | |
| Place Land-Farm on non-Landfill Property | | | | \$2,140** | |

* Employing a local operator at a rate of \$30 per hour would eliminate the need for out of town operators, airfare, lodging, per diem, and local transportation.

****Placing the Land-Farm on non-Landfill Property will eliminate the requirement to obtain a Land-Farm permit from the ADEC Solid Waste Division.**

These costs are based on the following assumptions:

- The soil in the vicinity of the battery parts in the outboard/motor repair shop will not be contaminated or will contain de minimis contamination and therefore will not require disposal;
- Up to 5 cubic yards of lead-contaminated soil will be transported to Columbia Ridge Landfill in Arlington, Oregon for disposal;
- Up to 10 cubic yards of petroleum-contaminated soil will be placed in a land-farm on the Golovin Landfill property;
- The lead-contaminated soil will fit in one container (provisions for one extra container have been included as a contingency);
- Confirmation soil samples will meet ADEC cleanup criteria;
- Contamination near the AST occupies approximately 100 square feet to a depth of up to 1 foot;
- Contamination near the outboard motor repair shop occupies approximately 80 square feet to a depth of up to 1 foot;
- Contamination near the abandoned forklift occupies approximately 40 square feet to a depth of up to 2 feet;
- Lead-contaminated soils are considered hazardous, and will be transported and disposed of as such;
- Tilling of the land-farm will be performed by local HAZWOPER-trained personnel, approximately twice per month, when the ground is not frozen (4 months per year), for 3 years;
- A liner will not be required for the land-farm;
- The City of Golovin and the Golovin Native Corporation will grant permission to construct a land-farm adjacent to the landfill; and
- No significant delays will be experienced.

3.d Abatement of hazardous building materials and off-site disposal (out of Golovin)

The ACM and materials with LBP on the subject property would be abated (physically removed from the structures) and shipped to the Columbia Ridge Landfill in Arlington, Oregon for disposal. The local community is agreeable to this alternative, as the remaining building materials would be available for the community to salvage; however, the community would then be responsible for demolition of the remaining building materials. Abatement of hazardous building materials and disposal in the Columbia Ridge Landfill in Arlington, Oregon would be effective in preventing receptors from coming into contact with ACMs and LBP.

Abatement of hazardous building materials and disposal in the Columbia Ridge Landfill in Arlington, Oregon would be somewhat difficult to accomplish. The hazardous materials would need to be appropriately packaged and containerized. ACM would need to be double-wrapped in plastic and LBP would need to be placed in secure containers such as supersacks. The materials would then be placed in

approximately three shipping containers that would be transported to Seattle, Washington by barge, and then to Arlington, Oregon by truck. Because of the remote location of Golovin, it is difficult to deliver empty shipping containers to the subject property as barges visit Golovin somewhat infrequently. In addition, it may be necessary to ship an additional container(s) to Golovin to make sure there is sufficient capacity to load and transport the contaminated soils, in order to prevent a project delay and second mobilization effort.

The estimated cost of abating and transporting hazardous building materials to the Columbia Ridge Landfill in Arlington, Oregon is summarized in the following table.

Table 4. Cost of abatement of hazardous building materials and off-site disposal

| Item | Work Plan | Abatement | Transportation & Disposal | Reporting |
|--|-----------|-----------|-------------------------------|------------------|
| Professional Labor | \$2,415 | \$550 | \$550 | \$1,025 |
| Local Site Labor & Equipment | | \$113,736 | | |
| Materials | | \$13,867 | | |
| Transport | | | \$149,269 | |
| Treatment Cost | | | \$3,410 | |
| Other Direct Costs | | \$9,320 | | |
| Task Totals | \$2,415 | \$137,473 | \$153,229 | \$1,025 |
| Project Total | | | | \$294,142 |
| Contingency (-30% / +50%) | | | \$205,899 to \$441,213 | |
| Items for Potential Cost Savings | | | Potential Cost Savings | |
| 4 Laborers (Paid \$25/hour for Approximately 7 Days) | | | \$33,722* | |
| TCLP-lead | | | \$51,876** | |
| Provide 2 Portable Restrooms | | | \$1,430*** | |

* Employing local laborers at a rate of \$25 per hour would eliminate the need for out of town laborers, airfare, lodging, per diem, and local transportation.

** Cost savings assume the building materials will be determined to not be hazardous with respect to LBP, in which case the LBP would not need to be abated. However, after abatement of ACMs, the community would be at risk of coming into contact with the LBP during salvaging and demolition of the remaining building materials. Additionally, disposal of the remaining building debris as non-hazardous would be based on the quantities present at the time of TCLP sampling, which may be different after salvaging.

*** If portable restrooms are available locally, this would eliminate the need to ship portable restrooms from out of town.

These costs are based on the following assumptions:

- The hazardous building materials will be transported to Columbia Ridge Landfill in Arlington, Oregon for disposal;
- The remaining building materials will not be demolished;
- The hazardous building materials will fit in two containers (provisions for one extra container have been included as a contingency);
- All ACM will fit in one shipping container, and all items with LBP will fit in a second shipping container;
- Gravel is available in Golovin;
- The environmental consultant will not be required to be onsite; and
- No significant delays will be experienced.

3.e Abatement of hazardous building materials and disposal within Golovin

The ACM and materials with LBP on the subject property would be abated (physically removed from the structures). The ACM would be placed in a single-use monofill in Golovin. Because there are no acceptable options for disposal of LBP within Golovin, the LBP would be transported to the Columbia Ridge Landfill in Arlington, Oregon for disposal. The local community should be consulted during selection of the monofill location and the associated permitting process. The local community would have the opportunity to salvage the remaining building materials; however, the community would then be responsible for demolition of the remaining building materials not salvaged. The local community has concerns regarding the impact of the monofill on the surrounding environment. For this reason, it is recommended that the monofill be constructed in a location that is not in the vicinity of any areas used for recreation or berry-picking. The community also has concerns regarding funding for the demolition of the remaining building materials not salvaged. Abatement of hazardous building materials and disposal of ACM within a single-use monofill in Golovin and disposal of LBP in the Columbia Ridge Landfill in Arlington, Oregon would be effective in preventing receptors from coming into contact with ACMs and LBP.

Abatement of hazardous building materials and disposal of ACM within a single-use monofill in Golovin and disposal of LBP in the Columbia Ridge Landfill in Arlington, Oregon would be somewhat difficult to accomplish. This alternative would require available land for the monofill and permission from both the City of Golovin and the Golovin Native Corporation. Construction of a single-use monofill also requires a permit from the ADEC Solid Waste Program. The ACM and LBP would need to be packaged and containerized as described above. The ACM would be transported to the designated location of the monofill, which would need to be lined such that the ACM will not come into contact with the surrounding soil, groundwater, or surface water. Upon covering the monofill with a final liner, top soil would be added

to grade and seeded with native grasses and/or shrubs, and the four corners of the monofill would need to be staked with permanent markers. Fencing and/or signs would also need to be posted to prevent disturbances to the monofill. Transportation of the LBP would involve the same challenges described above for alternative d.

The estimated cost of abating the hazardous building materials and disposing of ACM in a monofill in Golovin and disposing of LBP materials in the Columbia Ridge Landfill in Arlington, Oregon is summarized in the following table.

Table 5. Cost of abatement of hazardous materials and disposal within Golovin

| Item | Work Plan | Abatement | Transportation & Disposal | Reporting |
|--|-----------|-----------|-------------------------------|------------------|
| Professional Labor | \$3,295 | \$380 | \$550 | \$1,025 |
| Local Site Labor & Equipment | | \$101,098 | | |
| Materials | | \$14,793 | | |
| Transport | | | \$99,504 | |
| Treatment Cost | | | \$3,025 | |
| Other Direct Costs | | \$13,620 | | |
| Task Totals | \$3,295 | \$129,891 | \$103,079 | \$1,025 |
| Project Total | | | | \$237,290 |
| Contingency (-30% / +50%) | | | \$166,103 to \$355,935 | |
| Items for Potential Cost Savings | | | Potential Cost Savings | |
| 4 Laborers (Paid \$25/hour for Approximately 7 Days) | | | \$33,722* | |
| TCLP-lead | | | \$100,931** | |
| Provide 1 Portable Restroom | | | \$715*** | |

* Employing local laborers at a rate of \$25 per hour would eliminate the need for out of town laborers, airfare, lodging, per diem, and local transportation.

** Cost savings assume the building materials will be determined to not be hazardous with respect to LBP, in which case the LBP would not need to be abated. However, after abatement of ACMs, the community would be at risk of coming into contact with the LBP during salvaging and demolition of the remaining building materials. Additionally, disposal of the remaining building debris as non-hazardous would be based on the quantities present at the time of TCLP sampling, which may be different after salvaging.

*** If portable restrooms are available locally, this would eliminate the need to ship portable restrooms from out of town.

These costs are based on the following assumptions:

- The ACMs will be placed in a monofill in Golovin, and the materials with LBP will be transported to Columbia Ridge Landfill in Arlington, Oregon for disposal as hazardous waste;
- The remaining building materials will not be demolished;
- The LBP materials will fit in one container (provisions for one extra container have been included as a contingency);
- Gravel is available in Golovin;
- The City of Golovin and the Golovin Native Corporation will grant permission to construct a monofill adjacent to the landfill;
- The environmental consultant will not be required to be onsite; and
- No significant delays will be experienced.

3.f Abatement of hazardous building materials by removal of the entire structures and off-site disposal (out of Golovin)

The buildings on the subject property would be demolished and shipped to the Columbia Ridge Landfill in Arlington, Oregon for disposal. This alternative is favorable to the local community. Abatement of hazardous building materials by removal and disposal in the Columbia Ridge Landfill in Arlington, Oregon would be effective in preventing receptors from coming into contact with ACMs and LBP. Abatement of hazardous building materials by removal and disposal in the Columbia Ridge Landfill in Arlington, Oregon would be difficult to accomplish. Challenges would include coordinating delivery of approximately 55 empty shipping containers to the project site, containerizing the building materials for disposal, and coordinating transportation of the materials to a distant disposal facility. In addition, it may be necessary to ship an additional container(s) to Golovin to make sure there is sufficient capacity to load and transport the contaminated soils, in order to prevent a project delay and second mobilization effort.

The estimated cost of disposing of all building debris as hazardous waste in the Columbia Ridge Landfill in Arlington, Oregon is summarized in the following table.

Table 6. Cost of abatement of hazardous building materials by removal of the entire structures and off-site disposal

| Item | Work Plan | Building Demolition | Transportation & Disposal | Reporting |
|--|-----------|---------------------|-----------------------------------|--------------------|
| Professional Labor | \$2,205 | \$550 | \$550 | \$1,025 |
| Local Site Labor & Equipment | | \$858,064 | | |
| Materials | | \$47,451 | | |
| Transport | | | \$2,892,461 | |
| Treatment Cost | | | \$756,250 | |
| Other Direct Costs | | \$51,600 | | |
| Task Totals | \$2,205 | \$957,665 | \$3,649,261 | \$1,025 |
| Project Total | | | | \$4,610,156 |
| Contingency (-30% / +50%) | | | \$3,227,109 to \$6,915,234 | |
| Items for Potential Cost Savings | | | Potential Cost Savings | |
| Provide Lodging for 11 Personnel for Approximately 55 Days | | | \$20,162* | |
| Provide 2 Portable Restrooms | | | \$1,430** | |

* Employing local laborers at a rate of \$25 per hour would eliminate the need for out of town laborers, airfare, lodging, per diem, and local transportation.

** If portable restrooms are available locally, this would eliminate the need to ship portable restrooms from out of town.

These costs are based on the following assumptions:

- All of the building debris will be transported to Columbia Ridge Landfill in Arlington, Oregon for disposal as hazardous waste;
- All of the building debris will fit in 50 containers (provisions for five extra containers have been included as a contingency);
- Gravel is available in Golovin;
- The contractor will establish a man-camp for the laborers;
- The environmental consultant will not be required to be onsite; and
- No significant delays will be experienced.

3.g Abatement of hazardous building materials by removal of the entire structures and disposal within Golovin

Because there are no feasible options for disposal of the entire buildings within Golovin, the ACM would be physically removed from the buildings and placed in a single-use monofill in Golovin. The buildings on the subject property would then be demolished, and the building materials (including the LBP) would be transported to the Columbia Ridge Landfill in Arlington, Oregon for disposal. The local community has concerns regarding the impact of the monofill on the surrounding environment. For this reason, it is

recommended that the monofill be constructed in a location that is not in the vicinity of any areas used for recreation or berry-picking. Abatement of hazardous building materials by removal and disposal of ACM within a single-use monofill in Golovin and disposal of the remaining building materials (including LBP) in the Columbia Ridge Landfill in Arlington, Oregon would be effective in preventing receptors from coming into contact with ACMs and LBP.

Abatement of hazardous building materials by removal and disposal of ACM within a single-use monofill in Golovin and disposal of the remaining building debris (including LBP) in the Columbia Ridge Landfill in Arlington, Oregon would be somewhat difficult to accomplish. This alternative would involve the same challenges described above for alternative e, with the additional challenge of transporting approximately 54 shipping containers to and from the project site.

The estimated cost of disposing of ACM in a monofill in Golovin, and the remaining building debris (including LBP) in the Columbia Ridge Landfill in Arlington, Oregon is summarized in the following table.

Table 7. Cost of abatement of hazardous building materials by removal of the entire structures and disposal within Golovin

| Item | Work Plan | ACM Abatement & Building Demolition | Transportation & Disposal | Reporting |
|--|-----------|-------------------------------------|-----------------------------------|--------------------|
| Professional Labor | \$3,675 | \$550 | \$550 | \$1,025 |
| Local Site Labor & Equipment | | \$857,037 | | |
| Materials | | \$49,807 | | |
| Transport | | | \$2,841,715 | |
| Treatment Cost | | | \$741,125 | |
| Other Direct Costs | | \$47,500 | | |
| Task Totals | \$3,675 | \$954,894 | \$3,583,390 | \$1,025 |
| Project Total | | | | \$4,542,983 |
| Contingency (-30% / +50%) | | | \$3,180,088 to \$6,814,475 | |
| Items for Potential Cost Savings | | | Potential Cost Savings | |
| Provide Lodging for 11 Personnel for Approximately 55 Days | | | \$20,162 | |
| 10 Laborers (Paid \$25/hr for Approximately 55 Days) | | | \$525,938* | |
| TCLP-lead | | | \$4,380,001** | |
| Provide 2 Portable Restrooms | | | \$1,430*** | |

* Employing local laborers at a rate of \$25 per hour would eliminate the need for out of town laborers, airfare, lodging, per diem, and local transportation.

** Cost savings assume the building materials will be determined to not be hazardous with respect to LBP, in which case the LBP would not need to be abated. However, after abatement of ACMs, the community

would be at risk of coming into contact with the LBP during salvaging and demolition of the remaining building materials. Additionally, disposal of the remaining building debris as non-hazardous would be based on the quantities present at the time of TCLP sampling, which may be different after salvaging.

** If portable restrooms are available locally, this would eliminate the need to ship portable restrooms from out of town.

These costs are based on the following assumptions:

- The ACMs will be placed in a monofill in Golovin, and the remaining building debris will be transported to Columbia Ridge Landfill in Arlington, Oregon for disposal as hazardous waste;
- The remaining building debris will fit in 49 containers (provisions for five extra containers have been included as a contingency);
- Gravel is available in Golovin;
- The contractor will establish a man-camp for the laborers;
- The City of Golovin and the Golovin Native Corporation will grant permission to construct a monofill adjacent to the landfill;
- The environmental consultant will not be required to be onsite; and
- No significant delays will be experienced.

4.0 RECOMMENDED CLEANUP ALTERNATIVE

Based on feedback from the community and the estimated costs associated with each alternative, it is recommended that remediation of the subject property be accomplished by a combination of Alternatives c and e; such that the petroleum-contaminated soil is land-farmed in Golovin; the ACM is placed in a single-use monofill in Golovin; and the lead-contaminated soil and materials containing LBP are transported to the Columbia Ridge Landfill in Arlington, Oregon. The local community would then have the opportunity to salvage the remaining building materials, and the City of Golovin and the Golovin Native Corporation would be responsible for demolition of the remaining building materials. The total estimated cost of this combination is \$421,185. If a single contractor performs the excavation and abatement activities in a single mobilization, some savings associated with travel costs may be realized.

5.0 REFERENCES

ADEC. August 2017. *Field Sampling Guidance*.

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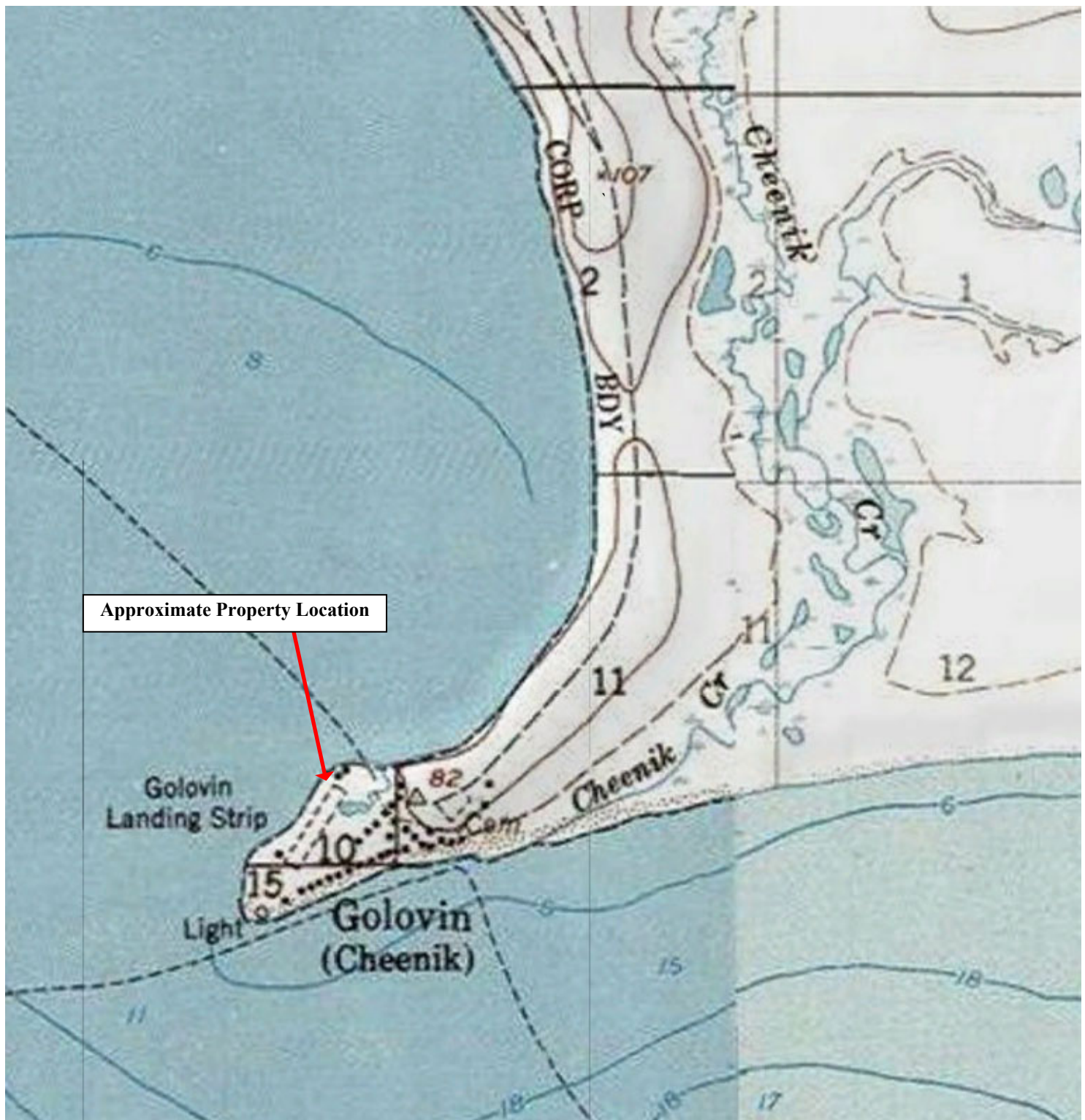
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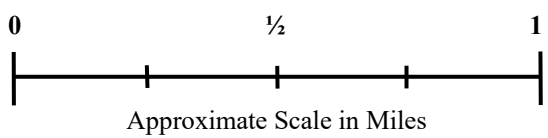
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OSHA. *Part 1910 Subpart Z Toxic and Hazardous Substances*.



Source: Provided by Google Earth Pro © and 2013 National Geographic Society ©



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| <p>Former Fish Processing Plant Golovin, Alaska</p> <p>Property Vicinity Map</p> | | |
|  <p>BGES, INC.</p> | <p>April 2019</p> | <p>Figure 1</p> |



Golovnin Lagoon

Approximate Property Location
(exact boundaries unknown)

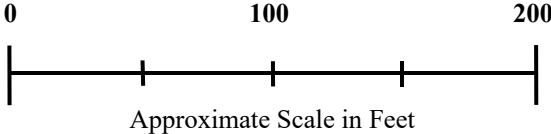
Approximate location of
petroleum-contaminated soil


Approximate location of
petroleum-contaminated soil

Approximate location of
lead-contaminated soil

Amaktoolik Street
(Former Air Strip)

Source: Google Earth and USGS



| | | |
|--|-------------------|-----------------|
| Former Fish Processing Plant Golovin, Alaska Site Map | | |
|  | April 2019 | Figure 2 |