



Alaska Department of Environmental Conservation

Reuse & Redevelopment Initiative

Brownfield Assessment



Former Golovin Dumpsite

Environmental Audit and Inventory

Golovin, Alaska



Submitted to:
Department of Environmental Conservation
Brownfield Program

By:
OASIS Environmental, Inc
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TABLE OF CONTENTS

ACRONYMS AND ABBREVIATIONS.....	iii
1. Introduction	1
1.1. Purpose	1
1.2. Scope of Services.....	2
1.3. Significant Assumptions.....	2
1.4. Limitations and Exceptions	2
1.5. Special Terms and Conditions.....	3
2. Site Description.....	3
2.1. Location	3
2.2. Site and Vicinity General Characteristics.....	3
2.3. Current Use of the Property	4
2.4. Description of Structures, Roads, and Other Improvements on the Site	4
2.5. Description of Adjoining Properties.....	4
3. User Provided Information	4
3.1. Title Records.....	4
3.2. Environmental Liens or Activity and Use Limitations	4
3.3. Specialized Knowledge.....	4
3.4. Valuation Reduction for Environmental Issues	4
3.5. Owner, Property Manager, and Occupant Information	5
3.6. Reason for Performing Assessment	5
4. Government and Historical Records Review.....	5
4.1. Standard Environmental Record Sources	5
4.2. Additional Environmental Record Sources	6
4.3. Physical Setting Sources	6
4.3.1. Soil and Geologic Conditions	6
4.3.2. Groundwater Conditions	6
4.3.3. Erosion Vulnerability	7
4.4. Historical Use Information.....	8
4.4.1. Governmental Action.....	8
4.4.2. Aerial Photograph Review.....	9
4.5. Historical Use Information on Adjoining Properties	10
5. Site Reconnaissance	10
5.1. Methodology and Limiting Conditions.....	10
5.2. General Site Setting.....	10
5.3. Structure Observations	11
6. Interviews.....	11
6.1. History of Former Dumpsite.....	11
6.2. Other Areas of Concern.....	12

6.3. Community Plan Development	13
7. Findings	14
7.1. Data Gaps.....	15
8. Conclusions and Recommendations	15
9. Additional Services.....	16
10. REFERENCES.....	17

FIGURES

- 1: Site Location Map
- 2: 2004 Aerial Photograph
- 3: 1980 Aerial Photograph
- 4: 1962 Aerial Photograph

APPENDICES

- A: Photographic Log of Site Visit
- B: Field Notes
- C: Photographic Log of Other Sites of Concern
- D: Photographic Log of Flooding – Provided by Chinik Eskimo Community

ACRONYMS AND ABBREVIATIONS

DCCED	Alaska Department of Commerce, Community, and Economic Development
ANTHC.....	Alaska Native Tribal Health Consortium
ASTM	American Society of Testing Materials
ATV	all-terrain vehicle
BE&E.....	Bristol Environmental Engineering Services Corporation
CEC.....	Chinik Eskimo Community
CS	Contaminated Site(s)
DBA.....	DEC Brownfield Assessment
DEC.....	Alaska Department of Environmental Conservation
HIS	Indian Health Services
IRA	Indian Reorganization Act
NTP	Notice-to-Proceed
OASIS	OASIS Environmental, Inc.
RFP	Request for Proposal
USACE.....	U.S. Army Corps of Engineers

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1. INTRODUCTION

Under Notice-to-Proceed (NTP) 18-9028-13-38, the Alaska Department of Environmental Conservation (DEC) tasked OASIS Environmental, Inc. (OASIS) to conduct an environmental audit of the former Golovin dumpsite, located slightly upstream of the mouth of Chinik Creek in the village of Golovin, Alaska (see Figure 1). In addition, DEC tasked OASIS to perform a data review of eroding dumpsite investigations in order to summarize available information about known and expected environmental conditions at these sites. This report presents the findings of the environmental audit. It is the second deliverable under NTP 18-9028-13-38, following a Planning and Scoping Meeting Summary (OASIS, 2007). Both deliverables were performed in accordance with OASIS' proposal for this project.

The Former Golovin Dumpsite at the mouth of Chinik Creek, in Golovin, Alaska, was actively used from the 1960s into the 1990s, when it was closed pending construction of a new airstrip. Although the former dump was capped during closure, it has been subject to increasing erosion, especially during fall storm events, in the intervening years. This eroding former dumpsite has emerged as one of the top environmental concerns in the community.

1.1. Purpose

DEC is conducting this investigation in response to a DEC Brownfield Assessment (DBA) Request submitted by the Chinik Eskimo Community (CEC) of Golovin to DEC's Brownfield Program, part of DEC's Reuse and Redevelopment Initiative. The CEC requested this assessment to better understand the problems that may be associated with the old dumpsite and what management options may be possible for a more comprehensive assessment or removal action. This environmental audit was performed to meet these objectives.

The community is interested in restoring this site to its original condition, before the site was used as a dump. Traditional uses included protection of drinking water and important subsistence salmon habitat, and using adjacent areas for loading, offloading or storing small boats.

This work was done in conjunction with an environmental audit of the eroding former dumpsite in Alakunak and a data review of available eroding former dumpsite studies to learn from past investigations and help DEC establish a management plan for eroding former dumpsites. .

This report presents the findings of the environmental audit, which includes information gathered from federal, state, and local agencies; personal interviews with people familiar with the site and surrounding properties; review of site photographs and historical aerial photographs; and a site visit conducted by an OASIS representative.

1.2. Scope of Services

OASIS conducted the following tasks to accomplish the project objectives:

- Reviewed available eroding dumpsite studies (presented in a separate document for DEC internal use).
- Reviewed historical records and aerial photographs of the site
- Interviewed local residents and government personnel familiar with the site
- Performed a site reconnaissance
- Prepared this report with audit findings, conclusions, and recommendations

1.3. Significant Assumptions

This environmental audit provides information regarding the environmental condition of the site. This report is a professional opinion and judgment based upon information obtained during the course of performance of the services.

Environmental conditions may exist at the site that cannot be identified by visual observation only. Where the scope of services is limited to observations made during site reconnaissance, interviews, and review of readily available reports and literature, any conclusions or recommendations are necessarily based in part on information supplied by others, the accuracy or sufficiency of which may not be independently verified by OASIS.

No investigation is thorough enough to exclude the presence of hazardous substances, petroleum products, or contamination resulting from spills of these products at a given site. Therefore, if no hazardous substances or materials or petroleum products are identified during the assessment, such a finding should not be construed as a guarantee of the absence of such materials or contamination resulting from such materials on the property. Rather, the assessment should only be considered the result of services performed within the scope, limitations, and cost of the work performed.

1.4. Limitations and Exceptions

Any opinions or recommendations presented apply to site conditions existing at the time of performance of services. OASIS is unable to report on or accurately predict events that may impact the site following performance of the described services, whether occurring naturally or caused by external forces. OASIS assumes no responsibility for conditions that OASIS is not authorized to investigate or conditions generally recognized as environmentally unacceptable at the time services are performed. OASIS is not responsible for changes in applicable environmental standards, practices or regulations following performance of services.

Performance of this environmental audit did not include the collection or analysis of soil, groundwater, surface water, or air samples.

1.5. Special Terms and Conditions

The environmental audit activities and report structure generally follow those outlined in the ASTM International Standard E1527-05, which was written for Phase I Environmental Site Assessments. However, as this investigation is not a complete or formal Phase I assessment, the project Request for Proposal (RFP) directed the consultant (OASIS) to establish which tasks were appropriate for this investigation and establish the reporting outline accordingly. OASIS slightly modified the tasks and report format of the ASTM Standard E1527-05 to fit the project's purpose and available data. Modifications are noted where appropriate.

2. SITE DESCRIPTION

Descriptions of the location, features, and use of the site and adjoining properties are provided in this section.

2.1. Location

Golovin is located on the south shore of the Seward Peninsula of Alaska, approximately 70 miles east of Nome. It is on a point of land between Golovnin Bay and Golovnin Lagoon (Figure 1) and encompasses 3.54 square miles. The area experiences a maritime sub-arctic climate, with average temperature ranges of -2°F to 19°F in winter and 40°F to 60°F in summer. The annual average snowfall is 40 inches, while the annual summer precipitation is 19 inches. Golovin has been a second-class city since 1971 and is occupied by the CEC, a federally-recognized tribe. The 2006 Alaska Department of Commerce, Community, and Economic Development (DCCED) population census estimated that 154 people reside in Golovin. Most of the village has plumbing. Drinking water is supplied by Chinik Creek, a meandering, anadromous fish stream that runs from northeast of town into Golovnin Bay. Access to Golovin is limited to air and sea, as no roads connect it with other communities (DCCED, 2006).

The project site is a former dumpsite located approximately one-half mile east of the main community area. It lies along the north bank of Chinik Creek, about 200 feet from where the creek empties into Golovnin Bay and approximately 250 feet southwest of the Golovin Airport runway. Its immediate borders are Chinik Creek to the south, Aukon Street to the west, and native beach and tundra area to the east and north. A 2004 aerial photo of the former dumpsite and surrounding area is shown in Figure 2.

2.2. Site and Vicinity General Characteristics

The CEC describes the dump area as less than 1.5 acres (CEC, 2007). Based on a recent aerial photograph showing the gravel pad covering the dump (Figure 2), the area appears to be approximately 1.0 acre. However, because the southeastern edge of the gravel pad has likely eroded between the dump closure and the time of this photograph, OASIS estimates the area to be between 1 and 1.5 acres.

The former dumpsite is covered with a gravel pad that is now partially vegetated with tall grasses (Figures A1 and A2 of Appendix A). Site drainage is believed to be to the south (into Chinik Creek) based on surface topography. The surface and southeastern edge of the former dumpsite have been eroding steadily since 2003 due to more frequent and severe fall storms (CEC, 2007). Further storm discussion is presented in Section 4.3.3.

2.3. Current Use of the Property

The property is currently used as a boat landing and boat storage area. In the summer, fishing, camping, swimming, and other recreational activities also occur at the site (CEC, 2007).

2.4. Description of Structures, Roads, and Other Improvements on the Site

As mentioned in Section 2.1, Aukon Street forms the western border of the site. The street runs from the mouth of Chinik Creek northwest toward the airport entryway and Golovin's upland residential area. The western approach of the airport runway lies approximately 250 feet northeast of the site. No other roads or structures lie within the site's immediate vicinity.

2.5. Description of Adjoining Properties

Other than Aukon Street and the Golovin Airport, property adjacent to the former landfill is undeveloped and heavily vegetated with tall grasses, tundra, and shrubs. The nearest dwelling is the Indian Reorganization Act (IRA) Building, located about 1,000 feet northwest and up-gradient from the site.

3. USER PROVIDED INFORMATION

User provided information is presented in Section 6, Interviews.

3.1. Title Records

None provided.

3.2. Environmental Liens or Activity and Use Limitations

None provided.

3.3. Specialized Knowledge

Specialized knowledge is presented in Section 6, Interviews.

3.4. Valuation Reduction for Environmental Issues

Not applicable.

3.5. Owner, Property Manager, and Occupant Information

The City of Golovin is the current landowner (CEC, 2007). Contact information is provided below.

City of Golovin
Thomas Punguk, City Mayor
P.O. Box 62059, Golovin, Alaska 99762
907-779-3211

The site is not occupied, nor is there any evidence it has ever been occupied, other than for use as a landfill.

3.6. Reason for Performing Assessment

This environmental audit was conducted as part of a DBA of the site. Brownfield sites are generally considered to be abandoned or underutilized properties (especially industrial and commercial facilities) where redevelopment or expansion may be complicated by possible environmental contamination (real or perceived). The program focuses on assessing contaminated or potentially contaminated sites to determine the suitability of the sites for reuse. The end goal is to provide the given community with comprehensive and useful information for achieving site reuse. The community is concerned with protecting their source of drinking water and important subsistence salmon habitat, and to continue to use adjacent areas for loading, offloading or storing small boats.

The specific objectives of this project are to better understand the problems that may be associated with the former dumpsite and to determine possible management options for a more comprehensive assessment or removal action.

4. GOVERNMENT AND HISTORICAL RECORDS REVIEW

4.1. Standard Environmental Record Sources

OASIS did not search the Environmental Data Resources database, as a search would likely yield little useful information for a site within a remote Alaskan village. Instead, OASIS reviewed all available files related to the site at the Fairbanks DEC office, as well as online DEC database information. Available historical aerial photographs were also examined. Lastly, OASIS reviewed reports that were presented by community members during OASIS' site visit.

OASIS reviewed the following record sources (presented in chronological order):

- Historical aerial photographs (1962, 1980, and 2004)
- U.S. Army Corps of Engineers (USACE) - *Flood Control Preliminary Reconnaissance Report – Golovin, Alaska* (1994)

- Golovin-site entries in the Bering Straits Foundation Hazardous Waste Site Identification and Prioritization Program database (1998)
- DEC Contaminated Sites (CS) Program *Site Screening Report for Village of Golovin* (1999)
- GeoArch Alaska - *Assessment of Erosion Hazards at a Landfill at Mouth of Chinik Creek, East of Golovin, AK; Report on a Field Visit* (1999)
- Bristol Environmental Engineering Services Corporation *Site Reconnaissance Report – Golovin, Alaska* (2001)
- DEC CS Program correspondence with the City of Golovin and CEC (1998-2007)
- DEC CS Program Database – Old Golovin Dumpsite Report (1999-2007)
- CEC's DBA application for former dumpsite (2007)
- Alaska Community Databases' Community Information Summary for Golovin

The useful information extracted from these sources is presented in this section (Section 4.).

4.2. Additional Environmental Record Sources

Perusal of DEC files for sites in Golovin, as described above, constitutes additional environmental records review.

4.3. Physical Setting Sources

An approximately 7.5-minute topographic map of the site is provided as Figure 1.

4.3.1. Soil and Geologic Conditions

No description of the site's subsurface soil conditions was found among the records reviewed. However, in a 2001 study conducted at two tank farms approximately ½ mile from the site, soil samples were taken as deep as 5 feet below ground surface. In both locations, the soil was described as fine, sandy material with various-sized pebbles (Bristol Environmental Engineering Services Corporation [BE&E], 2001).

Information on the presence and depth of permafrost was not found during the records search.

Regarding surficial soil, during the site visit OASIS observed a mix of well-sorted fine-grained sand typical of a shoreline environment as well as large cobbles and non-native gravel from the pad covering the site.

4.3.2. Groundwater Conditions

The presence of groundwater is unknown in this area. As part of a bridge construction project in the late 1990s, test holes were drilled approximately 800 feet west of the site; either bedrock or ice was encountered at shallow depths, preventing further drilling. Groundwater was not detected beforehand. Boring logs were not published because the bridge project was never completed (Olson, 2007).

If groundwater is present at the site, it likely discharges into Chinik Creek based on land-surface topography. The possibility of contaminant seepage has been suggested by the community as well as outside investigators (CEC, 2007; Mason, 1999) and may represent risks to human and ecological receptors. Concern centers on the potential impacts to fish and residents who eat the fish and swim in the creek. Golovin is also concerned about possible adverse effects on their drinking water intake, which, although upstream from the dumpsite, has been inundated by seawater, and presumably downstream creek water, during recent storm surges.

4.3.3. Erosion Vulnerability

As described in Section 2 and shown in Figure 2, the site lies at the mouth of Chinik Creek, which empties into Golovnin Bay. The dumpsite is landward of a small spit that encloses the creek. During a 1999 erosional hazard assessment of the dumpsite, a field geologist noted that the spit would offer only minimal protection from waves caused by low-level storm surges from the south; furthermore, the dumpsite was not sheltered to the southwest in any way (Mason, 1999).

The field geologist made several observations that indicated erosion was occurring at the site. He observed drift wood lying landward of the site at elevations up to 3 feet higher than the dumpsite elevation. He measured several depressions approximately 20 centimeters deep over the surface of the former dumpsite. Additionally, he observed a lack of sturdy vegetation on the spit and surrounding the site. These facts served as evidence that “erosion is frequent enough to inhibit more stable growth forms and that this deposit is well below most annual storm waves” (Mason, 1999).

In addition to surface erosion, the assessment found that riverbank erosion was affecting the site. The riverbank erosion occurs during spring breakup, as opposed to the surface erosion occurring during fall storms.

The assessment concluded that the site was subject to “very rapid erosion,” though the erosion rate was too difficult to determine based on the data collected. The assessment report also noted that the years leading up to the study were of no particular distinction in terms of storm activity or rapid spring breakup; a year of a high-energy storm or severe breakup could pose a serious threat to the site. The report indicated that in a single day, a large storm could erode the dumpsite by several times the amount measured during the assessment (Mason, 1999). Based on these conclusions, the report recommended relocating the contents of the dumpsite.

Since the 1999 assessment, the site has been subject to severe storm-surge flooding for three consecutive years (2003, 2004, and 2005). During the 2005 storm, floodwaters were driven up the Chinik Creek floodplain past the drinking-water intake pipes. This event created concern among the community that their drinking water may be affected by dumpsite contamination (CEC, 2007; Fagerstrom, 2007).

4.4. Historical Use Information

Records indicate that the dump operated from the early 1960s through the 1990s. No records exist identifying when and how the dump was initially located. The year of closure was reported as 1992 by multiple sources (CEC, 2007; Moses, 2007). However, Alaskan Native Tribal Health Consortium (ANTHC) records indicate that the dump was closed in 1996. In 1996 (before the creation of ANTHC), the Indian Health Service (IHS) funded and managed the construction of the new city landfill. The project's construction engineer, Tom Moeller, provided OASIS with information contained in the project foreman's logs. The foreman's logs indicated that excess gravel from the new landfill was hauled to the dump and used to cover the site. The gravel pad was placed during a week in early July 1996. The logs contained information on the volume of gravel hauled (1,512 cubic yards), the dismantling of the fence around the dump, and seeding around the site after the gravel pad was finished. The logs did not include any information on the dump's contents or dimensions (Moeller, 2007).

Golovin residents report that "anything and everything" was dumped into the site during its period of operation. Waste was not segregated prior to dumping. Potentially hazardous materials that were dumped included fuel barrels, car batteries, refrigerators, freezers, household chemicals, honey-bucket waste (i.e. raw sewage), and suspected fuel cell transformers at least 40 years old (CEC, 2007; Mason, 1999; Light, 1999). In addition, used oil was routinely poured on the ground and burned (Light, 1999). The depth of waste has been estimated as 9 to 10 feet with an additional 3 feet of gravel pad cover. As mentioned previously (Section 2.2), the aerial extent of the dumpsite is between 1.0 and 1.5 acres.

No records were found indicating the site has been used for anything except a boat landing since 1996.

4.4.1. Governmental Action

The following is a timeline of environmental action performed by government entities related to (though not necessarily focused on) the former dumpsite:

- 1986 – USACE conducts a coastal-erosion study of Golovin. The report concluded that no action was warranted at the time. USACE considered relocation of the village to be the most effective option to combat future erosion. However, the benefit/cost ratio for the alternative was considered low (USACE, 1994).
- 1994 – USACE performs a flood control preliminary site reconnaissance of Golovin. The study was intended to determine whether the federal government should participate in any further activities related to flood and erosion control in Golovin. The study involved a data review and visit to Golovin. Findings included an erosion-rate estimate of less than 0.5 foot per year and similar conditions to those in 1986. The study identified measures to reduce erosion, including construction of berms, concrete mats, gabion baskets, 55-gallon drums, acrylic sand pillows, and seawalls at critical locations. As in the 1986 study, the report noted that relocation was one of

the options but was unlikely due to local resistance. The report concluded that no further federal government studies were necessary because of the low risk of flood damage (USACE, 1994).

- October 1998 – Golovin requests assistance from the DEC CS Program in assessing potentially contaminated sites (Frechione, 1998).
- June 1999 – DEC CS Program performs a site screening of the potentially contaminated sites in Golovin. The former dumpsite was one of four sites screened (Light, 1999). The dumpsite screening report identified it as a candidate for removal; however, removal was not recommended in the report. Instead, the report cites interim actions to mitigate erosion, such as covering with soil or riprap, and recommends that the CS Program provide guidance to village entities for implementation of the interim activities.
- July 1999 – GeoArch Alaska performs an erosion hazard assessment and submits report to DEC CS Program. Findings are summarized in Section 4.3.3.
- January 2000 – The former dumpsite receives initial CS ranking.
- May 2000 – DEC CS Program staff correspond regarding the former dumpsite (DEC, 2000). Correspondence included the potential for removal and revisiting the site to determine if more waste was eroding into the creek. Questions were raised as to which DEC programs (CS, Solid Waste, and/or Prevention and Emergency Response) should be involved. Based on the correspondence on record, this issue was not resolved.
- February 2007 – Bering Straits Regional Housing Authority requests that DEC perform an ‘environmental review’ of the landfill to determine any impacts to an area designated for a housing project. DEC’s response stated that the former dumpsite does not pose an environmental risk based on available information. The response cited that the former dumpsite is at least 600 feet down-gradient of the housing site and that there was no risk to the community drinking water supply (which would presumably supply water to the housing development) (Frechione, 2007).
- April 2007 – CEC applies for a DBA for the former dumpsite (CEC, 2007).

4.4.2. Aerial Photograph Review

Aerial photographs from 2004, 1980, and 1962 were available. All were taken in the summer. The 2004 photo is presented in Figure 2; the 1980 photo is presented in Figure 3; and the 1962 photo is presented in Figure 4.

In the 2004 photo, the site appears very similar to its appearance during OASIS’ site visit, but with slightly less vegetation. The gravel pad is easily distinguishable and is approximately 1.0 acre in area. However, as noted in Section 2.2, the area encompassed by the buried dumpsite may be larger, as the southeastern edge of the gravel pad has likely eroded over time.

The next aerial photograph is from 1980. The dumpsite was operating at this time. The photograph's resolution is poorer than the 2004 photograph; thus, the full dumpsite extent cannot easily be discerned. However, it is possible to make out a large, primarily white area, which constitutes the site. This area is outlined in Figure 3.

The final aerial photograph, taken in 1962, does not show any sign of the dumpsite. Since the dumpsite was reportedly created in the early 1960s, the site was either created after the summer of 1962 or the amount of existing waste is too small to discern in the photo.

4.5. Historical Use Information on Adjoining Properties

The mouth of Chinik Creek has been and continues to be used for fishing and boat storage (CEC, 2007). As shown in the historical aerial photographs (Figures 2, 3, and 4), the adjacent property has remained undeveloped. The only signs of development are two roads: the current Aukon Street, shown in Figure 2, and a former dump access road, which ran generally east-west along the shore of Golovnin Bay and entered the site from the west. This road is shown in Figure 3. The site and adjacent property appears completely undeveloped in the 1962 aerial photograph.

While there are other sites with known or potential contamination in Golovin (Section 6), each is at least one-third of a mile away. None are suspected to have contributed contamination to the site.

5. SITE RECONNAISSANCE

5.1. Methodology and Limiting Conditions

On the evening of September 17, 2007, Julie Ahern of OASIS performed a site reconnaissance. Ms. Ahern was accompanied by Sonja Benson, the DEC project manager. Ms. Ahern and Ms. Benson were escorted by Toby Anungazuk, the CEC environmental coordinator, and Jack Fagerstrom, a 'concerned citizen' (Fagerstrom, 1998). The site visit lasted approximately 75 minutes, during which time Ms. Ahern performed a walk-around of the site and photo-documented observations. Ms. Ahern and Ms. Benson also interviewed Mr. Fagerstrom and Mr. Anungazuk while on site. Field notes are presented in Appendix B.

5.2. General Site Setting

Photographs of the site are provided in Appendix A. The surface of the site is strewn with partially-exposed municipal and industrial waste and debris. Items observed included plastics, metal debris, and pieces of the fence that formerly surrounded the dumpsite (Figures A3 and A4). Metal debris was also observed protruding from the southern edge of the site (Figure A5). However, the majority of the site remains well-covered (Figures A1 and A6). Most of the observed waste was only slightly exposed (Figure A7). Tall grasses are growing over about half of the site.

Section 2 provides additional information on site characteristics.

5.3. Structure Observations

The only significant structure on site was a connex trailer (Figures A6 and A8). Inside the connex, various debris and old gear were stored, including tarps, wooden pallets, boxes, and bags (Figure A9).

There was no evidence of recent disposal events. All of the waste appears aged: the metal was rusted, plastic showed extensive degradation, and there was no odor to indicate presently decaying waste. No petroleum-related staining on the soil or sheen in Chinik Creek were observed.

Adjacent property was essentially undisturbed and undeveloped. Aukon Street, which is used to access the Chinik Creek mouth, borders the western edge of the site and is the only main road nearby (Figure A10). An all-terrain vehicle (ATV) track was observed leading out of the eastern edge of the site (Figures A2 and A11). Additionally, two boats were stored near the eastern edge of the site (Figures A11 and A12).

6. INTERVIEWS

Interviews with community members were conducted in two formats during the visit to Golovin. First, OASIS interviewed community members during the site reconnaissance on September 17, 2007 (Section 5); Toby Anungazuk and Jack Fagerstrom accompanied Ms. Ahern and Ms. Benson to the site. Mr. Anungazuk is the CEC's environmental coordinator and has lived in Golovin for the past five years. Mr. Fagerstrom is a lifelong resident of Golovin and long-time advocate for environmental cleanup within the village.

Second, OASIS interviewed community members the following morning (September 18) between 9:00 a.m. and 12:00 p.m. in the IRA office building. During this second interview session, Mr. Anungazuk and Mr. Fagerstrom were again present, but the majority of the time was spent speaking with Peter Olson. Mr. Olson is the current landfill operator and a lifelong resident of Golovin.

Topics discussed during these interviews can be divided into three general categories: 1) former dumpsite history, 2) other areas of concern, and 3) community plan development. The following is a summary of relevant information obtained during the interviews. Note that not all information gained during the interviews is provided here. Some information is presented in previous sections where appropriate; such information has been cited accordingly.

6.1. History of Former Dumpsite

Mr. Olson reported that, at the start of the dump's closure, landfill operators had attempted to segregate different kinds of waste into stalls. However, the attempt was unsuccessful due to walls caving in. Mr. Olson was not involved in closing the dumpsite

but was part of a work crew who uncovered a portion of it in 1996. The northwest corner of the dumpsite was uncovered and waste was examined. Mr. Olson observed wastes including batteries, refrigerators and freezers, plumbing parts, and material from a former cannery. He estimated the waste thickness was about 9 to 10 feet with approximately 3 feet of gravel cover. Mr. Olson and Mr. Fagerstrom recommended talking with Charlie Brown, another Golovin resident, because he helped to close the dumpsite. However, Mr. Brown was in White Mountain during the site visit.

Both surface and bank erosion of the site were discussed. Mr. Fagerstrom estimated that at least three-quarters of the former dumpsite is flooded every year due to storms. He emphasized the severity of the 2003, 2004, and 2005 storms, noting that the site was completely inundated in all three instances. Mr. Fagerstrom's estimation of the former extent of the dumpsite, prior to erosion, is shown in Figure A13. Mr. Olson indicated that a cutbank of Chinik Creek is approaching the southeast portion of the site. He expressed concern that waste will soon be exposed.

No one interviewed knew of any photos of the dumpsite that were taken during its operation or closure. None of the interviewees had observed (or heard of others observing) wastes being carried from the site by flooding.

6.2. Other Areas of Concern

In addition to the former dumpsite, other areas of concern in Golovin were discussed at length. After the site reconnaissance, OASIS visited some of them. Photos from the site visits are provided in Appendix C. The sites include the following locations:

- *Former washeteria dump*: This site is located at the southwestern tip of town. It was used to dump sewage and materials from the city's washeteria upgrade shortly before the current landfill was opened. Due to its coastal and low-lying location, the site is continually eroded. Mr. Olson expects that PVC piping (from the washeteria upgrade) will be exposed soon. It is currently used as a boat landing.
- *Drum cache* (Figures C1-C3): This area is also near the shore at the southwestern end of the village. At least fifty drums are stored here, all of which are heavily rusted. Some may be leaking. Many of the drums are at least partially filled with unknown contents; tar, water, or mixtures of the two are some possible contents.
- *Drinking water supply intake*: The community's drinking water supply intake is located in Chinik Creek about 7,000 feet north of the former dumpsite (Figure C4). The community is concerned by high levels of salinity and lead recently found in drinking water samples. The source of the salinity and lead is unknown. During the site visit, Ms. Benson suggested that the high lead results are likely due to corrosion of the lead solder in the water-supply pipes rather than surface-water contamination.
- *Current landfill*: The current city landfill appears to be in good condition (Figure C5). However, concern was expressed over the drainage outlet from the landfill (Figure C6). The drain channels runoff through the tundra and eventually to Golovnin

Lagoon. The concern is over potential contamination of the lagoon if the tundra does not allow for adequate filtration.

While several different sites of concern exist in the village, the overarching issue is flooding. The lower portion of town is particularly troubling, as it was completely flooded by the 2004 and 2005 storms. Most of the village's infrastructure is located in this area. All three of the interviewees stressed that protection of this area is the community's biggest concern at this time. Photos of flooding in the lower portion of town shortly after the peaks of the 2004 and 2005 storms are provided in Appendix D.

6.3. Community Plan Development

Mr. Olson and Mr. Fagerstrom indicated that the community would like to remove the former dumpsite. Their plan is to haul the excavated material to a gravel pit located approximately one mile upland from the site, which is at a significantly higher elevation (The pit was created by excavating soil for berm construction in the lower portion of town). Although CEC does not have heavy equipment, the City of Golovin has the following pieces of equipment:

- 350B & C Cat (down as of April 2007, waiting on parts)
- D5B Cat
- John Deere 644C front-end loader with 6-yard bucket
- 8-yard dump truck
- 10-yard dump truck

The City Council is willing to make this equipment available, provided it is not needed for another project (CEC, 2007). If the excavation plan is implemented, the community wishes to hire and train local workers in hazardous material management.

The community has attempted some of the preventative measures for flooding recommended in the 1994 USACE study (USACE, 1994). For example, this year community members excavated material from an upland area northeast of town and constructed a berm to protect the city infrastructure (e.g., power plant, fuel tank farm, washeteria, and school) in the lower part of town (Figure C7). However, the community considers this (as well as many of the other USACE report's recommendations) a short-term solution. The severity of recent storms has led the community to give more consideration to relocating. During the interview session on September 18, a village map was examined. The upland area along the shore of Golovnin Lagoon was marked on the map as a potential relocation site. Mr. Olson noted that several of the buildings in the lower part of town (e.g., washeteria, clinic, power plant) are portable. Mr. Anungazuk pointed out that a first step the community must take is to prevent future development in the lower part of town. He expressed frustration that five new facilities had been built in the low-lying flood-prone area within the past five years.

Mr. Olson expressed the need to fund immediate community needs. He indicated that federal funding has historically been put toward assessing future needs. As a result, the

assessments often conclude that no action is warranted. Mr. Olson stated that Golovin's state senator, Donnie Olson, has suggested that community members travel to the state or national legislature and lobby for funding, as other villages have had success with it. Ms. Benson suggested the DCCED Community Development Block Grant as one potential source of funding.

7. FINDINGS

Based on information gathered from a records review, site reconnaissance, and interviews with concerned community members, OASIS determined that the following findings were relevant to the former dumpsite environmental audit:

- The site is between 1.0 and 1.5 acres in area. The dump contents are reportedly covered by approximately 3 feet of gravel and extend 9 to 10 feet below the gravel. Assuming these estimates are correct, the volume of waste in the dump is somewhere between 14,500 and 24,000 cubic yards.
- Disposal at the site occurred from the early 1960s through 1996. All manner of debris and waste was disposed of at the dumpsite, including hazardous materials.
- The site is currently used as a boat landing and storage area. Fishing and swimming also occur adjacent to the site in Chinik Creek.
- Waste is visibly eroding from the surface and shoreline side of the site. Observed materials include metal debris, plastic, and old fencing.
- A 1999 erosion hazard assessment concluded that the site was subject to "very rapid" surface and bank erosion (Mason, 1999), though the rate could not be determined from the study's field data. The report noted that a high-energy storm could erode the site by several times more than the erosion measured from relatively low-energy storms. Relocation of the site contents was recommended.
- A 1999 DEC CS Site Screening report identified the former dumpsite as a potential candidate for removal action. Subsequent correspondence among DEC staff suggested the possibility of removal. However, based on the correspondence on record, questions regarding which DEC program(s) should be responsible were not resolved.
- Storms in the fall of 2003, 2004, and 2005 caused significant flooding and erosion of the dumpsite. The recent increase in storm frequency and intensity indicates that similar flooding and erosion is likely in the near future. Even during years with relatively low-energy storms, approximately three-quarters of the site is flooded.
- A cutbank of Chinik Creek is approaching the former dumpsite. Community members are concerned that waste along the southeastern edge of the dumpsite will soon be exposed.
- The community would like to remove the former dump by excavating the waste and disposing of it in an existing gravel pit in an upland area about one mile north of the

site. The existing gravel pit was identified as a possible destination in order not to fill the current landfill to capacity with contents of the old dumpsite. They would like to use local workers and provide them with hazardous materials training so that hazardous materials could be handled safely and segregated.

- The City of Golovin has heavy equipment available for excavating the dumpsite, provided that it is not needed for another city project.
- Erosion of the former dumpsite is part of the overarching problem of flooding that Golovin faces. The village would like to establish a community plan that addresses the dumpsite as well as other flood-related concerns.

7.1. Data Gaps

After completion of the records review, site reconnaissance, and interviews with community members, OASIS was unable to determine the following information:

- *Distribution of waste within the former dumpsite:* The distribution and quantity of hazardous materials present are not known. No formal records of waste disposal were found, nor were documented observations of waste before or during the dump closure.
- *Exact volume of the former dumpsite:* The aerial extent has been estimated from aerial photographs and the gravel pad cover at the time of the site reconnaissance. Depth estimates were given by interviewed residents. However, the exact dimensions of the former dumpsite have not been delineated.
- *Impact of the former dumpsite to surrounding environment and wildlife:* Impact to groundwater (if present), soils, and nearby surface water is not known. Ecological effects, such as impact to anadromous fish in Chinik Creek, are also unknown at this time.

8. CONCLUSIONS AND RECOMMENDATIONS

Based on our findings, OASIS concludes that the former Golovin dumpsite poses a significant environmental risk to the community and the fish in Chinik Creek. The history of flooding at the site, combined with the increasing trend of storm strength and frequency, suggests that erosion will continue and possibly increase in the near future.

There is potential that contaminants are seeping from the site into Chinik Creek. However, regardless of current seepage, a high-energy storm could cause a catastrophic release. Furthermore, the timing of such a release is unpredictable.

OASIS recommends that the community proceed with their plan to remove the dump contents and transfer them to the upland gravel pit described in Section 6.3. In order to clearly establish the objectives and scope of the project, a written plan on waste removal and site restoration is recommended. OASIS also advises that the City Council and CEC work together to create the plan to assess funding and success of the project.

Establishing a removal plan will involve several steps, including (but not limited to) the following items:

- Improve the estimate of the volume of dump contents. As noted in Section 6.1, Mr. Brown might be able to provide further detail on the dumpsite extent. Additional minimal excavation exploration could be completed at modest cost to better determine landfill boundaries.
- Determine equipment requirements for the dump removal, identifying which pieces of equipment are not available locally, and whether equipment will be mobilized to the community as part of any other projects.
- Identify hazardous materials training opportunities for local workers, and investigate possible options to assist with financing this training.
- Identify a source of clean fill to place at the site once the dump contents are removed. Ideally, fill could be derived from the area displaced to receive this material.
- Develop a cost estimate for the dumpsite removal, taking into consideration the above factors (volume of waste and clean fill, hauling of waste, equipment and training needs, presence of hazardous materials, etc). Costs are dependent on these factors, and could range from \$25,000 such as the Redding Rancheria Dumpsite where removal was done by hand by volunteers, to well over \$100,000, if unknown hazardous materials are detected and removal and storage of hazardous substance-contaminated soil and materials are very costly.
- Identify sources of funding to assist with landfill relocation. One source recommended during the site visit is the DCCED's Community Development Block Grant.
- Complete the Golovin *Hazard Mitigation Plan*. Approval of this plan by the Department of Homeland Security would make Golovin eligible to apply to state and federal hazard mitigation grant programs for grants such as the *Robert T. Stafford Disaster Relief and Emergency "Assistant Act" Hazard Mitigation Project Grant*.

To help generate funding, OASIS also recommends that USACE update their 1994 flood control reconnaissance study. Since significant flooding and erosion have occurred since 1994, study findings might indicate that federal government action is now warranted.

9. ADDITIONAL SERVICES

As noted in Section 6.2, OASIS visited and discussed other community sites of concern with community members in Golovin. The site visits and discussion constitute services outside of OASIS' original scope.

10. REFERENCES

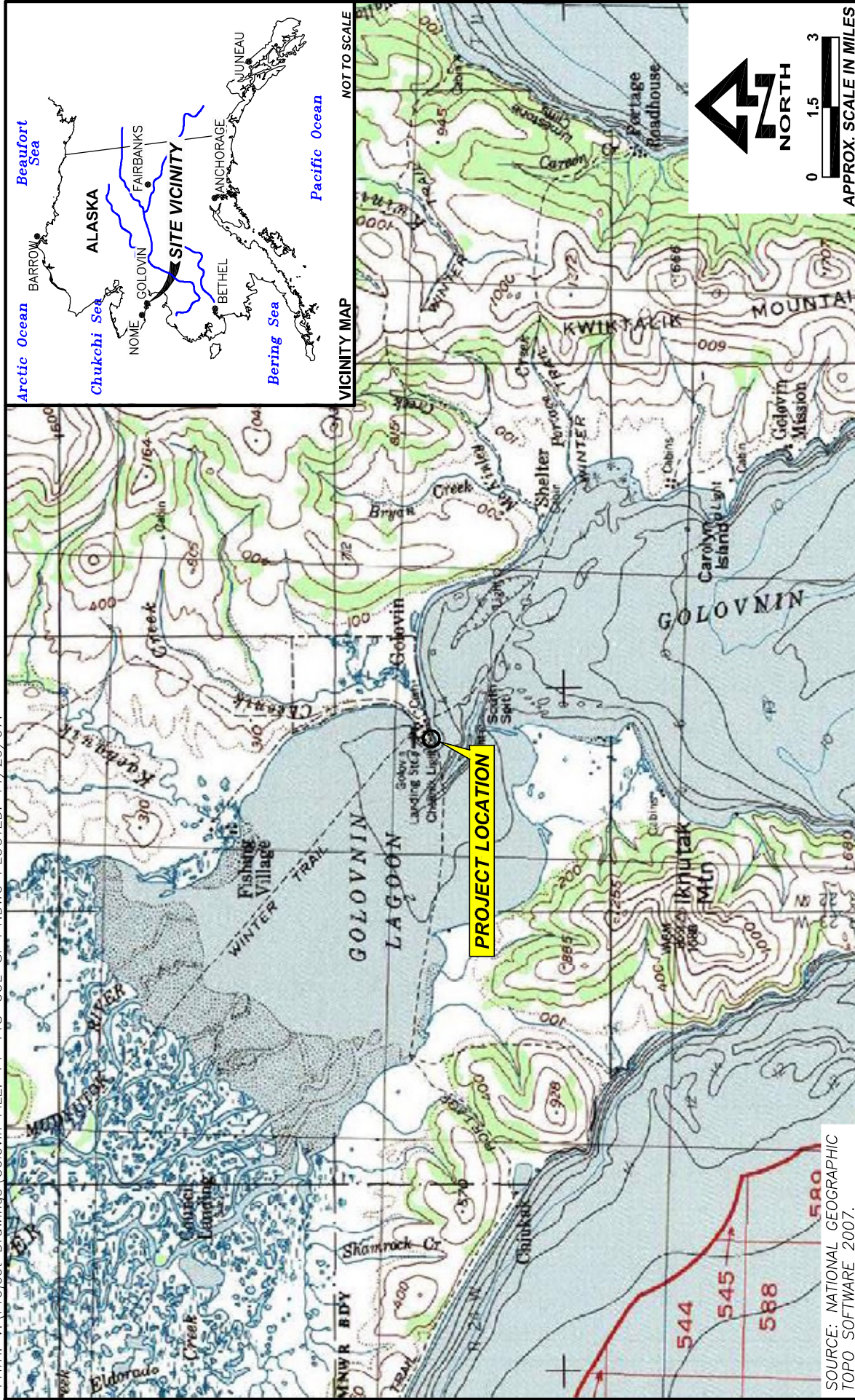
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FIGURES

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SOURCE: NATIONAL GEOGRAPHIC TOPO SOFTWARE 2007.

DATE: NOV. 2007
 CHKD: M.S.
 DRAWN: C.E.H
 PROJ. No.: 14-118
 825 W. 8th Ave., Anchorage, AK 99501, (907) 258-4880



SITE LOCATION MAP

FORMER GOLOVIN DUMPSITE
 Golovin, Alaska

FIGURE

1

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PATH: V:\Project Drawings\Golovin FILE: 2004 GOLOVIN.DWG PLOTTED 11/29/07.



SOURCE: AERIAL PHOTOGRAPH GOLOVIN6/11/04.TIF
DATED 6/11/04 PROVIDED BY AERO-METRIC INC.

NORTH

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APPROX. SCALE IN FEET

oasis
ENVIRONMENTAL

DATE: NOV. 2007
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 825 W. 8th Ave., Anchorage,
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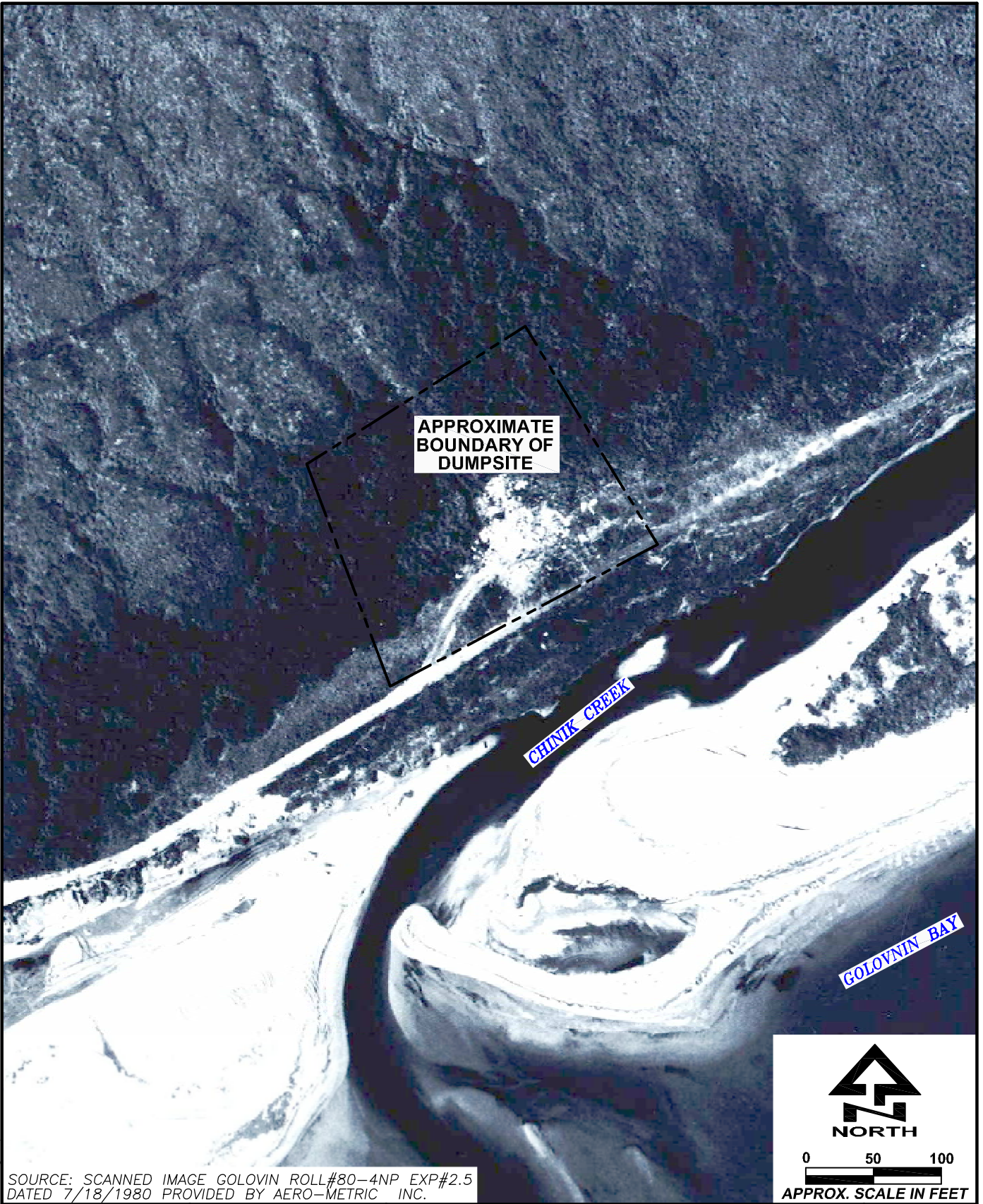
2004 AERIAL PHOTOGRAPH

FORMER GOLOVIN DUMPSITE
Golovin, Alaska

FIGURE
2

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PATH: V:\Project Drawings\Golovin FILE: 2004 GOLOVIN.DWG PLOTTED 11/29/07.



SOURCE: SCANNED IMAGE GOLOVIN ROLL #80-4NP EXP#2.5
DATED 7/18/1980 PROVIDED BY AERO-METRIC INC.

NORTH

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APPROX. SCALE IN FEET



DATE: NOV. 2007

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DRAWN: C.E.H.

PROJ. No.: 220-114

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1980 AERIAL PHOTOGRAPH

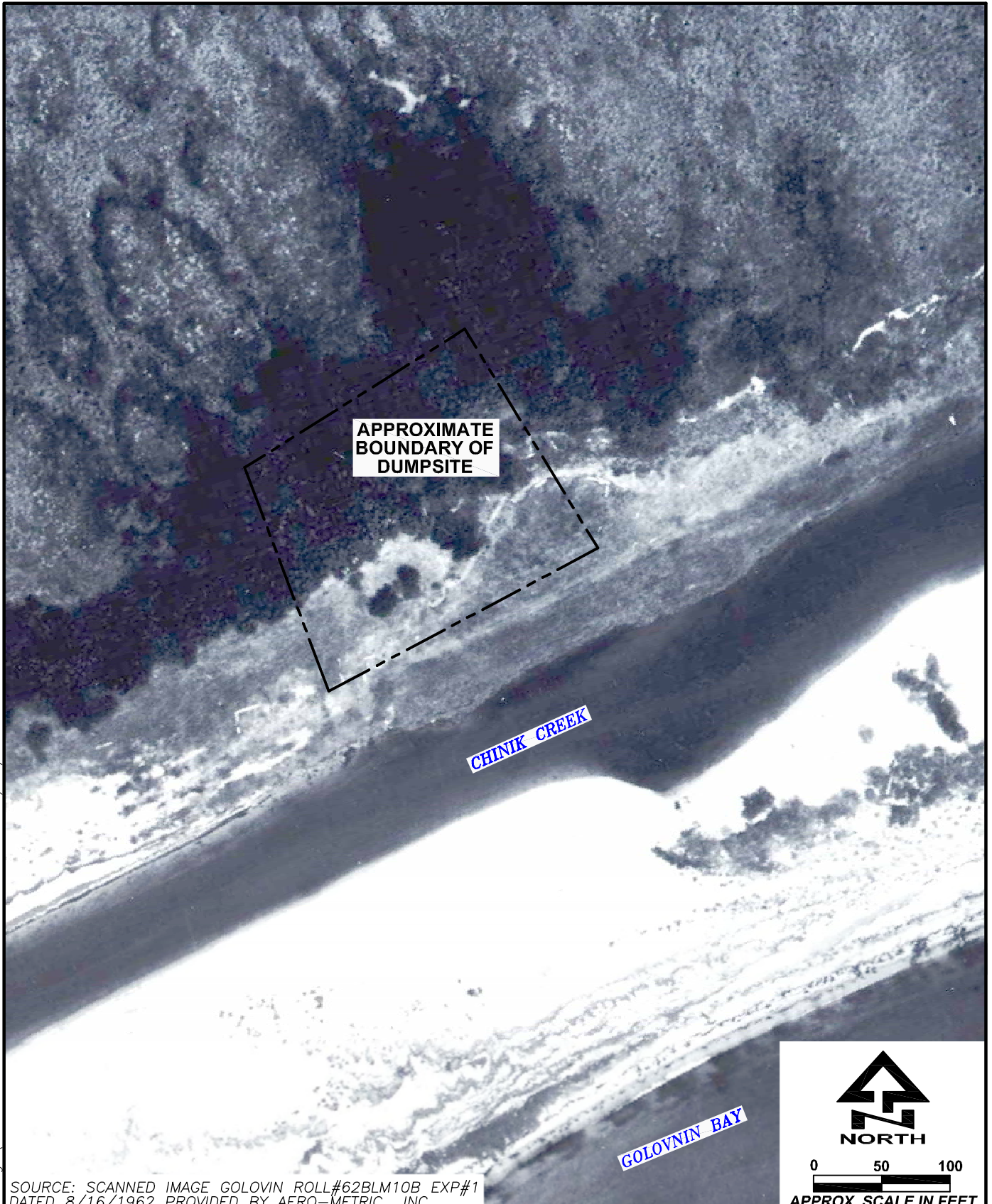
FORMER GOLOVIN DUMPSITE
Golovin, Alaska

FIGURE

3

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PATH: V:\Project Drawings\Golovin FILE: 2004 GOLOVIN.DWG PLOTTED 11/29/07.



SOURCE: SCANNED IMAGE GOLOVIN ROLL #62BLM10B EXP#1
DATED 8/16/1962 PROVIDED BY AERO-METRIC INC.

NORTH

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APPROX. SCALE IN FEET



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 DRAWN: C.E.H.
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1962 AERIAL PHOTOGRAPH

FORMER GOLOVIN DUMPSITE
 Golovin, Alaska

FIGURE
4

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APPENDIX A

Photographic Log of Site Visit

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Figure A1. Looking east from Aukon Street (western extent of site).



Figure A2. Looking west from eastern extent of site.



Figure A3. Metal debris exposed on surface of former dump site.



Figure A4. Rolled-up fencing that was erected around former dump site.



Figure A5. Metal protruding from southern edge of site.



Figure A6. Looking northwest across site. Jack and connex in background. Connex marks approximate northern extent of site.



Figure A7. Plastic exposed at surface of former dumpsite.



Figure A8. Looking north from southern extent of site.



Figure A9. Inside of connex shown in Figure 2. Connex is used to store various debris and waste.



Figure A10. Looking north down Aukon Street, western border of site. IRA building visible in distance.



Figure A11. Looking east from eastern extent of site. Note edge of gravel pad at bottom of photo and Chinik Creek in background.



Figure A12. Boat located near eastern extent of site.



Figure A13. Looking north at site from Chinik Creek shore. Line in sand is Jack Fagerstrom's estimate of former dumpsite extent (prior to erosion).

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APPENDIX B

Field Notes

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"Outdoor writing products for outdoor writing people."

8:00



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Projects 14-118 & 14-119
Environmental Audits @
Former Golovin & Alakanuk Dump
Sites and @ Former Alotna Site

4 1/8" X 7" - 64 Pages

September 2007

J Aurn, S. Benson

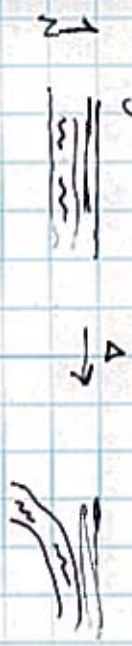
① 9/17/07 14-118 - Golovin P. Andy, NSF

1515 Arrived to Golovin. Received ride on ATV to IRA bldg (Sean Drury)

1525 Arrived to IRA bldg. Met Toby & Clair Belle. Inhaled @ find photos & COE report.

1540 Arrived to dumpsite. Jack told us about existing wastes. Painted out drink water intake exists up the creek.

Creek mouth moved somewhat to mine gravel



Discussed ANTHC's water/wastewater Project, millions spent

Discussed several landfill-related issues, took several photos -> see legal pad for notes.

. Note: on site with Jack & Toby

1655 Left site for IRA Bldg

1710 Arrived to new landfill. Landfills not lined. Took approx 6 photos

1730 Visited pump house. Took approx 5 photos.

1755 Returned to IRA bldg. Had dinner

1940 Stopped at beach harbor (4 photos), water

J Aurn 9/17/07 1/3

9/17/07

J. Ahum
14-118-Govinn

(2)

Storage tanks (Alphab), and old tanks that washed across barbar (20m in, 2 photos), old tanks knocked over in 2003.

2000 Drive up to water tank, new tank from power plant. Took approx 6 photos.

- Water tank can hold 1.2 million gallons.

- This low-lying portion of town has been flooded 3 years in a row (2003-05) water level almost reached top fence in backbar.

- Jack asked what next step is. Requested that we communicate w/ COE & recommend they follow up with 1994 flood control report. I explained I will be reviewing that report & other village studies that relate to riverbank erosion & landfills.

- Songa asked about what Jack & Toby thought about costs & possible solutions

- Toby: Prohibit any future construction in low-lying area (at least 5 years)
- Jack: thought a seawall at one time.

2030 - Songa discussed reuse funds & ideas → COE is already source of funds

J. Ahum, 9/17/07 2/3

(3)

9/17/07

J. Ahum
14-118 Govinn

- Jack: land planning handled mostly by woman, a lot of squabbling & local politics.

- COE recommended 3 options @ Govinn's (sandbags) @ relocating village (3)

- Wastewater/sewer system was 'in exercise' on how not to design a system (e.g., brought in supplies for a marina at full system, changed ownership all supplies at again).

- Songa: Community Commerce & Economic Development = one potential source. Toby: deadline has past for this year.

2100 Returned to IRA bldg. Agreed to meet at 0800 tomorrow. End of day

J. Ahum
9/17/07

3/3

J. Ahern

(4)

14-118 - Colonn

ca. n. windy, 50F

9/15/07

0900

Began interview w/ Peter Olson,

1200 (approx.)

Ended interview w/ Peter. Note:

Sonja, Jack, and myself were present w/ Peter.

1230

Making copies of maps & relevant report data (94C0E, 2001 Landfill permit proposal).

1300

Obtained photos (hard copies & CD) from Toby.

Sonja discussed follow-up to DEC Inspection Report on Colonn Leachfield Sys' w/ Peter - left assign w/ Marie Kingman.

1500

Packed up, paid lodging, left IRA Bldg w/ Sen.

1540

Flew out of Colonn.

J. Ahern 9/21/07

1/1

APPENDIX C

Photographic Log of Other Sites of Concern

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Figure C1. Drum cache.



Figure C2. One of drums in drum cache. Note tar stains on exterior.



Figure C3. More drums in cache. Note punctures in some and fuel tank in background.



Figure C4. Looking northeast at drinking water intake. Toby Anungazuk in foreground.



Figure C5. Looking northwest at current city landfill.



Figure C6. Looking west at drainage outlet of landfill.



Figure C7. Berm protecting infrastructure of lower town area.

APPENDIX D

Photographic Log of Flooding

Provided by Chinik Eskimo Community

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School 04



School 05



Generator 04



Generator 05



Co-op 04



Co-op 05



Cliffs 04



Cliffs 05



Main Road 04



Main Road 05



Golovin 04



Golovin 05