Final Strategic Project Implementation Plan

Gambell, St. Lawrence Island, Alaska
Contract No. DACA85-98-D-0007
Delivery Order No. 18, Task 1

December 2000

Prepared for:

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Acronyms

ACM	asbestos-containing material(s)
Air Force	United States Air Force
Army	United States Army
ATV	all-terrain vehicle
BLM	Bureau of Land Management
CAA	Civil Aeronautics Administration
DERP	Defense Environmental Restoration Program
DoD	Department of Defense
FUDS	formerly used defense sites
IRA	Native Village of Gambell, Indian Restoration Act
NALEMP	Native American Lands Environmental Mitigation Program
Navy	United States Navy
RI	remedial investigation
SPIP	Strategic Project Implementation Plan
USAED	United States Army Engineer Division, Huntsville

INTRODUCTION

The Native Village of Gambell (IRA) entered into an cooperative agreement with the Department of Defense (DoD) under the Native American Lands Environmental Mitigation Program (NALEMP). This agreement includes the development of a Strategic Project Implementation Plan (SPIP).

THE SPIP

- Identifies DoD impacts
- Discusses how DoD activities affects land use
- Provides a time frame for anticipated land development
- Proposes desired remediation of DoD-impacted areas
- Estimates the cost of remedial activities
- Prioritizes the remedial actions

The SPIP is a tool to express tribal members' ideas and concerns to the DoD, and will serve as a basis for further discussions with the DoD regarding military impacts to Gambell. The SPIP does not guarantee that any DoD money will be available to perform removal actions at Gambell.

APPROACH

A community survey was performed in cooperation with the Native Village of Gambell (IRA) to solicit information from community members regarding the whereabouts of remaining military debris, primarily buried debris. The survey forms included a site map of the Gambell area (Appendix A) and were completed by the survey participants to better locate the areas in question. The surveys were compiled, a priority list completed (Appendix A), and the information combined with information gathered through previous remedial investigations and removal actions. Previous restoration activities were performed under the Defense Environmental Restoration Program (DERP) for Formerly Used Defense Sites (FUDS) and managed by the United States Army Engineer District, Alaska.

To aid in the development of the SPIP, a geophysical investigation of several sites identified in the community survey was performed in the summer of 2000 (Golder, 2000). Seven sites were investigated covering an area of approximately 13 acres. The purpose of the geophysical investigation was to confirm the presence and estimate the quantity of suspected buried metallic debris resulting from military activity. The results of the geophysical investigation were used in the SPIP to help estimate cost of remediation (Appendix B).

Montgomery Watson completed a visual inspection of nine former Civilian Aeronautics Administration (CAA) buildings to identify the possibility of the presence of friable asbestos. Seven of the buildings are currently being occupied by local native residents. The field notes are located in Appendix C.

LOCATION

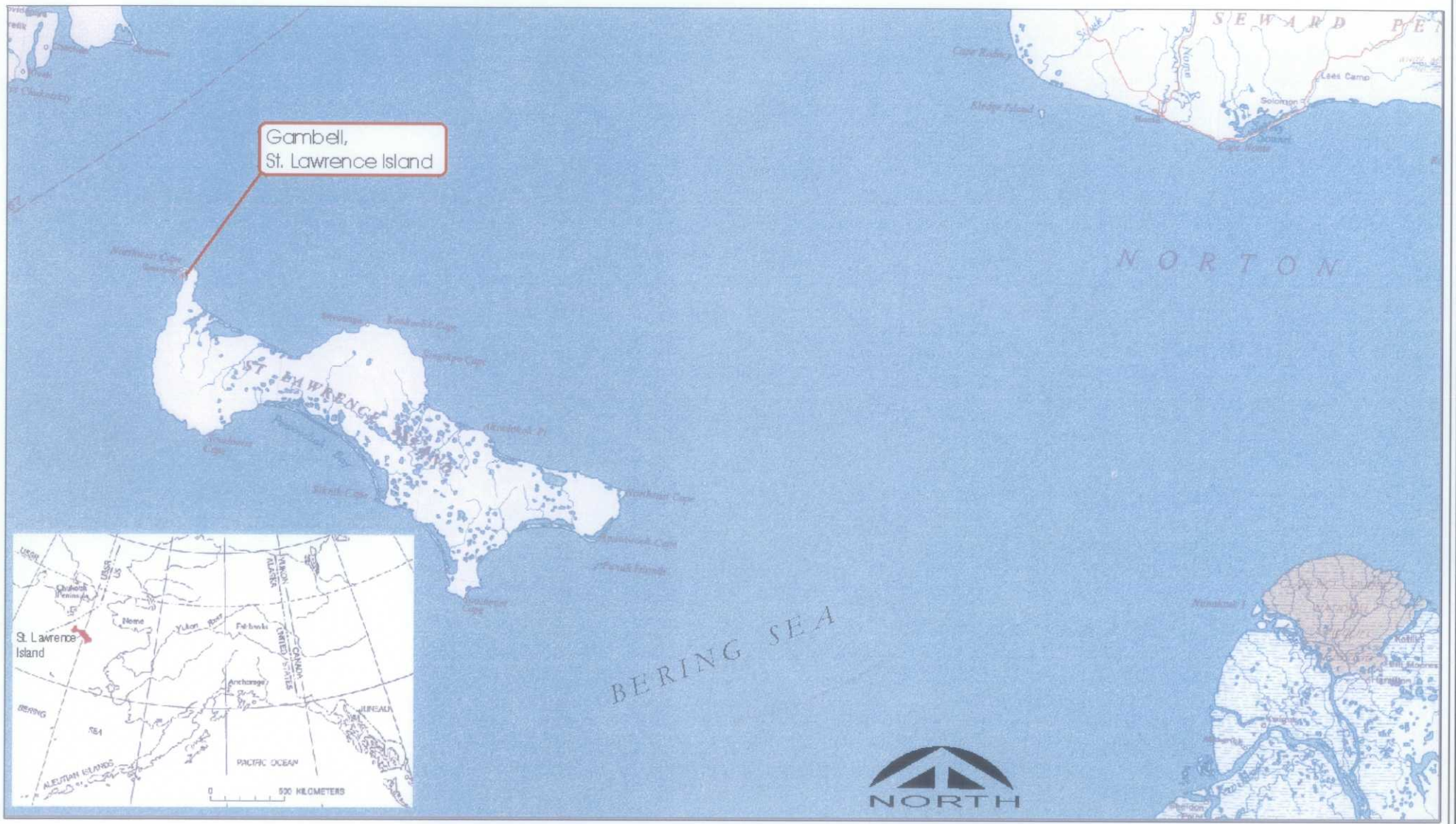
Gambell is located off the coast of western Alaska (Figure 1) on the northwest tip of St. Lawrence Island in the western portion of the Bering Sea, approximately 200 air miles southwest of Nome, Alaska. The island is accessible by boat or regularly scheduled or chartered commercial airline from the city of Nome. Gambell is 39 air miles from the Siberian Chukotsk Peninsula. The village of Gambell is built on a gravel spit that projects northward and westward from the Island. The location of the site is 63 degrees 47 minutes north latitude and 171 degrees 43 minutes west longitude, in Township 20 South, Range 67 West, Kateel River Meridian.

SITE HISTORY

The Gambell area was used by the United States Army (Army), United States Navy (Navy), and United States Air Force (Air Force) from approximately 1948 until the late 1950s. Various facilities around the village of Gambell were constructed to provide housing, communications, and other military functions. The Air Force operated an Aircraft Control and Warning Station as early as 1948, but the site was abandoned about 1956 when a similar facility was constructed at Northeast Cape on the northeast end of St. Lawrence Island. The Army operated a base at Gambell that reportedly supported several hundred personnel. A search of historical records failed to yield base plans or site information from the Army Installation. However, according to Winfred James, a local Gambell resident, the Army was active in Gambell from 1954 to 1957. Information regarding Navy activities at Gambell is sparse; however, their presence in Gambell is known to have occurred during the beginning the cold war.

Extensive background research into Navy activities at Gambell yielded no pertinent information. Air Force property was transferred to the Bureau of Land Management (BLM) in 1962, and Army property was transferred to the BLM in 1963. All DoD structures were demolished, burned, or scavenged, and the debris buried on site.

Today, as a result of the Alaska Native Claims Settlement Act of 1971, St. Lawrence Island is held jointly by Sivuqaq, Inc. in Gambell and Savoonga Native Corporation in Savoonga. Land not owned by Alaska Natives on St. Lawrence Island is limited to state lands used for airstrips and related facilities. The area around the village of Gambell is classified as a FUDS under the DERP.



MONTGOMERY WATSON

Anchorage, Alaska

SOURCE: U.S. Geological Survey
Reston, Virginia 22092, 1976
St. Lawrence, Alaska
N6265 – W16830 /60x210
Surveyed 1948, Compiled 1957
Minor Revisions 1974
Scale 1:250,000 Contour Interval 100'

FIGURE 1

U.S. ARMY ENGINEER DISTRICT, ALASKA
GAMBELL, ST. LAWRENCE ISLAND, ALASKA
STRATEGIC PROJECT IMPLEMENTATION PLAN

VICINITY MAP – GAMBELL

SITE DESCRIPTIONS

This section presents the sites (areas of concern) identified by the community survey (Appendix A) as being impacted by former DoD activities, the primary focus being buried debris and areas which have been identified for future land development (Appendix D). The site descriptions are presented in numerical order for clarity. Table 1 lists the sites in order of community priority, provides a brief site description, and presents the preferred remedial alternative and its estimated cost. Figure 2 shows the site boundaries, areas of concern identified in the community survey forms, and locations of geophysical anomalies. Figure 3 presents historical photographs of Gambell showing the locations of the former military sites and areas where there is a potential for buried material.

SITE 1A, ARMY LANDING AREA

Site 1A, the Army Landing Area, is located in the central portion of North Beach where two well-established all-terrain vehicle (ATV) roads intersect. It is located east of an area that is currently used to beach whaling boats. Near the intersection of the two ATV roads, there is a substantial amount of buried metallic debris, primarily Marsten matting, which continues to be exposed and reclaimed by the shifting gravels along the beach area. This site also includes a half-buried crane. The debris presents a physical hazard to ATV and snowmobile traffic.

SITE 1B, NORTH BEACH/AIR FORCE LANDING AREA

Site 1B, the former Air Force Landing Area, is located adjacent to a beach berm approximately 1,900 feet east of the southeast corner of Site 1A. As with Site 1A, it is believed that there is a substantial amount of Marsten matting and other buried metallic debris remaining at the site. Portions of buried debris are exposed periodically as the gravel beach deposits shift. This area receives a large amount of ATV traffic due to its proximity to the bird rookeries, which are utilized by the villagers for both subsistence and tourism activities. The debris presents a physical hazard to ATV and snowmobile traffic.

SITE 1C, NORTH BEACH

This site runs the majority of the length of North Beach and consists of underwater metallic debris located just offshore. The majority of the debris is thought to be Marsten matting used to construct the two landing areas, Sites 1A and 1B. Community survey information also noted that miscellaneous metallic debris, such as wire and drums, were disposed at the shoreline. North Beach is the primary area used for launching boats in Gambell. The underwater debris presents a potential physical hazard to villagers while launching and returning to shore.

SITE 2, FORMER MILITARY HOUSING/OPERATIONS BURIAL SITE

This site is located approximately 600 feet south of Area 1B. A partially-buried concrete pad remains on site and presents a physical hazard for ATV and snowmobile traffic.

SITE 3A, FORMER COMMUNICATIONS FACILITY BURIAL AREA

The former Communications Facility is located approximately 700 feet southeast of Site 1B, and 750 feet northeast of Site 2. Items that were reportedly buried in the area include: two Jamesway huts; a 15-kilowatt power plant containing auxiliary generators, transformers, oils, fuels, and batteries; and approximately 5- to 10-gallon glass carboys of sulfuric acid (E&E, 1993). Results from a 1994 geophysical survey of the site indicate the presence of buried debris (Golder, 1994). Buried debris in this area presents a potential physical hazard (e.g., sinkholes) to villagers who use the area for subsistence activities associated with the nearby bird rookeries.

SITE 4E, WESTERN FACE OF SEVUOKUK MOUNTAIN

This area consists of the steeply sloped western face of Sevuokuk Mountain. The area contains various types of cabling used to support military activities at the summit. The debris represents a physical hazard to villagers who use the area for subsistence activities.

SITE 5, FORMER TRAMWAY SITE

Site 5 is located approximately 1,900 feet southeast of the former military power facility and is immediately adjacent to the new village water supply. In 1997, Montgomery Watson conducted an investigation of two large geophysical anomalies north-northwest of the Village well house. Debris was removed or identified as not being an environmental or human health threat. One smaller geophysical anomaly remains just north of the well house (MW, 1997). This site is thought to contain buried transformers and wire. The presence of buried debris at Site 5 may pose a hazard to the village water supply.

SITE 6, MILITARY LANDFILL

This site is located north of the Gambell High School and east of the new housing area. URS Corporation reported there to be approximately 3,000 drums filled with human waste buried at Site 6 during military activities at Gambell (E&E, 1992). The barrels containing human waste were reportedly treated with lime prior to final sealing, and then buried underneath a thin soil covering (URS, 1985a). During a 1994 Remedial Investigation (RI), a geophysical survey of the site confirmed the presence of substantial subsurface metallic debris (Golder, 1994). In 2000, additional geophysical surveys were performed to support the SPIP at Grids H, K, and M, each of which partially overlaps Site 6 (Figure 2). Anomalies associated with Grids H and K are within the original boundaries of Site 6, while anomalies at Grid M are outside the original boundaries of Site 6 (Golder, 1994; 2000). For simplicity, the geophysical survey Grids H, K, and M have been combined with and are now referred to collectively as Site 6.

The Bering Straits Regional Housing Authority is proposing to construct 8 to 10 additional houses east of the existing homes located adjacent to Site 6 in the near future (Appendix D). This would place them in the vicinity of Site 6 and the buried debris. The buried debris may pose difficulties in the construction of planned and future housing projects in the vicinity.

SITE 7, FORMER MILITARY POWER FACILITY

This facility was reportedly buried north of the Municipal Building in an estimated 375- by 85-foot area.
Geophysical surveys performed in 1994 and 2000 suggest that there is buried ferrous material remaining at the site (Golder, 1994; 2000). The City of Gambell is planning the construction of a fire hall in the immediate vicinity of Site 7. Buried debris may underlay the area proposed for development and hinder the construction efforts.

SITE 8, SMALL ARMS AMMUNITION BURIAL SITE

This area is located approximately 1,500 feet south of Troutman Lake near the natural ridge of the shoreline. The United States Army Engineer Division, Huntsville (USAED) removed approximately 800 30-caliber rounds in the summer of 2000 (USAED, 2000). An area approximately 15 feet square by 3 feet deep is thought to contain additional small arms rounds and associated metallic debris, such as empty ammunition cans, all of which are intermingled with the beach gravels.

Site 8A, Eastern Edge Of Runway

This area is located immediately east of the current runway. The construction of the original runway by the military used Marsten matting to stabilize the soils. The current runway, now owned and maintained by the Alaska Department of Transportation and Public Facilities, overlays the original runway and Marsten matting. Large sections of the Marsten matting have recently been exposed due to severe weather events. This area is heavily traveled by ATV and snowmobile traffic; the exposed matting presents a physical hazard.

Site 8B, West Beach, Old Gambell Village Site

This area is located just south of what is commonly referred to as Old Gambell Village. Miscellaneous metallic debris, including numerous 55-gallon drums and a Jeep, has been buried at this site. The presence of buried and partially-exposed debris at this site poses a physical hazard to villagers who actively excavate the area.

Site 8C, Navy Landfill

This area is located northwest of the former Civil Aeronautics Administration (CAA) housing and south of the village landfill. The landfill was thought to have been constructed during Navy activities in Gambell, when they utilized the former CAA housing. It was inspected during the 2000 field visit and was suspected to contain some asbestos-containing materials (ACM).

SITE 13, FORMER RADAR POWER STATION

This area is located east of the unnamed pond just south of Troutman Lake. The radar power station consisted of two wooden Quonset huts, one long wooden building, and a number of 150-foot towers that were reportedly demolished and buried on-site (E&E, 1993). Geophysical survey data collected in 1994 indicates the presence of buried debris (Golder, 1994; MW, 1995).

SITE 15, TROUTMAN LAKE DEBRIS BURIAL SITE

This area is located along the northern edge of Troutman Lake. Marsten matting, wire, 55-gallon drums, and other metallic debris can be seen from the shoreline of the lake on a calm day. In the spring of 2000, the USAED performed a geophysical survey over a 144-acre area of the northern edge of the lake, focusing specifically on unexploded ordnance. The presence of miscellaneous metallic debris was confirmed. (USAED, 2000). It is estimated that less than 1-ton of metallic debris is present in Troutman Lake along its northern shore. The debris presents a physical hazard to those who recreate on and in the lake during the summer months.

SITE 16, GAMBELL MUNICIPAL BUILDING SITE

This site consists of a 35- by 55-foot area of stained gravel, located immediately west of the Municipal Building. The staining is most evident after a rainfall event. It is uncertain whether the staining is from military actions, village activities, or a combination of both. However, historical photographs of the area show this area to have been heavily used by the military. Surface and subsurface soils samples collected during the 1994 RI confirm the presence of petroleum contamination. The presence of the contaminated soils may hinder future development of the area by the Village of Gambell.

SITE 17, AIR FORCE LANDFILL

This site is located immediately south of Site 1A and immediately north of Site 6. There are two landfills in this area, which contain materials that were regularly burned and covered (E&E, 1993). During the 1994 RI, a geophysical survey of the site indicated the presence of subsurface metallic debris and disturbed ground (Golder, 1994; MW, 1995). Due to its proximity to North Beach, this area is prone to severe weather events. The buried debris has the potential to become exposed and present a physical hazard to ATV and snowmobile traffic.

SITE 18, FORMER MAIN CAMP

This area is adjacent to the northeast end of Troutman Lake and extends from the location of the current Municipal Building east to the High School. There were reportedly ten 25,000-gallon fuel tanks located at the site during military activities. Geophysical survey information collected during the 1994 RI indicates the presence of buried metallic debris (Golder, 1994; MW, 1995). Due to its proximity to Troutman Lake, the site is subject to extreme weather events and buried debris has the potential to become exposed and present a physical hazard to ATV and snowmobile traffic.

SITE 19, DIATOMACEOUS EARTH

This area is located east of Site 18, adjacent to the northern edge of Troutman Lake. Diatomaceous earth was left buried in-place from the former military water treatment facility. The area is subject to erosion from storm events associated with Troutman Lake and ATV traffic along a well-established trail that extends along the northern edge of the lake. As the diatomaceous earth becomes exposed, it becomes a physical hazard for ATV traffic due to its physical dissimilarity with the surrounding, gravelly soils.

SITE 20, SCHOOLYARD

This site is located just northeast of the former main camp. The schoolyard contains two rubble piles that consist primarily of concrete rubble and rebar, plus one semi-exposed concrete slab. These present a physical hazard for the children attending school, as well as a physical hazard for ATV and snowmobile traffic.

SITE 21, TOE OF SEVUOKUK MOUNTAIN

The area located at the toe of Sevuokuk Mountain, just southwest of Site 5, it is thought that miscellaneous wire and metallic debris was buried in this area during military activities consisting of the construction and subsequent decommissioning of the tramway that served the Air Force radar site at the top of Sevuokuk Mountain. The presence of buried debris at this site poses a physical hazard to villagers who actively excavate the area.

SITE 22, FORMER CAA HOUSING

The former CAA housing is located near the northeastern edge of what is commonly referred to as Old Gambell. The CAA housing consists of six homes and one lodge originally built as a weather data collection facility to help guide Russian pilots during World War II. The housing was also used by the Navy and Army in the cold war era during their efforts to lay submarine detection cable off Gambell. It is unclear when the CAA housing was transferred to the current owners. The primary concern regarding the CAA housing is that of asbestos-containing materials commonly used in homes of this era.

SITE 23, DEBRIS FROM HIGH SCHOOL CONSTRUCTION

This area is located due east of the Gambell landfill and consists of metallic debris unearthed during the construction of the Gambell High School. The area is said to be 150-feet long, 70 feet wide, and 20-feet deep. The cost impact to the City of Gambell will result from the reduction of space available in the city landfill, now occupied by the military debris. Currently, this site does not present a physical hazard; however, the potential for the debris to become exposed in the future and pose a physical collision hazard does exist.

SITE 24, SOUTH OF MUNICIPAL BUILDING

This area is located south of the Municipal Building along the northern shore of Troutman Lake. A geophysical survey of the area was conducted in the summer of 2000 (Grid J), and subsurface anomalies consistent with metallic debris were found. The area is subject to erosion from storm events associated with Troutman Lake, and ATV traffic along a well-established trail that extends along the northern edge of the lake. If exposed, the buried debris would pose a physical hazard for ATV and snowmobile traffic.

SITE 25, VILLAGE OF GAMBELL, SOUTH HOUSING UNITS

This area is located between the three rows of the south housing units. During Village Safe Water (VSW) construction in 1997, oily soils were encountered at the permafrost interface. Historical aerial photographs identify areas of disturbed ground, a former trench and a former pit in the vicinity where the oily soils were encountered (Figure 3, Photo 7). Site 25 has not been formally investigated and the type and extent of contamination has not been quantified. However, the presence of contaminated soils at the permafrost interface poses a potential threat to the water supply of the houses in the affected area.

COSTS

The costs estimated (Appendix E) for the SPIP are in year 2000 dollars and are inclusive of administrative, engineering and construction costs. Unit cost rates presented in Table 1 are based on a one-time mobilization effort, utilization of shared resources, and are inclusive of all proposed removal actions. Due to the remote location of the site, multiple mobilization efforts would increase the costs of remedial activities substantially. Each additional mobilization would cost roughly the same as a one-time mobilization for all proposed removal actions. Thus, to maximize the effectiveness of the removal actions while minimizing overall project costs, a one-time field effort was used for estimating purposes.

In general buried debris would be excavated and segregated into recyclable metallic debris, non-hazardous debris, hazardous debris, and asbestos containing material. All excavated debris would be shipped off-site via barge for either recycling or disposal in an approved landfill. Petroleum contaminated soils would be treated on site and the excavation back-filled with local fill material.

With proper training, most of the projects included in the SPIP could be performed by residents of Gambell. It is estimated that up to 30 Gambell community members could be employed to support the remedial activities. Potential types of employment positions include:

- Environmental Technicians
- Equipment Operators / Construction Workers
- Asbestos Abatement and Inspection
- Solid Waste Handling
- Hazardous Waste Handling

NORTH

SCALE IN FEET
0 1200

RUNWAY

BERING SEA

TROUTMAN LAKE

WEST BEACH

CITY LANDFILL

OLD GAMBELL

OLD VILLAGE WELL

CAA HOUSING

VILLAGE OF GAMBELL

NORTH BEACH

BERING SEA

SMALL ARMS AMMUNITION BURIAL SITE

ARMY LANDFILL

1994 SUMMER LAKE BOUNDARY

NAYVAGHAQ LAKE

UNNAMED POND

SOUTH AREA

NORTH AREA

MUNICIPAL BUILDING

WATER TREATMENT

HIGH SCHOOL

FORMER MAIN CAMP

LANDFILL NO. 1

LANDFILL NO. 2

ARMY LANDING AREA

FORMER CABLE BURIAL AREA

BURIED FORMER TRAM ANCHOR

FORMER INFILTRATION GALLERY (NOT CURRENTLY USED)

NEW VILLAGE WATER SUPPLY

FORMER MILITARY HOUSING/ OPERATIONS BURIAL SITE

AIR FORCE LANDING AREA

FORMER COMMUNICATIONS FACILITY BURIAL AREA

COMMUNICATIONS CABLE ROUTE

CABLE

ARMY TRAIL

AIR FORCE TRAIL

FORMER AIR FORCE RADAR SITE

AREAS OF CONCERN

G GEOPHYSICAL SURVEY LOCATION PERFORMED IN 2000

GEOPHYSICAL SURVEY LOCATION PERFORMED IN 1994

GEOPHYSICAL SURVEY LOCATION PERFORMED IN 1996

GEOPHYSICAL ANOMALIES

MONTGOMERY WATSON
Anchorage, Alaska

FIGURE 2
U.S. ARMY ENGINEER DISTRICT, ALASKA
GAMBELL, ST. LAWRENCE ISLAND, ALASKA
STRATEGIC PROJECT IMPLEMENTATION PLAN

AREAS OF CONCERN

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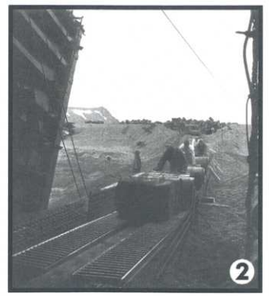
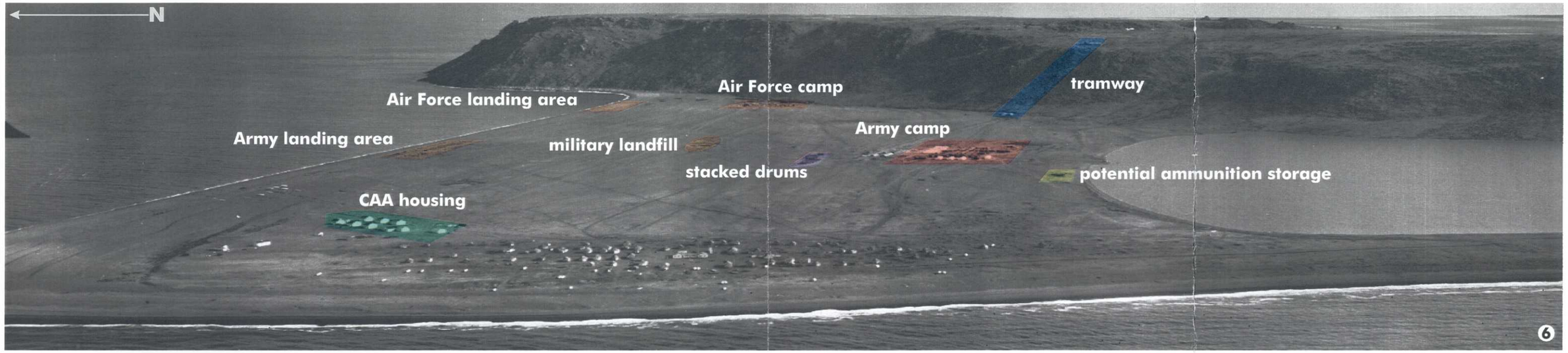
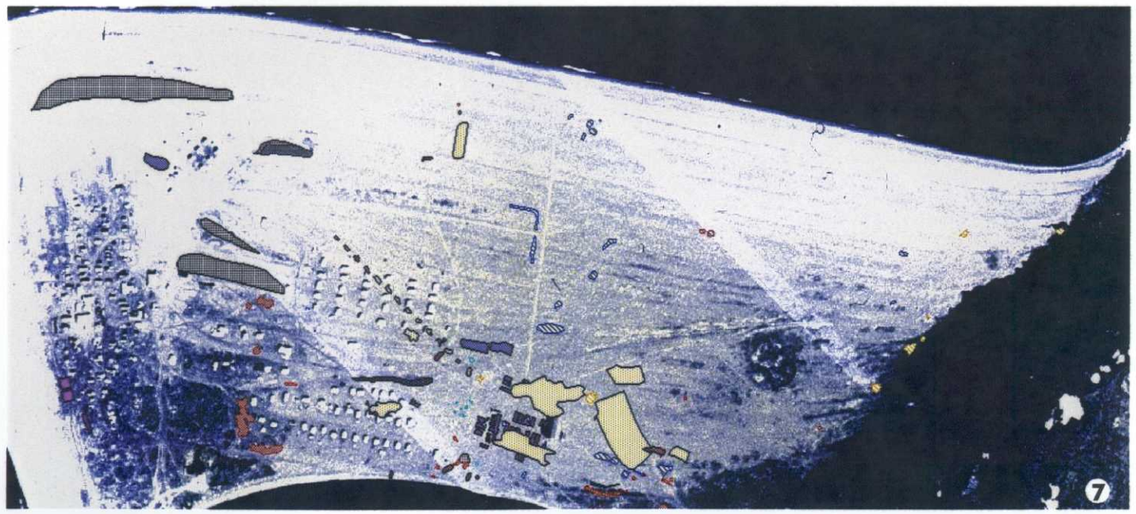
JOB No. 1850566.180101







1. Army landing area with barge
2. Army landing area, off loading of drums, note marsten matting.
3. Tramway site (winter)
4. Army camp 1955
5. Army camp. Closeup of potential ammunition storage adjacent to Troutman lake.
6. Areas of military presence.
7. Areas of physical disturbance where there is potential for buried material (trenches, pits, depressions, mounds, and disturbed ground) and former military installation locations. The areas of interest were compiled by the U.S. Army Topographic Engineering Center from aerial photographic documentation taken in 1948, 1955, 1972, 1973, and 1980.

MONTGOMERY WATSON
Anchorage, Alaska

FIGURE 3
U.S. ARMY ENGINEER DISTRICT, ALASKA
GAMBELL, ST. LAWRENCE ISLAND, ALASKA
STRATEGIC PROJECT IMPLEMENTATION PLAN
HISTORIC SITE PHOTOGRAPHS

Table 1 Cleanup of Former Department of Defense Facilities

Site or Location[1]	Description	Military Impact	Desired Remediation	Estimated Cost for Remediation
18	Former main camp	Buried metallic debris, potentially buried tanks.	Excavate buried debris and recycle off site.	$140,000
8A	Eastern edge of runway	Exposed Marsten matting	Excavate buried debris and recycle off site.	$300,000
2	Former military housing/operations burial site	Buried concrete slab.	Excavate concrete slab and dispose off site.	$30,000
7, 16 & 7	Former military power facility (includes geophysical survey area L)	Buried metallic debris	Excavate buried debris and recycle off site.	$145,000
1A	Army landing area	Buried metallic debris and one half-buried crane.	Excavate buried debris, remove crane, and recycle off site.	$280,000
16 & 25	Gambell Municipal Building Site and Village of Gambell, South Housing Units	Petroleum contaminated soils, potential buried debris.	Excavate buried debris, and treat contaminated soil.	$1,260,000
6 & 17	Military landfill & army landfill (includes geophysical surveys H, K, & M)	Buried metallic debris and barrels of human waste.	Excavate buried debris and dispose/recycle off site.	$120,000
8	Small arms ammunition burial site	Buried small arms munitions and associated metallic debris.	Excavate buried debris and dispose/recycle off-site.	$10,000
1B	North beach/ Air Force landing area	Buried metallic debris.	Excavate buried debris and recycle off site.	$30,000
5	Former tramway site	Buried debris and possible transformers in close proximity to village water supply	Excavate buried debris and recycle off site.	$37,000
13	Former radar power station	Buried metallic debris.	Excavate buried debris and recycle off site.	$20,000
3A	Former communication facility burial area	Buried wood and metallic debris, transformers, oils, fuels, batteries, and glass carboys of sulfuric acid.	Excavate buried debris and recycle off site.	$5,000.
15	Troutman Lake debris burial site	Metallic debris in Troutman Lake	Raise underwater metallic debris and recycle off-site.	$20,000
1C	North Beach (underwater debris)	Underwater metallic debris, primarily Marsten matting.	Raise underwater metallic debris and recycle off-site.	$40,000

Table 1 (continued) Cleanup of Former Department of Defense Facilities

Site or Location[1]	Description	Military Impact	Desired Remediation	Estimated Cost for Remediation
4E	Western face of Sevuokuk mountain	Surface cables running along mountainside.	Remove cable and recycle off site.	$50,000
19	Diatomaceous earth	Diatomaceous earth	Excavate diatomaceous earth and dispose off site.	$5,000
20	Schoolyard	Concrete rubble debris piles with protruding rebar and partially-buried concrete slab.	Remove mixed concrete debris and dispose off-site.	$195,000
21	Toe of Sevuokuk Mountain	Buried metallic debris and cable.	Excavate buried debris and recycle off site.	$5,000
22	Former CAA housing	Potential asbestos-containing material.	Inspect, sample and analyze, and abate asbestos-containing material	$50,000
23	Debris from high school construction	Metallic debris excavated during construction of the Gambell High School and reburied east of the village landfill.	Excavate buried debris and recycle off site.	$240,000
8B	West Beach Old Gambell Village site	Buried and/or partially exposed metallic debris/jeep.	Excavate buried debris and recycle off site.	$10,000
8C	Navy landfill	Buried landfill material.	Excavate buried material and dispose off site.	$25,000
24	South of Municipal building (geophysical survey area J)	Buried metallic debris.	Excavate buried debris and recycle off site.	$5,000
Itemized Project Cost[2]	--	--	--	$3,025,000
Mobilization Cost[2]	--	--	--	$350,000
Training[3]	--	--	--	$250,000
Total Cost	--	--	--	$3,625,000

[1] - Sites are listed in order of community priority.
[2] - Costs are based on shared resources between sites, if performed on an individual basis the costs will be significantly higher
[3] - Costs are for off-site education/training for up to 30 Gambell community members

-- Not applicable

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APPENDIX A

Community Surveys

NATIVE VILLAGE OF GAMBELL

P.O. Box 99 • Gambell, Alaska 99742 • (907) 985-5346 • FAX (907) 985-5014

8 March 2000

MEMORANDUM for: Bonnie Mclean (MW) FAX # 907-248-8884

FROM: Michael Apatiki NVG IRA Council/DoD CA Manager

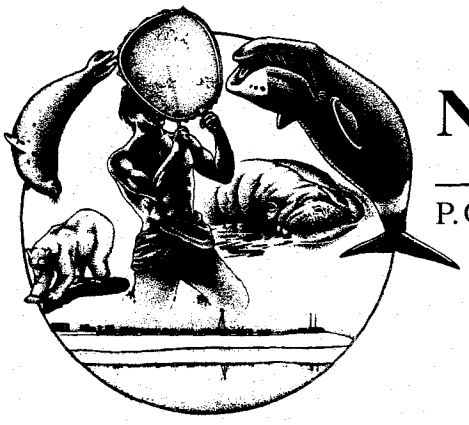
SUBJECT: Priorities (SPIP) Survey at Gambell

1. The priorities of the Gambell SPIP survey in January and February are listed below. The priorities are based on the number of first and next sites combined from question number six. The next site added to the first site, that is the number of next site list that are the same as the first site.

2. The top priority or the first priority of the survey questonaire is Area 18. The next priority is Area 2. These two are the overall priorities. The people surveyed mostly used the geophysical investigation numbers to pinpoint their priorities. The priorities are from top to bottom.

Area 18	27
Area 2	24
All Military debris in Gambell	17
Area 7	16
Area 17	15
Area 8 Ordnance	15
Area 1A	12
Area 16	11
Area 6	7
Area 1b	5
Area 5	5
Area 13	5
Ammunition under lake	5
Area 4A & 4B	4
Area 4B	4
Oily soil in village area	4
Area 1	2
Area 3, tractors	2
Drums under the lake	2
All north beach	2
Area 4	1
Area 12	1
Cables at mountain	1
Debris east of new housing	1
Tractors, weasels	1
Transformers, fig 1, #2	1
Electrical equipment	1
Transformer A5	1
Mountain top	1
White stuff, east of Area 18	1
Debris under school playground	1
New village water supply area	1
Area near Area 16	1
Drums/wire at historical site	1

Michael Apatiki
NVG, Gambell, Ak
907-985-5474



NATIVE VILLAGE OF GAMBELL

P.O. Box 99 • Gambell, Alaska 99742 • (907) 985-5346 • FAX (907) 985-5014

28 March 2000

MEMORANDUM for: Bonnie Mclean (MW)

FROM: Michael Apatiki Telephone # 907-985-5474, FAX # 907-985-5014

SUBJECT: Steelmats/debris along North Beach and Ocean

1. Enclosed is a ahort narrative of the Gambell North Beach and the submerged debris.

2. If you have questions call me at above number.

Michael Apatiki
Gambell Project Manager
Gambell, Alaska

STEELMATS/DEBRIS ALONG NORTH BEACH AND OCEAN

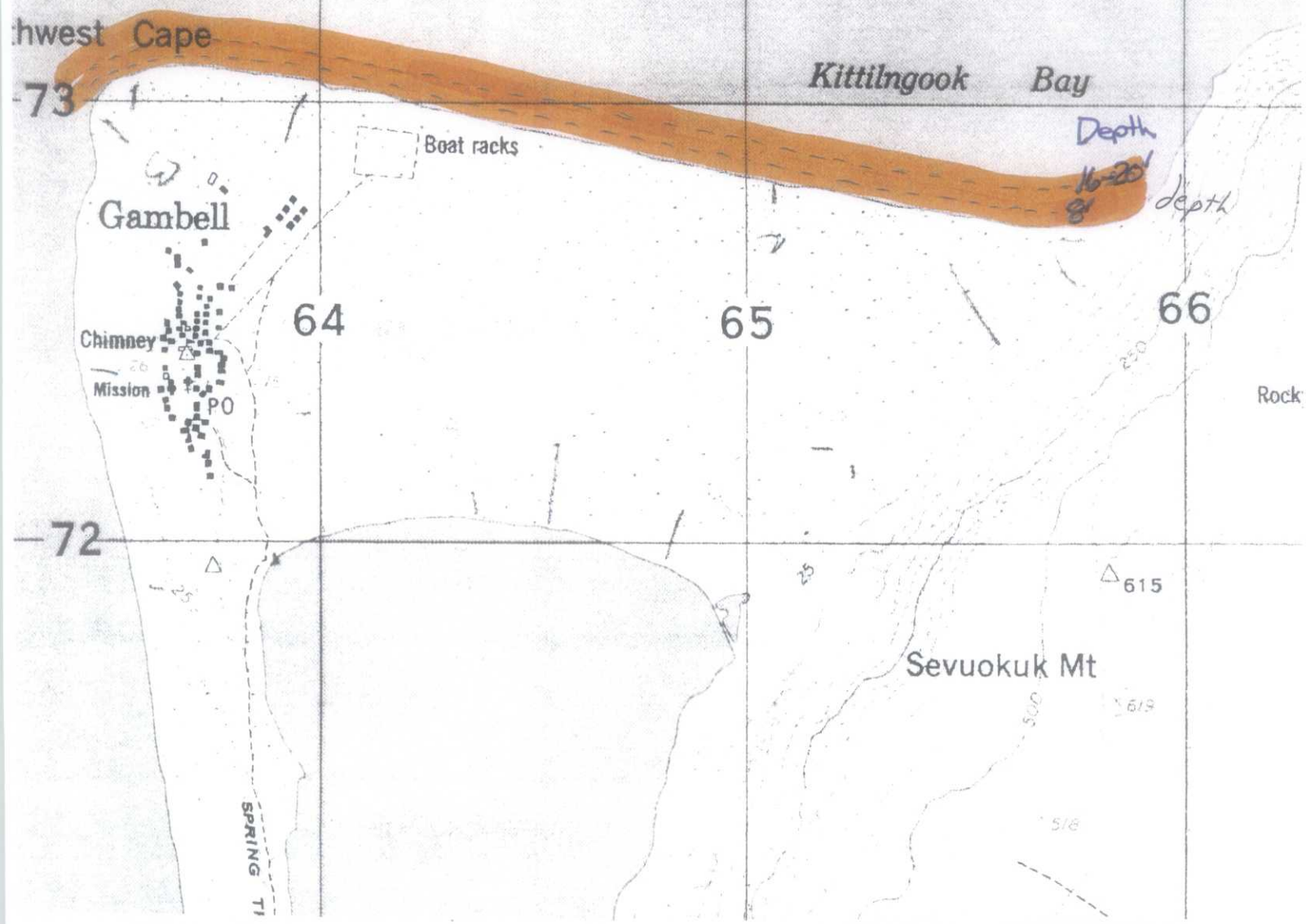
1. The orange marked area indicates where the submerged steelmats are along the water at the North beach of Gambell. Some Military ammunition and ordnance might be under Kittilngook bay and other debris like drums etc.

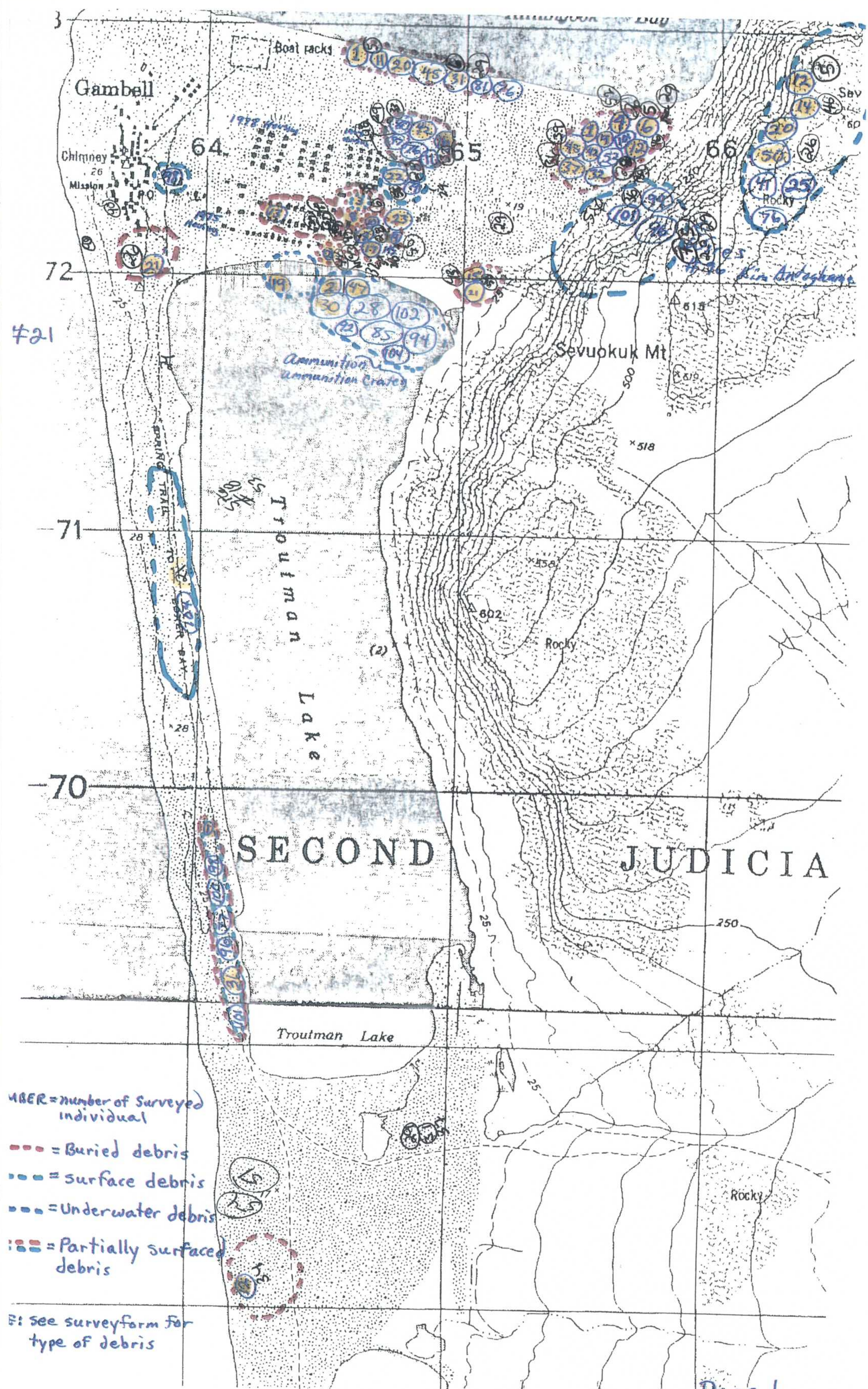
2. The steelmats are scattered under the water from the shoreline to about 200 feet out to sea. Some steelmats are buried like all the other debris that is buried by the movement of the waves. They surfaced then is buried again.

3. The depth of the water along the shoreline from Kittilngook bay to Northwest Cape is very uniform. So 20 feet from the shore is about 8 feet deep from Kittilngook bay to Northwest Cape. 40 feet offshore is 16 feet deep.

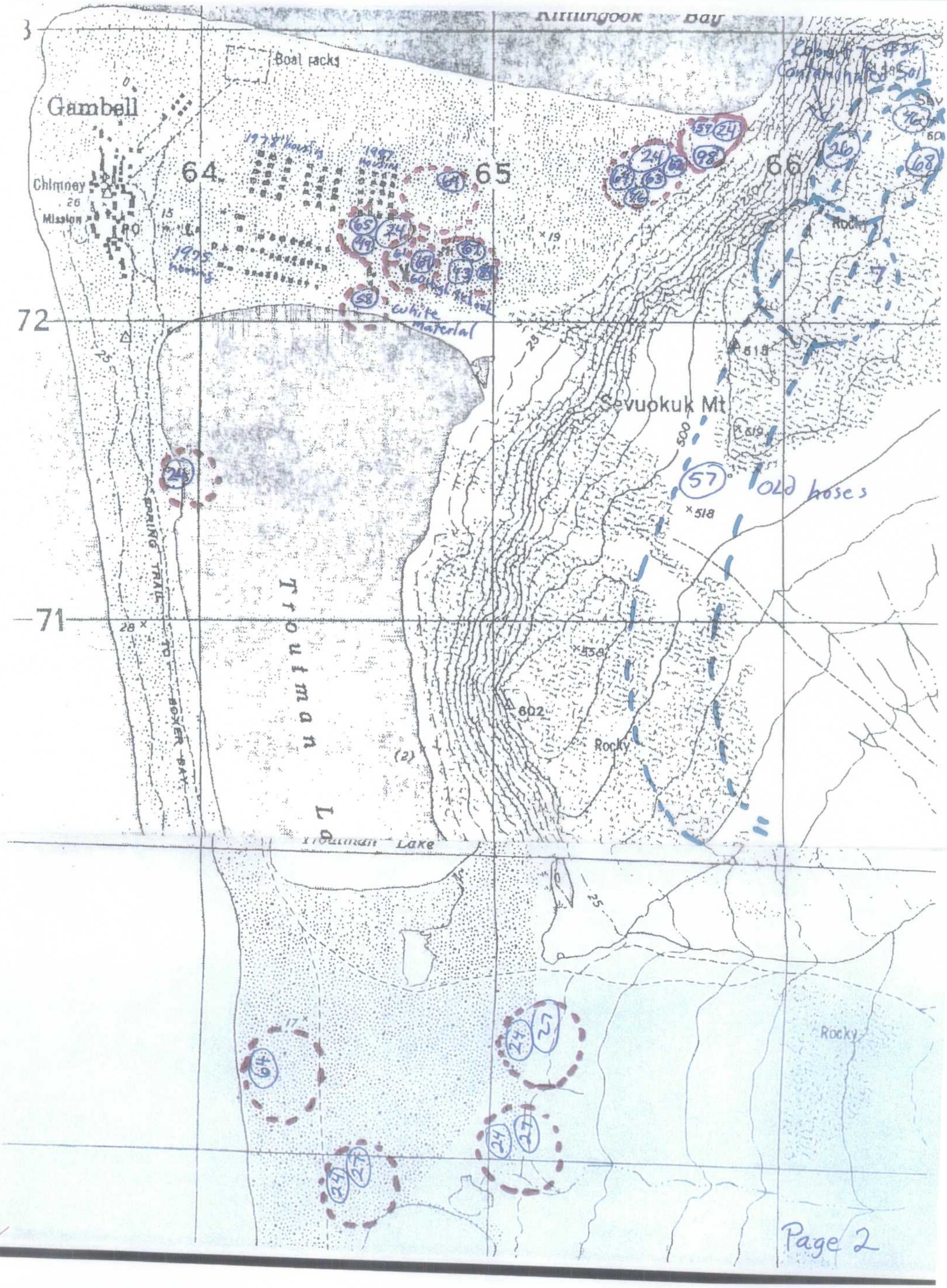
4. The steelmats and other debris is 1 feet deep to about 40 feet deep from the shore. ~~The other debris is buried along the shoreline. The ocean current shifts every 6 hours on the North Beach.~~

5. The steelmats could be located by scanning by boat on a calm clear day. They could be retrieved by using hooks. The ones on the shoreline could be just picked up. The other military debris is not likely because of strong currents moving it around.

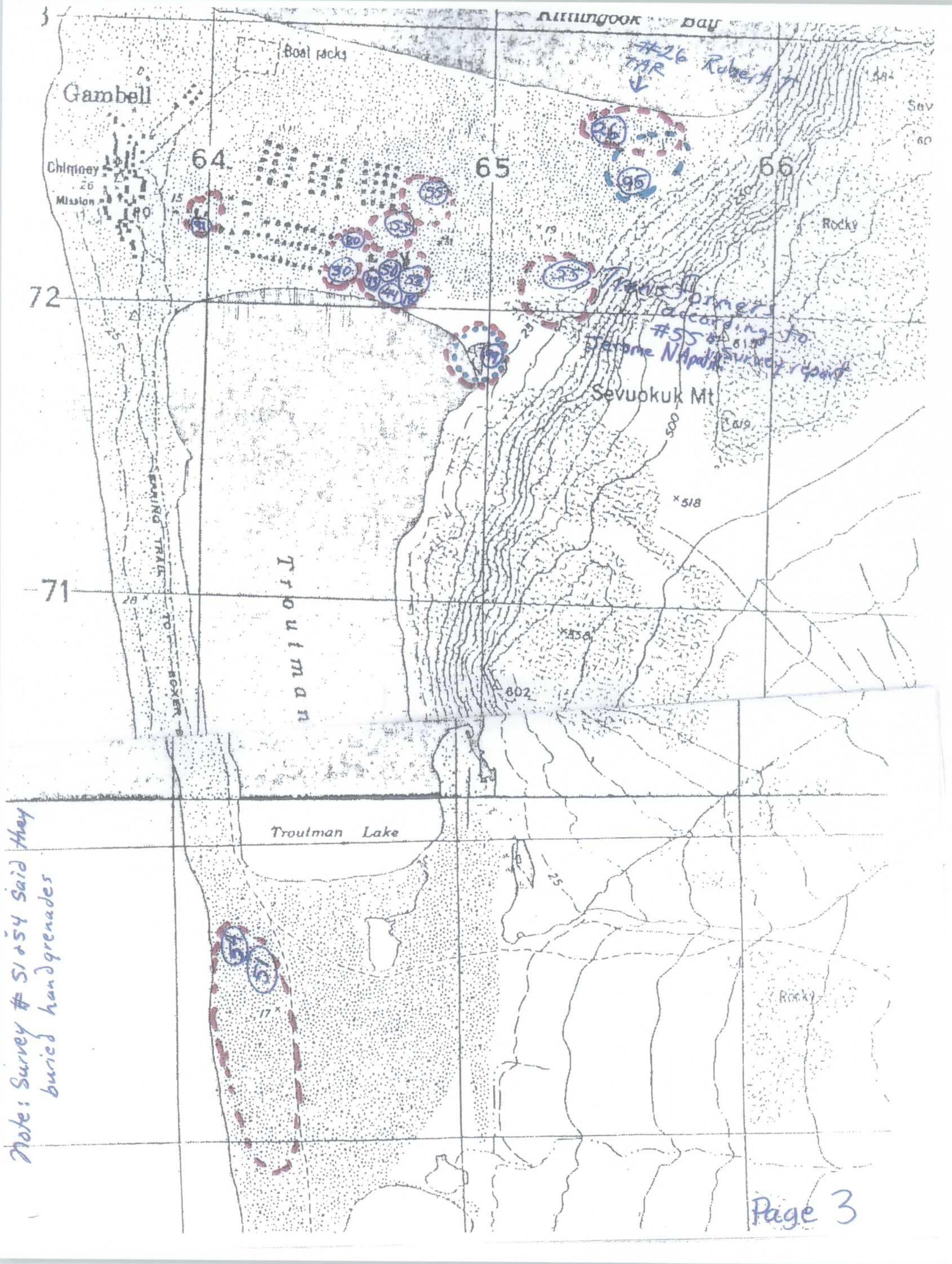




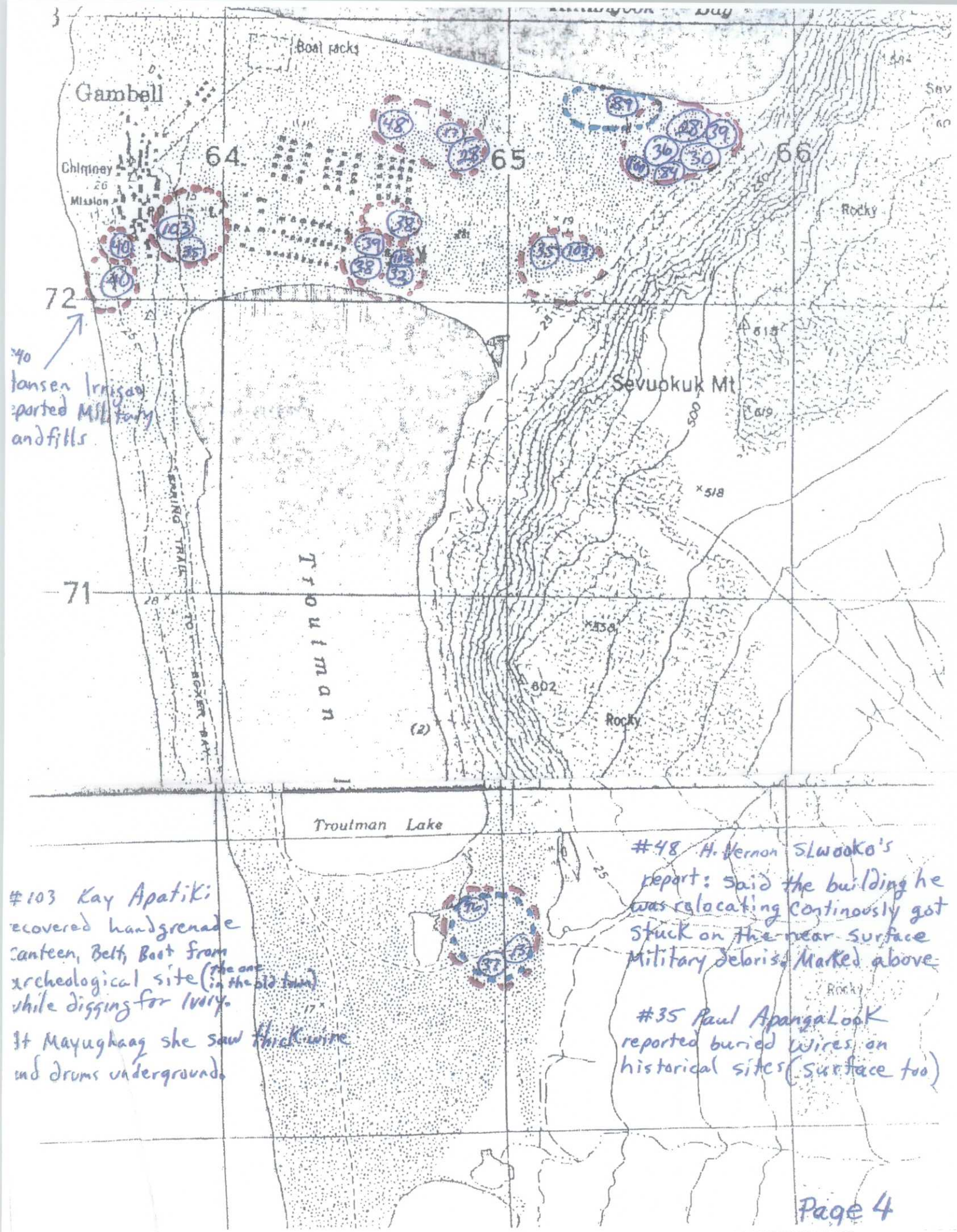
Boat racks
Gambell
Chimney
Mission
1978 Housing
1975 Housing
64
65
66
72
71
70
#21
Ammunition
Ammunition Crates
Sevuokuk Mt
500
518
602
Rocky
Troutman Lake
SECOND
JUDICIA
250
25
28
Troutman Lake
Rocky
MBER = number of Surveyed individual
= Buried debris
= surface debris
= Underwater debris
= Partially surfaced debris
E: see surveyform for type of debris



Bay
Boat racks
Gambell
Chimney
Mission
PO
64
65
66
72
71
1978 housing
1987 housing
1975 housing
High School
White Material
Contaminated Soil
Rocky
Sevuokuk Mt
618
519
518
538
602
OLD hoses
Troutman Lake
Troutman Lake
SPRING TRAIL TO BOXER BAY
Rocky
Page 2



Bay
Boat racks
Gambell
Chimney
Mission
64
65
66
72
71
#26 Rubert T.
Transformers according to #55 Jerome NApak Survey report
Sevuokuk Mt
Rocky
Troutman
Troutman Lake
Note: Survey # 51 + 54 said they buried handgrenades
Page 3

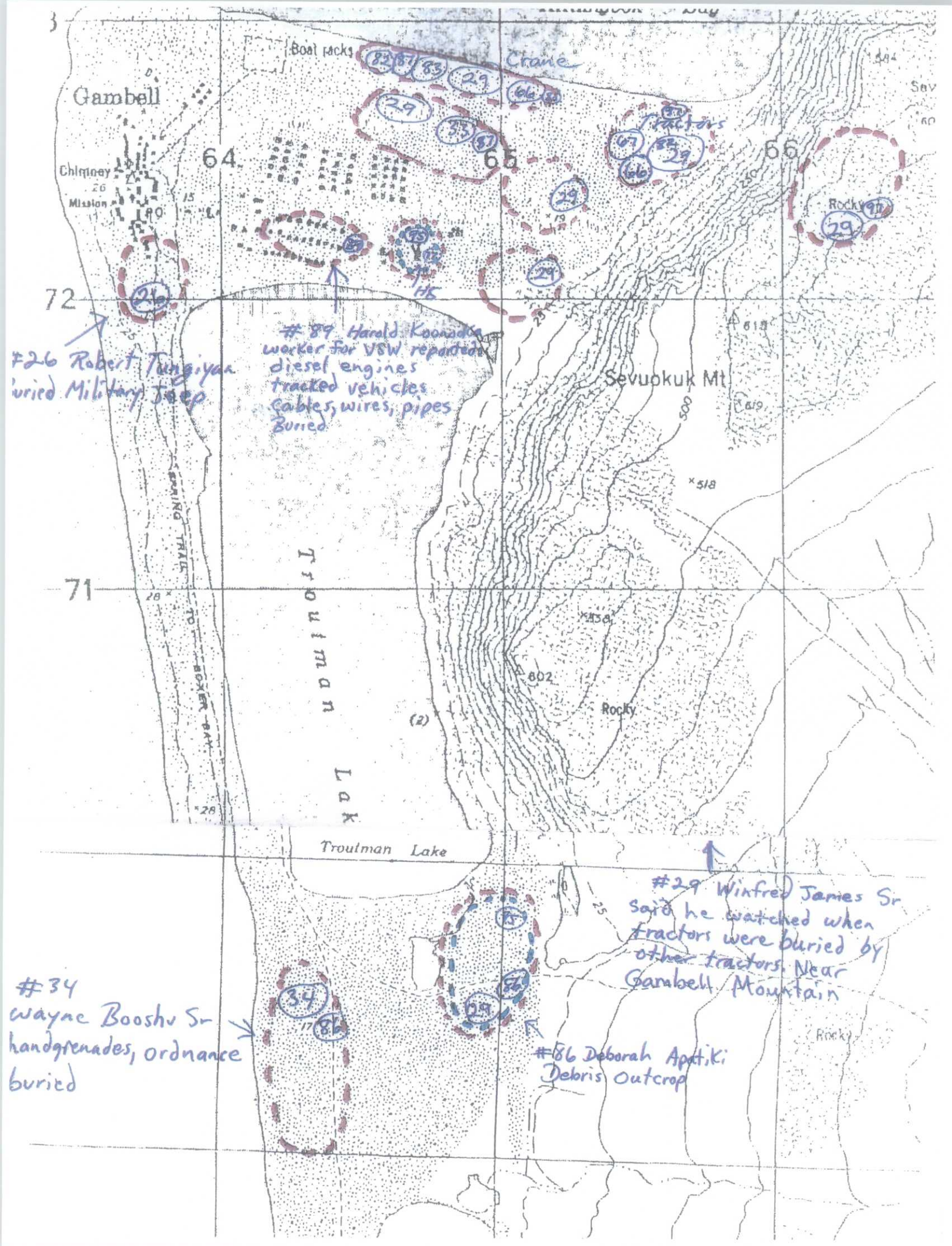


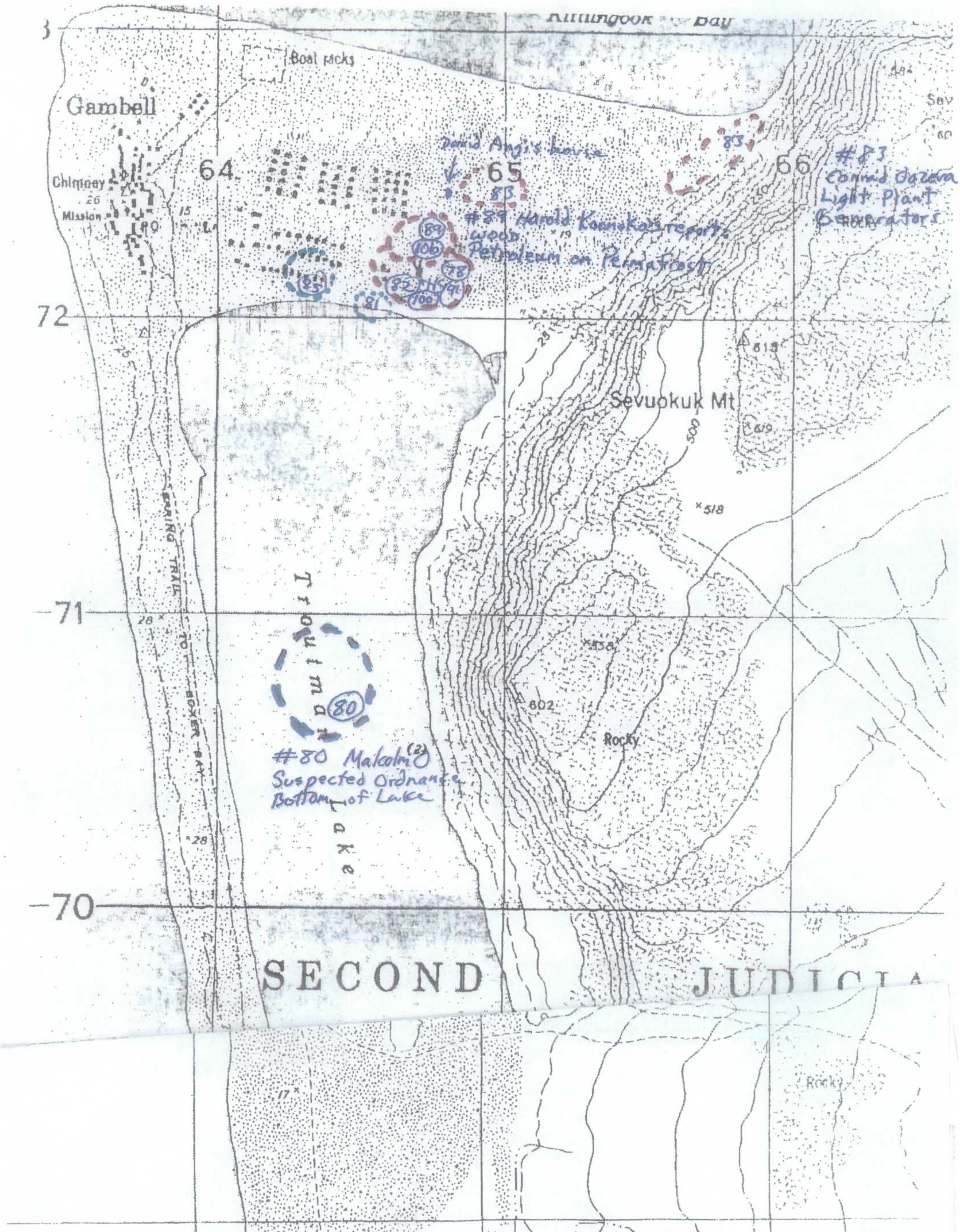
40 Hansen Irrigated reported Military landfills

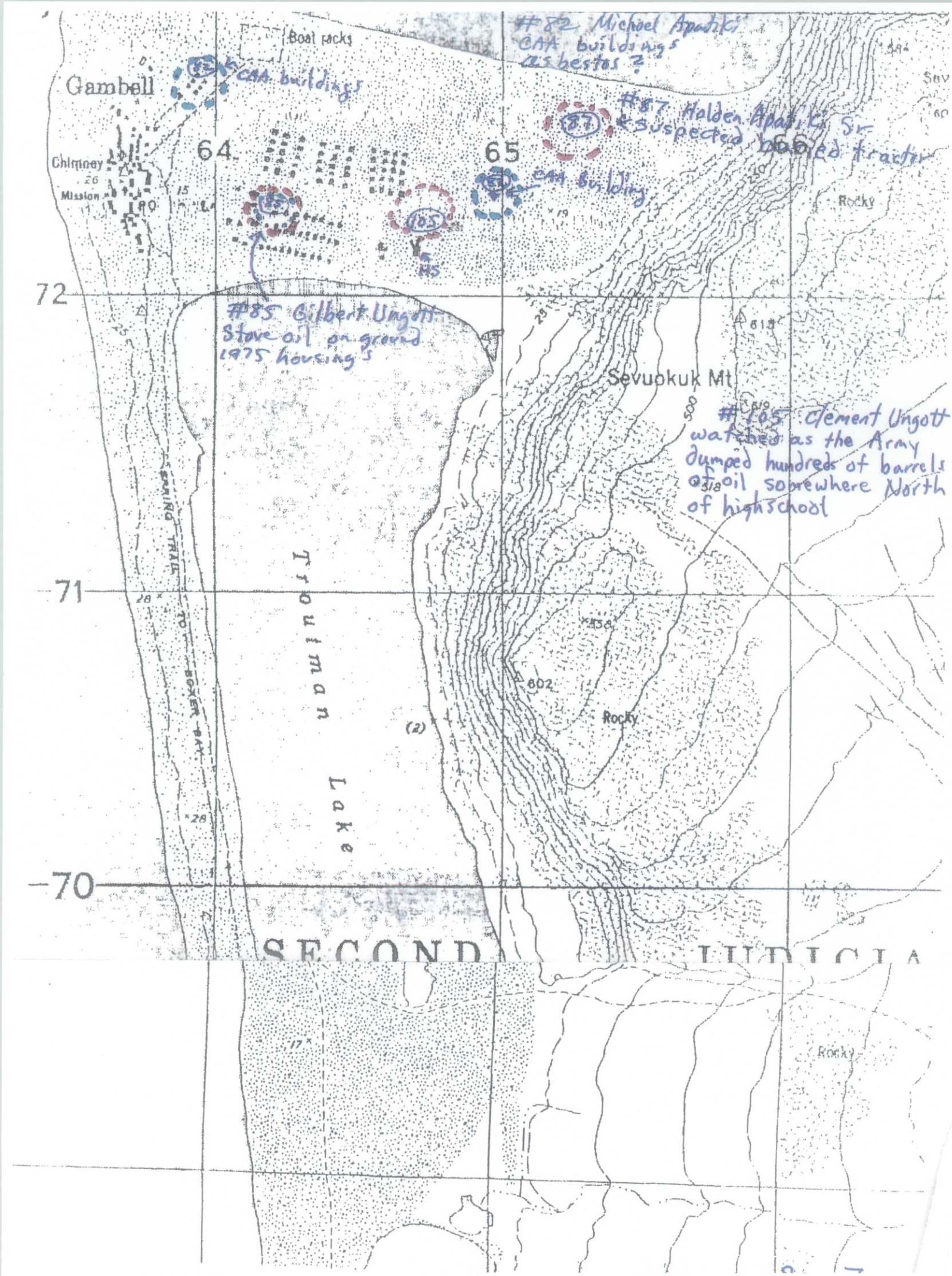
#103 Kay Apatiki recovered handgrenade canteen, Belt, Boot from archeological site (the one in the old town) while digging for Ivory. At Mayughaaq she saw thick wire and drums underground.

#48 H. Vernon Slwooko's report: said the building he was relocating continously got stuck on the near surface Military debris. Marked above.

#35 Paul ApangaLook reported buried wires on historical sites (surface too)


Gambell
Boat racks
Crane
Tractors
Chimney
Mission
Rocky
Sevuokuk Mt
Troutman Lake
Troutman Lake
Rocky
64
65
66
71
72
#26 Robert Tungiyan buried Military Jeep
#89 Harold Koonuk worker for VSW reported diesel engines tracked vehicles cables, wires, pipes Buried
#29 Winfred Janes Sr said he watched when tractors were buried by other tractors Near Gambell Mountain
#34 Wayne Booshu Sr handgrenades, ordnance buried
#86 Deborah Apatiki Debris Outcrop


Kittingook Bay
Boat racks
Gambell
Chimney
Mission
64
65
66
72
71
70
David Angi's house
83
#83 Conrad Oozeva Light Plant Generators
#89 Harold Koonooka's report: wood Petroleum on Permafrost
89
106
78
82
99
100
85
81
Sevuokuk Mt
518
602
Rocky
Troutman Lake
80
#80 Malcolm (?) Suspected Ordnance Bottom of Lake
BERING TRAIL TO BOXER BAY
SECOND JUDICIA


#82 Michael Apatiki
CAA buildings
asbestos ?
Gambell
CAA buildings
#87 Holden Apat, Sr
suspected buried tractor
Chimney
Mission
64
65
CAA building
Rocky
105
HS
72
#85 Gilbert Ungott
Stove oil on ground
1975 housing's
Sevuokuk Mt
#105 Clement Ungott
watched as the Army
dumped hundreds of barrels
of oil somewhere North
of highschool
Troutman Lake
71
602
Rocky
(2)
70
SECOND
Rocky


#93 Jerome W. Apatiki WSW worker
old waste oil on sewer line in first sewer built in 1993
Soil is highly Contaminated
#93 Jerome W Apatiki
metal inside pump house
Gambell
Boat racks
Chimney
Mission
1975 housing
Sevuokuk Mt
Troutman Lake
Rocky
64
65
66
72
71

Summary of Sites Identified for Investigation/Clean up at Gambell, Alaska

	Name of Person Surveyed	Date of Survey	Phone Number	Description of Debris (3)	Map Location (5)	Site Location (5)	Impact of Debris (6)	Future Land Use (7)	Is Debris Hazardous ? (8)
1	Apassingok, Melvin	18 Jan 2000		Buried Crane	Grid 6472 North beach	1	Hazard to riders	FISHING SPOT Future boat racks	Yes
	" "	" " "		Drums, tractors, Metals	Grid 6572 near Mountain	FIG2 AREA 2	rusty earthy oil, grease Contamination	Bird watchers Paradise	Yes
	" "	" " "		Steel mats	Grid 6469 near end of Lake/strip	Figure 1 Area 8	bad site for visitors, bird W etc	Bird watchers trail atv trail	Yes
2	Oozevaseuk Francine	19 Jan 00		Live 50 cal Ammo Boxes	Grid 647718	Troutman Lake	No more/drink-swimming/ing Water	Recreation Swimming	yes Kids do swim in spite of debris in the Lake
3	Koonooka, Cheryl	19 Jan 00		Meta/with concrete	surface inside Area 7	Area 7	Crash on ATV	ATV route	Yes cause Crashes on ATV, Snowmobile
4	SLwooka, Joe Jr	19 Jan 00		Army huts Barrells	near mountain	Area 2	Contaminates greens Pick area	housing	Yes - health hazard
5	Koozata, Claudia	19 Jan 00		Geophysical investigation	North Beach	Area 1A	Contaminates FISHING SPOT	FISHING AREA	yes - Contaminates FISHING SPOT
	" "	"		"	Mountain top	Area 4A & 4B	Contamination wildlife Breed Area	recreation trail	Yes Health hazard to our edible wildlife & Plants
6	Aningayou, Roger	19 Jan 00		Metal Sticking out	near mountain	Fig 2 Area 2	HAZARD to ATV RIDERS	BIRD WATCHING POINT	Yes RUST CONTAMINATION hazardous to health
	" "	19 Jan 00		SUSPECTED ODNANCE SITE	In Area 2	Fig 2 Area 2	Contaminates environment	BIRD WATCHING POINT	Yes RUST CONTAMINATION ORDNANCE MIGHT EXPLODE
7	Campbell Tyler	19 Jan 00		stoves, drums, Wires, Metal	Area 4	Area 4	Water Contamination	BIRD WATCHING POINT	Yes water Contaminated in greens Picking area
8	Soonagrook, Gerald	19 Jan 00		steel mat, wires	Area 8	Area 8	Bad site for visitors	BIRD WATCHERS Trail	Yes rusty, health hazard ruins ATV tires
	" "	"		cement block by house	Fig 2 Area 7	Area 7	Impacts Water Source	housings to be build	Yes ruins ATV's Snows
	" "	"		Debris under School area	Fig 2 Area 7	Area 7	impacts future housing Location	housings to be build	Yes health hazard to school Children
9	Booshu Wilbur	19 Jan 00		Engines, Tractors, metals	Area 2	Fig 2 Area 2	Contaminated greens Picking Area	Tourist Attraction Area	Yes health hazard to Bird watchers to People of Gambell greens Pickers
	" "	" "		Drums, Wires	inside Site 18	Fig 2 Area 18	Pollutes Troutman Lake	Future housing Area	Yes - Asbestos & PCB
10	Matuklook, Winfred	19 Jan 00		Metals, Drums, Wires	inside Site 18	Fig 2 Area 18	Contaminates Soil	Future housing area	Yes - Contaminates Water treatment
11	Campbell, Victor Sr	20 Jan 00		Huts, engines, Ordnance, Metals, Drums	Military Landing Site	Fig 1 Area 1A	debris on Boat docking Area	Net fishing spot	Yes - PCB Contamination possible
	" "	" "		Military Landfills	inside Area 17	Fig 2 Area 17	Contaminated Future housing Lots	Future housing Area	Yes - health hazard Subsurface Contaminated w/debris
12	Apangalook, Charlene	21 Jan 00		PCB (Lead Poison)	Top & under Mountain	Fig 2 Area 4A	Contaminated bird nesting Area	greens Picking spot	Yes - health hazard on greens Picking Area
	" "	"		Ordnances (mil Ammo dump)	end of Lake near Mountain	Fig 1 Area 8 Fig 1 Area 2	Contaminated Subsistance Areas	Bird watchers, Tourist Attraction	Yes - health hazard
13	Kaningok, Elbert	21 Jan 00		greasy Silt	under ground	area 16	harms environment	housing Area	Yes PCB hazard

Summary of Sites Identified for Investigation/Clean up at Gambell, Alaska

	Name of Person Surveyed	Date of Survey	Phone Number	Description of Debris (3)	Map Location (5)	Site Location (5)	Impact of Debris (6)	Future Land Use (7)	Is Debris Hazardous ? (8)
							burned soil		
14	UqlowooK, Davis	21 Jan 00		Burned radar site	Area 4B	Area 4B	Contaminated Soil, rust, grease,		
							bad scene on trail	trail to subsistence Areas	PCB hazard
							Contaminates bird breeding Area		
15	Irriqoo, Dexter	24 Jan 00		cans, wires, metal	Area 5	new Village water supply Area	Contaminated water source	greens Picking spot	health hazard
16	Iworrigan Kenneth	24 Jan 00		ammo, huts, equipment etc.	Area 17	Site 17	Contaminated water Supply	future housing Area	Toxic or PCB Possible Contaminants
17	SiwooKo, Archie	24 Jan 00		Ammunition, transformers, etc	Area 18	Site 18	Contaminated Soil	water source for Gambell	Yes contaminates water Source for Gambell & schools
18	ApatiKi, Wesley	24 Jan 00		Beer Cans, whiskey bottles	Area 18	18	Contaminated Soil	Water Source for Gambell	yes water source not pure
19	NupowhotuK, Joseph	24 Jan 00		Drums, 50 cal ammo 223 blanks, Cans	Area 16	16	rust Contamination to soil	Clean water source	Yes health hazard
20	ApassingoK, Edmond	25 Jan 00		Tractor, Metal	Area 1	1B & 1A	environment damaged	boat docking	Yes Safety hazard for travelers
21	ApatiKi, Clifford	25 Jan 00		Weasel tracks	#5, 8A, South of old Village ←	Same as	water Source, future housing Area Contaminated	future housing Area	Yes health & Safety hazard
22	Ungott, Eddie	25 Jan 00		WIRES, CANS, Metal, Junk	east of new housing	Site 6	Contaminates Soil	clean school Playground	Yes Safety hazard
23	KaningoK, Keith	25 Jan 00		Steel nets, Drums, Tractor Parts, Cans, metal	area 18	Site 18	Contaminated water Source	clean water Source	Yes health hazard
24	Lowery, Jessie	26 Jan 00		Pipes, wires, Cement oil cans, metal	army landfills 8, 12, 7, 1, Area 4B	Landfill site 8, 12, 7, 1, Area 4B, 2, 8	Produces Toxic Chemical	Birdwatching, Picnic area	Yes - health hazard safety hazard
25	ApatiKi, Lydia	26 Jan 00		wire spool, wire everywhere	Area 4, 4b - radar site	4, 4b, radar site	PCB in Vegetation & water	Trails to other Side of Mountain	Yes - health hazard
26	Tungiyan, Robert	18 Jan 00		Military Jeep	near old Village -South of-	old Gambell	Contaminates Childrens Play Area	Birdwatchers domain	Yes - Area where children Play
				Tar	Area 1b	Area 1b	Contaminated Gaming area	Bird watching area	Yes - health hazard Contaminated Fishing spot (Sea food gather area)
				Contaminated Soil on Radar Site	Area 4b	Area 4b	edible Plants & birds Contaminated	trail to other side	Yes health hazard
27	NupowhotuK, Lester	19 Jan 2000		old drums	#8 army landfill	Area 8	Contaminates ground / rusty	Bird watchers area	Yes health hazard
				Cranes	#2 Area	#2 Site	rust contamination	boat dock	Yes Safety hazard health hazard
				old Pipes/wires	Fig 1 #12 - N area	area 12 north area	rust contamination	Bird watchers Area	Yes Safety hazard health hazard
28	Apangaloak Preston	19 Jan 2000		Tractors Heavy Equipment	in Area 2	Fig 1 #2	Contamination rust, oil, grease	Bird watchers area	yes health hazard
	" "			Landfill	Fig 1 #6 Lake	Fig 1 #6	Contaminated Soil	Housing area	yes health and safety hazard
				Amunition at the Lake 50 Cal (ordnance)		near #18	Contamination Corrosion in Lake	Swimming recreation area	yes health and Safety hazard

Summary of Sites Identified for Investigation/Clean up at Gambell, Alaska

	Name of Person Surveyed	Date of Survey	Phone Number	Description of Debris (3)	Map Location (5)	Site Location (5)	Impact of Debris (6)	Future Land Use (7)	Is Debris Hazardous ? (8)
29	James, Winfred Sr	19 Jan 00		machinery, wires, transformers etc	main Army Camp	13, 1, 2, 4A, 5A, 16	PCB danger underground	Housing Area	health hazard
				cranes, weasels, tractori, Metal	north beach 6, 17	6, 17 N Beach	oily, rusty earth DDTs	future housing	safety & health hazard
30	Ungott, Donald	19 Jan 00		Tractors, Weasels	Fig 1 #2	Fig 1 #2	rusty, oily, greasy surface	Bird watchers area	health hazard Bad scene
				50 cal ammo on lake	troutman Lake	Fig 1 #18	Contamination	rec creation	health Safety hazard
				alcohol, beer, whiskey	Fig 1 #16	Fig 1 #16	Contamination of land	future housing	health hazard
31	Walunga, Willis	19 Jan 00		Steel mat	Gambell Airport vicinity	Fig 1 #8	rust Contamination	Air Port	health hazardous
				Tractors weasels	NORTH BEACH	Fig 1 #1A	Contamination of Soil	FISHING SPOT BOAT DOCKING	Safety and health hazard
				drums, Ammo Transformers	end of troutman Lake	Fig 1 #13	Contaminated Soil	Possible housing Area	PCB danger
32	Walunga David	19 Jan 00		transformers	Fig 1 #2	Fig 1 #2	PCB Contamination	Bird Watchers area	PCB danger
				Landfills	Fig 1 #17	Fig 1 #17	very messy ground	Possible housing Location	health & safety hazard
				unclean School area	Fig 1 #18	Fig 1 #18	Contamnated School	school for Gambell Children	health & safety hazard
33	Antoghame Roger	19 Jan 00		Beer & whisKey	Landfill #1	Site 17	Rust Contaminated earth	housing location	health hazard
34	Booshu Wayne Sr	19 Jan 00		Hand Grenades Ordnance	South of Gambell end of Lake	Area 8 ordnance site	Life endanger	BIRD WATCHERS AREA	Safety hazard
35	Apangalook, Paul	19 Jan 00		wires	archeological Sites	Fig 1+2 #5	obstacle for future housing	housing Area	Safety hazard
36	Apangalook, Michael	19 Jan 00		tractors tracks	Site 2	Site 2	Contamination of soil	greens Picking tourism area	health hazard
				transformers	Fig 1 #3	Fig 1 #3	rust, corrosion, Contamination	greens Picking Area bird watcher Area	health hazard
				drums, huts, Plywood	Fig 1 #2	Fig 1 #2	corrosion, rust Contamination	Bird watchers area	health hazard
37	Apassingok, Lillian	19 Jan 00		Tractors, Weasels cranes, transformers	in Areas 2 & 18	Area 2, 18	Contamination of green harvest area	Tourist attraction	health hazard
				drums, wires, Aspestos	Fig 1 #13 #6	Fig 1 #13, #6	Contamination	Bird watching area	health hazard
38	James, Joel	21 Jan 00		Drums, Metal	Fig 2 Area 7	Fig 2 Area 7	Contamination rust	Buildings Lot	health & safety hazard
				oil drums metal scraps	Fig 1 #18	Fig 1 #18	Kids play ground Contaminated	housing Area	health hazard
39	Apassingok, Anders Sr	21 Jan 00		Transformers, Drums, Wires, huts	Fig 1 #2	Fig 1 #2	PCB Contamination	Bird watching, tourism, hunting Area	PCB health hazard
				tanks / Barrels	Fig 1 #3	Fig 1 #3	Rust Contamination	greens Picking area	health hazard

Summary of Sites Identified for Investigation/Clean up at Gambell, Alaska

	Name of Person Surveyed	Date of Survey	Phone Number	Description of Debris (3)	Map Location (5)	Site Location (5)	Impact of Debris (6)	Future Land Use (7)	Is Debris Hazardous ? (8)
40	Irrigoo, Hansen	23 Jan 00		Landfills	old Village Near West beach	Area 8	none	Bird watchers Area	no
41	Antoghame, Thomas	24 Jan 00		Ammo/ordnance	Mountain top	Area 4A	rust Contamination	Hunting trail	health and Safety hazard
42	SLwooKo, Vernon K	24 Jan 00		Tractors, Cranes, huts, Beverages	areas 2, 17, 18	areas 2, 17, 18	Rust Contamination	Community home Area	health and Safety hazard
43	KuluKhon, Jones	24 Jan 00		Huts, Frames	Fig1 #5	Fig1 #5	Contaminated material	Future buildings	oily, unclean Hut Frames hazardous to the health of community
				EMPTY BARRELS	Fig1 #18	Fig 1 #18	Rusty ground	some housings to be built	hazard to our village Drinking Water
44	UngwiluK, Rodney Sr	24 Jan 00		Soda + beer Cans	inside Area 18	Area 18	Rusty Ground Contamination	Future housing	health hazard
45	Aningayou, John	24 Jan 00		Cranes, Weasels, tractors	North Beach	Fig 2 #2	Rust, oil Contamination	Boat dock Fishing, Seafood Area	health and Safety hazard
				Military Landfills	Fig 2 #17	Fig 2 #17	Contaminating debris Surfacing	Future Housing	health & Safety Hazard
46	Campbell, Salvador	24 Jan 00		Tractors Quanset huts	Fig1 #2, 4B	Fig1 #2, 4B	rust, oil, grease Contamination	greens Picking Spot	health & Safety hazard
47	KaningoK, FranKlin Sr	25 Jan 00		Ordances Ammo 50cal	in the Lake	Fig2 #18 Lake	Corroded rusty underwater	recreational activities	health & Safety hazard
48	SlwooKo, H. Vernon	25 Jan 00		Drum, Cable, wire, JunK	Military Landfills #6 & 17	Area 6 & 17	Moving items tangled Waste of Money	Future Housing	health & Safety hazard
49	Aningayou, Steven	25 Jan 00		Drums, Steelmat, Landfill, alcohol Be	Fig2 #16	Fig2 #16	Contamination of land	Future Housing	health & Safety hazard
50	KoonooKa, Gerard	26 Jan 00		Metal, insulation, wire	Fig1 Area 4B	Fig1 Area 4B	health & Safety hazard	hunting trail	health hazard
				sheeting Asbestos	Fig 1 Area 18	Fig 1 Area 18	Contaminated School Playground	Clean school Play Activity Area	health hazard Material/ soil
51	ApatiKi, Hugo	26 Jan 00		AMMOs, Handgrenades	Fig1 #8 end of Lake	Fig1 #8 end of Lake	Danger of explosion if Pluked out by ANY	ATV trail, berry Picking Area	Safety hazard - Could explode
52	ApatiKi, Tanya	26 Jan 00		Steelmat	Area 1B N-Beach	Area 1B	Creates safety hazard	fishing, seafood Picking Area	Safety hazard for ATVs
53	Iyakitan, Daniel Sr	26 Jan 00		weasel, tractors, Drum	Fig1 Area 18	Fig 1 Area 18	Cancer, related Contamination	housing Area	health hazard
54	Oittillian, Simeon Sr.	26 Jan 00		Ammos, ordnance Hand grenades	Fig1 #8 West end Beach	Fig1 #8	Dangerous, health hazard	ATV trail Berry Picking Area	safety & health hazard
55	ApatiKi, Jerome N	27 Jan 00		heavy Metal, drums, tractor blades, Vehicles	West Wing of (Fig 1) highschool	west wing school Fig1	Future housing obstacle	Future housing	health hazard for school children
				"	east of New houses	east of New houses	Future housing obstacle	Future housing	health hazard
				transformers	Base of (Fig 2 mountain	Base of mountain	PCB Danger	Bird Watching greens picking	PCB hazard
6	Aningayou Reggie Jr.	27 Jan 00		old Mil house on top of Mtn	top of Mtn	top of Mtn	Contaminated Soil	greens, berries, harvest Area	health hazard
				Communication Lines along the Mountain					

Summary of Sites Identified for Investigation/Clean up at Gambell, Alaska

	Name of Person Surveyed	Date of Survey	Phone Number	Description of Debris (3)	Map Location (5)	Site Location (5)	Impact of Debris (6)	Future Land Use (7)	Is Debris Hazardous ? (8)
57	Kotongan, John	27 Jan 00		old hoses	Top of Gambell Mountain	Top of Gambell Mtn Areas 10+11	obstacle	trails ATV human	SAFETY HAZARD
58	OseuK, Aaron Jr	27 Jan 00		white stuff by Lake	near AREA 18	near Area 18	Contamination rec Area	recreation Area	Yes health hazard
59	Booshu, Bob	27 Jan 00		steelmats, wires, pipes	Fig 1 #2+3	Fig 1 #2+3	rust contamination	greens, Picking Area Bird Watching	health + Safety hazard
60	Koonooka, Merlin	27 Jan 00		creosoted timbers, Diesel engines, Metal	Fig 1 #18	Fig 1 Area 18	Litter Problem	buildings Locations	health hazard
				debris Pieces Concrete debris	Fig 1 #1	Fig 1 #1	Safety Problem	FISHING, BOAT Docks, Seafood Picking Area	Safety hazard
				Loose rounds of 30 Cal Ammo	Gambell School Yard	Gambell School yard	Contamination	Clean School grounds	health + Safety hazard
61	IyaKitan, Lewis Jr	27 Jan 00		Tractors, Cranes, drums, transformers	Fig 1 #18	Fig 1 #18	ATV TIRE Problem	Buildings ?	Safety hazard
62	Koonooka, Gerry	27 Jan 00		Tractors, Steelmats, Cranes, Weasels	Fig 1 #2	Fig 1 #2	obstacle	greens Picking spot tourist area	health and Safety hazard
63	Koonooka, Ben	27 Jan 00		Cranes, tractors, Weasels, Drum, Ammo	Fig 1 #2	Fig 1 #2	Cancer TO FOLKS	greens Picking Area Bird Watching Area	health and Safety hazard
64	Oozeva, Alex	27 Jan 00		Buried explosive Grenade	end of Lake SOUTH END	Fig 1 Area 8	Cancer Causing	Bird Watchers Area Berry Picking Area	Yes Cancer hazard
				Buried Tractor AMMO	Area 1B, Area 2	Area 1B, Area 2	health hazard ground Pollution	FISHING Area BIRD WATCHING Area	health hazard
65	OozevaseuK, Bert	27 Jan 00		Steel (steel) matting	Area 7, 8 + 18	Area 7, 8 + 18	Sharp metal edges	good clean gravel	Safety hazard to ATV riders
				30 mile long cable	Beyond site 10 & 11	Beyond Site 10+11	Danger for ATV riders	ATV trails	Safety hazard
66	SilooK, John	28 Jan 00		tractors, Weasels, transformers, landfill	Fig 1 Area 1B	Fig 1 Area 1B	Contaminating the Community	FISHING, Bird Watching Area	health hazard
				Corrugated Material	Fig 1 #1+2	Fig 1 #1+2	rusted ground	FISHING & Seafood area	health + Safety hazard
67	IyaKitan, Farrell	28 Jan 00		tractors, Cranes, Weasels, transformers	Fig 1 #2+5	Fig 1 #2+5	Contaminated health hazard	Future housing Area	health + Safety hazard
68	Boosh, clinton	28 Jan 00		Drums, Metal objects	top of Gambell Mountain Fig 1	Area 4B	eye sore, Waste all over	trail, Bird Watchers area	health + Safety hazard
69	Iworrigan, Aaron	28 Jan 00		WIRES, Barrells, Steel mats	east of Fig new housing 2	Between site 6+7	hazardous when digging for water pipes	clean ground in the Village	health + Safety hazard
				transformers, Drums, Waste oil	under New School (Fig 2)	School Site	Contaminated Soil	Clean School grounds	Cancerous hazard
				Wire cable	along the north beach	Area 1	obstacle	Fishing Sea food Picking Area	Safety hazard
76	Campbell, Miller	Jan 18, 00		Land Fill	Fig 2 #17, 2 Landfills	Fig 2 Area 17	Contamination	Possible housing	health & Safety hazard
				Crane	Fig 2 1A+1b	Fig 2 1A+1B	unsafe ATV trail	sea food area FISHING Area	Safety hazard
				radar Site	Fig 2 Area 4a	Fig 2 Area 4a	Contaminated trail	hunting trail	heath hazard

Summary of Sites Identified for Investigation/Clean up at Gambell, Alaska

	Name of Person Surveyed	Date of Survey	Phone Number	Description of Debris (3)	Map Location (5)	Site Location (5)	Impact of Debris (6)	Future Land Use (7)	Is Debris Hazardous ? (8)
77	Apatiki, Jenna	Jan 19, 00		Steel Matting, WIRES	Area 8 & 1	Area 8 & 1	health & safety hazard	Clean Community	health & Safety hazard
				ordnance	Area 8 & 2	Area 8 & 2	hazards to Kids playing	Safe Community	Safety hazard
78	Campbell, Edgar	Jan 19, 00		Tractors, C-Ration, Ammo, Alcohol	Under the highschool	North of Area 18	Unhealthy school Area	Clean school environment	health & Safety hazard
					washeteria & teachers Quarters	Area 18	unhealthy threat	Clean environment	health and Safety hazard
79	Campbell Sally	Jan 19, 00		Steelmats Partly Surfaced	new housing area		Safety danger	Clean & safe Area	Safety hazard
				Pipes	all over the Village	Village of Gambell	Safety danger	Safe Village	Safety hazard
80	Oozevaseuk, Malcolm	Jan 19, 00		drums, steel matting	North of highschool	Site 5	rust Contaminates drinking Water	Clean Lot	health hazard
				Alcoholic Beverages	Mid town	near Site 16	caused Alcoholism	Clean Lot	health hazard
				Landfill	Area 17	Site 17	health Problem	housing Area	health hazard
81	Oozevaseuk, Delbert	Jan 19, 00		chlorine (water treatment)	north side of troutman Lake	Site 18	recreation hazard	recreation Area	health hazard
				old heavy equipment (Crane, Dozer)	by North beach	Site 1	Safety hazard	Boat dock	Safety & health hazard
82	Apatiki, Michael	Jan 20, 00		Crane, tractors, generators, Barrels, Misc	area 1, 2, 18	1, 2, 18	oil, rust, grease Contamination	good clean Spot	health & Safety hazard
				oily Plywood, oily debris Contaminated Soil	Area 18	Area 18 northward	Contaminated Area	Clean Village	health hazard
				CAA houses	NW of Village of Gambell	near Site 1	Asbestos danger	Clean Village	health hazard
83	Oozeva, Conrad	Jan 21, 00		drums	east of new housing	Site 6	health hazard	Future housing	health hazard
				tractors, crane	Area 1a	Area 1A	obstacle	FISHING SPOT BOAT DOCK	Safety & health hazard
				Light Plant generators	Area 3	Area 3	waste oil Contamination	green Picking area	health hazard
84	Tungiyan, Jerry	Jan 21, 00		OLD METAL OLD ENGINES	near Area 2	Site 2	Contaminated soil	Tourist Attraction	health hazard
85	Ungott, Gilbert	Jan 21, 00		Barrels, stove oil oil in Permafrost	around 1975 housing Fig 3	1975 housing Fig 3	oily earth	Clean Yard	health hazard
86	Apatiki, Deborah	Jan 24, 00		Suspected Ordnance	South of Lake	Area 8	Contaminated berry Pick area	clean Berry & greens Picking Area	health hazard
				Army Landfill	near NAYVAGHAT	Area 8	Contaminated soil	greens and berry Picking Area	health hazard
				Surface/buried debris	Area 13	Area 13 near unnamed Pond	Wiry earth rusty	Green and berry picking Area	health hazard

Summary of Sites Identified for Investigation/Clean up at Gambell, Alaska

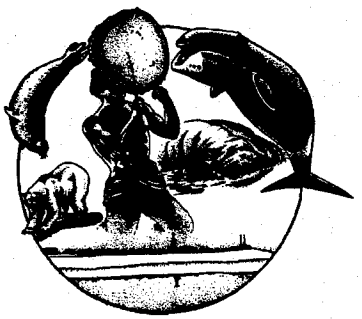
	Name of Person Surveyed	Date of Survey	Phone Number	Description of Debris (3)	Map Location (5)	Site Location (5)	Impact of Debris (6)	Future Land Use (7)	Is Debris Hazardous ? (8)
87	ApatiKi, Holbon Sr	Jan 24, 00		tractors	east of Area 6	east of area 6	waste oil leak to drinking water	Poss. Hse building Locations	health hazard
				Crane	North Beach Area 1	North Beach Area 1	Waste oil affects Sea Foods	clean Sea food harvest area	health hazard
				Land fill	Area 17	Site 17	unclean earth	Possible housing	health & Safety hazard
88	ApatiKi, Evans	Jan 24, 00		Weasel/Vehicle	NORTH BEACH FIG 1	FIG 1	unsafe environment	BOAT DOCKING AREA	health & Safety hazard
				steelmats underwater	along NORTH BEACH	Along Site 1B	rusty seafood picking Area	good clean beach	health & Safety hazard
				Military Ammunition	under water north beach	Site 1B	contaminated Seafood area	Fishing/ Sea food area	health & Safety hazard
89	KoonooKa, Harold	Jan 24, 00		Steelmats	NORTH BEACH FIG 2 AREA 1B	FIG 2 AREA 1B	health hazard	Sea food Area BOAT DOCK	health and Safety hazard
				diesel engines, cables, tracked Vehicles	Mid wires pipes upper town	Fig 2 Area 1b	health hazard	Sea food Area FISHING SPOT	health and Safety hazard
				wood on Petroleum permafrost	upper town	Fig 2 Area 5 west part	health hazard	healthy town	health hazard
90	KavingaK, Vincent	Jan 24, 00		debris around new Village Water Supply	New Village water supply	Site 5	Contaminated drinking Water	Clean Water Supply area	health hazard
91	Walunga, June	Jan 24, 00		Barrells Buried Mil Camp	highschool Grounds	Site 1B	contaminated Yard	Clean Yard	health & Safety hazard
				Steelmats	Junes Lot Fig 3 map	Fig 3 map	Safety hazard	Clean Yard	Safety hazard
92	Tungiyan, Tracy	Jan 25, 00		Metal under Lake	Under Troutman Lake	Troutman Lake	Messy Lake	recreation Area	health hazard
93	ApatiKi, Jerome W	Jan 25, 00		Metal	Pump house	inside the Pump house fence	Contamination of water supply	Clean Water Supply	health hazard
				old waste oil	1975 housing area	Fig 1 Line between houses	enclean village soil	Clean Village	health hazard
94	SoonaqrooK, Ladd	Jan 26, 00		Wires	FIG 2 Area behind Area 3	FIG 2 Area behind Area 3	Safety hazard	Safe Land	Safety hazard
				WIRE SPOOLS	FIG 2 behind Area 3	FIG 2 behind Area 3	Could fall on People	Safe environment	Safety hazard
				Ammunition	under troutman Lake	under troutman Lake	dangerous chemicals	swimming recreation	health hazard
95	KonaluK, Carmel	Jan 24, 00		steelmats, steel, tracks, Powder	MOUNTAIN FIG 2	Site 2	TOXIC WASTE Contamination	Clean Bird Watchers Area	health hazard
				black cable & glass insulators	highschool Area	high School Area FIG 2	hazardous to School Kids	clean School AREA	health & Safety hazard
				tractors ?	SOUTH SIDE troutman Lake	around SITE 13	may cause illness	Berry Picking Area	health hazard
96	Antoghame, Kim	Jan 26, 00		Steelmats	Area 8	Site 8	could cause Contamination	Clean Area	health & Safety hazard
				Ammo	South side of Lake →		underground Contamination	Clean berry Picking Area	health & Safety hazard
				Wires on the mountain	Mountain Fig 2 Area 3	Site 3	Safety hazard	Safe Mtn, no old Military wires	Safety hazard

Summary of Sites Identified for Investigation/Clean up at Gambell, Alaska

	Name of Person Surveyed	Date of Survey	Phone Number	Description of Debris (3)	Map Location (5)	Site Location (5)	Impact of Debris (6)	Future Land Use (7)	Is Debris Hazardous ? (8)
17	Gologergen, Zilma	Jan 26,00		Left over Mil Junk	TOP of Mtn Area 4B	Site 4B	Bad Sight	Clean trail	health & Safety hazard
				tractors	area 1	Area 1	Contamination of Boat harbor	BOAT HARBOR & hunting Area	health & Safety hazard
				Pipes	Area 6	Area 6	safety hazard to ATVs	Possible housing Area	Safety hazard
18	Slwooka, Quinn	Jan 26,00		Bulldozer blade	near GNS tank farm	old Village	Safety hazard	Safe Area	Safety hazard
				Steel mat	near end of runway	Site 8	rust Contamination	clean and safe environment	Safety hazard
				old cat near mountain (B)	near Mountain	Site 2	underground Contamination	BIRD WATCHERS area	health & Safety hazard
19	Apassingok, John	Jan 26,00		tractor	near GNS Tank farm	old Village	Safety hazard	Safe town area	Safety hazard
				metal & steel mat	NAYVAGHAQ LAKE	South of Site 12	Messy Land	BIRD WATCERS AREA	health & Safety hazard
				Drum	NORTH & WEST BEACH	Site 1 & 8	Rust on the Seafood Picking Area	Clean Beaches	health & Safety hazard
20	Apassingok, Delma	Jan 26,00		Steel mats	all over Gambell MOSTLY Area 8	All over Gambell MOSTLY Area 8	Crash hazard (ATV)	Clean environment for travelers	health & Safety hazard
				Pipe	Area 18	Area 18	Crash hazard to ATVs/snogos	Safe domain	Safety hazard
				Tractors	Area 2	Area 2	hazard to ATVs	BIRD WATCHERS AREA	Safety hazard
101	Apatiki, Trudy	Jan 26, 00		WIRES UP & down the MOuntain	Mountain area Mayughaaq 5	area 5	obstacle	greens Picking area	Safety hazard
				Barrels & Steel mats	Area 1	area 1	rusty earth/ obstacle	Boat docking	health & Safety hazard
				Ammunition	Area 2	area 2	Safety hazard	BIRD WATCHERS AREA	health & Safety hazard
12	Apassingok, Suzanne R	Jan 26,00		Piles of Ammunition	under troutman Lake	Fig 2	unsafe swimming recreation	recreation area	health and Safety hazard
				Buried Mil debris (School area)	School area Area 7, 16, 18	site 7, 16, 18	Contaminated School Soil	healthy	unsafe, unhealthy soil on kids school grounds
13	Apatiki, Kay	Jan 27, 00		hand grenade Ammo belt	Area 16	Area 16	explosion risk	Safe environment	Safety hazard
				canteen/Boots	Archedogical Site	Archedogical Site	rust and mess	Clean land	none
				drums/thick wire	archeological site area 5	area 5	obstacle	historical site	health hazard
4	Oozeva, Ellis	Jan 27,00		OLD DRUMS, Tracks radiators	Area 1, 8&8A, 3	Area 1, 8&8A, 3	Contaminated water	clean & healthy environment	health & Safety hazard
				OLD DRUMS, Steel mats	Area 1, 8 & 8a	area 1, 8 & 8a	rusty ground unsafe riding	clean safe environment	health & Safety hazard
				50 cal bandoleers crates	troutman Lake	troutman Lake	contaminated water	clean Recreation Activities	health & Safety hazard

Summary of Sites Identified for Investigation/Clean up at Gambell, Alaska

Name of Person Surveyed	Date of Survey	Phone Number	Description of Debris (3)	Map Location (5)	Site Location (5)	Impact of Debris (6)	Future Land Use (7)	Is Debris Hazardous ? (8)
Ungott, clement	Jan 27, 00		hundreds of Barrels of oil dumped	North of high school	clement Ungott See F16 2	oily Perma frost all over town	clean healthy village	health hazard
			Motor Pool oil debris	Motor Pool 2	Army CAMP MOTOR POOL	oily Lots for homes	healthy neighborhood	health hazard
APATIKI, HOLDEN JR	Jan 27, 00		oily Sunk, Soil grease, dirt	high school Area underground	area 7, 16, 18	contaminated Soil Perma Frost	Clean, healthy school grounds	health hazard



NATIVE VILLAGE OF GAMBELL

P.O. Box 90 Gambell, Alaska 99742
(907) 985-5346 FAX (907) 985-5014

The Native Village of Gambell (IRA) entered into an agreement with the Department of Defense (DOD) to prepare a Strategic Project Implementation Plan (SPIP). This plan will form the basis for further discussions between the community and DOD concerning remediation of remaining military debris in Gambell.

The SPIP will identify military impacts, how these affect land use, the desired remediation, the estimated costs of the remediation actions, and a priority list for identified remediation.

The completion of the SPIP will be a tool to express tribal members' ideas and concerns to DOD. It does not guarantee that any money will be available to perform any removal action in Gambell.

You are being asked today to contribute your knowledge of locations of any remaining military debris within Gambell and to discuss how military impacts affect land use.

Name: _____ Phone: (907) 985-_____

Address: P.O. Box _____ Gambell, AK 99742

Would you like to be added to an information mailing list? Yes No

1. Do you have any concerns about remaining military debris in Gambell? Yes No (Thank you for your time)

2. What is your knowledge of any remaining military debris in Gambell? (Saw it being buried, have seen parts on the surface, heard about it from someone who saw it)

Surface (S)_____ Buried (B)_____

3. What kind of debris is it?

    1. (S) (B)

    _____

    2. (S) (B)

    _____

    3. (S) (B)

4. Where is the debris located? Please use the maps to mark the location.

1. _____

2. _____

3. _____

5. What is the impact of this debris to you or the community?

1. _____

2. _____

3. _____

6. Many buried sites were identified in 1994, please use the provided map and look over these sites. Add these sites to your list, which of these sites do you think should be removed:

First? _____

Next? _____

8. How is this debris hazardous or impact the following:

First Site _____ Next Site _____

a. Environment

b. Wildlife

c. People

a. Environment

b. Wildlife

c. People

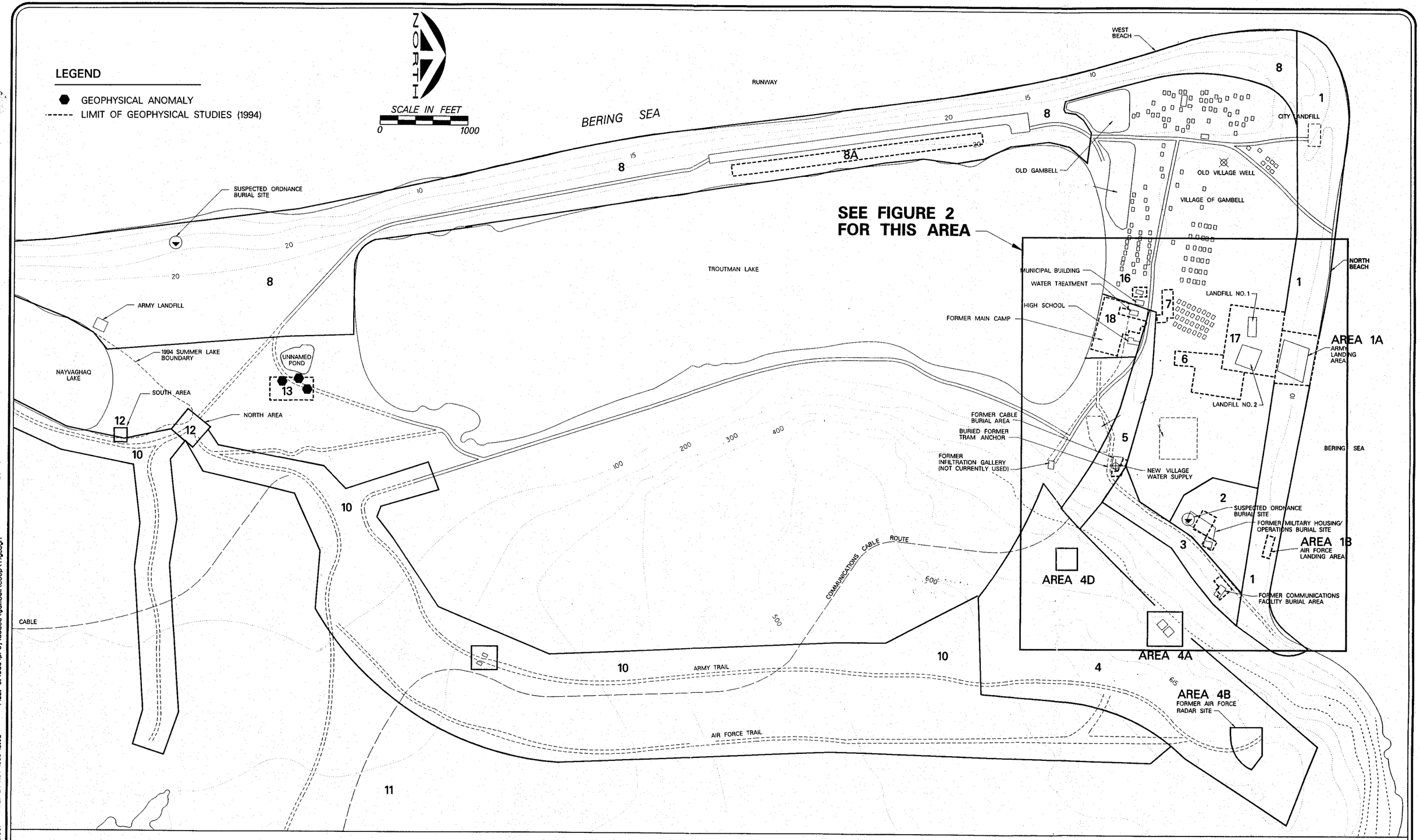
9. Are you willing to help locate the debris you have discussed, without cost to the IRA Counsel or DOD?
Yes No

10. Remarks:

Thank you for your time and information.

If you have any additional information to provide or questions regarding this program, please contact:

Native Village Of Gambell
Michael Apatiki, Project Manager
985-5474



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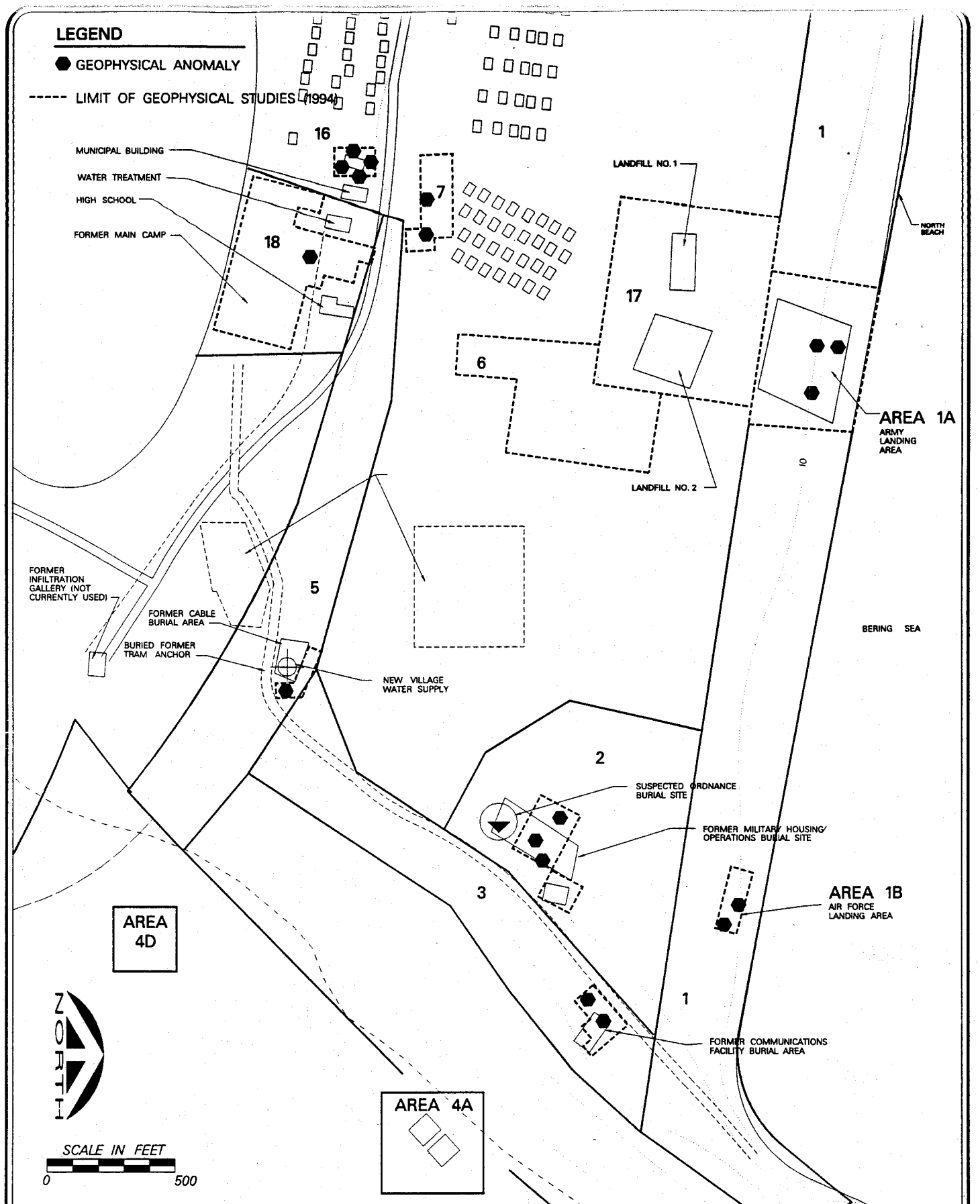
MONTGOMERY WATSON
Anchorage, Alaska

FIGURE 1
U.S. ARMY ENGINEER DISTRICT, ALASKA
GAMBELL, ST. LAWRENCE ISLAND, ALASKA
PREVIOUS GEOPHYSICAL INVESTIGATION AND ANOMALIES



MONTGOMERY WATSON

Anchorage, Alaska

FIGURE 2

U.S. ARMY ENGINEER DISTRICT, ALASKA
GAMBELL, ST. LAWRENCE ISLAND, ALASKA

PREVIOUS GEOPHYSICAL INVESTIGATION AND ANOMALIES

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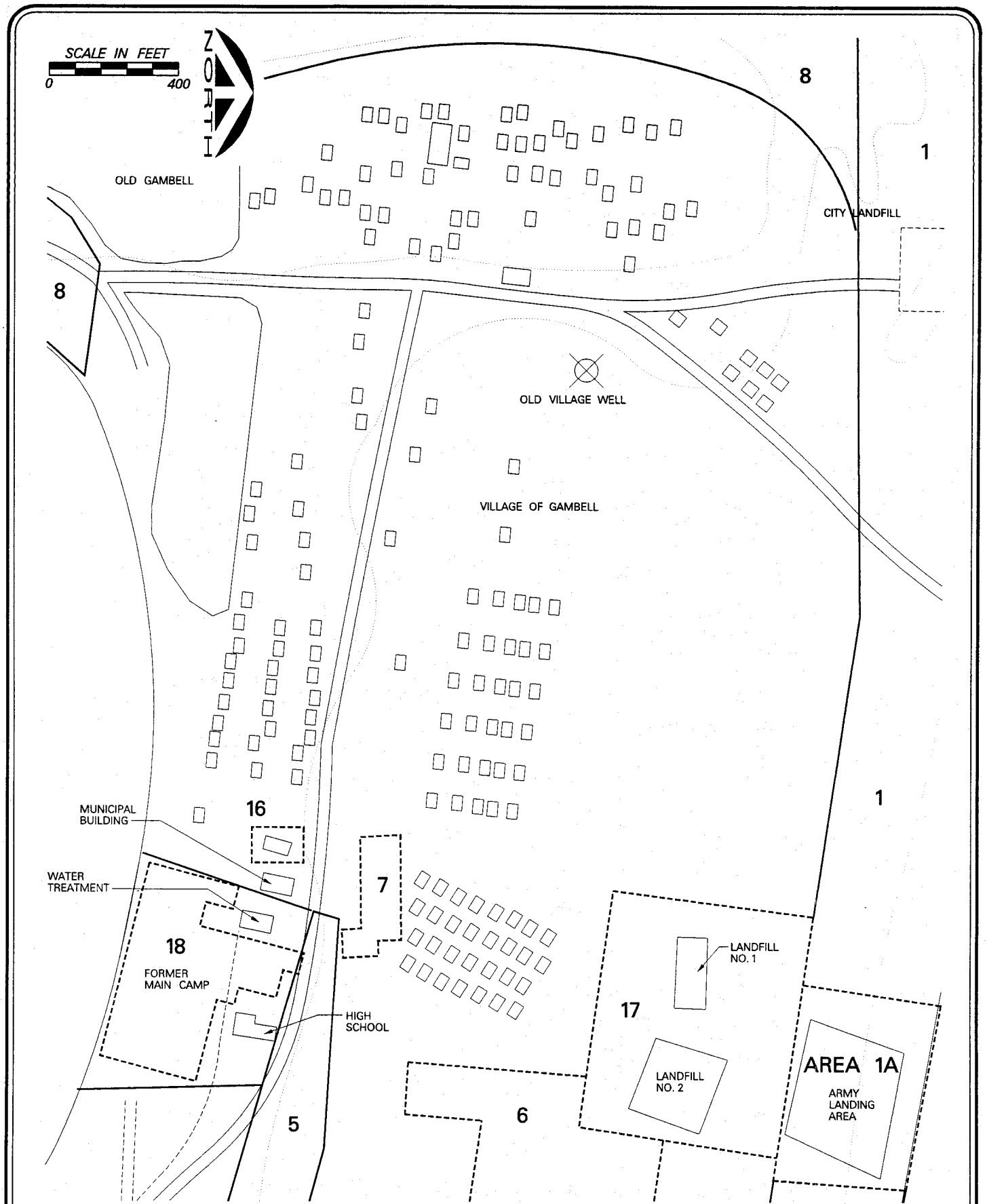

MONTGOMERY WATSON

Anchorage, Alaska

FIGURE 3

NATIVE VILLAGE OF GAMBELL, ALASKA (IRA)
INTERVIEW HOUSING

LOCATION CHECK MAP

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APPENDIX B

Geophysical Report – July 2000

Golder Associates Inc.

1750 Abbott Road, Suite 200
Anchorage, AK USA 99507-3443
Telephone (907) 344-6001
Fax (907) 344-6011

Golder Associates

REPORT

GEOPHYSICAL SURVEY INVESTIGATION NATIVE AMERICAN LANDS ENVIRONMENTAL MITIGATION PROGRAM GEOPHYSICAL AND COOPERATIVE AGREEMENT SUPPORT GAMBELL, ST. LAWRENCE ISLAND, ALASKA

Prepared for:

Montgomery Watson
4100 Spenard Road
Anchorage, Alaska 99517

Prepared by:

Golder Associates Inc.
Anchorage, Alaska

August 25, 2000

Distribution: Montgomery Watson - 3 copies

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Golder Associates Inc.

1750 Abbott Road, Suite 200
Anchorage, AK USA 99507-3443
Telephone (907) 344-6001
Fax (907) 344-6011

Golder Associates

August 25, 2000 003-5435

Montgomery Watson
4100 Spenard Road
Anchorage, Alaska 99517-2901

Attention: Bonnie McLean, Project Manager

RE: REPORT FOR GEOPHYSICAL SURVEY INVESTIGATION
GAMBELL, ALASKA

Dear Bonnie:

Please find attached three copies of our report for the Geophysical Survey Investigation at Gambell, Alaska. This investigation was conducted for the Native American Lands Environmental Mitigation Program.

Thank you very much for the opportunity to assist you with this interesting project. Please call me if you have any questions or require additional information.

Sincerely,

GOLDER ASSOCIATES INC.

Robert G. Dugan, C.P.G.
Associate and Senior Engineering Geologist

RGD/ljh

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1. INTRODUCTION

Golder Associates Inc. (GAI) was requested by Montgomery Watson Alaska, to conduct a geophysical survey at Gambell, a village located on St. Lawrence Island off the west coast of Alaska (Figure 1). The geophysical investigation forms part of a larger survey undertaken by Montgomery Watson for the Native American Lands Environmental Mitigation Program administered by the U.S. Army Corps of Engineers. The project was carried out under a subcontract agreement with Montgomery Watson.

The purpose of the geophysical investigation was to delineate suspected buried metallic debris resulting from military activity. The investigation used a time-domain electromagnetic metal detector (Geonics EM-61) and a magnetometer.

The location of the project area, in the vicinity of Gambell, is shown in Figure 1, along with the approximate locations of the individual survey sites. In this report the grids are discussed in terms of their local coordinates because the surveyed coordinates were not available at the time of writing. The true spatial position of the grids can be found in Montgomery Watson's report to the U.S. Army Corps of Engineers.

The survey was conducted by Golder Associates between June 24th, 2000 and July 2nd, 2000 using a Geonics Model EM-61 metal detector and data logger, and a Geometrics Model 858 vertical gradiometer. Montgomery Watson personnel laid out the corners of the survey sites.

This document describes, on a site-by-site basis, the geophysical techniques, the methods of acquisition, the processing techniques and the results of the survey.

2. SURVEY AND INTERPRETATION TECHNIQUES

2.1 Introduction

At each site, both geophysical survey techniques were used to describe the nature of the subsurface materials and to locate the boundaries of structures. These two techniques were time-domain electromagnetic induction and magnetometry.

2.1.1 The Survey Grid

The control grid at each site was set out by Montgomery Watson who placed labelled wooden stakes at each corner of the survey region. The grid lines were positioned so that the Y-axis was oriented approximately north to south and 0E, 0N was located at the south-west corner of the grid. The local magnetic declination was approximately 13° east of true north. At each site, data were collected along survey lines spaced 10 ft apart. Along each survey line, readings were recorded continuously and the data marked at 25-ft intervals.

During the surveys, a sketch map was made of the surface features such as metal debris or buildings.

2.1.2 Field Hardcopy and Presentation

A full-color field map of the gridded data was prepared following each survey. The map was produced using the Surfer contouring package, Version 7.0. Unless otherwise stated, the plot for each type of dataset was contoured using the same linear contouring interval.

2.2 Ground Conductivity Surveys

2.2.1 Equipment and Software

The presence of near surface electrically conductivity material was measured with the Geonics EM-61 time-domain electromagnetic metal detector. The response for both the top

and bottom coil were recorded digitally on a Geonic data logger. The logger also recorded the acquisition direction (north, east etc.), station spacing and line number. After the survey, all the data were downloaded to a portable computer using the Geonics program, DAT61W.EXE. Following a limited amount of data reduction, the data were output to a new file, which contained values of easting, northing, top coil response and bottom coil response for each measurement station. This file was transferred to the Surfer contouring package for presentation and analysis.

2.2.2 Principles

Electromagnetic methods are based on the measurement of magnetic fields associated with alternating currents induced in subsurface conductors by primary magnetic fields. The EM-61creates a pulsed primary magnetic field through a transmitter coil. The generation of this primary field then induces circular eddy current loops in conductive material in the earth. When the primary magnetic field is removed, the eddy current loops in the ground decay, which generates a magnetic field. The decay of this secondary magnetic field is recorded by measuring the induced voltage in two coils at the surface. The measured voltage is proportional to the speed of the decay of the magnetic field, which is proportional to the conductivity of the surface and subsurface material.

2.2.3 Data Acquisition

The EM-61 continuously transmits electromagnetic pulses and samples the associated decaying magnetic field at 0.25 second intervals. The decay curve is sampled at two points by two coils (top and bottom channels located at 36 in. and 18 in. above the ground surface respectively). These coils are positioned so as to function as a spatial filter when the coil responses are subtracted from each other. This processing helps to separate the effect of surface debris from that of buried debris. Data were recorded continuously along each survey line and marked at 25-ft intervals. The position of the data between these marked locations was interpolated assuming a constant surveying velocity.

2.2.4 Interpretation of Electromagnetic Induction Data

Interpretation of the EM data involves analysing the color contour plots for anomalies. Anomalies are defined as measurements that are above or below background values that are not related to natural conditions or visible surface features.

2.3 Magnetometry Surveys

2.3.1 Equipment and Software

The total magnetic field and the vertical gradient were measured with the Geometrics Model 858 optically pumped cesium magnetometer/gradiometer. The equipment also records the easting and northing of the measurement station in local grid coordinates. After the survey the data are downloaded to a portable computer using the program MagMap2000. After limited data reduction and checking, a file is sent to the Surfer contouring package for presentation and analysis.

2.3.2 Principles

The cesium magnetometer measures the Earth's natural magnetic field and detects variations in this field caused by ferrous materials.

Two types of measurements are recorded during a gradiometer survey: total field and vertical gradient. Strength or intensity of magnetic fields is measured in nanoteslas, where 1 nT = 1 gamma (cgs unit). The Earth's field is approximately 50,000 nT. The total field measurement is affected by regional changes in the magnetic field and anomalies caused by buried ferrous material. The vertical gradient data are primarily affected by near-surface sources and provide better resolution of shallow buried objects. Vertical gradient data are not affected by regional or diurnal variations in the magnetic field.

2.3.3 Data Acquisition

During the survey, the axes of each sensor were horizontal and oriented east-west. The two sensors were separated by 24 inches. Base station readings were recorded at the start and end of each site survey. No significant changes in the base station magnetic data were observed during the surveys, so no corrections were made for changes in the diurnal field. Measurement of vertical gradients, which are not affected by diurnal fluctuations, and total field measurements collected over a short period of time are sufficient for detecting and delineating the extent of ferrous metallic objects.

2.3.4 Interpretation of Magnetic Data

The shape of the distortion to the Earth's magnetic field caused by a ferrous object depends on the orientation of the object with respect to the magnetic field. Often, a characteristic signature for magnetic anomalies caused by a ferromagnetic object is a "cross-over" anomaly. With this type of anomaly, magnetic measurements increase above background; decrease to zero or a negative value, and increase again to background values. In the northern hemisphere, the positive values are usually to the south of the object, the negative values to the north, and the zero crossing at the center of the object. In areas with large concentrations of buried metal, such as a trench, the area behaves as a single large ferromagnetic object, with negative values near the northern edge of the buried material. The magnitude of the anomaly is dependent on the size, orientation, depth of burial, and magnetic properties of the buried material.

3. SURVEYS AROUND THE VILLAGE OF GAMBELL

3.1 Introduction

The village of Gambell is located on the northwestern end of St. Lawrence. Gambell lies on a flat sand and gravel spit created by accreting beach ridges overlying a wave-cut bedrock platform. The spit is composed of unconsolidated, well-rounded gravels and coarse sand of Quaternary age derived from granitic rock. Maximum elevation is approximately 20 ft above sea level. Most of the geology around Gambell is typified by Cretaceous granite rock. Sevuokuk Mountain is an eroded headland immediately east of Gambell that rises abruptly to a maximum elevation of 619 ft.

The site has been used in the past by the United States Army, Air Force and Navy with most impact occurring in the 1950s.

3.2 Site G: Army Landfill

This site, located on the north-west shore of Nayvaghaq Lake (Figure 1) is a suspected former army landfill. The area of investigation was 300 ft square and was surveyed on lines spaced at 10 ft, oriented east-west. A Montgomery Watson monitoring well was located just east of the survey region. The surface material was loose gravel with some patches of vegetation.

The results of the geophysical grid surveys are presented in the following figures:

Figure 2. Magnetometer Data (total magnetic field)
Figure 3. Vertical Gradient Data (vertical gradient)
Figure 4. EM Data (top and bottom channels)
Figure 5. EM Data (differential channel)

There is a very slight variation in the total magnetic field across the site. The south-east side of the site has a total field value that is approximately 200 nT higher than the south-

west corner of the site. The contour interval for Figure 2 was reduced from 500 nT to 25 nT to illustrate this variation. There are two locations where the top sensor recorded anomalously low readings (40E, 90N and 200E, 30N). These values are interpreted to be erroneous readings since similar readings were not recorded by the bottom sensor. The vertical gradient magnetic data (Figure 3) indicates no variations across the site as observed in the data from the top, bottom, and differential channels of the EM-61.

The results of the magnetometer and TDEM surveys (Figures 4 and 5) indicate that there is no buried metallic debris in the shallow subsurface.

3.3 Site H: North of New Housing Development

Site H is a rectangular grid (600 ft x 150 ft with the long axis oriented east-west) located approximately 175 ft north of the new housing development. The EM and magnetometer data were collected along east-west survey lines spaced 10 ft apart. The ground conditions at the site consisted entirely of coarse gravel. There was no metallic debris on the surface at this site.

The results of the geophysical grid surveys are shown in the following figures:

Figure 6. Magnetometer Data (total magnetic field)
Figure 7. Magnetometer Data (vertical gradient)
Figure 8. EM Data (top and bottom channels)
Figure 9. EM Data (differential channel)

The only region with anomalous magnetic data is located in the south-east corner of the grid (Station 510E to 600E and 0N to 80N). This region is outlined in red in Figures 7 and 9. The EM data also indicates that the south-east corner of the site contains conductive material. The anomalous region in the EM-61 differential dataset, however, is not as broad as that indicated by the magnetometry data and reveals several isolated anomalies. Two EM anomalies, located at Stations 525E, 60N and 510E, 150N, are significantly reduced in the differential channel. This suggests that these objects are buried immediately beneath

the surface. The remainder of the region having magnetic anomalies, appears to be associated with three buried objects located at Stations 545E, 30N; 550E, 0N; and 585E, 10N.

3.4 Site I 1: East of School

This site is located on the east side of the school immediately east of several above ground tanks. The survey area is 150 ft square and was surveyed along east-west lines spaced 10 ft apart. The surface material consisted primarily of gravel and contained no surface metal. The only noteworthy surface feature is a dirt mount located at Station 0E, 60N.

The results of the geophysical grid surveys are shown in the following figures:

Figure 10. Magnetometer (total magnetic field)
Figure 11 Magnetometer (vertical gradient)
Figure 12. EM Data (top and bottom channels)
Figure 13. EM Data (differential channel)

There is a notable variation in the total magnetic field on the southwestern side of the site (Figure 10) that does not appear in the vertical gradient data (Figure 11). This is possibly due to metallic objects, such as the above ground tanks, immediately east of the survey area. The magnetic field gradient indicated an anomalous area centered on Station 15E, 70N. This is the approximate location of a dirt mound.

The EM data revealed several more anomalous areas. A linear anomaly oriented north-south in the EM data was identified on the eastern side of the site at Station 140E. Anomalies of this shape are characteristic of underground utilities. At two locations along this linear anomaly (Stations 5N and 95N) there appear to be subsurface targets not associated with the linear feature. These features did not appear as magnetic anomalies suggesting that although they are electrically conductive they are non-ferrous.

The EM single channel data indicated two additional anomalies located at Stations 50E, 70N and 120E, 80N. These did not appear in the differential channel data and therefore indicate that the object is near the surface.

3.5 Site I 2: School Playground West of School

This site is located west of the school near the playground. The site dimensions are 200 ft west to east and 180 ft south to north and data were collected along east-west survey lines spaced 10 ft apart.

The results of the geophysical grid surveys are shown in the following figures:

Figure 14. Magnetometer Data (total magnetic field)
Figure 15 Magnetometer Data (vertical gradient)
Figure 16. EM Data (Top and bottom channels)
Figure 17. EM Data (differential channel)

There were many metallic features on the surface that influenced both the magnetic and EM data. These features, annotated on Figures 15 and 17, included various playground structures, an iron pipe, a concrete pad and a large metal gate. The only region within the site where the magnetometer data did not correlate with surface debris is in the south-east corner between Stations185E and 200E and south of Station 80N. The extent of the magnetometer anomaly is outlined in red in Figures 15 and 17.

The differential channel data supports the magnetometer data and indicates that the debris is located along the eastern site boundary between Stations 20N and 75N. The regions that are negative in this data (plotted in black, Figure 17) correspond to locations of metallic objects at the surface or extending slightly above the surface. The strong response in the differential channel data in the region of the concrete pad suggests that there is possibly a large metal object located beneath the pad.

3.6 Site J: South of City Building, Along North Shore of Troutman Lake

This site consisted of two sections or regions. Region 1, located in the north-east corner of the site, and south of the city building, is 75 ft square. Region 2, located along the north shore of Troutman Lake is 640 ft by 100 ft. Data were collected in both regions along east-west survey lines spaced 10 ft apart.

The results of the geophysical grid surveys are shown in the following figures:

Figure 18. Magnetometer Data (total magnetic field)
Figure 19 Magnetometer Data (vertical gradient)
Figure 20. EM-61 Data (top and bottom channels)
Figure 21. EM-61 Data (differential channel)

Region 1 did not contain any surface metallic debris, and did not have either magnetic or electromagnetic anomalies. Region 2 contained frequent piles of surface metallic debris and other objects that affected the magnetometer and the EM-61 readings. These surface features are noted in Figures 19 and 21.

There were two magnetic anomalies that were not associated with surface features. One is located at Station 50E, 40N and the other at Station 460E, 10N. Both of these magnetic anomalies are relatively weak and isolated to a small region. The E data also indicated an anomaly at the first of these locations (Station 50E, 40N). The location of the second magnetic anomaly did not correlate to anomalies in the EM data. This could indicate an object buried too deep for the EM-61 to detect.

3.7 Site K: Snow Fence Area

This site, located north of the school by the snow fence, is 325 ft by 350 ft. Data were collected along east-west lines spaced 10 ft apart. Most of the site consisted of gravel,

however the eastern region of the site still contained a snowdrift. The site extended north of the snow fence near the south-west corner of site M.

The results of the geophysical grid surveys are shown in the following figures:

Figure 22. Magnetometer Data (total magnetic field)
Figure 23 Magnetometer Data (vertical gradient)
Figure 24. EM-61 Data (top and bottom channels)
Figure 25. EM-61 Data (differential channel)

The magnetometer data indicated anomalies at the far north-east corner north of the snow fence and in a linear region along Lines 50N and 60N east of Station 230E. The high gradient reading along Line 220N and 340N resulted from failure of the top sensor. This can be seen in Figure 22, by comparing the top and bottom sensor readings. The top sensor has readings that fluctuate by tens of thousands of nT while the bottom sensor is stable. An object could not affect the top sensor so drastically without influencing the bottom sensor. The region of anomalous magnetic readings is outlined in red in Figures 23 and 25.

The EM data further delineates the locations and boundaries of the magnetic anomalies. The EM data indicates several isolated objects in both of the regions north of the snow fence and in the south-east corner of the site.

3.8 Site L: By Q Building

This site is 320 ft by 150 ft and is located in the area surrounding building Q and the nearby sea vans. Data were collected along north-south survey lines spaced 10 ft apart.

The results of the geophysical grid surveys are shown in the following figures:

Figure 26. Magnetometer Data (total magnetic field)
Figure 27 Magnetometer Data (vertical gradient)
Figure 28. EM-61 Data (top and bottom channels)
Figure 29. EM-61 Data (differential channel)

The primary areas with high magnetic values are associated with the building and with the two sea vans to the east of the building. There are two weak anomalies, however, at Station 320E, 50N and Station280E, 0N. These regions are outlined in red in Figures 27 and 29. Both of these locations had anomalous EM-61 values in differential mode and are interpreted to be small, buried metallic objects.

3.9 Site M: North of Snow Fence

This site is located north of the snow fence and is 300 ft by 320 ft. No surficial debris was present at the site. Data were collected along east-west survey lines spaced 10 ft apart.

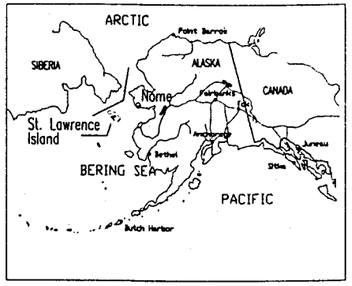
The results of the geophysical grid surveys are shown in the following figures:

Figure 30. Magnetometer Data (total magnetic field)
Figure 31 Magnetometer Data (vertical gradient)
Figure 32. EM-61 Data (top and bottom channels)
Figure 33. EM-61 Data (differential channel)

The data from the top sensor contains some faulty readings along the Line 160N between Stations 160E and 240E. These reading are interpreted to be erroneous for the same reason as described above. Magnetic field anomalies were found primarily in the south-east corner of the site. In addition, there are anomalous readings at Station 30E, 160N and between Stations 20E and 90E along the Line 310N. The magnetic field anomalies are outline in red in Figures 31 and 33.

The EM-61 confirmed the presence of a metallic object at this location and also indicated an object at Station 160E, 170N, and in the area that is obscured in the magnetometry data by the faulty readings.

FIGURES



LEGEND

—— LIMIT OF GEOPHYSICAL STUDIES (1994)

▨ 2000 GEOPHYSICAL STUDY

BERING SEA

WEST BEACH

RUNWAY

SUSPECTED ASPHALT BARREL CACHE

CITY LANDFILL

OLD CAMBELL

OLD VILLAGE WELL

VILLAGE OF CAMBELL

NORTH BEACH

TROUTMAN LAKE

MUNICIPAL BUILDING

WATER TREATMENT

LANDFILL NO. 1

HIGH SCHOOL

FORMER MAIN CAMP

AREA 1A

ARMY LANDFILL

1994 SUMMER LAKE BOUNDARY

UNNAMED POND

NAYVAGHAQ LAKE

SOUTH AREA

NORTH AREA

LANDFILL NO. 2

FORMER CABLE BURIAL AREA

BURIED FORMER TRAM MOTOR

FORMER INFILTRATION GALLERY (NOT CURRENTLY USED)

NEW VILLAGE WATER SUPPLY

BERING SEA

FORMER MILITARY HOUSING/ OPERATIONS BURIAL SITE

AREA 1B

AIR FORCE LANDING AREA

CABLE

COMMUNICATIONS CABLE ROUTE

AREA 4D

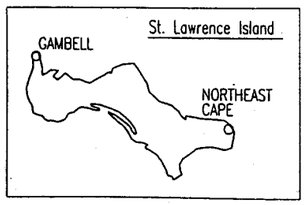
FORMER COMMUNICATIONS FACILITY BURIAL AREA

AREA 4A

AREA 4B

ARMY TRAIL

AIR FORCE TRAIL



0 1200 2400

FEET

NOTE:
This map was produced from data recieved from Montgomery Watson.

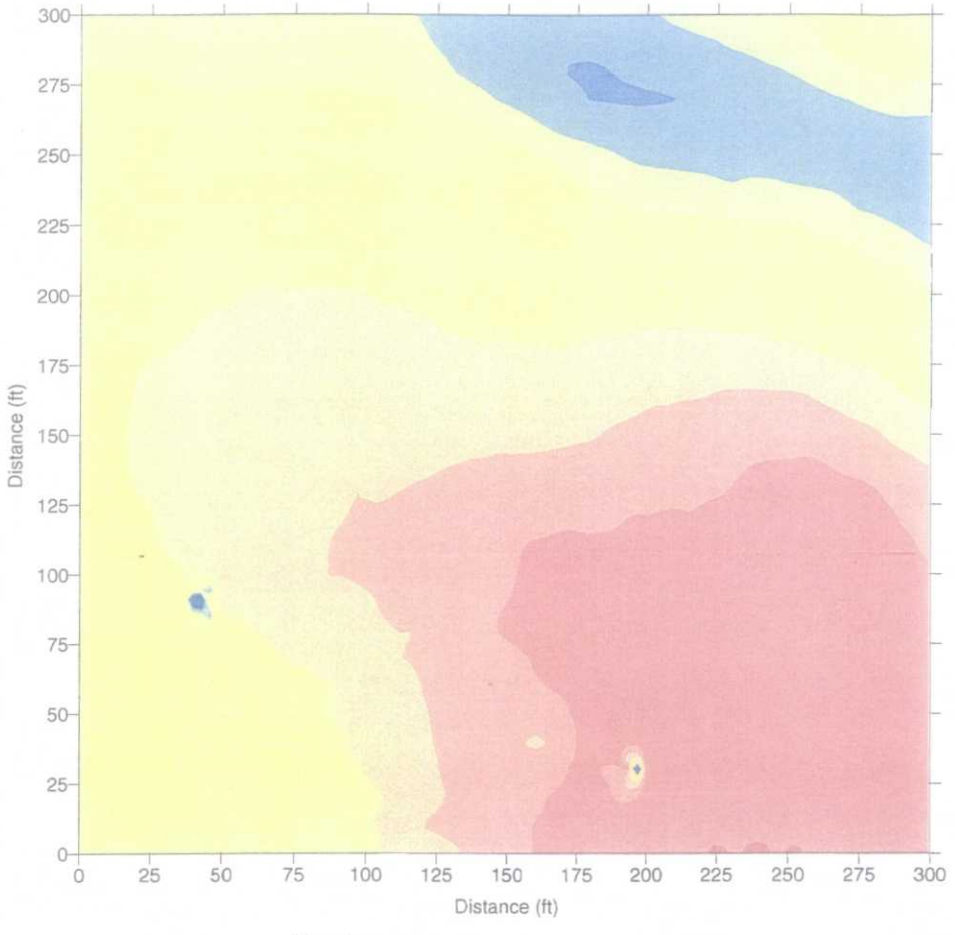
FIGURE **1**

VICINITY MAP AND LOCATION OF THE SURVEY SITE

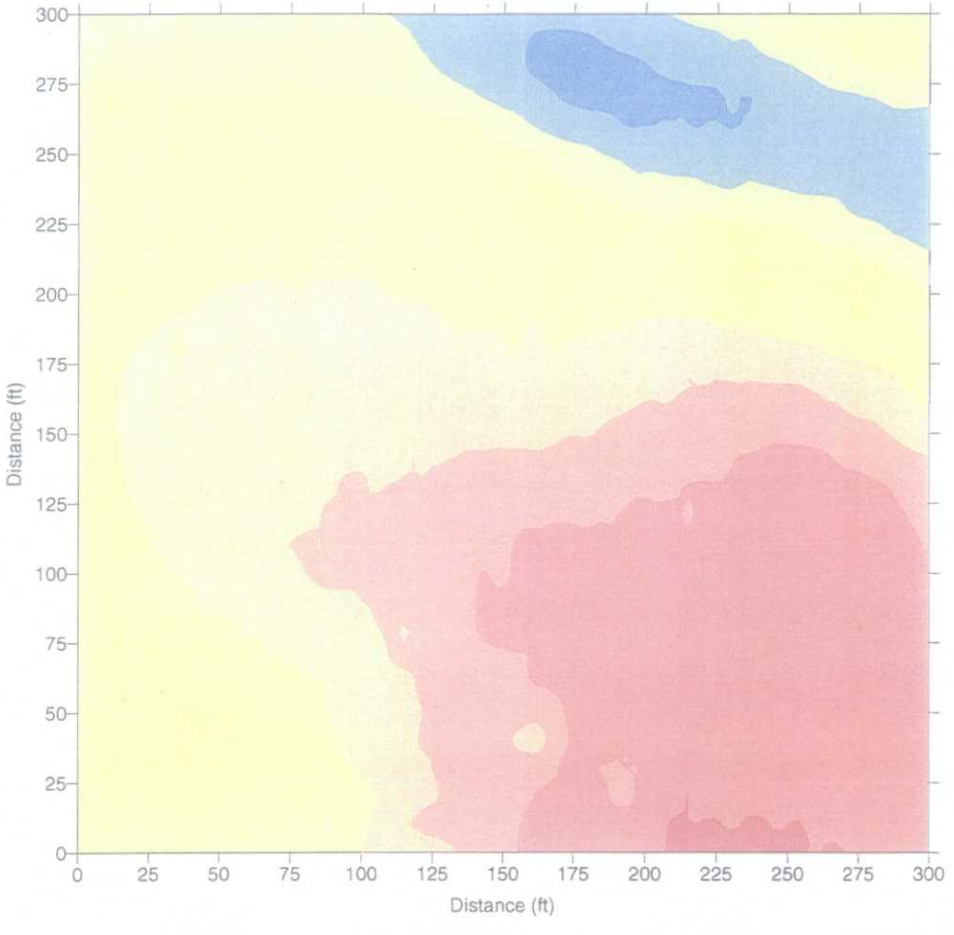
MW/GAMBELL BURIED DEBRIS/AK

bclark|K:\Projects\2000\0035435\000\93913.dwg|8-24-0 15:19|x:-|i:-

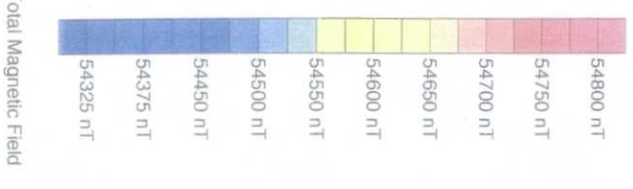
Golder Associates



Top Sensor



Bottom Sensor

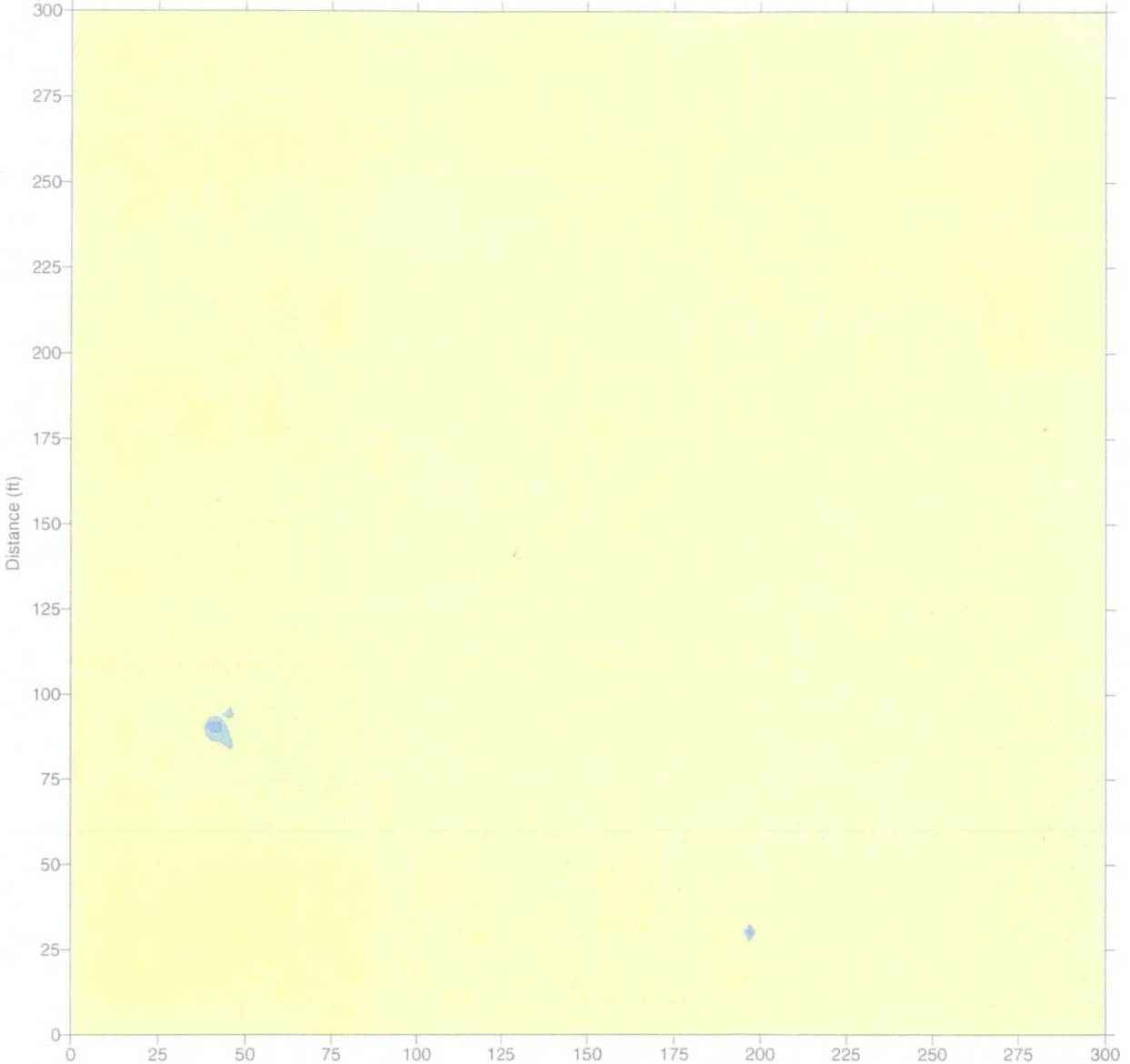


SITE G
MAGNETOMETRY SURVEY
Mag 858 TOTAL FIELD

GEOPHYSICAL ASSESSMENT
GAMBELL, ST. LAWRENCE ISLAND, AK
MONTGOMERY WATSON

GOLDER ASSOCIATES, INC.
REDMOND, WA

August 15, 2000	003-5435 task 000	Fig. 2



⊕ Well

10000 nT/ft
400 nT/ft
300 nT/ft
200 nT/ft
100 nT/ft
0 nT/ft
-100 nT/ft
-200 nT/ft
-300 nT/ft
-400 nT/ft
-500 nT/ft

Vertical Magnetic Field Gradient

N

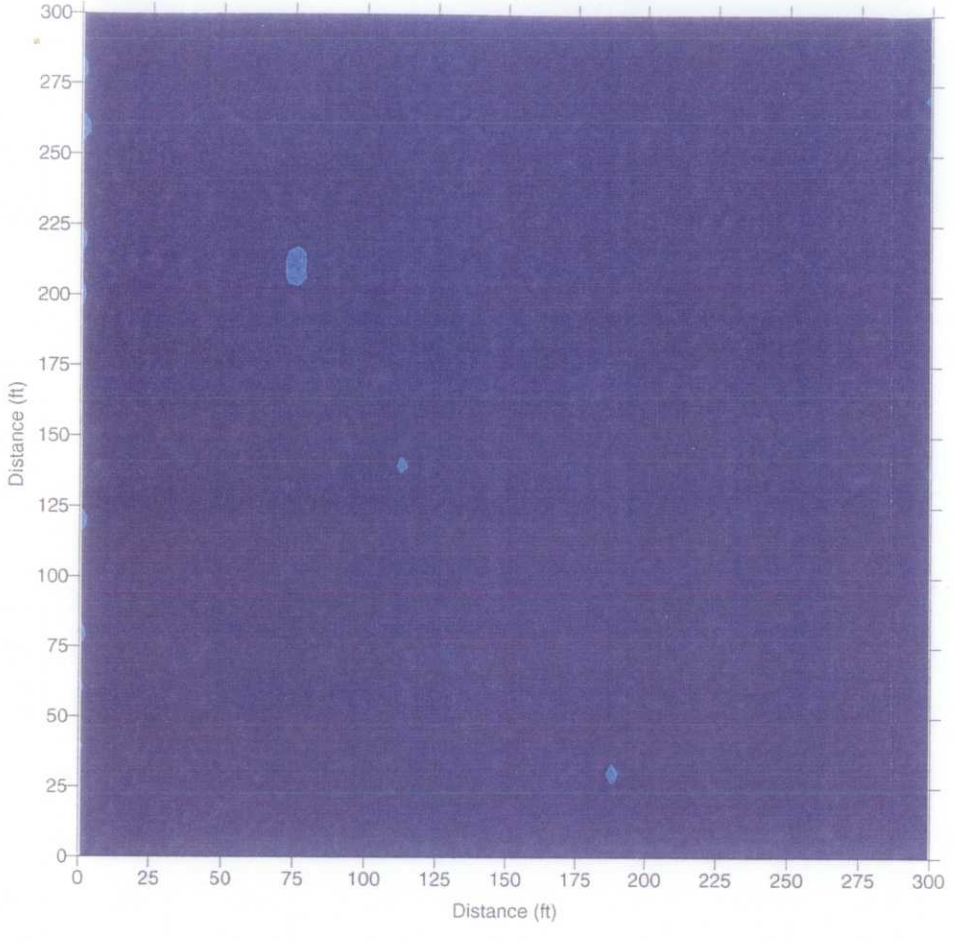
0 ft 25 ft 50 ft 75 ft 100 ft

SITE G
MAGNETOMETRY SURVEY
Mag 858 GRADIENT

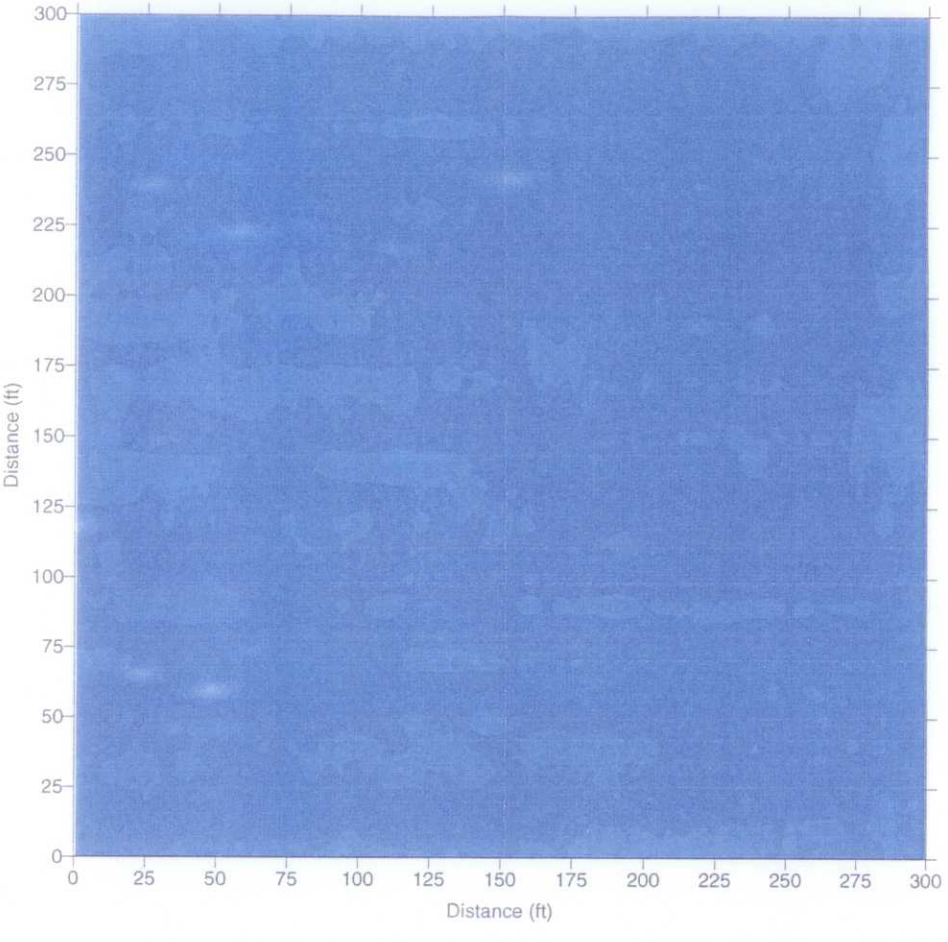
GEOPHYSICAL ASSESSMENT
GAMBELL, ST. LAWRENCE ISLAND, AK
MONTGOMERY WATSON

GOLDER ASSOCIATES, INC.
REDMOND, WA

August 15, 2000 | 003-5435 task 000 | Fig. 3



Top Channel



Bottom Channel

EM-61 response

-10 mV 0 mV 10 mV 20 mV 30 mV 40 mV 50 mV 60 mV 70 mV 80 mV 90 mV 100 mV

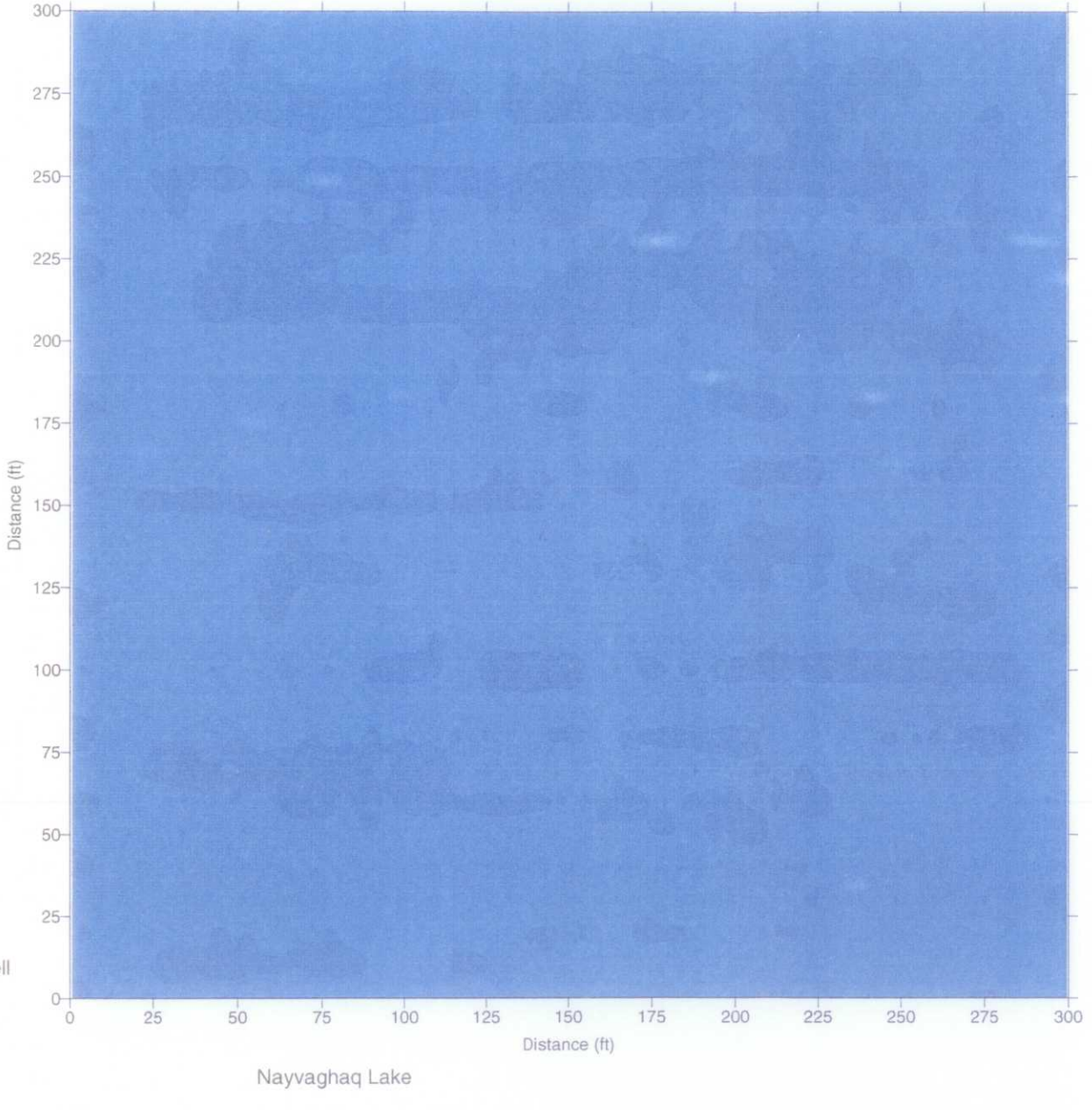
0 ft 25 ft 50 ft 75 ft 100 ft

SITE G
TIME DOMAIN EM
EM-61 TOP AND BOTTOM CHANNELS

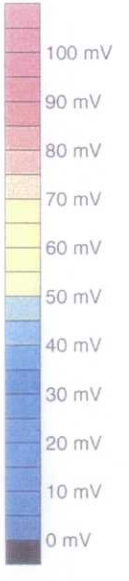
GEOPHYSICAL ASSESSMENT
GAMBELL, ST. LAWRENCE ISLAND, AK
MONTGOMERY WATSON

GOLDER ASSOCIATES, INC.
REDMOND, WA

August 15, 2000	003-5435 task 000	Fig. 4



⊕ Well



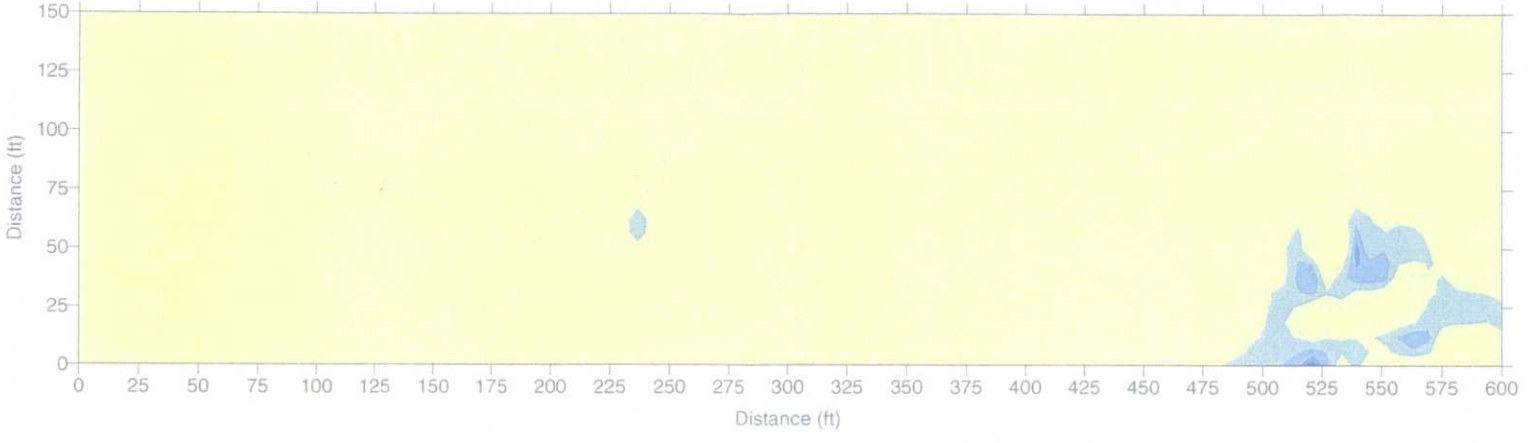
EM-61 response

SITE G
TIME DOMAIN EM
EM-61 DIFFERENTIAL CHANNEL

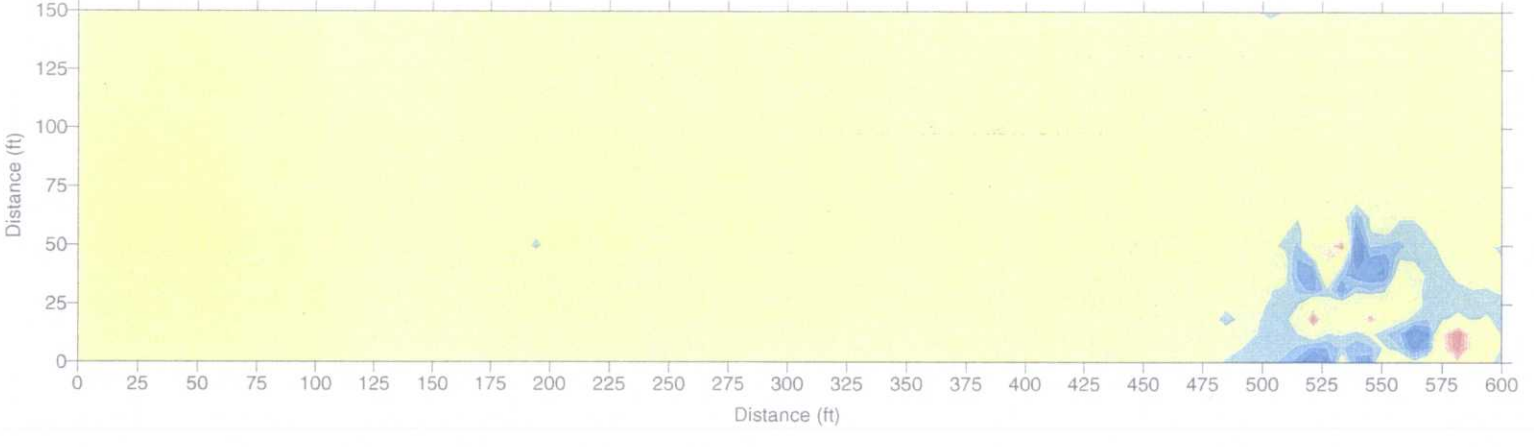
GEOPHYSICAL ASSESSMENT
GAMBELL, ST. LAWRENCE ISLAND, AK
MONTGOMERY WATSON

GOLDER ASSOCIATES, INC.
REDMOND, WA

August 15, 2000	003-5435 task 000	Fig. 5

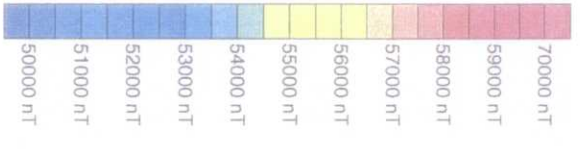


Top Sensor



Bottom Sensor

Total Magnetic Field

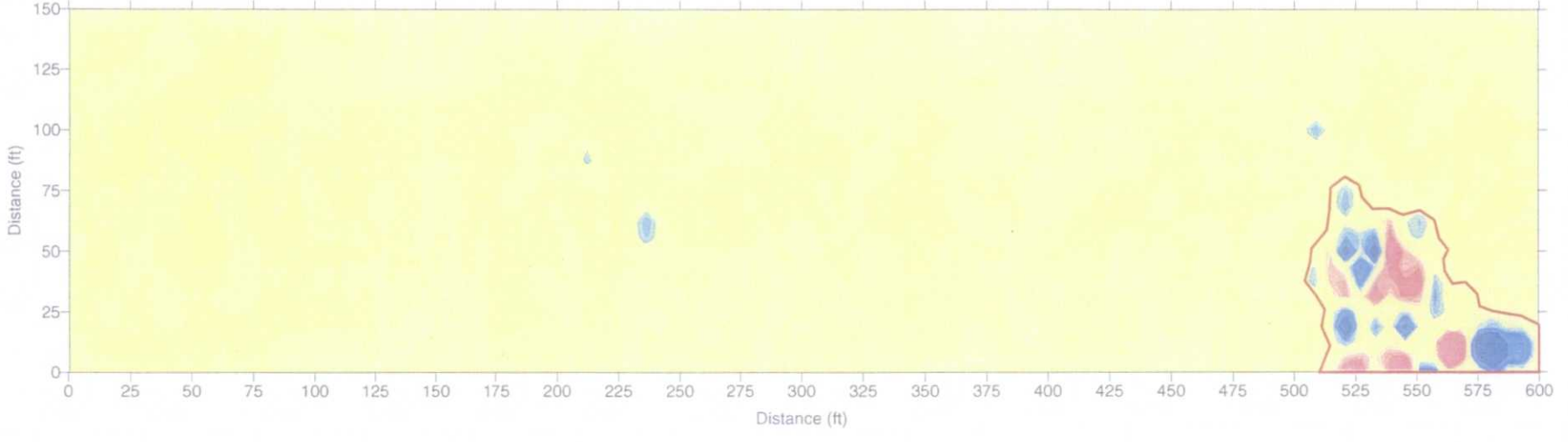


SITE H
MAGNETOMETRY SURVEY
Mag 858 TOTAL FIELD

GEOPHYSICAL ASSESSMENT
GAMBELL, ST. LAWRENCE ISLAND, AK
MONTGOMERY WATSON

GOLDER ASSOCIATES, INC.
REDMOND, WA

August 15, 2000	003-5435 task 000	Fig. 6



Vertical Magnetic Field Gradient

-500 nT/ft -400 nT/ft -300 nT/ft -200 nT/ft -100 nT/ft 0 nT/ft 100 nT/ft 200 nT/ft 300 nT/ft 400 nT/ft 10000 nT/ft

0 ft 25 ft 50 ft 75 ft 100 ft

Surface features/surfice debris

EM or magnetic anomaly
Interpreted to be buried debris

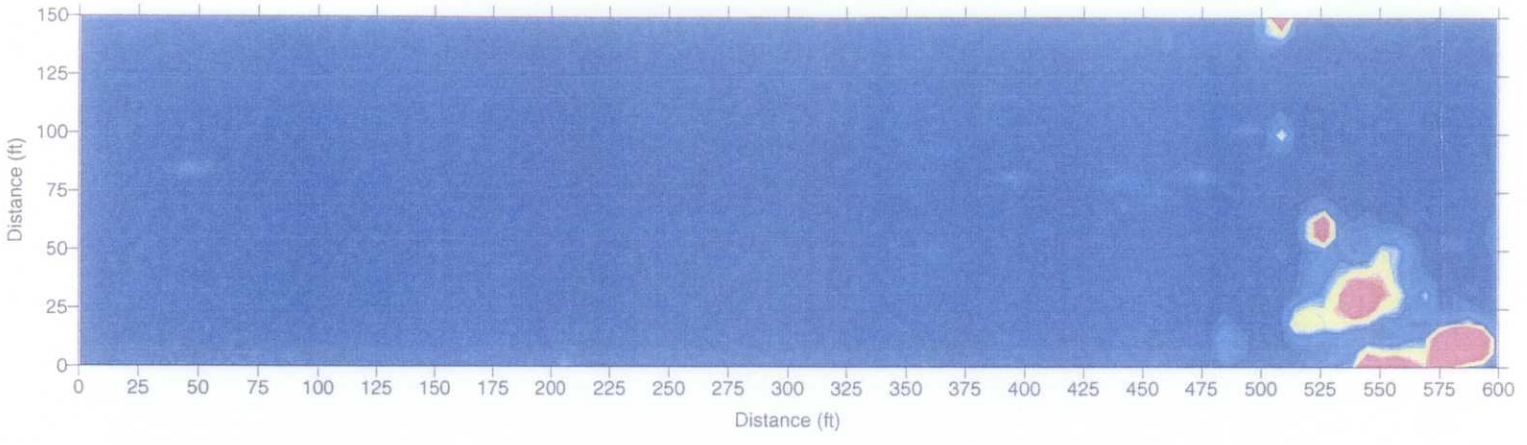
N

SITE H
MAGNETOMETRY SURVEY
Mag 858 GRADIENT

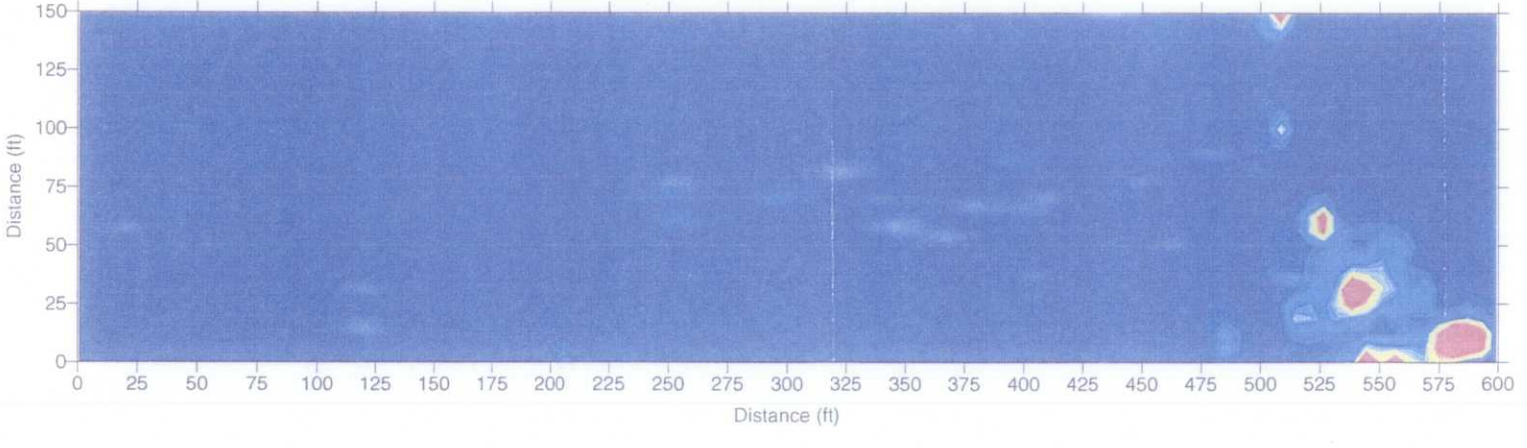
GEOPHYSICAL ASSESSMENT
GAMBELL, ST. LAWRENCE ISLAND, AK
MONTGOMERY WATSON

GOLDER ASSOCIATES, INC.
REDMOND, WA

August 15, 2000 | 003-5435 task 000 | Fig. 7

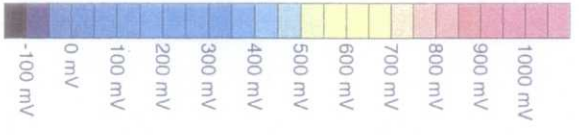


Top Channel



Bottom Channel

EM-61 response

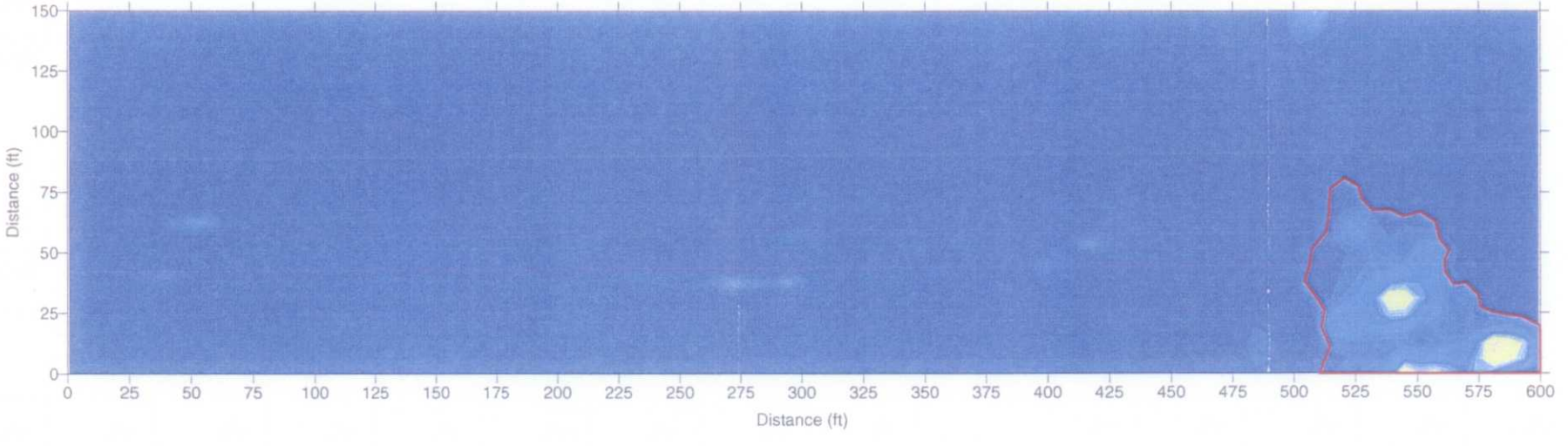


SITE H
TIME DOMAIN EM
EM-61 TOP AND BOTTOM CHANNELS

GEOPHYSICAL ASSESSMENT
GAMBELL, ST. LAWRENCE ISLAND, AK
MONTGOMERY WATSON

GOLDER ASSOCIATES, INC.
REDMOND, WA

August 15, 2000	003-5435 task 000	Fig. 8



EM-61 response

0 mV 100 mV 200 mV 300 mV 400 mV 500 mV 600 mV 700 mV 800 mV 900 mV 1000 mV

0 ft 25 ft 50 ft 75 ft 100 ft

Surface features/surfice debris

EM or magnetic anomaly
Interpreted to be buried debris

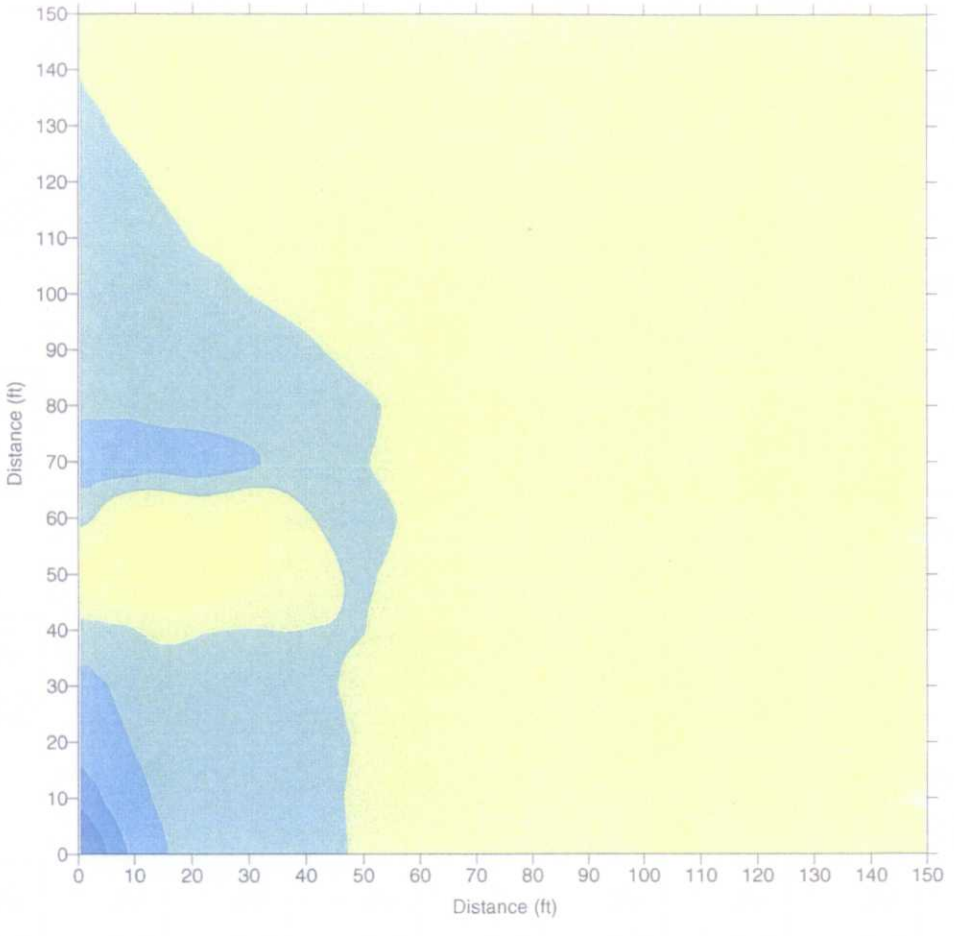
N

SITE H
TIME DOMAIN EM
EM-61 DIFFERENTIAL CHANNEL

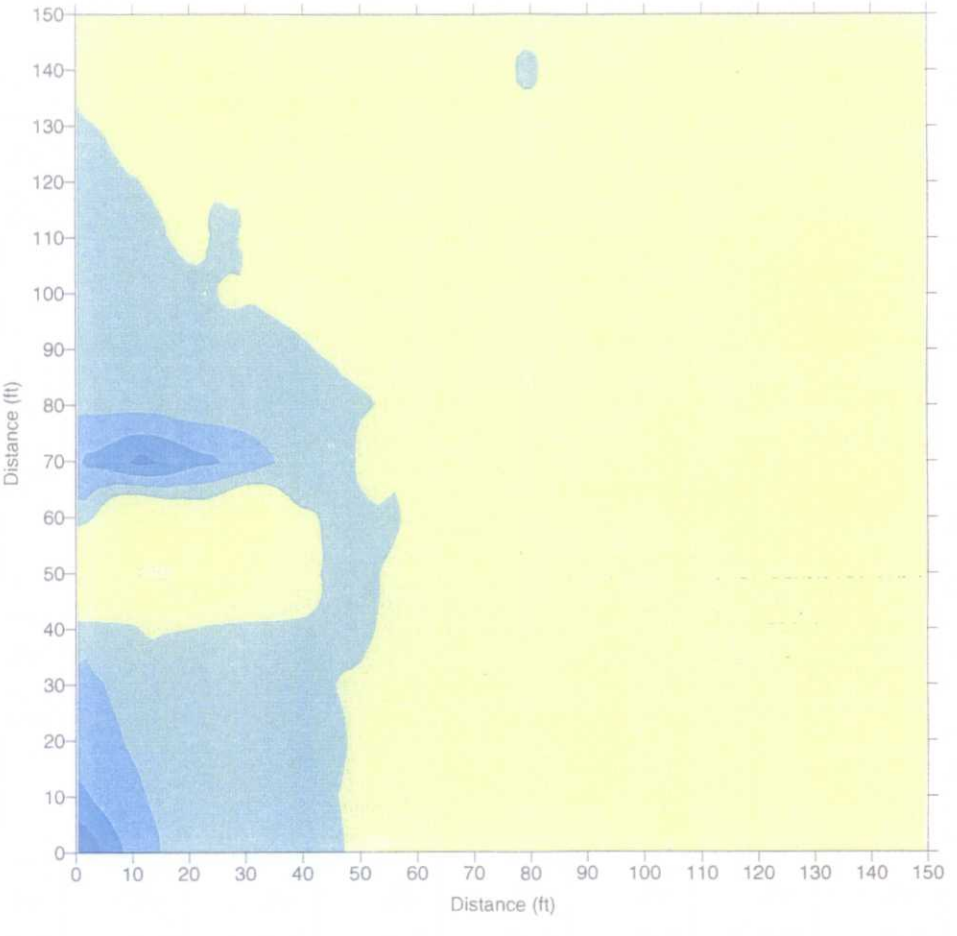
GEOPHYSICAL ASSESSMENT
GAMBELL, ST. LAWRENCE ISLAND, AK
MONTGOMERY WATSON

GOLDER ASSOCIATES, INC.
REDMOND, WA

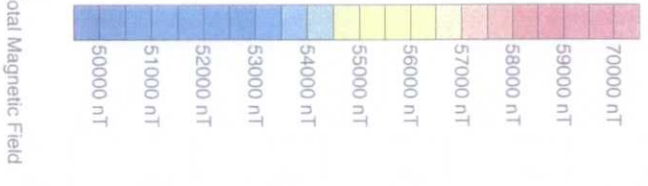
August 15, 2000 | 003-5435 task 000 | Fig. 9



Top Sensor



Bottom Sensor

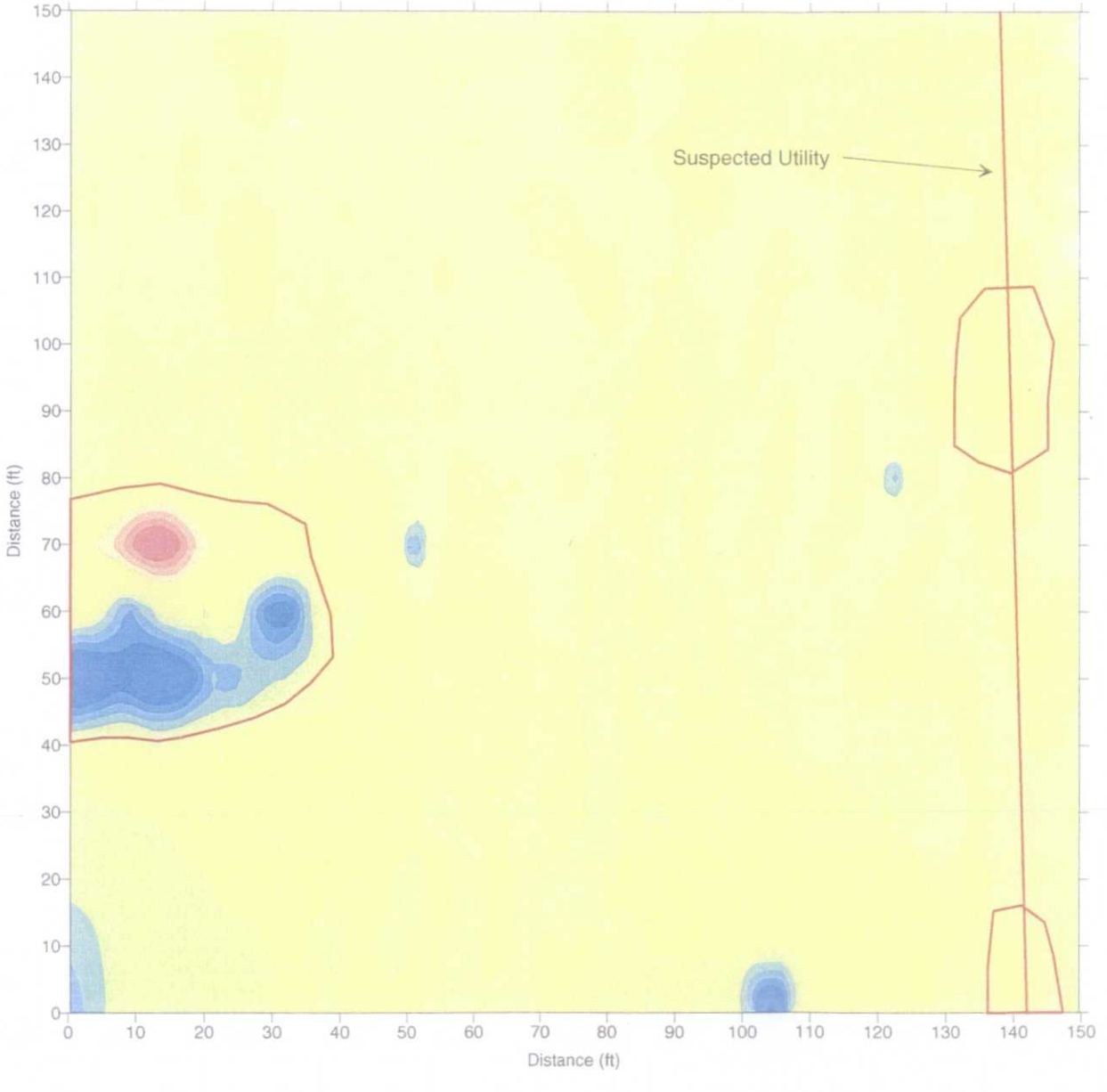


SITE I1
MAGNETOMETRY SURVEY
Mag 858 TOTAL FIELD

GEOPHYSICAL ASSESSMENT
GAMBELL, ST. LAWRENCE ISLAND, AK
MONTGOMERY WATSON

GOLDER ASSOCIATES, INC.
REDMOND, WA

August 15, 2000 | 003-5435 task 000 | Fig. 10



10000 nT/ft
450 nT/ft
400 nT/ft
350 nT/ft
300 nT/ft
250 nT/ft
200 nT/ft
150 nT/ft
100 nT/ft
50 nT/ft
0 nT/ft
-50 nT/ft
-100 nT/ft
-150 nT/ft
-200 nT/ft
-250 nT/ft
-300 nT/ft
-350 nT/ft
-400 nT/ft
-450 nT/ft
-500 nT/ft
-10000 nT/ft

Vertical Magnetic Field Gradient

N

0 ft 25 ft 50 ft

Surface features/surfice debris

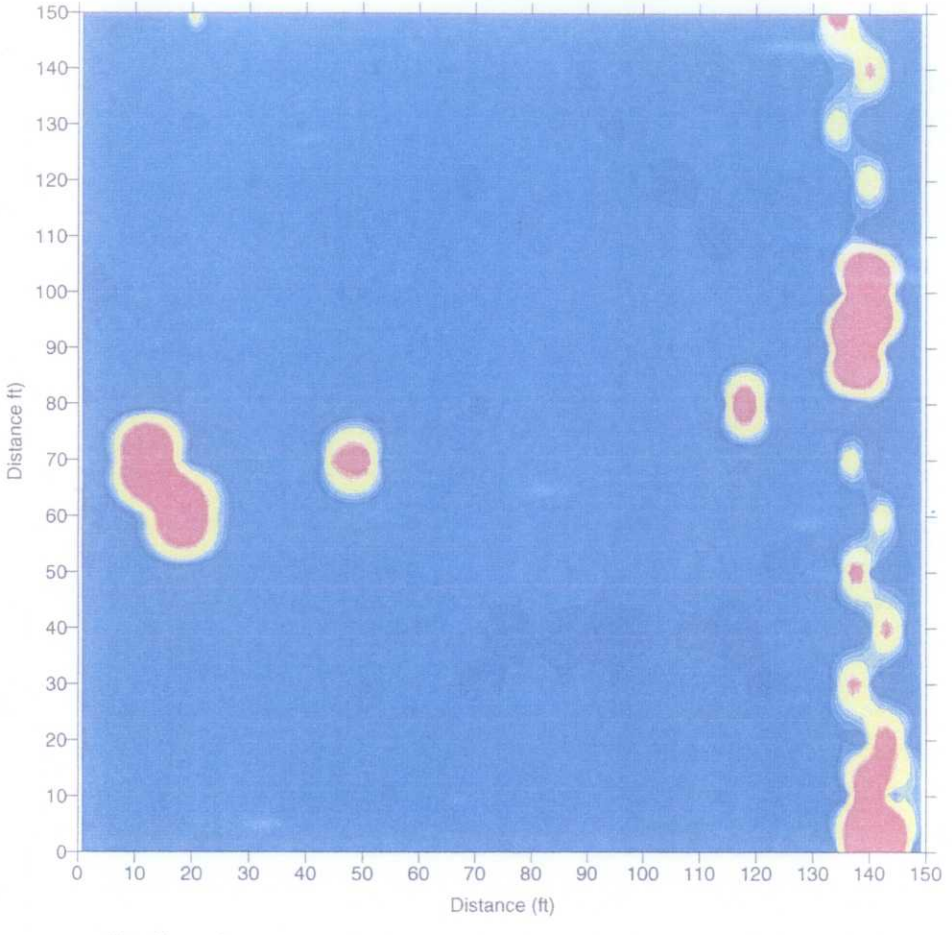
EM or magnetic anomaly Interpreted to be buried debris

SITE I1
MAGNETOMETRY SURVEY
Mag 858 GRADIENT

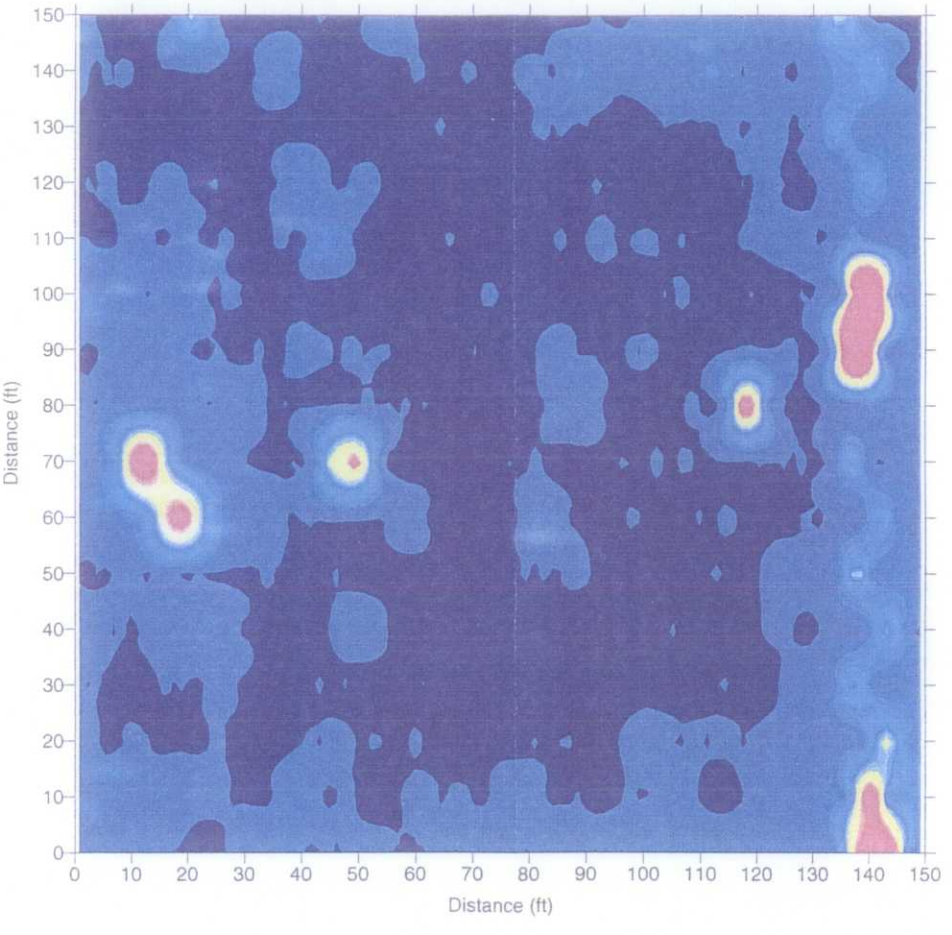
GEOPHYSICAL ASSESSMENT
GAMBELL, ST. LAWRENCE ISLAND, AK
MONTGOMERY WATSON

GOLDER ASSOCIATES, INC.
REDMOND, WA

August 15, 2000 | 003-5435 task 000 | Fig. 11

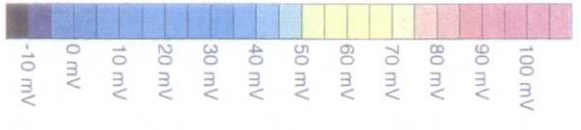


Top Channel



Bottom Channel

EM-61 response

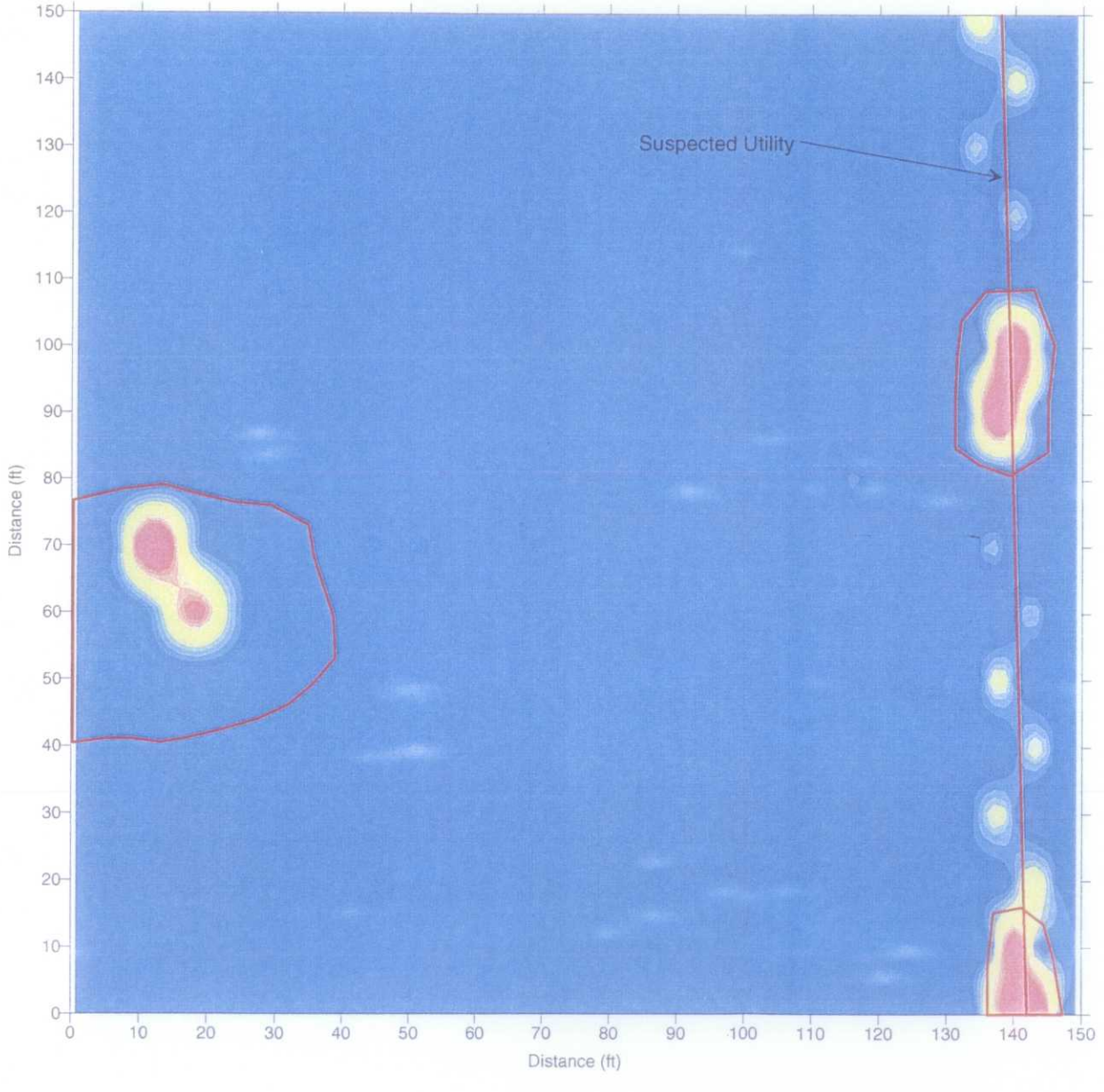


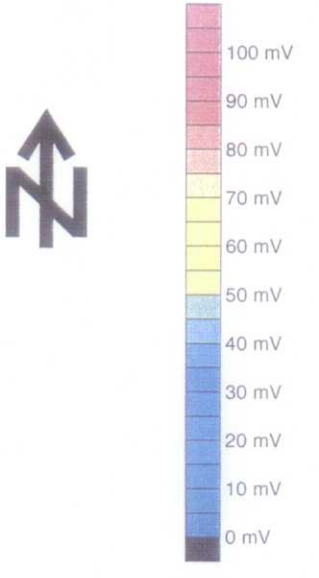
SITE I1
TIME DOMAIN EM
EM-61 TOP AND BOTTOM CHANNELS

GEOPHYSICAL ASSESSMENT
GAMBELL, ST. LAWRENCE ISLAND, AK
MONTGOMERY WATSON

GOLDER ASSOCIATES, INC.
REDMOND, WA

August 15, 2000	003-5435 task 000	Fig. 12





Surface features/surfice debris

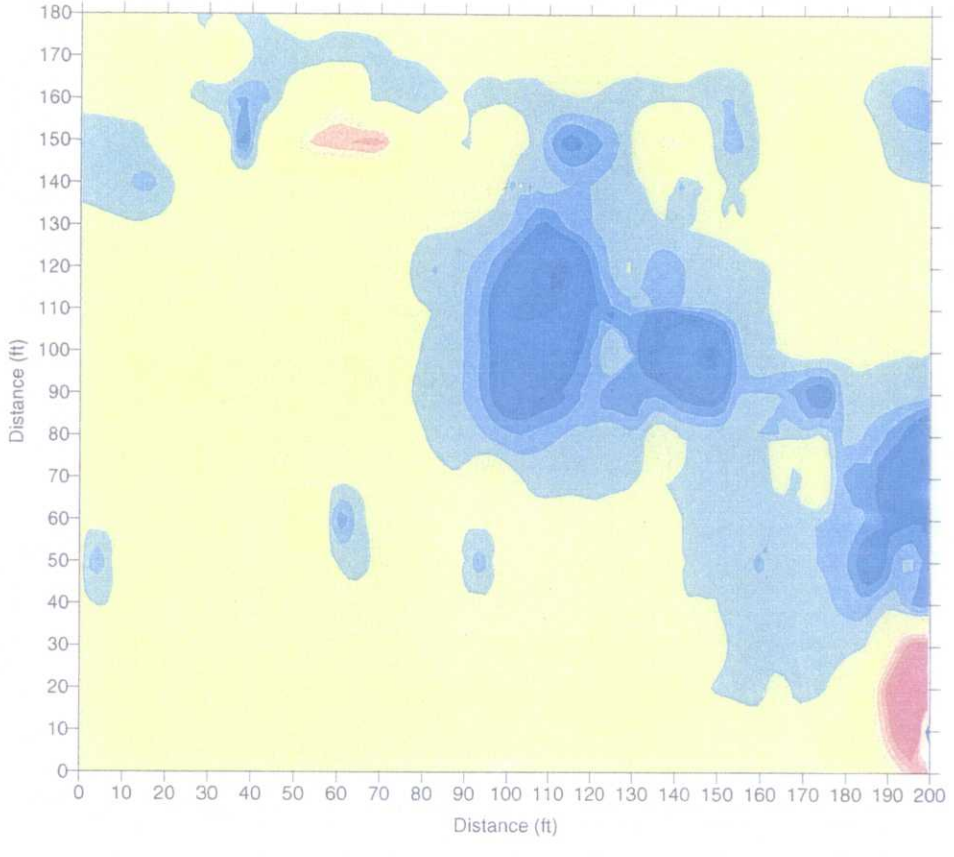
EM or magnetic anomaly
Interpreted to be buried debris

SITE I1
TIME DOMAIN EM
EM-61 DIFFERENTIAL CHANNEL

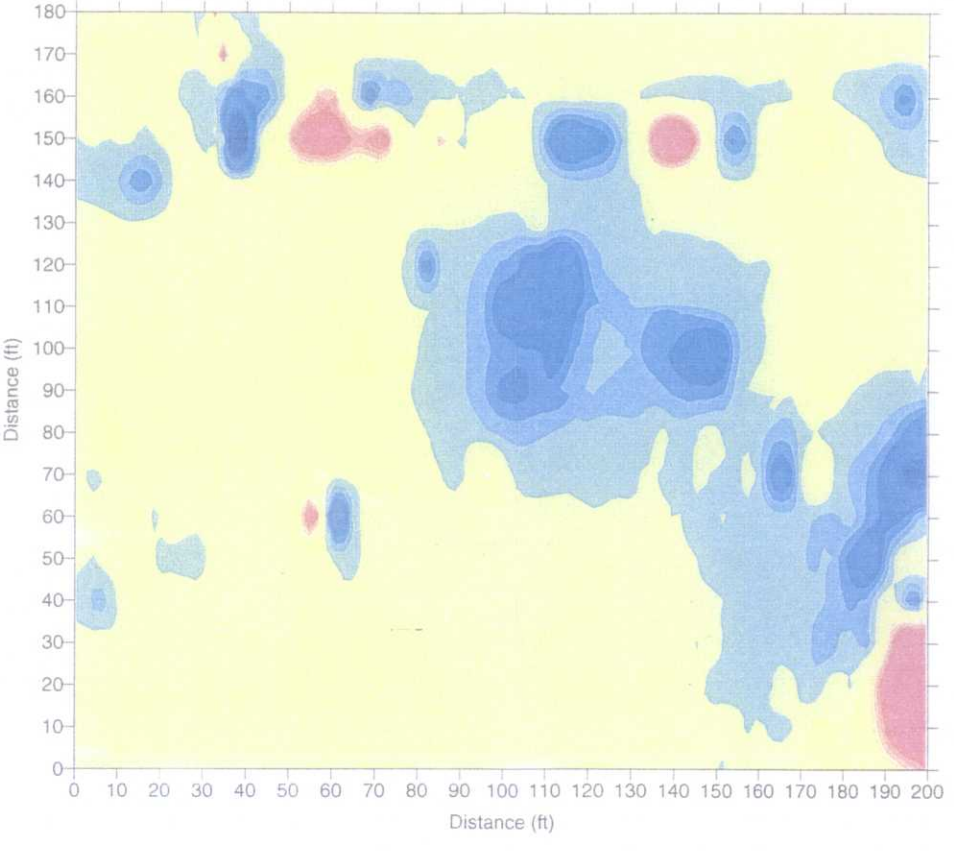
GEOPHYSICAL ASSESSMENT
GAMBELL, ST. LAWRENCE ISLAND, AK
MONTGOMERY WATSON

GOLDER ASSOCIATES, INC.
REDMOND, WA

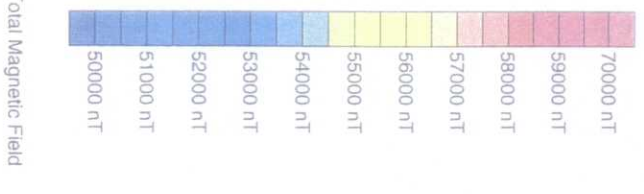
August 15, 2000 | 003-5435 task 000 | Fig. 13



Top Sensor



Bottom Sensor

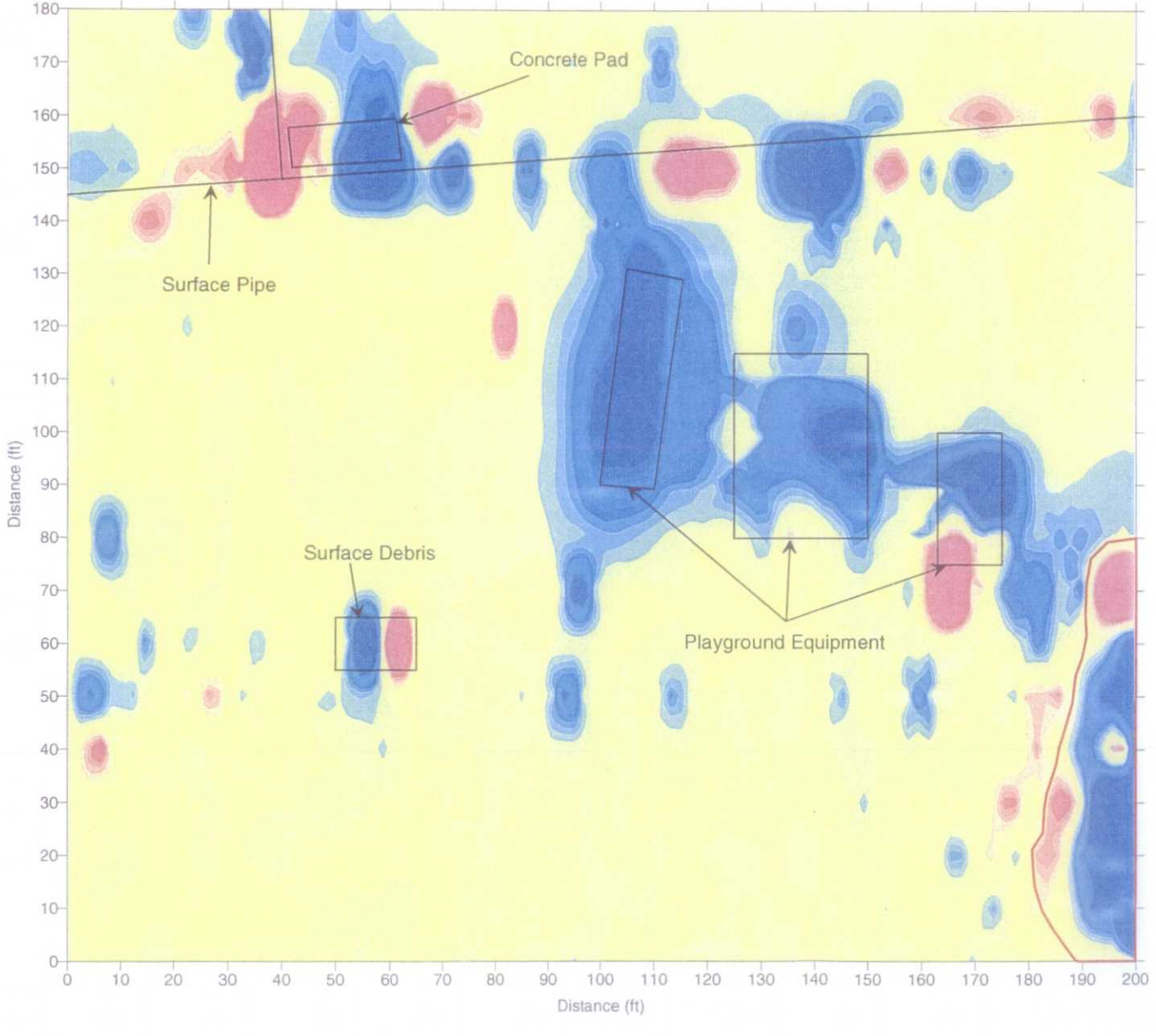


SITE I2
MAGNETOMETRY SURVEY
Mag 858 TOTAL FIELD

GEOPHYSICAL ASSESSMENT
GAMBELL, ST. LAWRENCE ISLAND, AK
MONTGOMERY WATSON

GOLDER ASSOCIATES, INC.
REDMOND, WA

August 15, 2000	003-5435 task 000	Fig. 14



10000 nT/ft
400 nT/ft
300 nT/ft
200 nT/ft
100 nT/ft
0 nT/ft
-100 nT/ft
-200 nT/ft
-300 nT/ft
-400 nT/ft
-500 nT/ft

Vertical Magnetic Field Gradient

N

0 ft 25 ft 50 ft

Surface features/surface debris

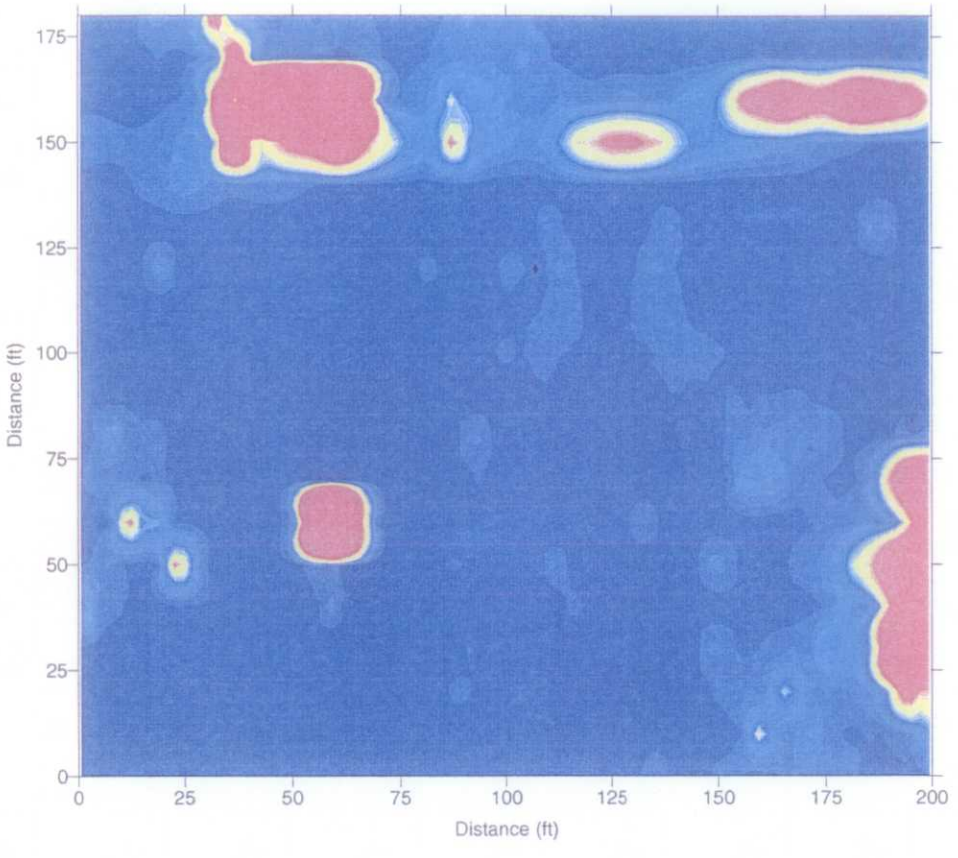
EM or magnetic anomaly Interpreted to be buried debris

SITE I2
MAGNETOMETRY SURVEY
Mag 858 GRADIENT

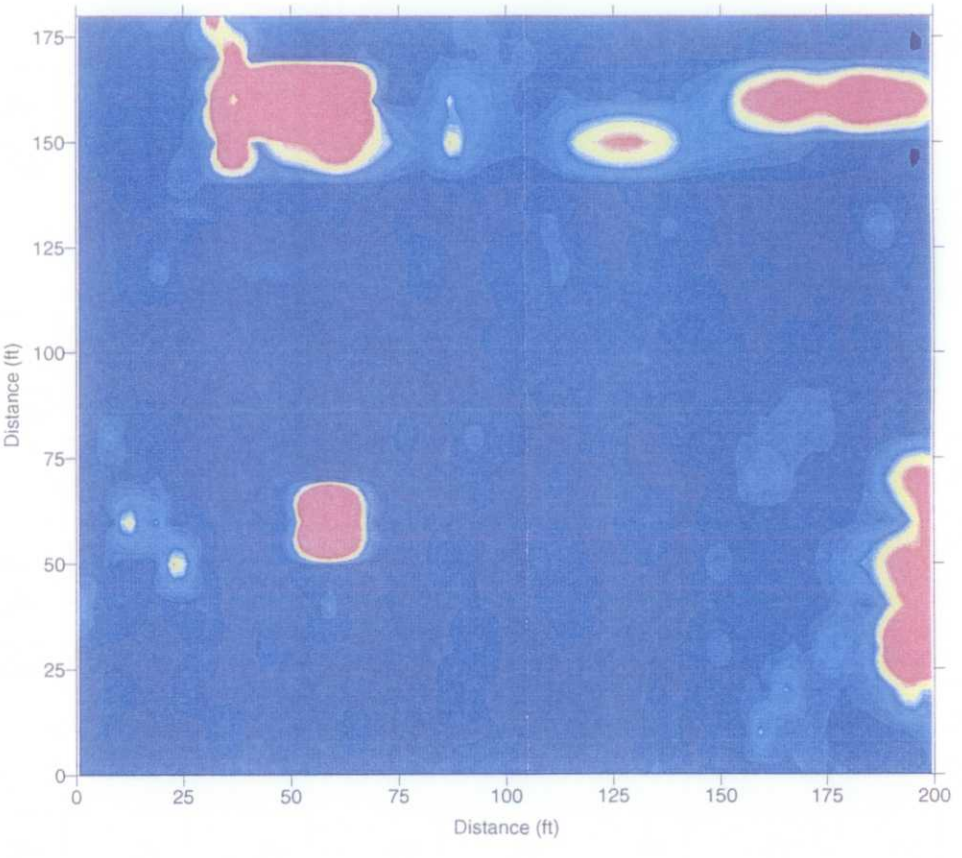
GEOPHYSICAL ASSESSMENT
GAMBELL, ST. LAWRENCE ISLAND, AK
MONTGOMERY WATSON

GOLDER ASSOCIATES, INC.
REDMOND, WA

August 15, 2000 | 003-5435 task 000 | Fig. 15



Top Channel



Bottom Channel

EM-61 response

-100 mV | 0 mV | 100 mV | 200 mV | 300 mV | 400 mV | 500 mV | 600 mV | 700 mV | 800 mV | 900 mV | 1000 mV

0 ft 25 ft 50 ft

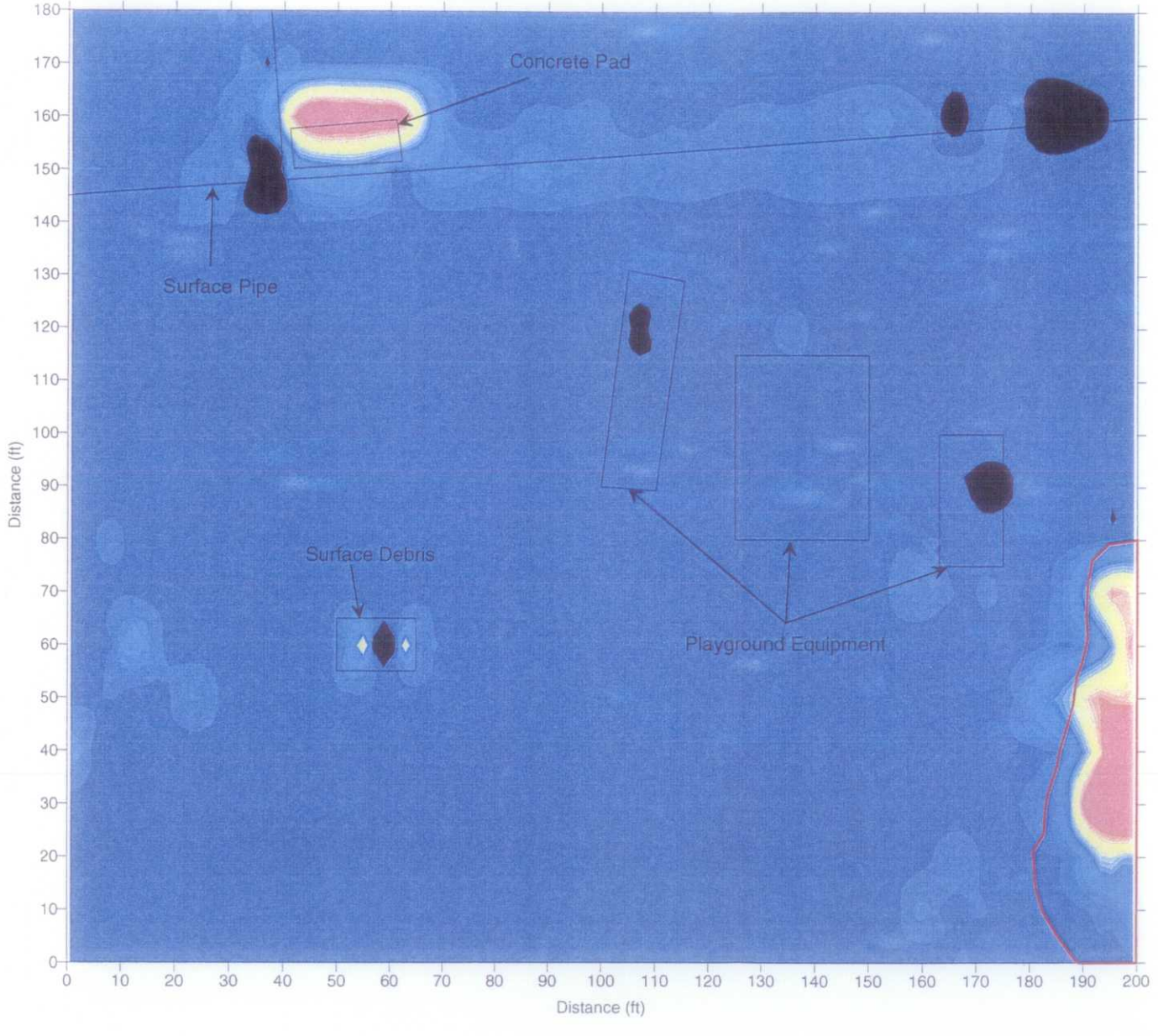
N

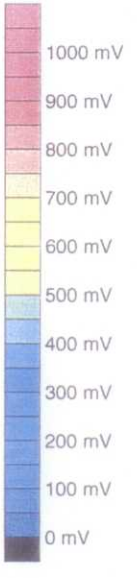
SITE I2
TIME DOMAIN EM
EM-61 TOP AND BOTTOM CHANNELS

GEOPHYSICAL ASSESSMENT
GAMBELL, ST. LAWRENCE ISLAND, AK
MONTGOMERY WATSON

GOLDER ASSOCIATES, INC.
REDMOND, WA

August 15, 2000 | 003-5435 task 000 | Fig. 16





EM-61 response

0 ft 25 ft 50 ft

Surface features/surfice debris

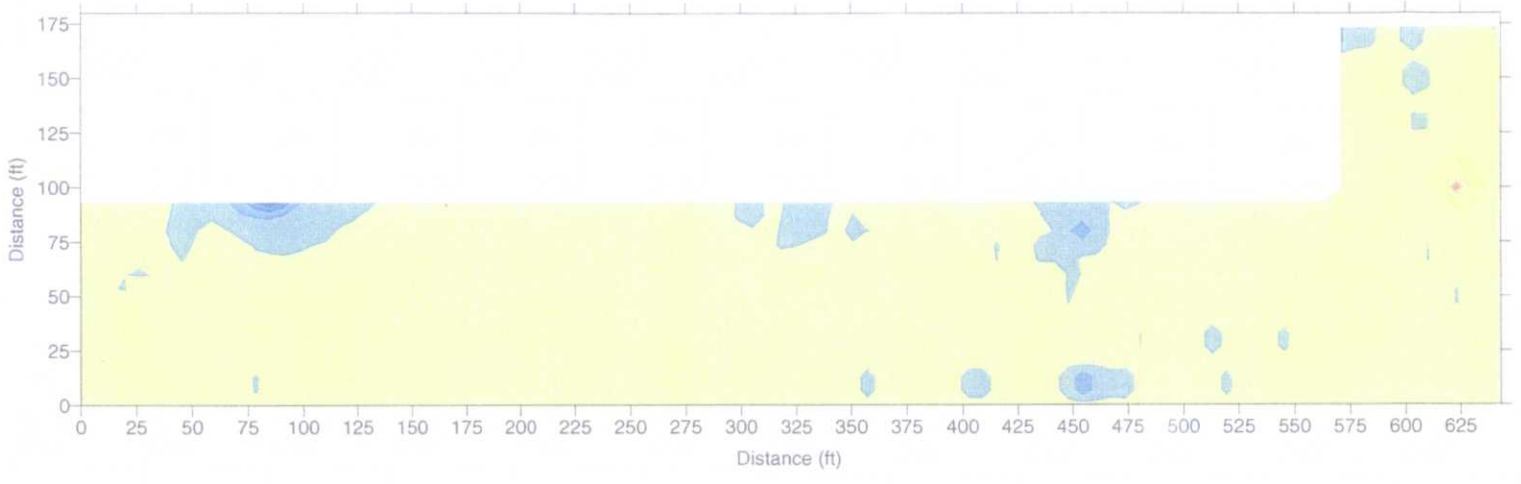
EM or magnetic anomaly
Interpreted to be buried debris

SITE I2
TIME DOMAIN EM
EM-61 DIFFERENTIAL CHANNEL

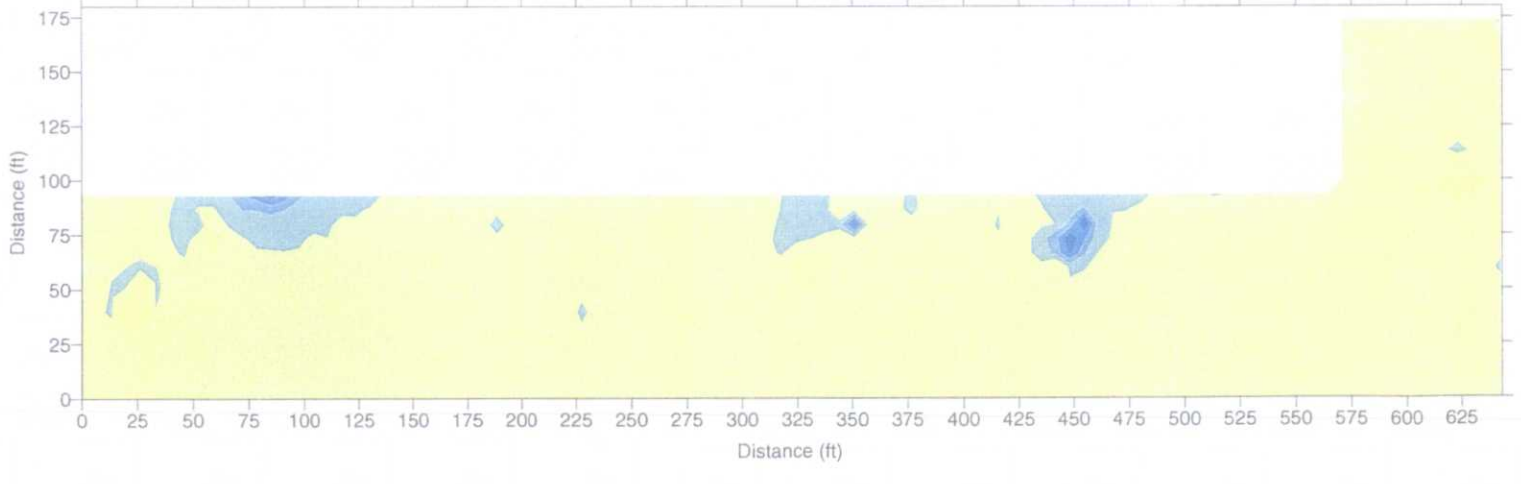
GEOPHYSICAL ASSESSMENT
GAMBELL, ST. LAWRENCE ISLAND, AK
MONTGOMERY WATSON

GOLDER ASSOCIATES, INC.
REDMOND, WA

August 15, 2000	003-5435 task 000	Fig. 17

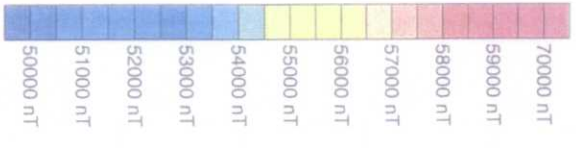


Top Sensor



Bottom Sensor

Total Magnetic Field

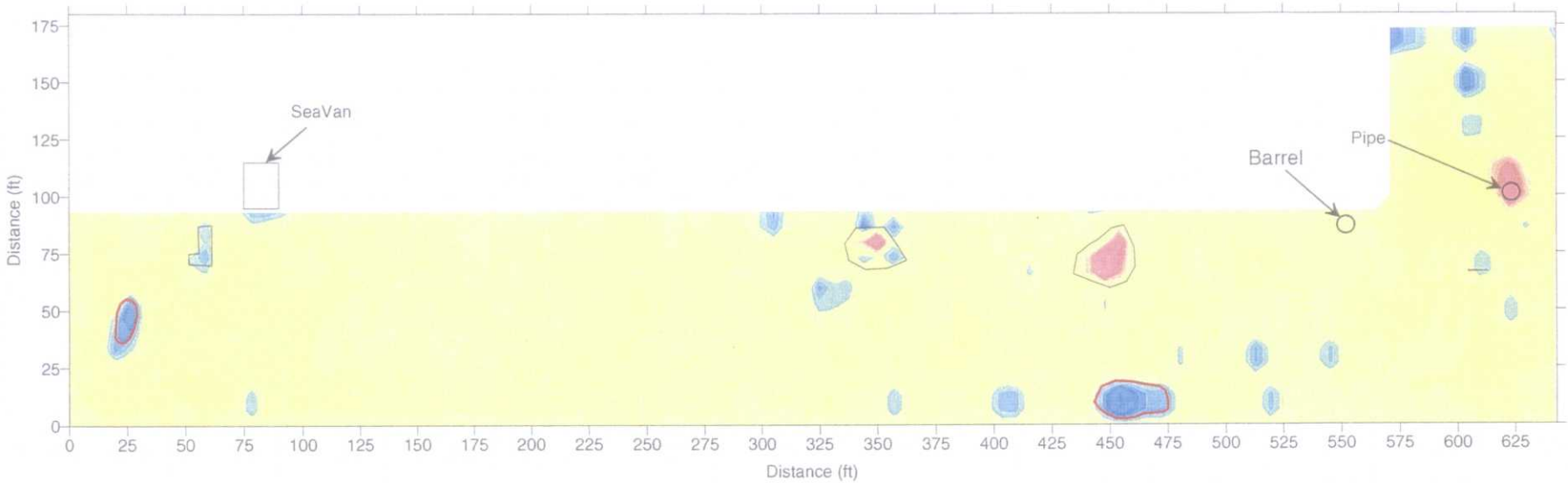


SITE J
MAGNETOMETRY SURVEY
Mag 858 TOTAL FIELD

GEOPHYSICAL ASSESSMENT
GAMBELL, ST. LAWRENCE ISLAND, AK
MONTGOMERY WATSON

GOLDER ASSOCIATES, INC.
REDMOND, WA

August 15, 2000	003-5435 task 000	Fig. 18



Vertical Magnetic Field Gradient

-500 nT/ft
-400 nT/ft
-300 nT/ft
-200 nT/ft
-100 nT/ft
0 nT/ft
100 nT/ft
200 nT/ft
300 nT/ft
400 nT/ft
10000 nT/ft

0 ft 25 ft 50 ft 75 ft 100 ft

Surface features/surfice debris

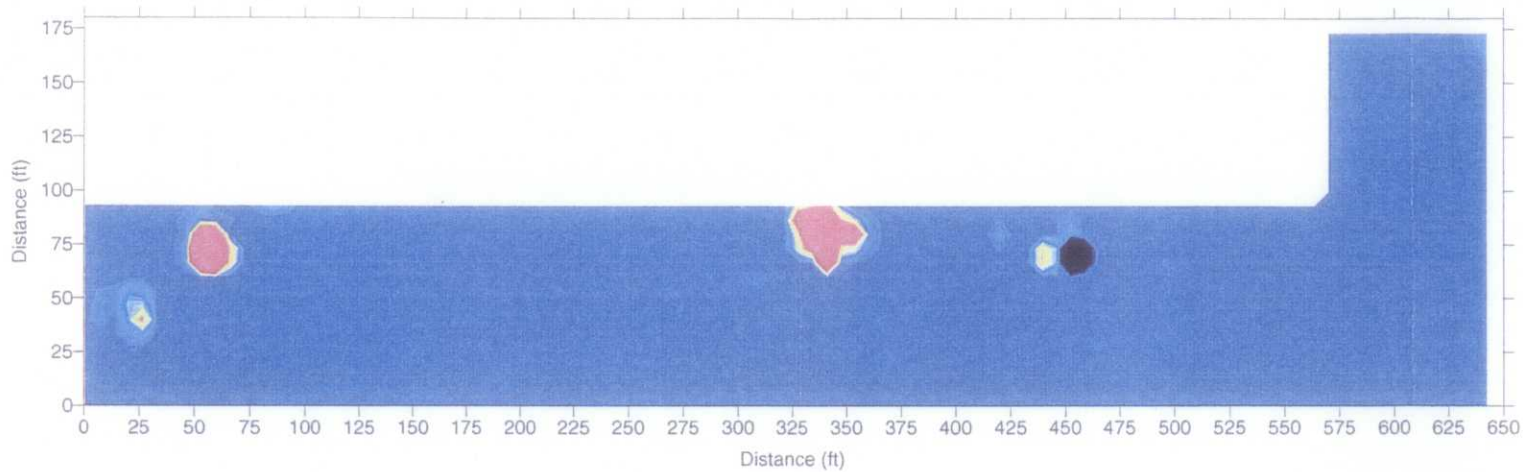
EM or magnetic anomaly
Interpreted to be buried debris

SITE J
MAGNETOMETRY SURVEY
Mag 858 GRADIENT

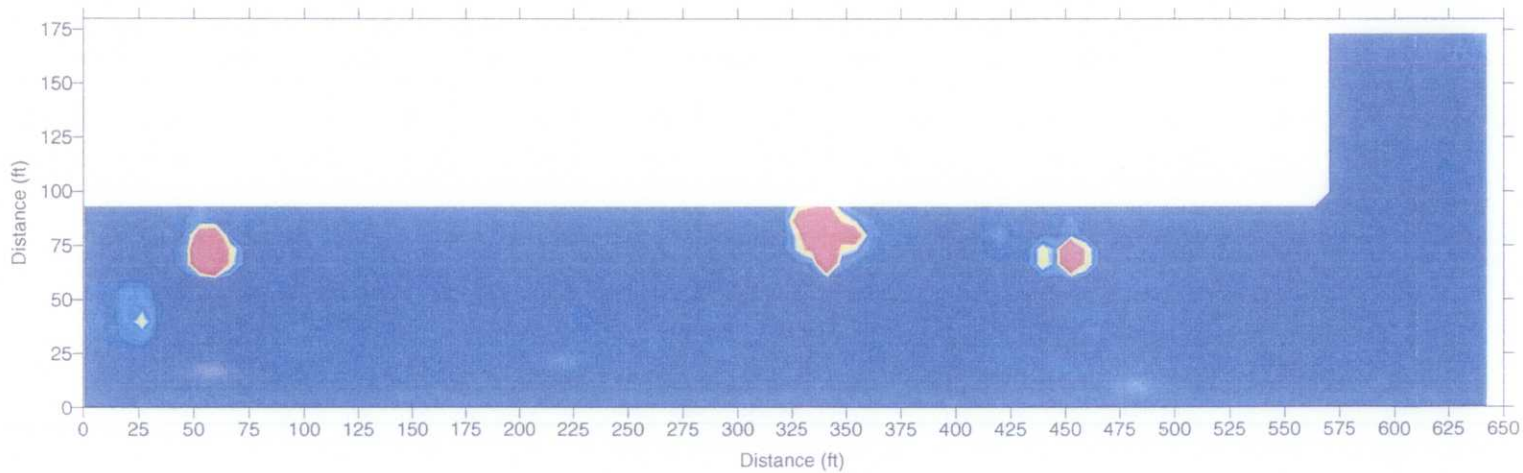
GEOPHYSICAL ASSESSMENT
GAMBELL, ST. LAWRENCE ISLAND, AK
MONTGOMERY WATSON

GOLDER ASSOCIATES, INC.
REDMOND, WA

August 15, 2000 | 003-5435 task 000 | Fig. 19

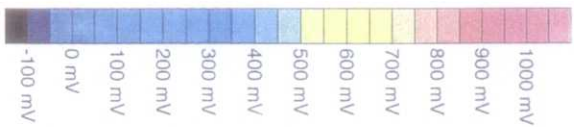


Top Channel



Bottom Channel

EM-61 response

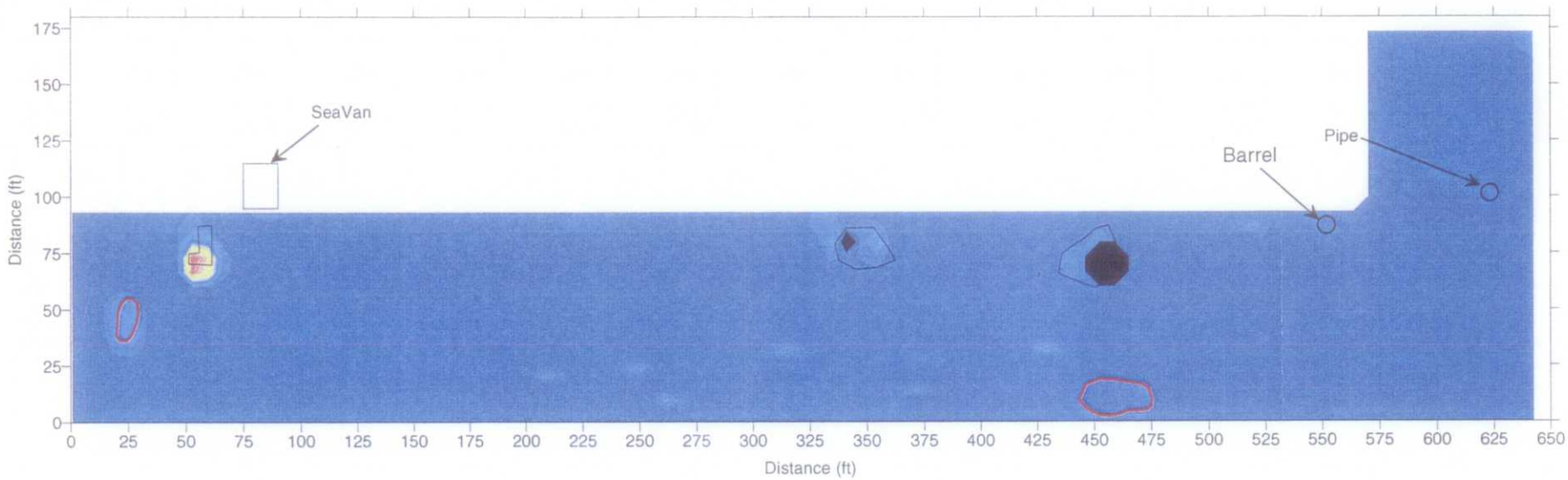


SITE J
TIME DOMAIN EM
EM-61 TOP AND BOTTOM CHANNELS

GEOPHYSICAL ASSESSMENT
GAMBELL, ST. LAWRENCE ISLAND, AK
MONTGOMERY WATSON

GOLDER ASSOCIATES, INC.
REDMOND, WA

August 15, 2000	003-5435 task 000	Fig. 20



EM-61 response

0 mV 100 mV 200 mV 300 mV 400 mV 500 mV 600 mV 700 mV 800 mV 900 mV 1000 mV

0 ft 25 ft 50 ft 75 ft 100 ft

Surface features/surfice debris

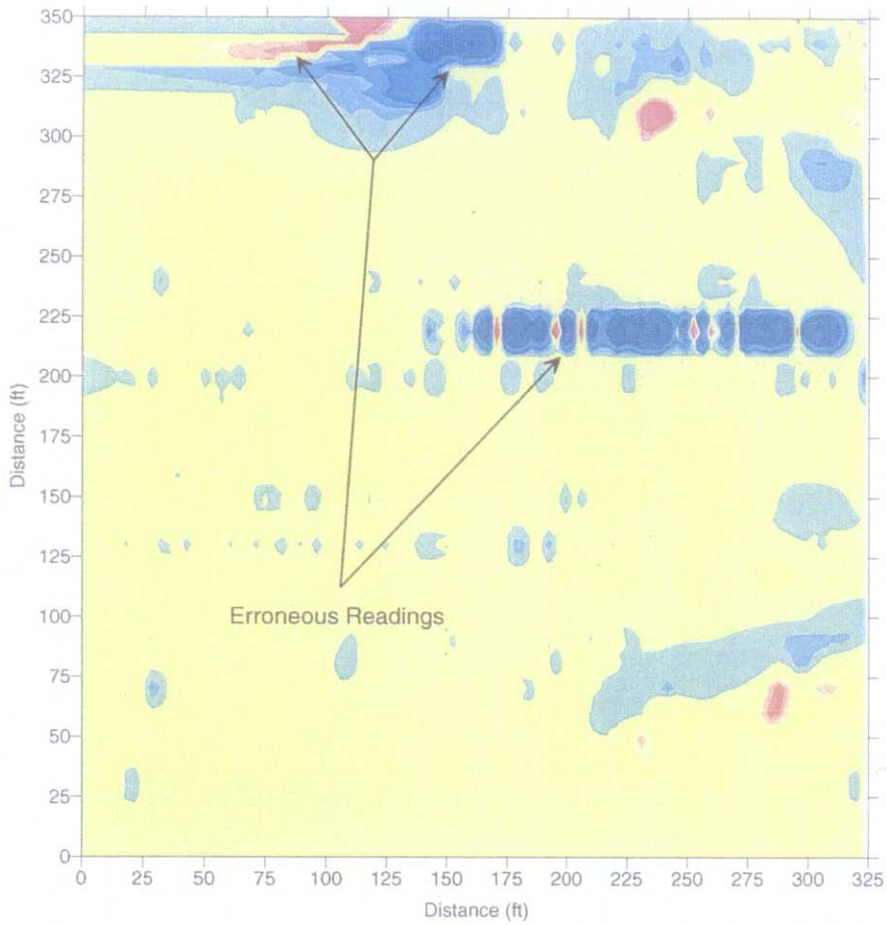
EM or magnetic anomaly
Interpreted to be buried debris

SITE J
TIME DOMAIN EM
EM-61 DIFFERENTIAL CHANNEL

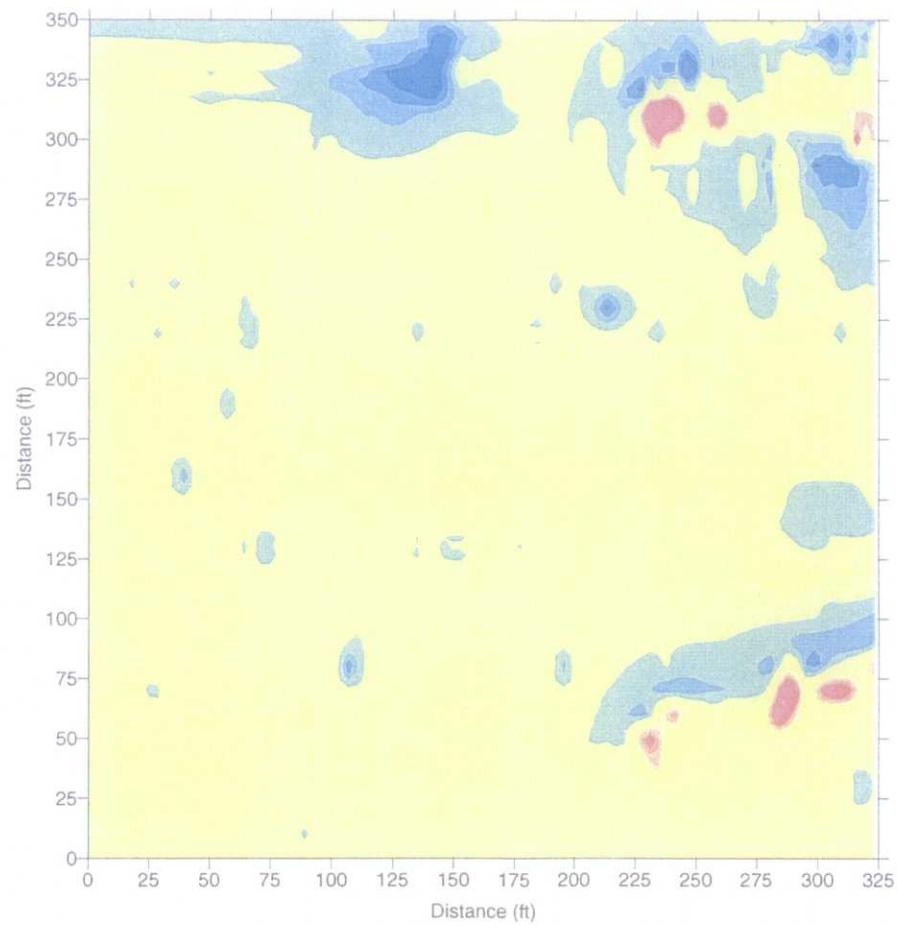
GEOPHYSICAL ASSESSMENT
GAMBELL, ST. LAWRENCE ISLAND, AK
MONTGOMERY WATSON

GOLDER ASSOCIATES, INC.
REDMOND, WA

August 15, 2000 | 003-5435 task 000 | Fig. 21



Top Sensor



Bottom Sensor

Total Magnetic Field

50000 nT 51000 nT 52000 nT 53000 nT 54000 nT 55000 nT 56000 nT 57000 nT 58800 nT 59000 nT 70000 nT

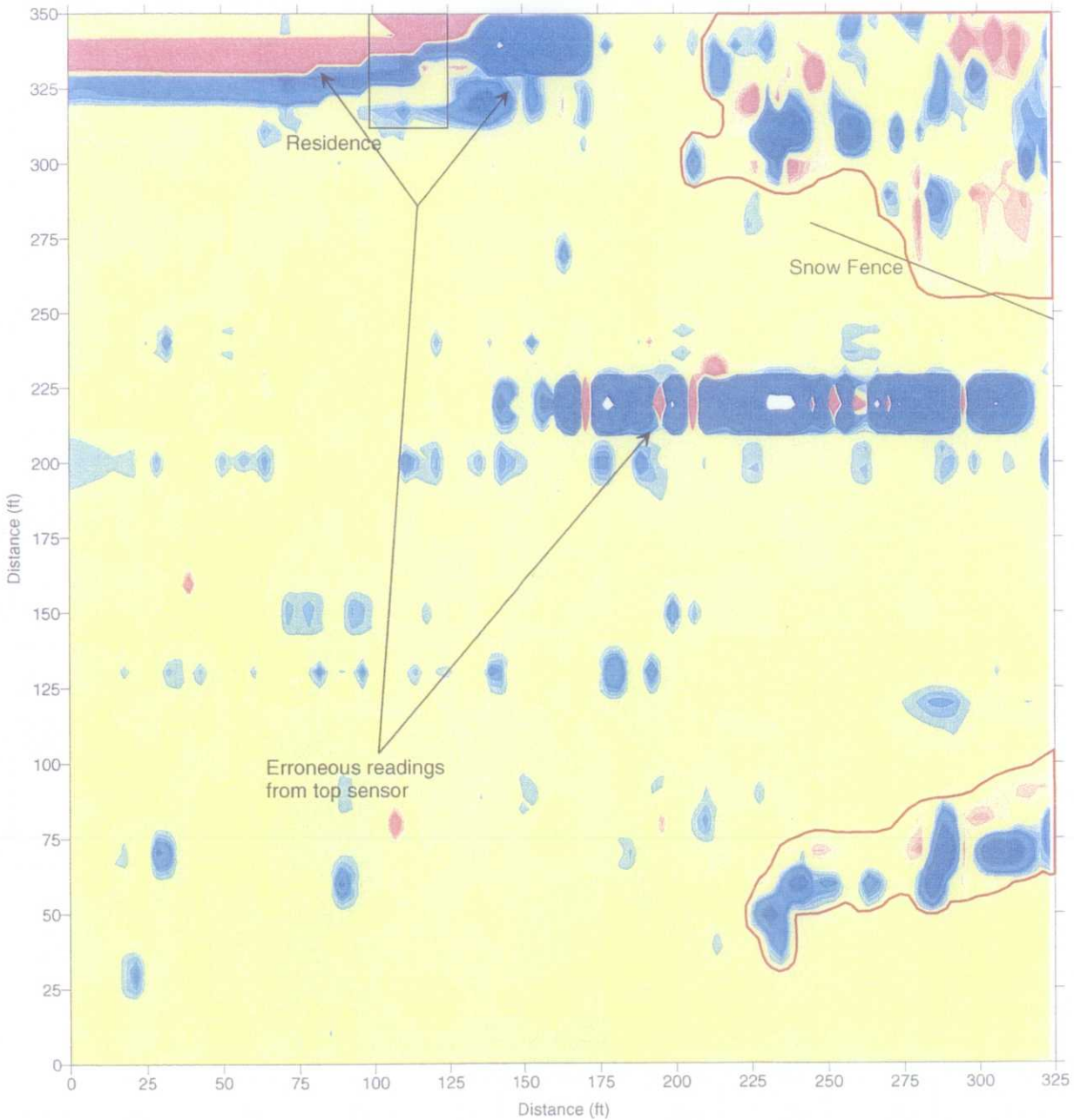
0 ft 25 ft 50 ft 75 ft 100 ft

SITE K
MAGNETOMETRY SURVEY
Mag 858 TOTAL FIELD

GEOPHYSICAL ASSESSMENT
GAMBELL, ST. LAWRENCE ISLAND, AK
MONTGOMERY WATSON

GOLDER ASSOCIATES, INC.
REDMOND, WA

August 15, 2000 | 003-5435 task 000 | Fig. 22



10000 nT/ft
400 nT/ft
300 nT/ft
200 nT/ft
100 nT/ft
0 nT/ft
-100 nT/ft
-200 nT/ft
-300 nT/ft
-400 nT/ft
-500 nT/ft

Vertical Magnetic
Field Gradient

N

0 ft 25 ft 50 ft 75 ft 100 ft

Surface features/surfice debris

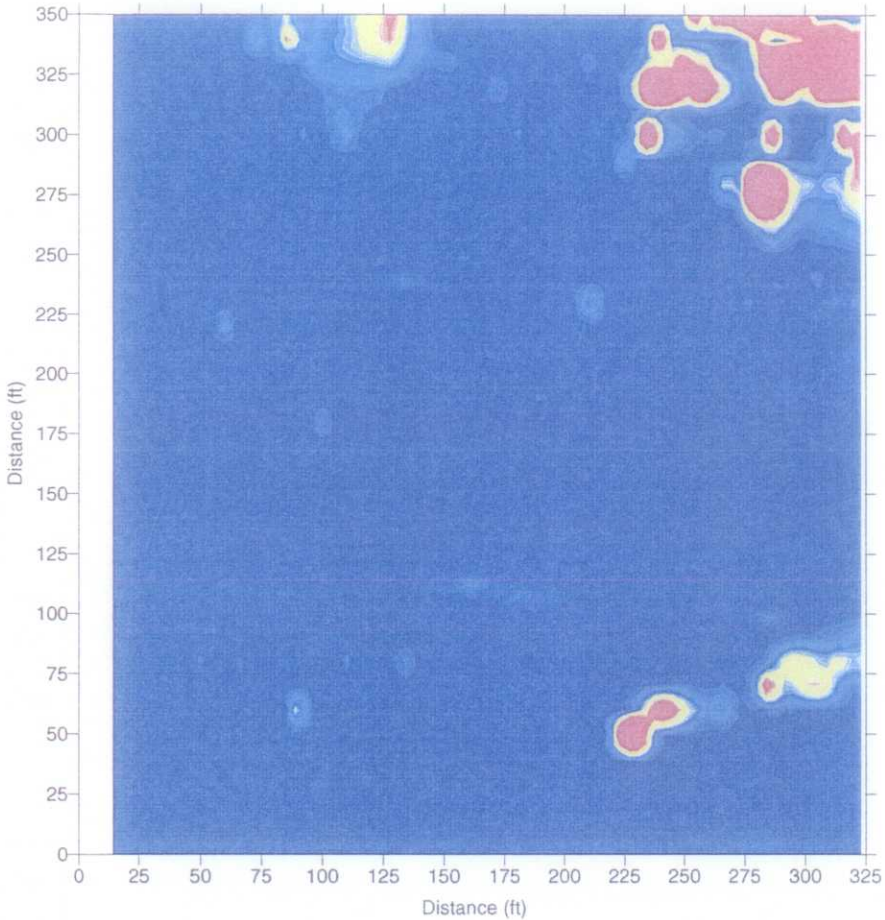
EM or magnetic anomaly
Interpreted to be buried debris

SITE K
MAGNETOMETRY SURVEY
Mag 858 GRADIENT

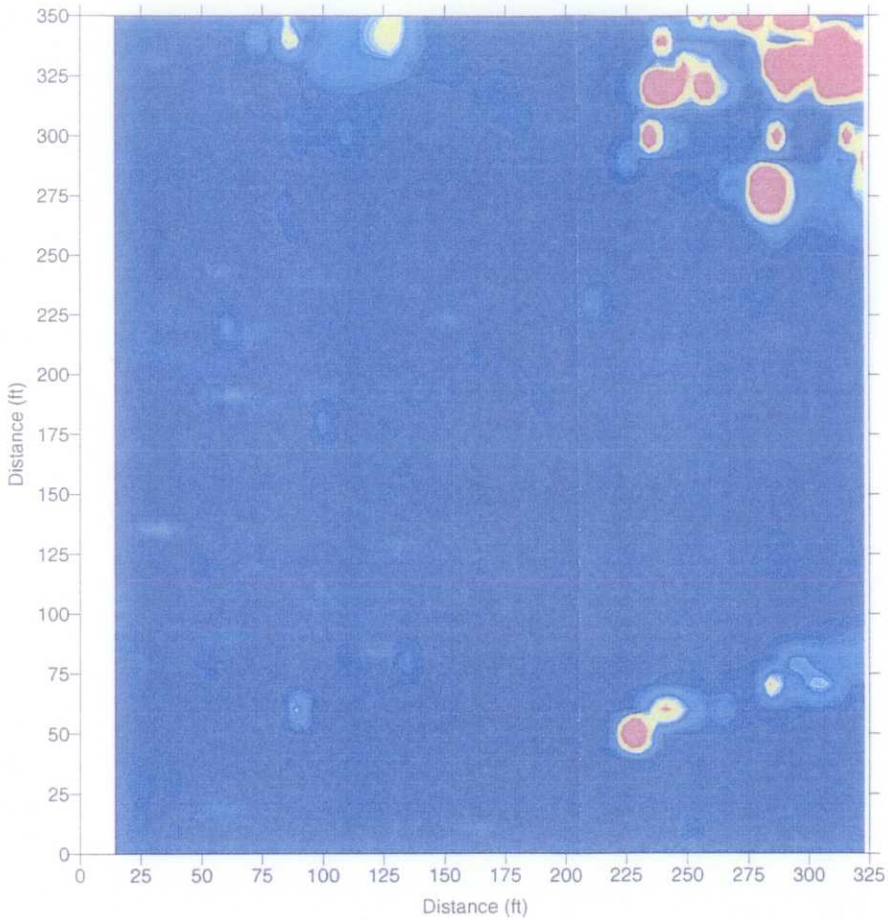
GEOPHYSICAL ASSESSMENT
GAMBELL, ST. LAWRENCE ISLAND, AK
MONTGOMERY WATSON

GOLDER ASSOCIATES, INC.
REDMOND, WA

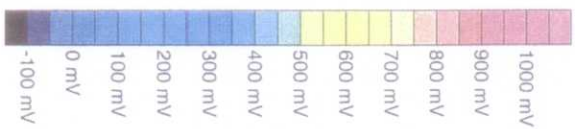
August 15, 2000 | 003-5435 task 000 | Fig. 23



Top Channel



Bottom Channel

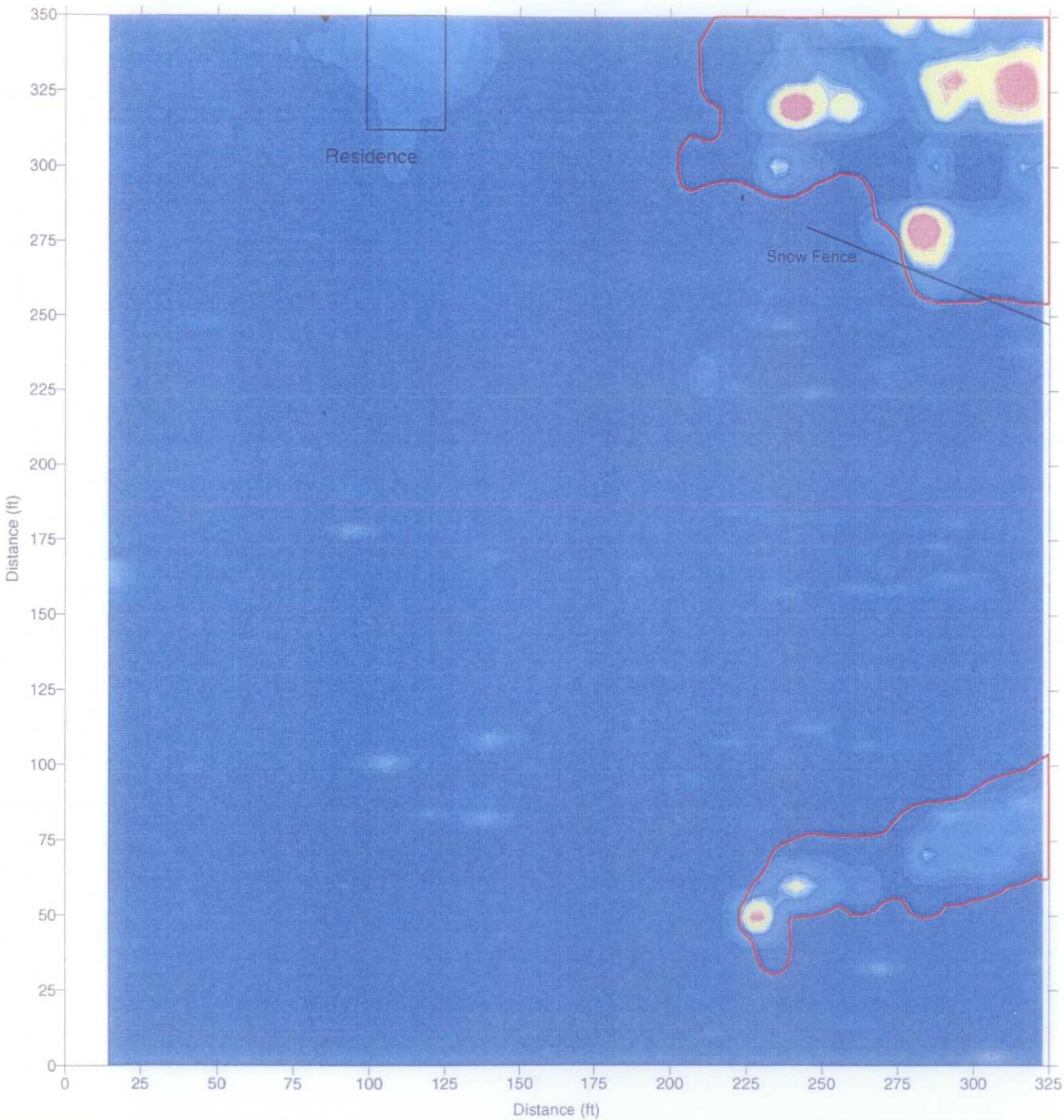


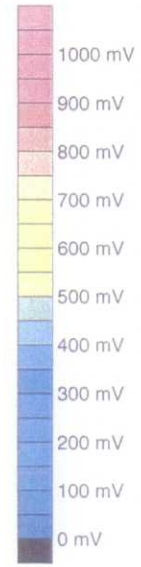
SITE K
TIME DOMAIN EM
EM-61 TOP AND BOTTOM CHANNELS

GEOPHYSICAL ASSESSMENT
GAMBELL, ST. LAWRENCE ISLAND, AK
MONTGOMERY WATSON

GOLDER ASSOCIATES, INC.
REDMOND, WA

August 15, 2000	003-5435 task 000	Fig. 24





EM-61 response

0 ft 25 ft 50 ft 75 ft 100 ft

Surface features/surfice debris

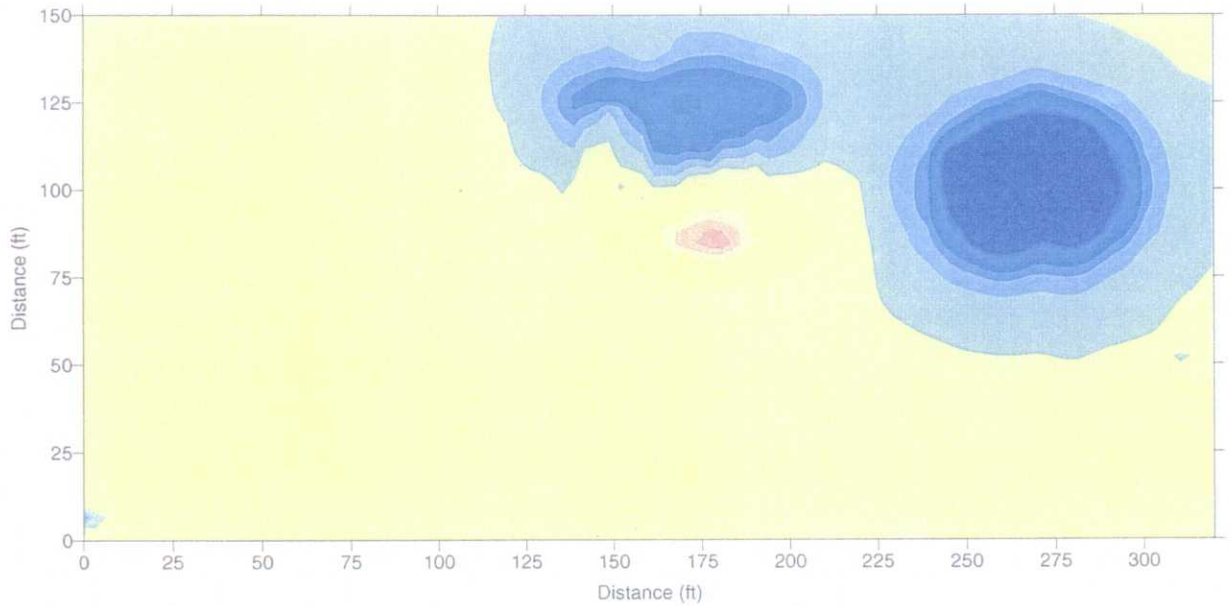
EM or magnetic anomaly
Interpreted to be buried debris

SITE K
TIME DOMAIN EM
EM-61 DIFFERENTIAL CHANNEL

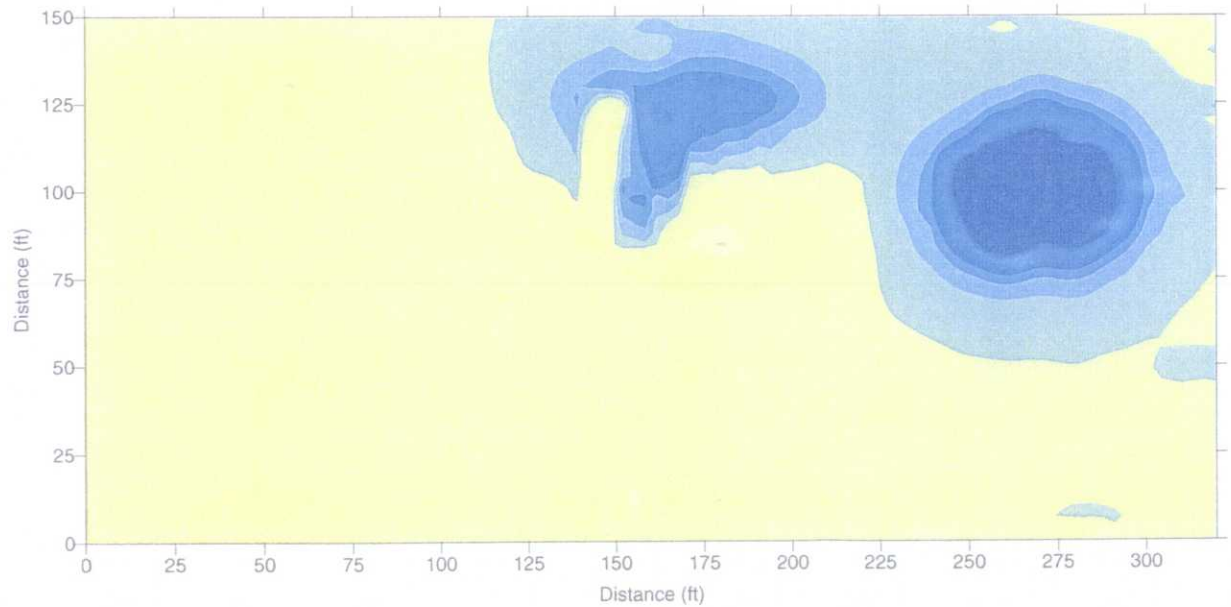
GEOPHYSICAL ASSESSMENT
GAMBELL, ST. LAWRENCE ISLAND, AK
MONTGOMERY WATSON

GOLDER ASSOCIATES, INC.
REDMOND, WA

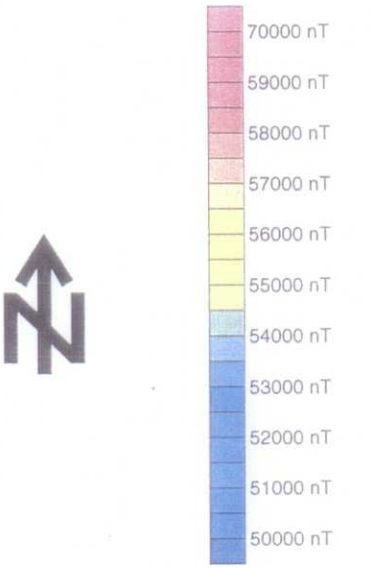
August 15, 2000 | 003-5435 task 000 | Fig. 25



Top Sensor



Bottom Sensor



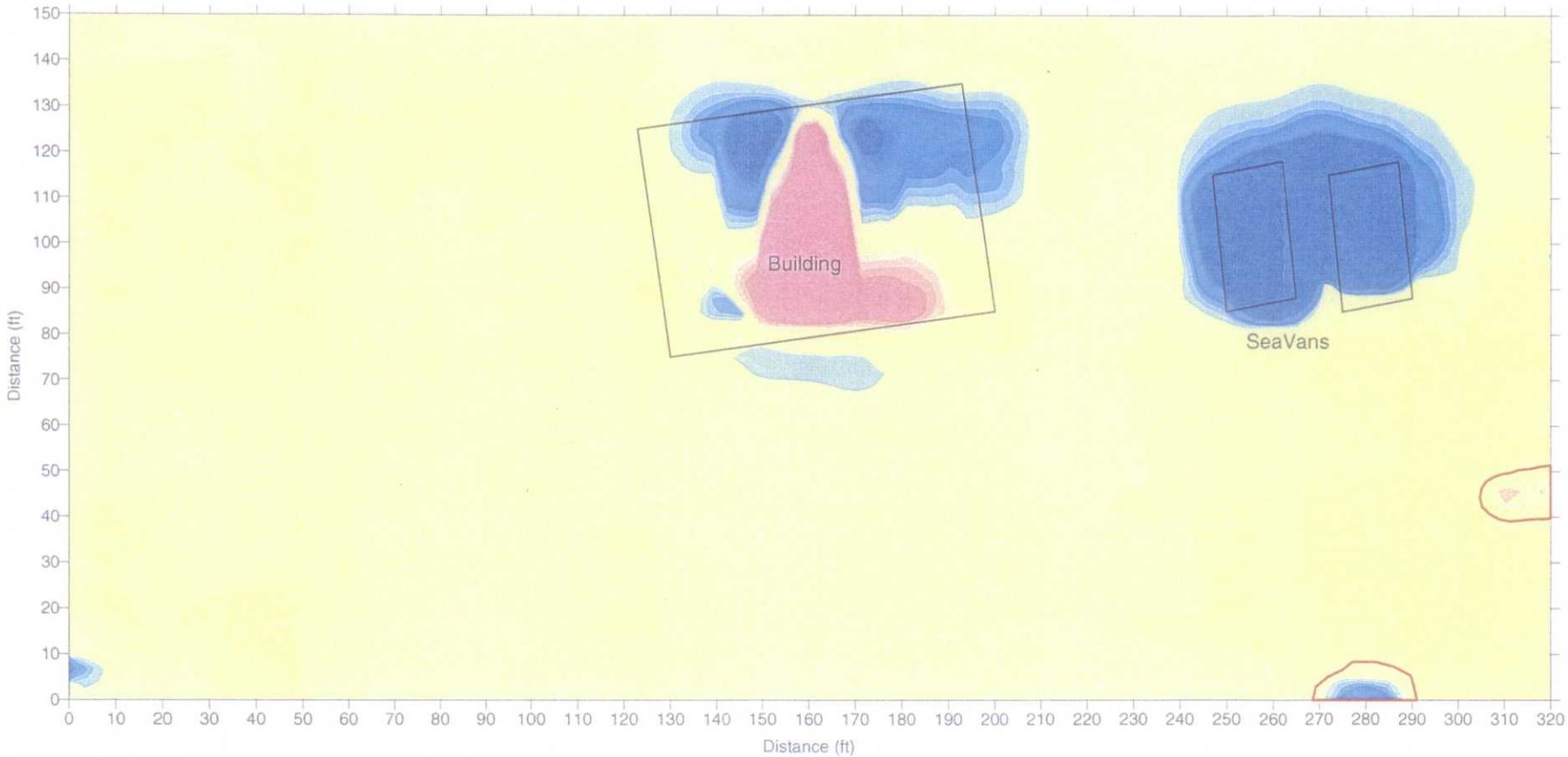
Total Magnetic Field

SITE L
MAGNETOMETRY SURVEY
Mag 858 TOTAL FIELD

GEOPHYSICAL ASSESSMENT
GAMBELL, ST. LAWRENCE ISLAND, AK
MONTGOMERY WATSON

GOLDER ASSOCIATES, INC.
REDMOND, WA

August 15, 2000	003-5435 task 000	Fig. 26



Vertical Magnetic Field Gradient

-500 nT/ft -400 nT/ft -300 nT/ft -200 nT/ft -100 nT/ft 0 nT/ft 100 nT/ft 200 nT/ft 300 nT/ft 400 nT/ft 10000 nT/ft

0 ft 25 ft 50 ft

Surface features/surfice debris

EM or magnetic anomaly Interpreted to be buried debris

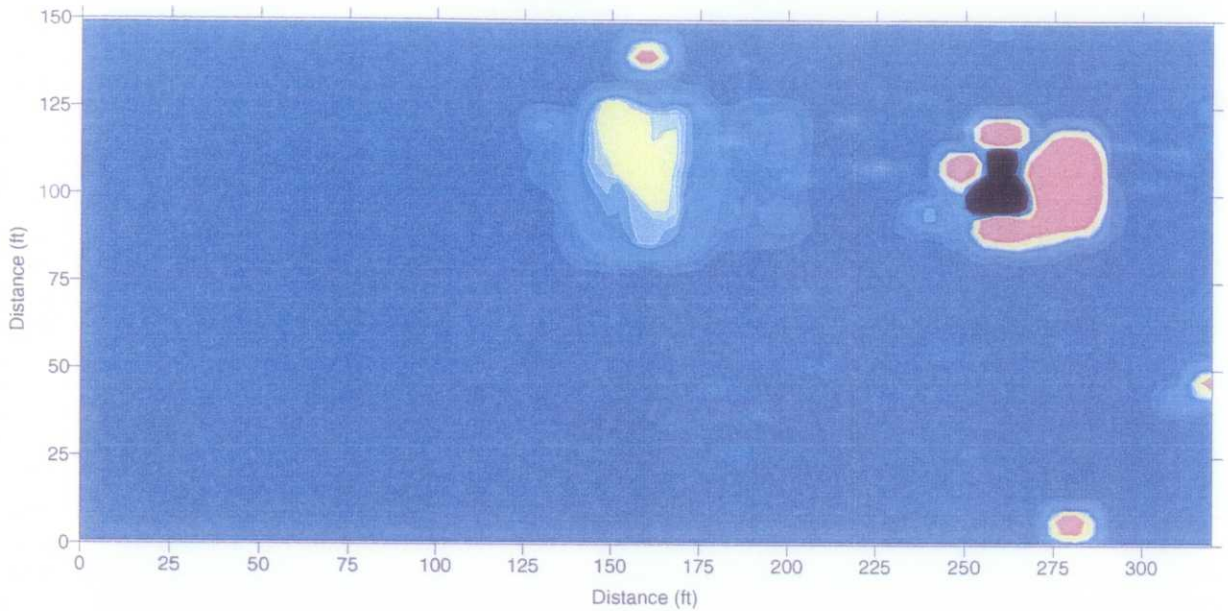
N

SITE L
MAGNETOMETRY SURVEY
Mag 858 GRADIENT

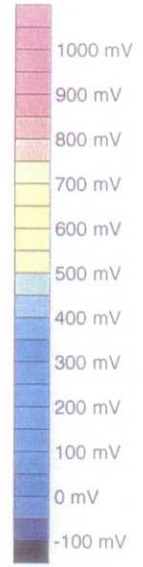
GEOPHYSICAL ASSESSMENT
GAMBELL, ST. LAWRENCE ISLAND, AK
MONTGOMERY WATSON

GOLDER ASSOCIATES, INC.
REDMOND, WA

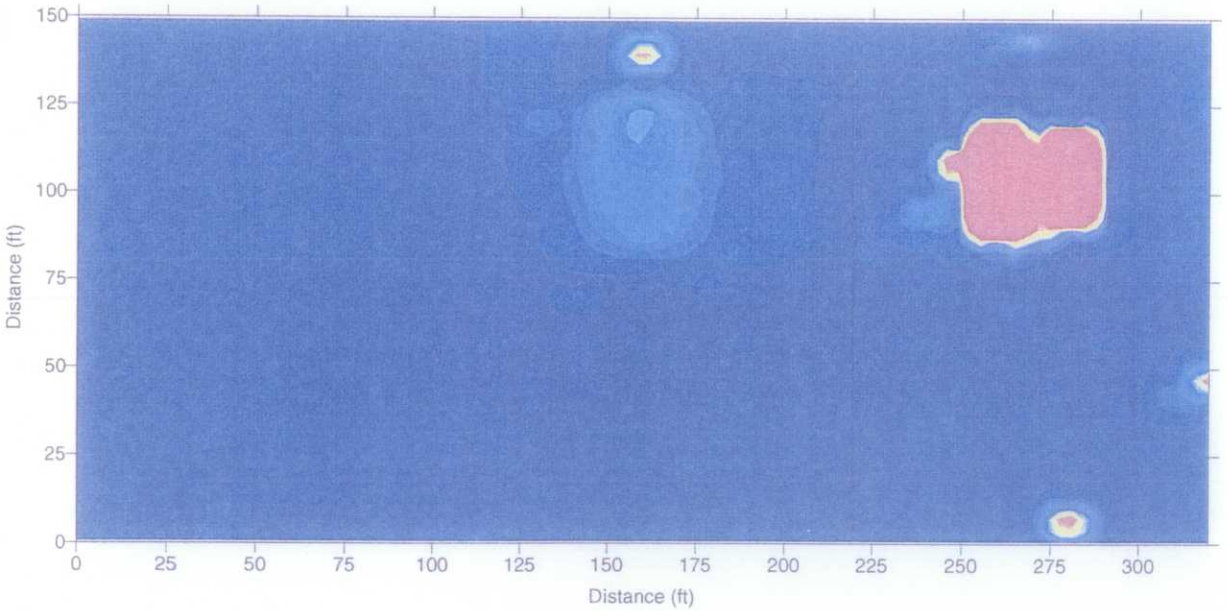
August 15, 2000 | 003-5435 task 000 | Fig. 27



Top Channel



EM-61 response



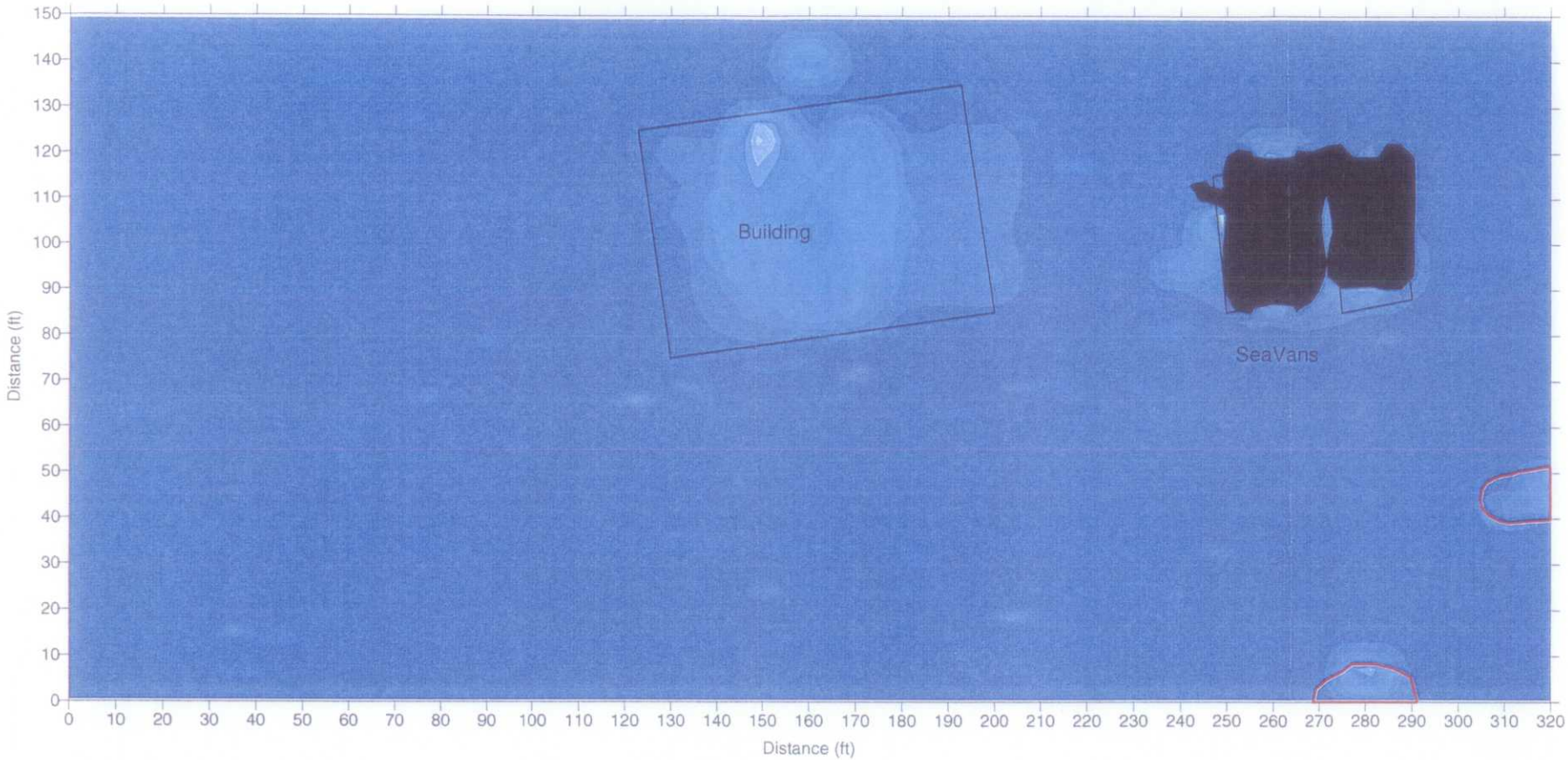
Bottom Channel

SITE L
TIME DOMAIN EM
EM-61 TOP AND BOTTOM CHANNELS

GEOPHYSICAL ASSESSMENT
GAMBELL, ST. LAWRENCE ISLAND, AK
MONTGOMERY WATSON

GOLDER ASSOCIATES, INC.
REDMOND, WA

August 15, 2000	003-5435 task 000	Fig. 28



EM-61 response

0 mV 100 mV 200 mV 300 mV 400 mV 500 mV 600 mV 700 mV 800 mV 900 mV 1000 mV

0 ft 25 ft 50 ft

Surface features/surfice debris

EM or magnetic anomaly
Interpreted to be buried debris

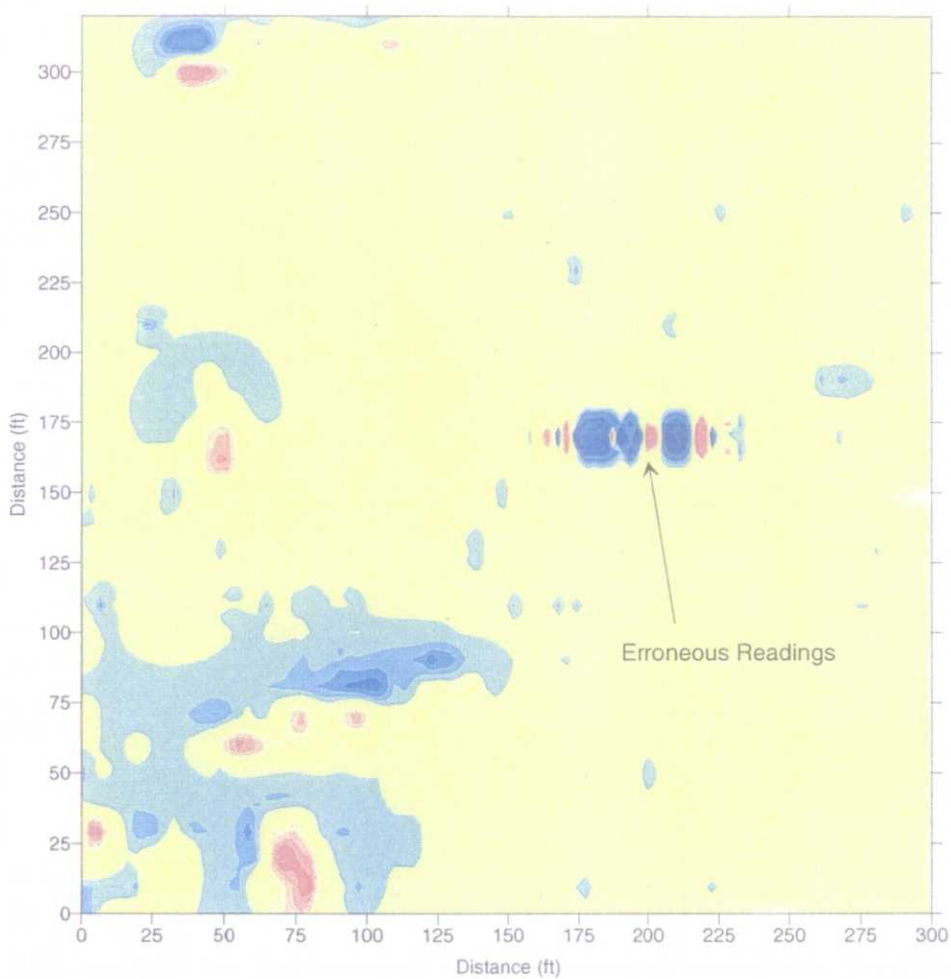
N

SITE L
TIME DOMAIN EM
EM-61 DIFFERENTIAL CHANNEL

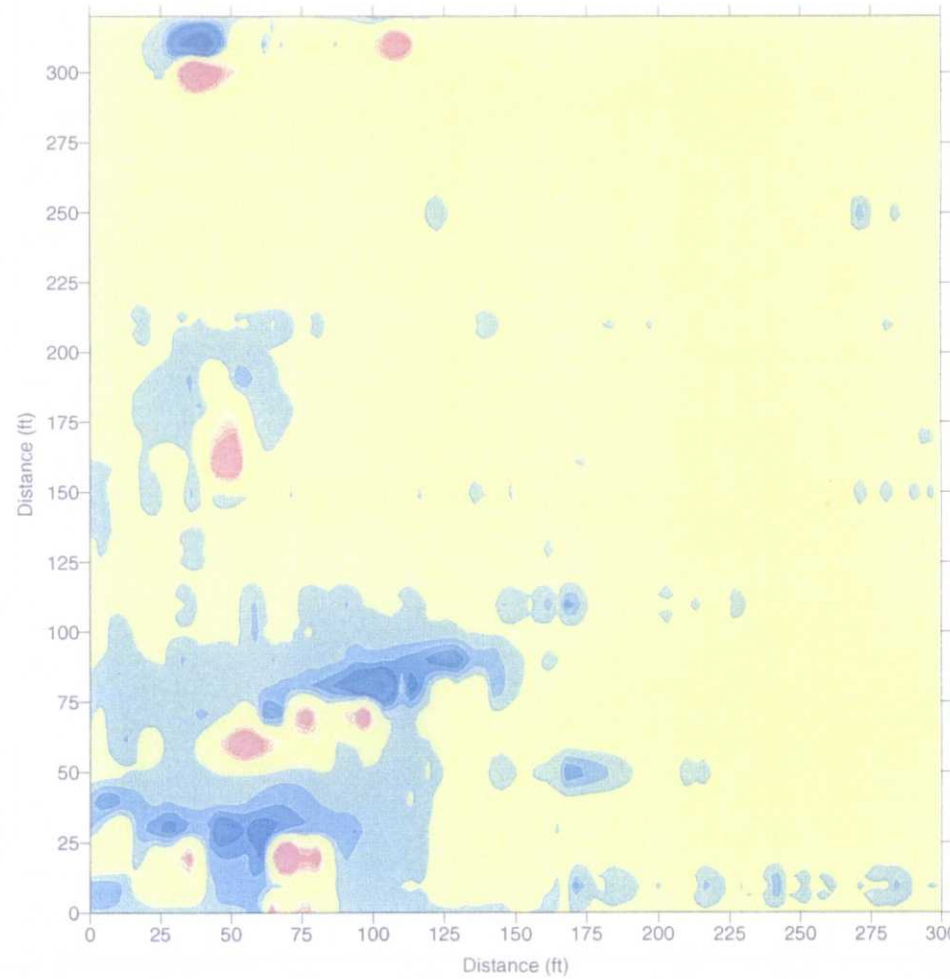
GEOPHYSICAL ASSESSMENT
GAMBELL, ST. LAWRENCE ISLAND, AK
MONTGOMERY WATSON

GOLDER ASSOCIATES, INC.
REDMOND, WA

August 15, 2000 | 003-5435 task 000 | Fig. 29



Top Sensor



Bottom Sensor

Vertical Magnetic Field Gradient

50000 nT
51000 nT
52000 nT
53000 nT
54000 nT
55000 nT
56000 nT
57000 nT
58000 nT
59000 nT
70000 nT

0 ft 25 ft 50 ft 75 ft 100 ft

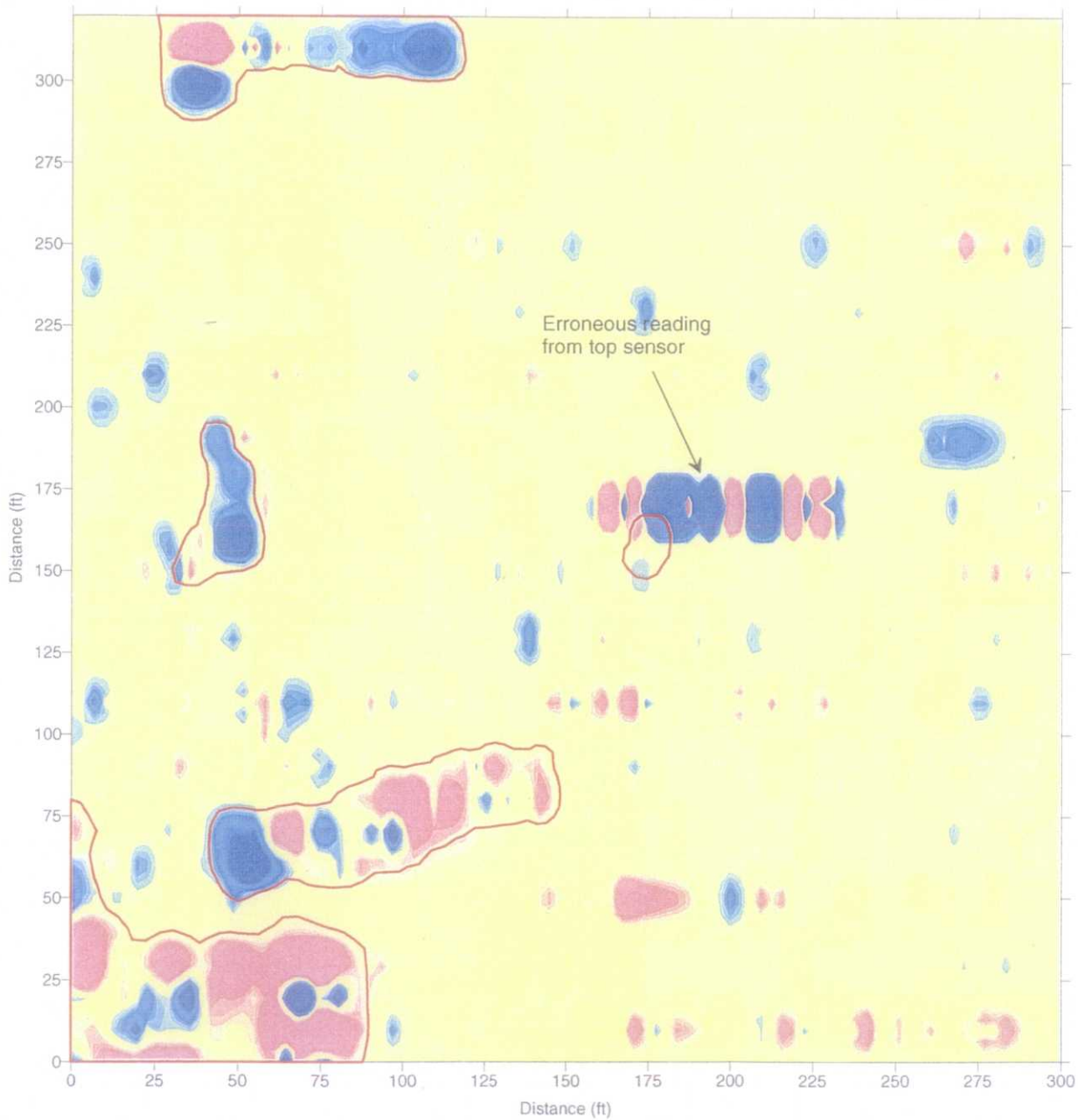
N

SITE M
MAGNETOMETRY SURVEY
Mag 858 TOTAL FIELD

GEOPHYSICAL ASSESSMENT
GAMBELL, ST. LAWRENCE ISLAND, AK
MONTGOMERY WATSON

GOLDER ASSOCIATES, INC.
REDMOND, WA

August 15, 2000 | 003-5435 task 000 | Fig. 30



10000 nT/ft
400 nT/ft
300 nT/ft
200 nT/ft
100 nT/ft
0 nT/ft
-100 nT/ft
-200 nT/ft
-300 nT/ft
-400 nT/ft
-500 nT/ft

Vertical Magnetic
Field Gradient

N

0 ft 25 ft 50 ft 75 ft 100 ft

Surface features/surfice debris

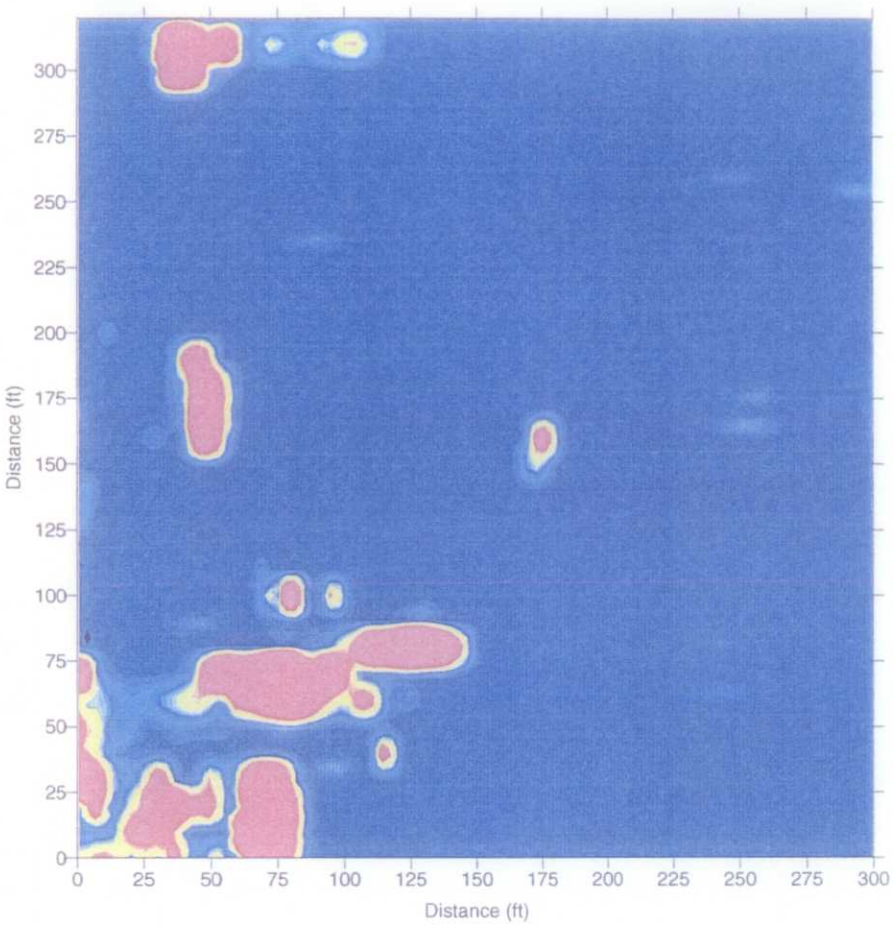
EM or magnetic anomaly
Interpreted to be buried debris

SITE M
MAGNETOMETRY SURVEY
Mag 858 GRADIENT

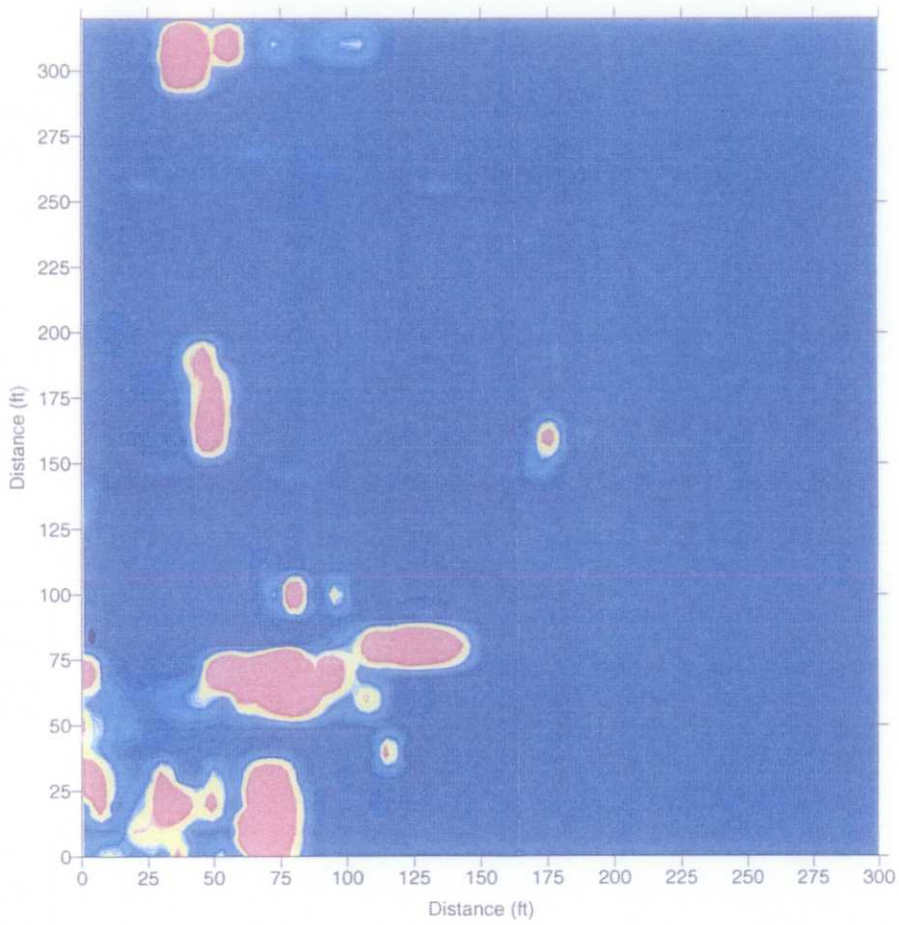
GEOPHYSICAL ASSESSMENT
GAMBELL, ST. LAWRENCE ISLAND, AK
MONTGOMERY WATSON

GOLDER ASSOCIATES, INC.
REDMOND, WA

August 15, 2000 | 003-5435 task 000 | Fig. 31

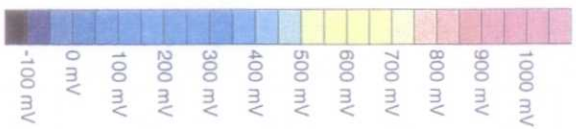


Top Channel



Bottom Channel

EM-61 response

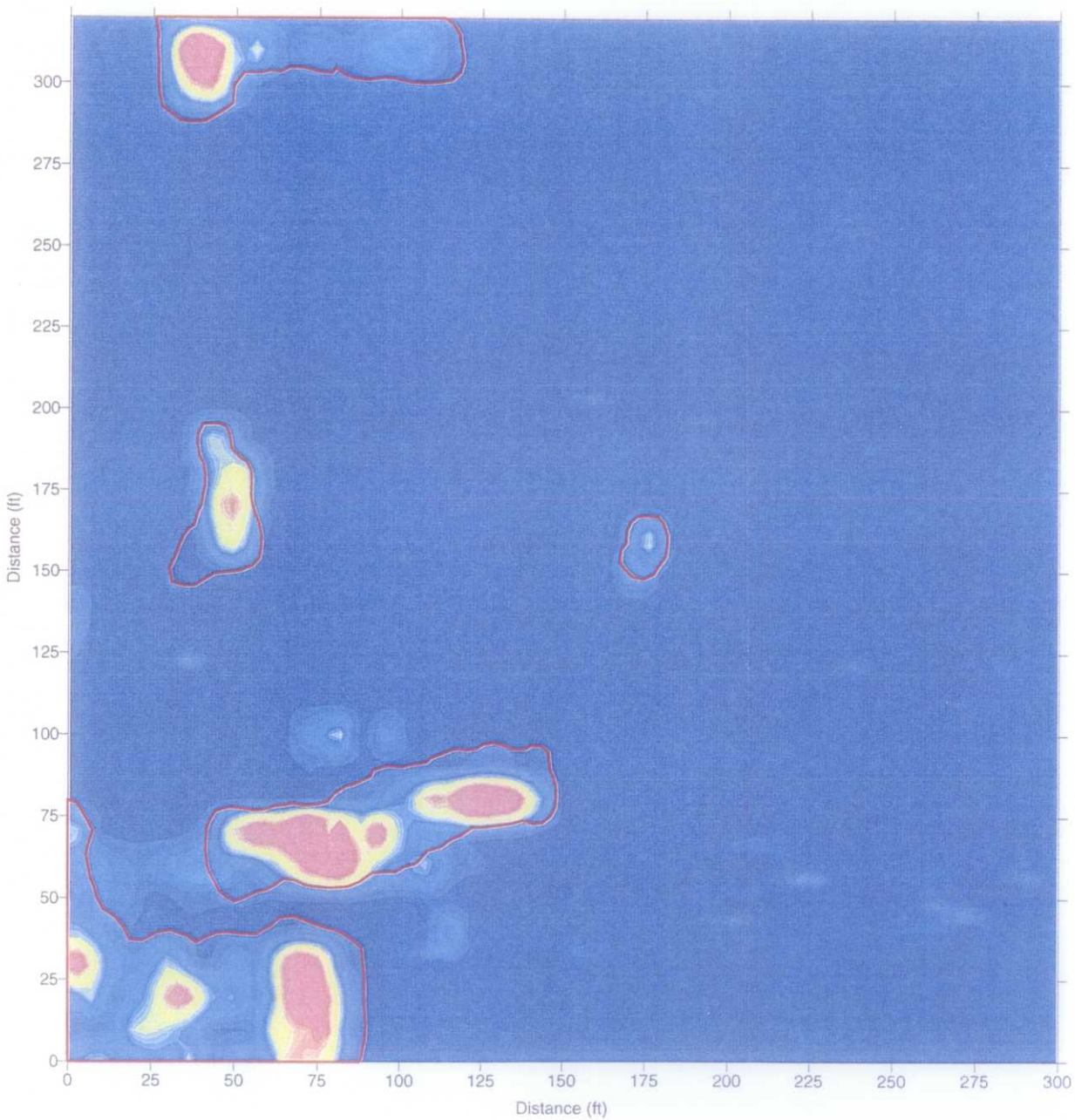


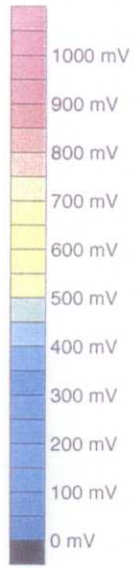
SITE M
TIME DOMAIN EM
EM-61 TOP AND BOTTOM CHANNELS

GEOPHYSICAL ASSESSMENT
GAMBELL, ST. LAWRENCE ISLAND, AK
MONTGOMERY WATSON

GOLDER ASSOCIATES, INC.
REDMOND, WA

August 15, 2000	003-5435 task 000	Fig. 32





EM-61 response

0 ft 25 ft 50 ft 75 ft 100 ft

Surface features/surfice debris

EM or magnetic anomaly
Interpreted to be buried debris

SITE M
TIME DOMAIN EM
EM-61 DIFFERENTIAL CHANNEL

GEOPHYSICAL ASSESSMENT
GAMBELL, ST. LAWRENCE ISLAND, AK
MONTGOMERY WATSON

GOLDER ASSOCIATES, INC.
REDMOND, WA

August 15, 2000 | 003-5435 task 000 | Fig. 33

APPENDIX C

Asbestos Survey Field Notes

MONTGOMERY WATSON

By _____ Date 6/28/00 Client USACOE Sheet _____ of _____

Chkd. By _____ Description Gambell ACM Inventory Job No. _____

Former CAA Buildings.

Purpose to Identify friable asbestos containing materials.
PACM –

(1) Heating WRAP remaining in concrete Utilidors running within 3/4' basements; seems to be fiberglass wrapped with cloth material. No mag observed.

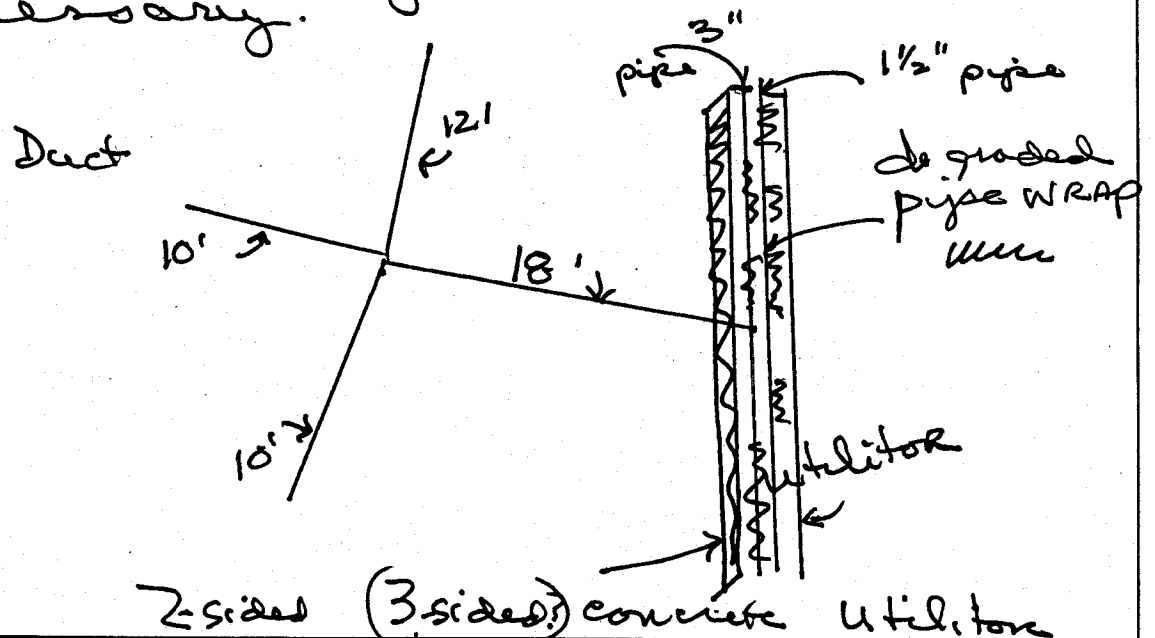
(2) Heating duct systems which were used to distribute heat from the main plant (Now Jones Hotel) to each Building.

There are four runs from a common duct off main utilidor piping.

Ducting is 8" x 4" square is covered with a thin material applied directly to the duct.

This should be removed as a Whole component, using wet methods, should bag, & disposal off is land.

Replacement of the duct will not be necessary.



MONTGOMERY WATSON

By Bergen Date 4/28/00 Client USACE Sheet ____ of ____
Chkd. By ____ Description Gambell ACM Inventory Job No. ____
Former CAA Buildings

Owners. phone

985-

1. Merle Apassingok 5479
This home has been remodeled throughout, Walls have been removed, and 2nd floor completed.

2. Roger Silook 5631
out of town

3. Sivugaq - "Red Lodge" 5826
used as overflow of visitors
remodeled

4. Veronica James - 5232
Out of town

5. Winnie James SR. 5232
- vacant
- Some remodeling

6. Roy Waluga 5411
- has store in basement
- out of town

7. Jones Kulukhon - ?
Jones Hotel
Building in poor shape inside.
Debris pile outside, N side
Contains wallboard, mud & tape

8. Cabin - DAVIS Ungloowook
Vacant -
Vandalized - No heating system
No trash

9. Bldg. moved East of Village - 5720
Harold Silook Jr
Did not want inspection

MONTGOMERY WATSON

By [illegible] Date 6/28/02 Client _____ Sheet _____ of _____

Chkd. By _____ Description Gambell ACM Inventory Job No. _____

9. Cont.

was unable to locate foundation which would remain from moving house. Winnie Adams through VSW removed it to the dump.

10. Former shed on skids - heating plant. This was a wooden structure unfinished inside. No asbestos of concern observed.

MONTGOMERY WATSON

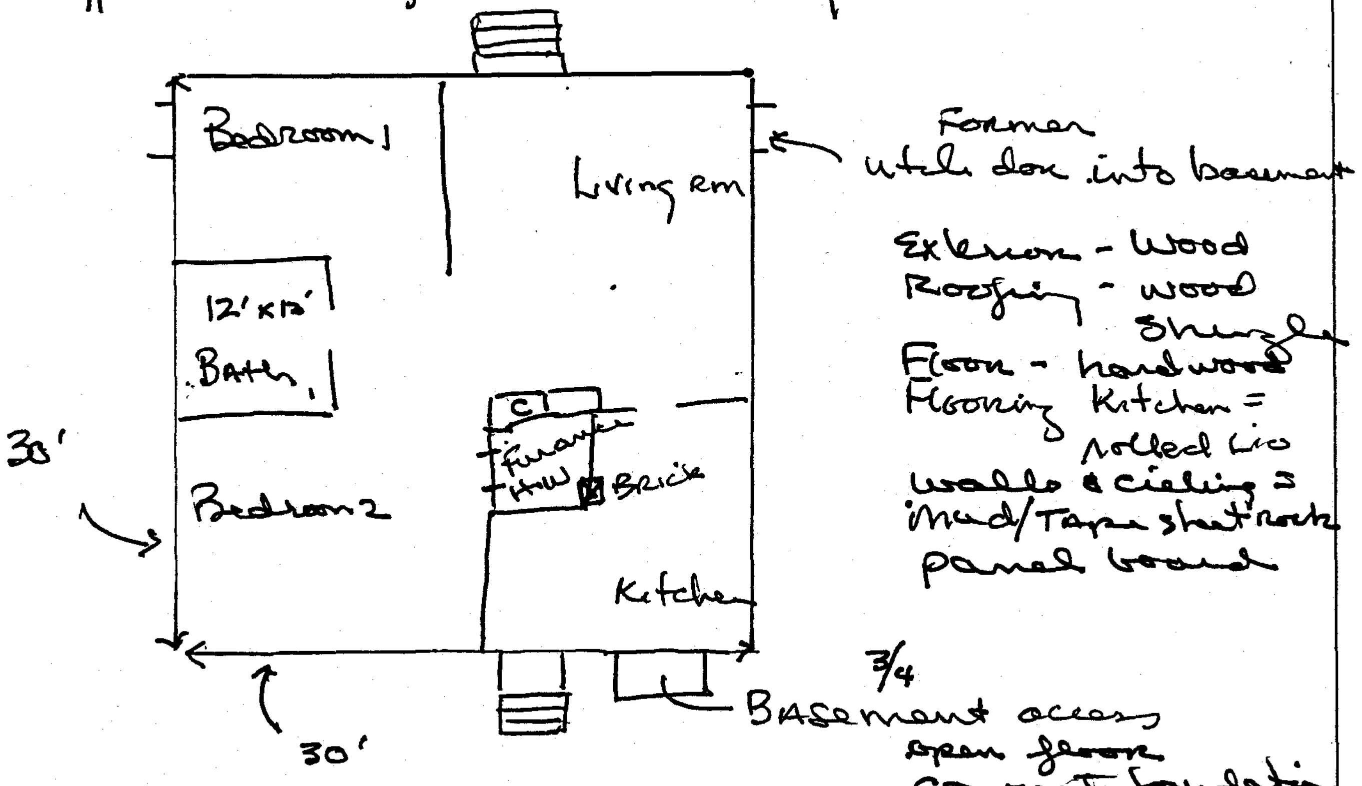
By Bega(?) Date 6/28/00 Client USACOE Sheet ____ of ____

Chkd. By ______ Description Gambell ACM inventory Job No. ______

Former CAA Buildings

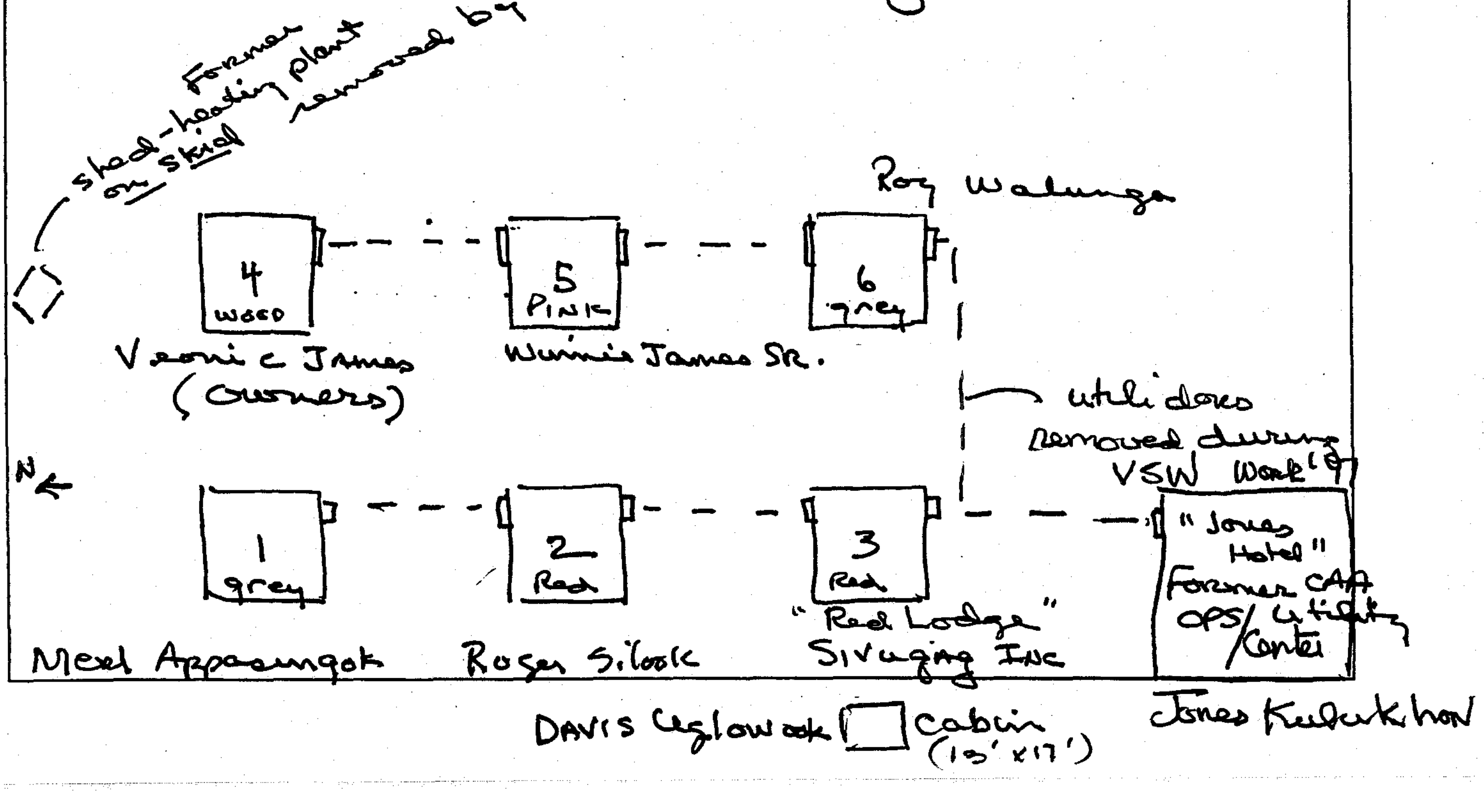
Former CAA Housing

Typical Housing Materials & Layout



Exterior - Wood
Roofing - wood shingle
Floor - hardwood
Flooring Kitchen = rolled lino
walls & ceiling = mud/Tape sheetrock panel board

open floor
concrete foundation
2nd floor - one room
some have been finished



MONTGOMERY WATSON

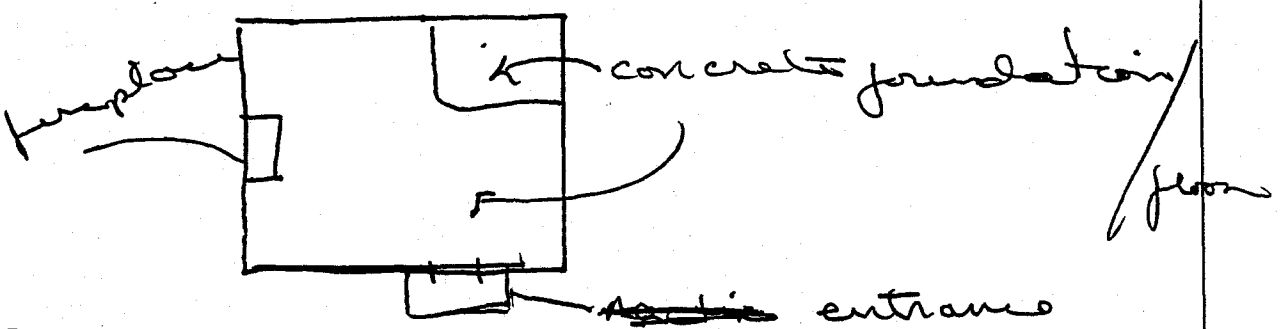
By Bgm Date 4/20/00 Client USACOE / SPK Sheet ____ of ____

Chkd. By ____ Description Gambell ACM Inventory Job No. ____

Former CAA Buildings

Cabin, Davis Leglowook, owner

West of "Red Lodge", 110 ft.



Exterior

Wood over TAR Black Building Paper

Interior:

Walls 1" x 4"

Insulation: paper over fiberglass

No Heating system in place

No Utilities as in other buildings

Building not habitable, walls are collapsing, has been vandalize.

No Friable asbestos seen.

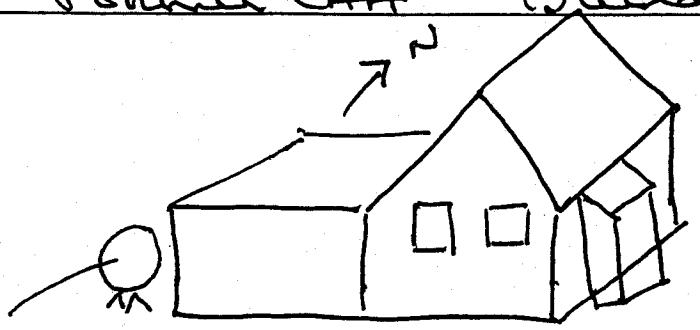
~~RACM - Sprayed ceiling~~ Bgm delete.

MONTGOMERY WATSON

By Begm Date 6/28/00 Client USACOE Sheet ____ of ____

Chkd. By ____ Description Gambell ACM Inventory Job No. ____

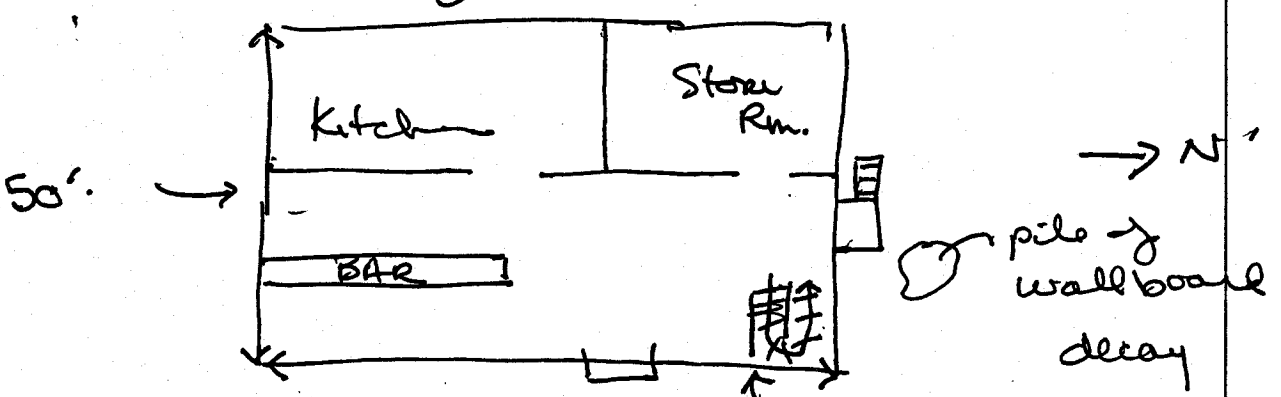
Former CAA Building



"Jones Hotel"

1000 gal TANK
foam over fiberglass

Jones Kulukhon



No electric working at this time 52'
Wood exterior, painted blue
Metal roof
Unable to access upstairs areas
Spray texture ceiling
insulation inside crawl space - fiberglass, no mag seen
flooring: Roofed tiles may be over plywood

Area of concern:
Sprayed ceiling material
Pile of wall board debris outside on N. side - contains mud, tape, & trowelled

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All-Weather Notebook
No. 391

Gambell AK
26 June 2090
Task 2 Completed
1189098.98102
100102

4 5/8" x 7" - 48 Numbered Pages

Gambell Geophysical TASK 2
6-26-00
515 ARRIVE GAM LATE
Go to End of RAB mtg

Michael & I discuss next day work.

We will start survey locations 8 AM

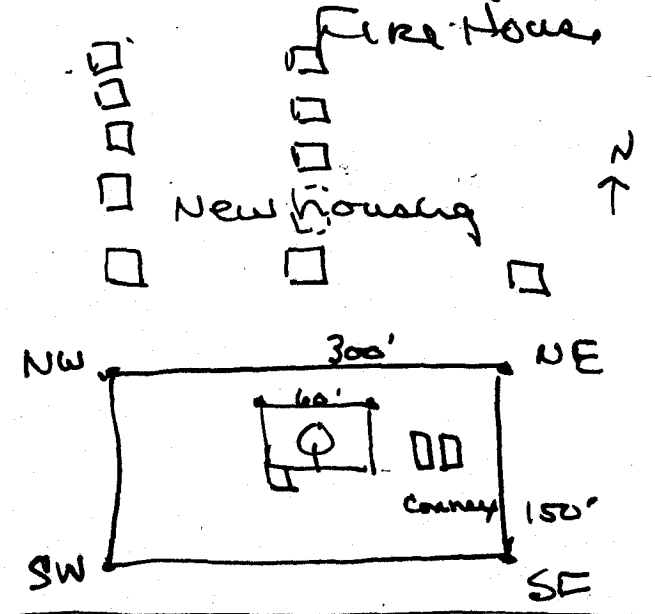
He has several options located for inclusion.

John Apassingok has been hired to assist Golder.

Nancy Golder Equipment had arrived in Nome - as yet - Sent Thurs Bob did not track airbill.

Gambell TASK 2
6-27-00 1189098-050152

Sta L - Future Fire House



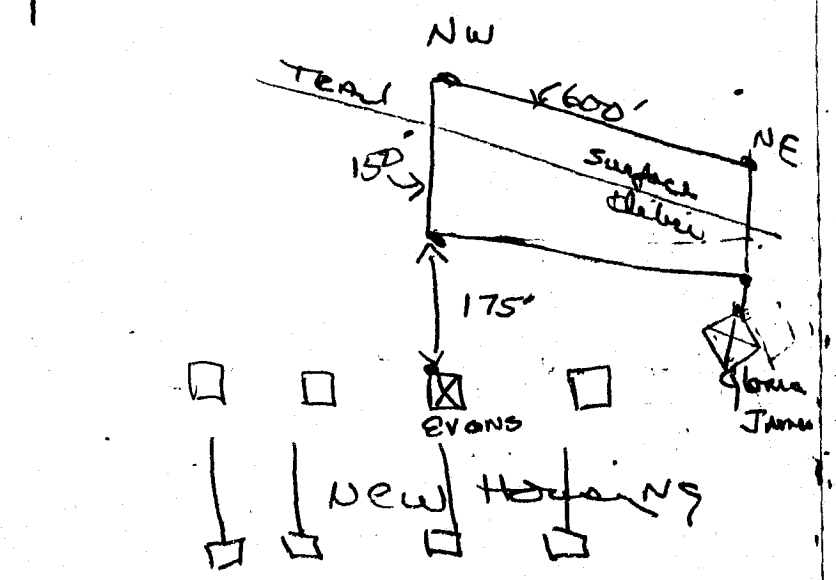
Survey: 4 CORNERS L SITE
4 Corners of Bldg.

Fog NO flights AM
Golder has located add equipment in Nome

Bgm

6-27-00 Gambell TASK2
1189098.180102

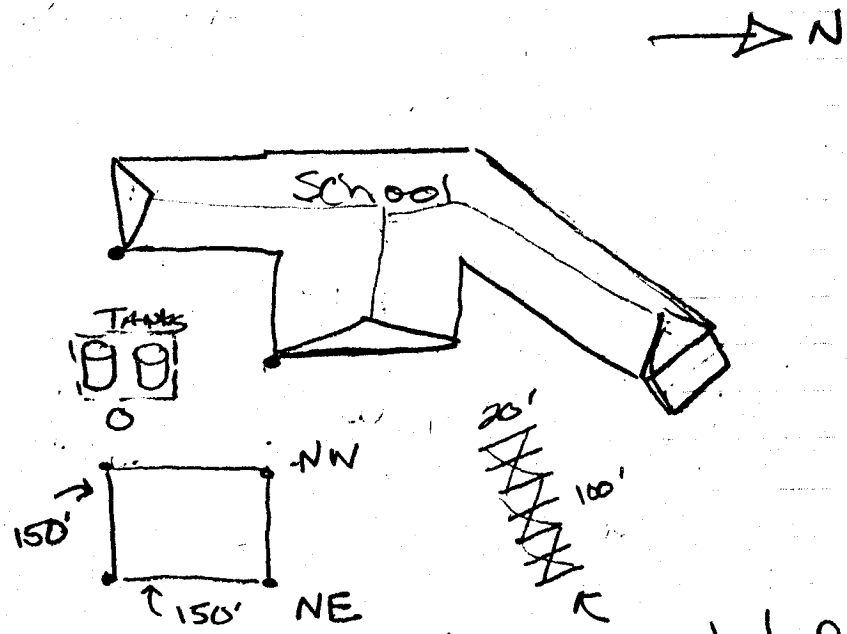
Site H



4-Corners
NW Corner House
NE Corner House (JAMES)

6-27-00 Gambell TASK2
1189098.180102

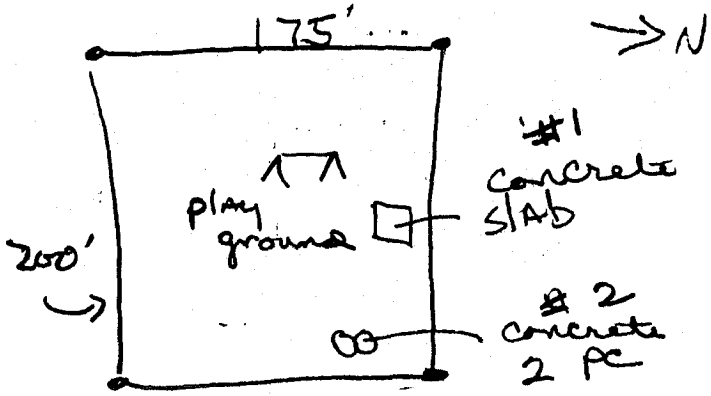
Site I - Part 1
E. of School

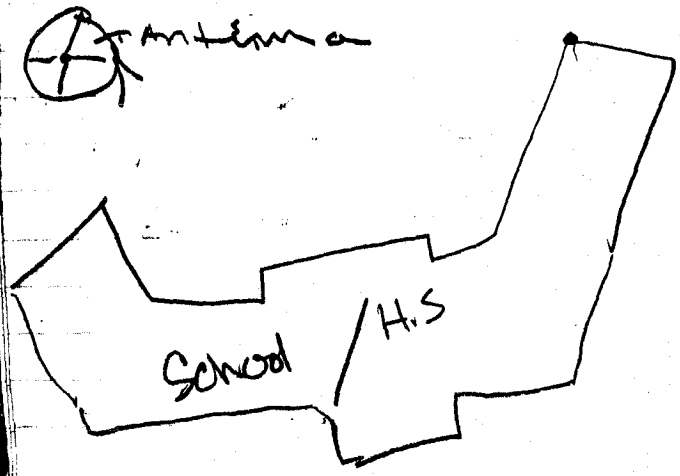


4-Corners
1-SE HS
2-NE HS

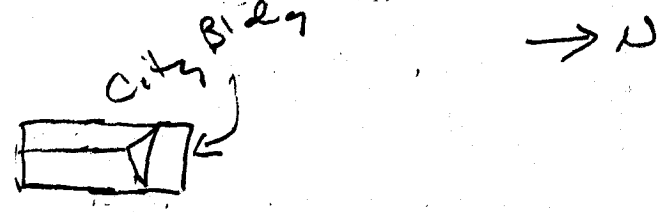
completed metal detector survey
No Detection

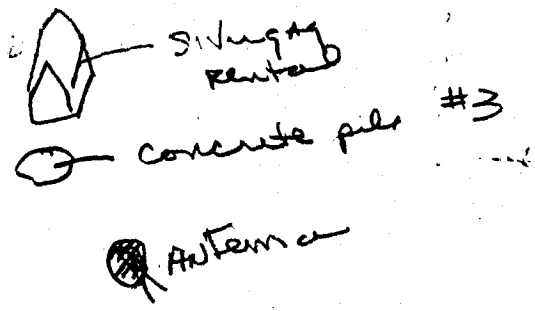
Gambell 6-27-00 TASK 2
Site I & II Part 2
School/High School
west side
Playground area





Gambell 6-27-00 TASK 2
Concrete Removed
3-areas around school.



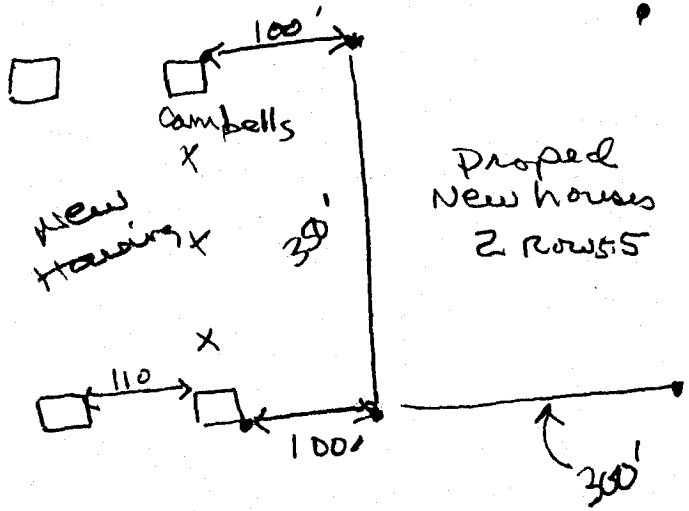


#1 slab 25' x 12' x 8"
NOT reinforced

#2 2 pc ① 4 x 3 x 1.5'
3 x 2 x 1.5'

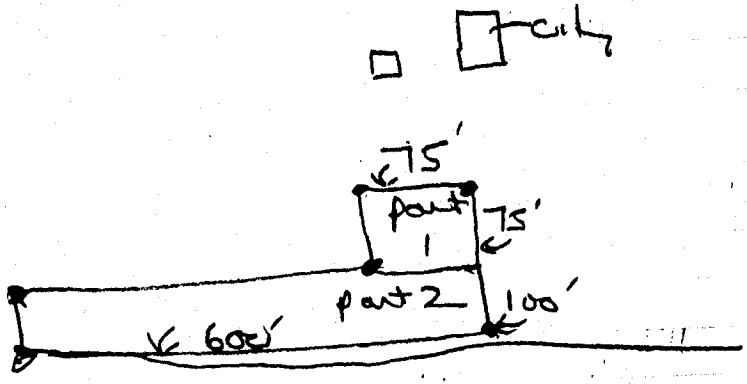
#3 pile - reinforced
1/2" rebar
13' x 14' x 3'

Gambell Ak 6-27-00
Selek TASK 2
New housing (10)
300' x 300'



4- corners
2- Bld. corners

Gambell Ak 62700
Site J TASK 2
S of main housing
N of LK

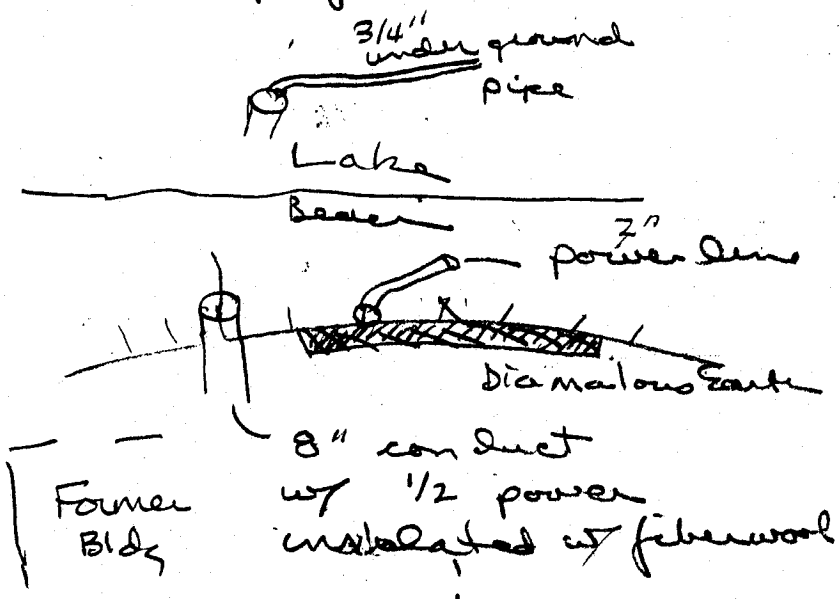


Part 1 75' x 75'
Part 2 100' x 600'
run on beach

7- corners

TASK 2 6-27-00 Gambell AK
Military Water
pump station

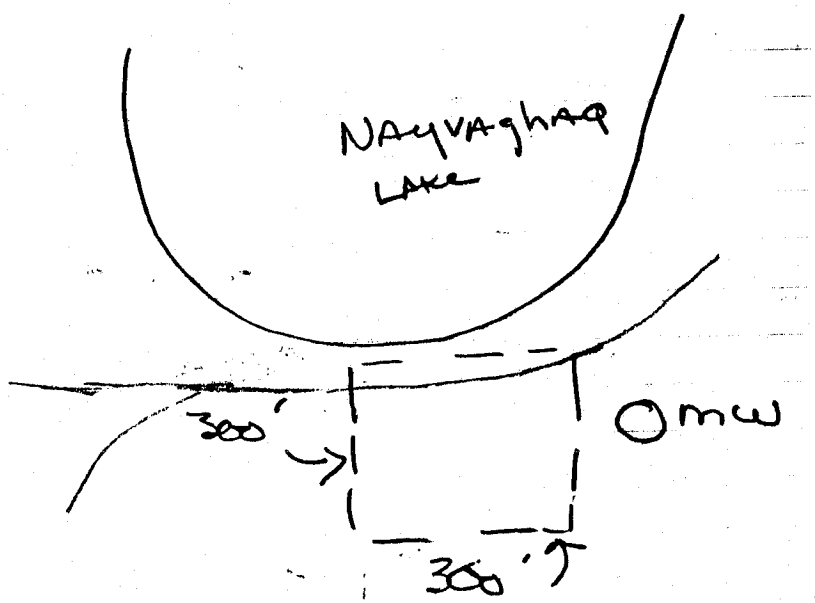
Buried Diamatous Earth in burlap
Bags 30' x 3' x 4'



Dia Earth exposed on
lake side berm cut
away at beach.

RQinn

TASK 2 Gambell 6-27-00
Site G
NAYUAghaQ LAKE
High WATER



4 corners
1 MW

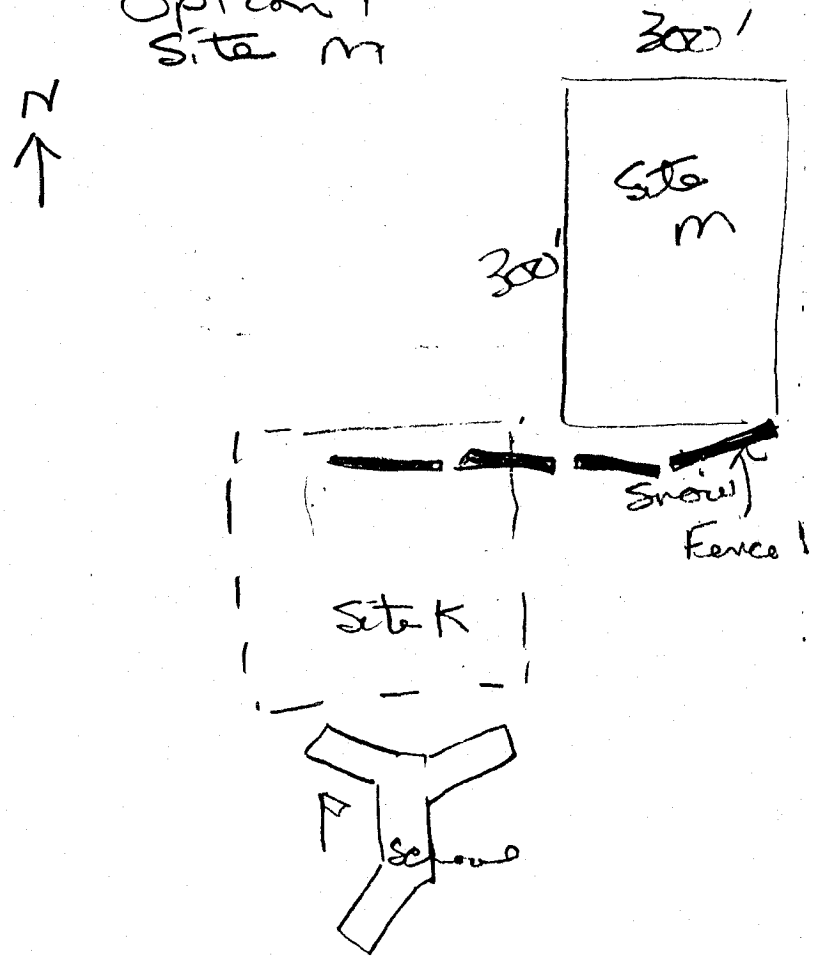
BRinn

6-27-00

Gambell AK 11890.98.180102

Option 1

Site M



SPIP

18

Gambell TASK 2 6-27-00

Sites AREA

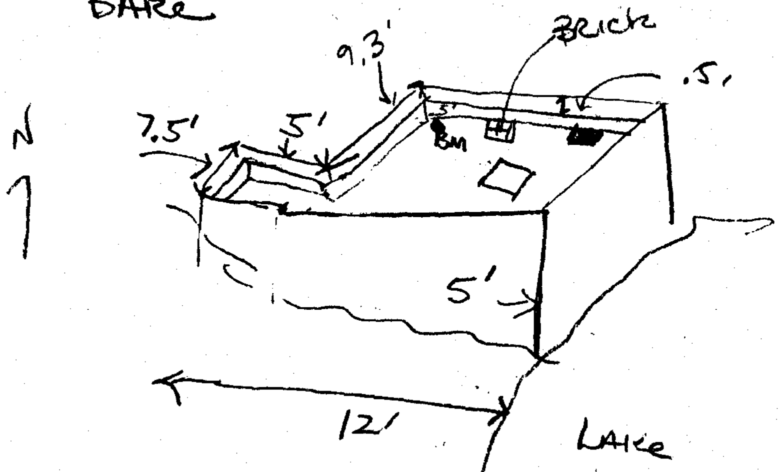
Site ID	Dia (ft.)	ft²	Ac
G	300 × 300	90000	2.14
H	150 × 600	90,000	2.14
I	200 × 175	35000	.8
J	150 × 150	22500	.5
K	75 × 75	5625	.14
L	100 × 600	60000	1.43
M	300 × 350	105000	2.50
	300 × 150	45000	1.07
	300 × 300	90000	2.14

TOTAL AC. 12.86

READY to Survey

6-27-00 SPIP

NW Troutman Lake – Gambell
Former Pump House
Concrete foundation
reinforced
BARE



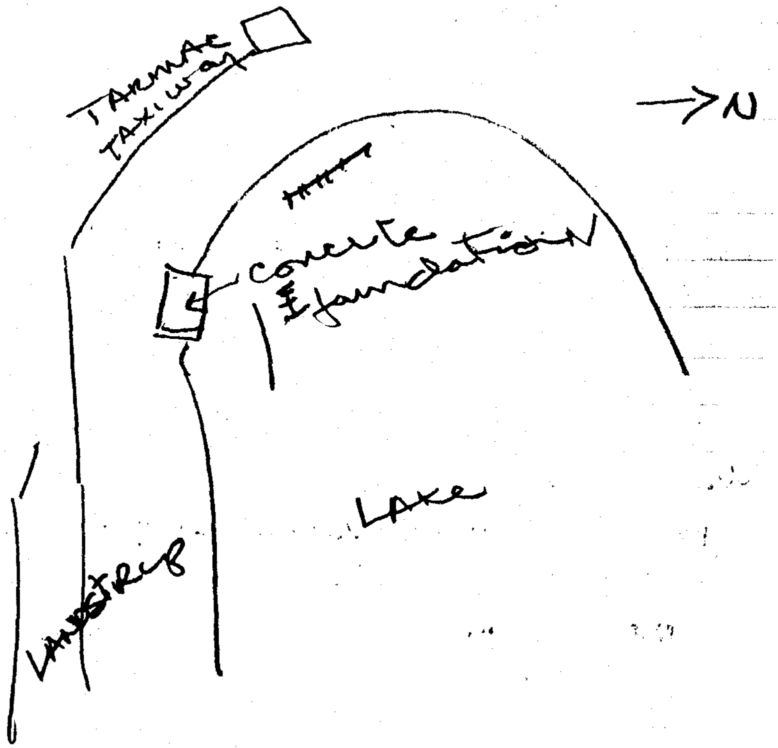
- Per Winnie James this was FAA structure during WWII. The Navy & army used them until their camp was built.
- unable to determine if any piping associated with housing

NATIONAL OCEAN Survey marker
No. 50391

6-27-00 SPIP

Gamble Geophysical, TASK R
Troutman Lake – in WATER
N End
marsten matting
& piping seen

Est. quantity –
pull up w/ hooks & boats



6-27-00 TASK 2 Gambell

Completed

Staking of survey areas
water pump house survey
Inspected N. Beach —
No surface debris found
measured all Concrete slabs
military pump station &
foundation

Need to Complete

FAA housing ACM inspection
locate exposed piping
W. side town

Mike to do:

Locate new voltage line for
air strip — as-built
Get geophysical survey
from Earth Tech (Tractrain)
+ surface — water removal
for Steffy left behind (buried)

BGM

6-28-00 SPIP Wed. Gambell

made copies of notes
for Don (survey)
Hamm (geophysical)
Michael (pm IRA)

Fog No Am planes

Don called will try to get out
on first plane out — Am
arrange for ATV — one day
may need helper

- Found reports for Bob on
previous NW Gambell work in
Gambell
- Loaned 200' tape to
start marking geophysical
10' grids
-

BGM

Gambell SPIP TASK 2
6-28-00 Fog
Don called will try to get out today pm on Bering Air.

Fog

The former CAA Bldgs were used during WWII as weather data collection for Russian pilots. During Korean War Navy Seals & Army used houses.
They set up sub detection 15 mi into ocean
3- cables (sonar) were used. This was run from the "Red house" near City Adm Dept 1957 —
IN 1960 military returned & built camp.

Bgm

6-28-00 Gambell TASK 2
Former Federal Housing
Visual Inspection
ONE home moved East of town by JR SIWOOKO
Does NOT want inspection of his home completed.

Completed:

Red Lodge
Merle Apassingok

Small Bldg

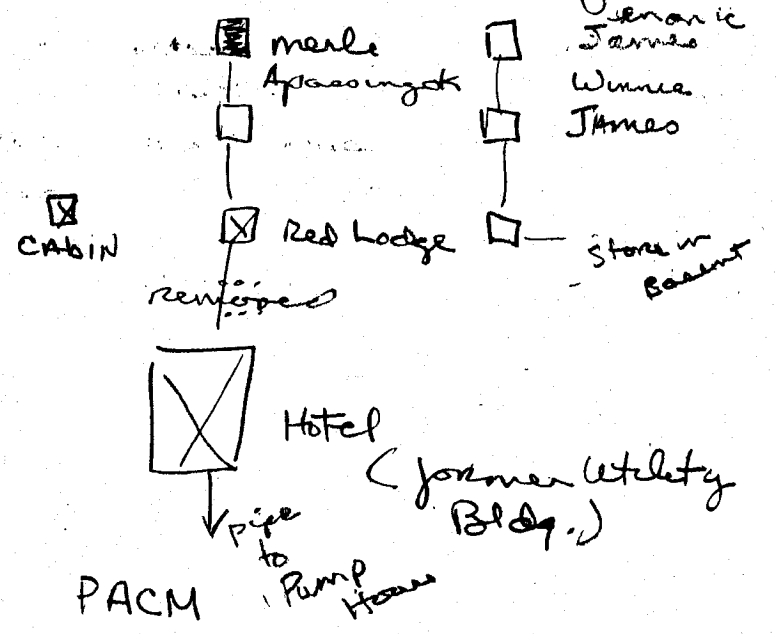
Restraunt/ Hotel

All Built w/ similar material some have been retro vated Extensively (Merle) All Utilidors Bent Bldgs & former heating Bldg (Bent Merle & several houses) were removed by VSW.

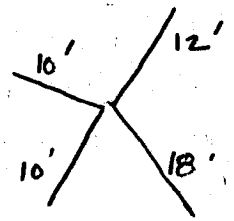
Bgm

6-28-00
Wed

VSW moved former heating plant



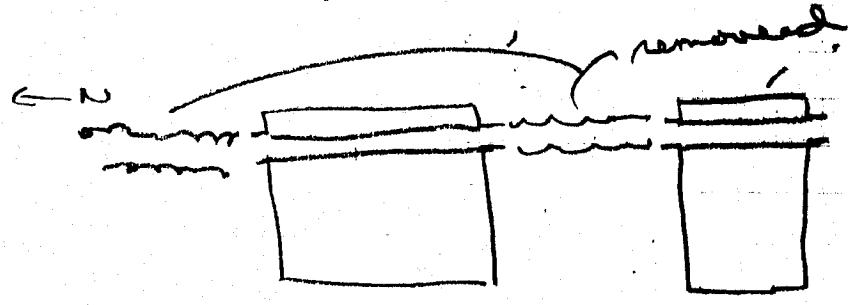
Heating Duct has thin insulate applied to venting
Each Bldg (homes)
8" x 4" four runs from common area

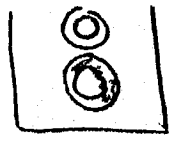


Byron

6-28-00 Gambell TASK 2

Each home has concrete utilidor with one 1½" pipe and one 3" pipe covered with fiberglass like material NO hard joints were found The connecting runs were dismantled during VSW work — disposal site unk.





The blanketing had fallen off and remained in the bottom of the utilidors along with other debris

Byron

6-28-00 Gambell TASK 2
Other materials to be tested ACM
Wall board
mud & tape
Duct wrap
insulate pipes
Cold roll adhesive
window glaze

6-28-00 Gambell AK
Other Items:
Site 18 - Possible RI work
Site 16 - Report oil ground on permafrost Bert housing

Landfill (OLD TOWN)

Pile ACM - see Winnie James

Buried Debris from Seal see Winnie James

Jeep - Old Town
Wire - NT
Follow power cable to transformer

Marsden MATTING along Runway (est) 60' x 3500'
Buried under 1' gravel
Now exposed by partial removal by COE in 1999.
"DANGER" to travelers
BG

SPIP

6-28-00 Gambell Task 2

Went to archaeological site at Old Gambell to inspect for reported buried Jeep in "Bone Yard". I viewed many items of military vintage throughout the site

Army: used WWI –

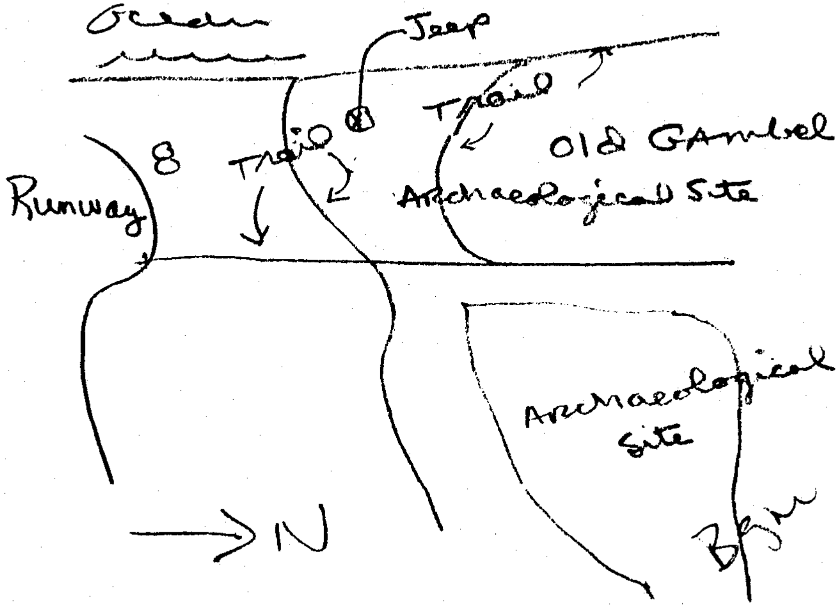
Helmet (AK Territory guard WWII)

rifle

engine

Q hut frame

drums



6-28-00 Gambell Task 2

Recommendation:

① Walk site (10' grid) w/ metal locator; use pin flag to locate anomaly.

② Hand dig each point; Remove item, replace dirt in reverse order. Must have archaeologist on-site.

Area to be surveyed Approx. 200' x 1000'

6-29-00 SPIP Gambell

Military debri –
– Reburied debri at City Dump from School expansion
60T.
City Expensed the reburial W. of Honey Bucket Dump
in a Trench – was built
70' x 150' x 20'
Debri moved & covered.
This is where VSW put utilidors (FAA)
– LANDfill (Dump) Behind FAA Housing was used during the period of use by FAA, Navy, & Army. The City covered it.

Begn

6-29-00 Gambell SPIP

Debri pile on surface from CAA Bldg dismantled & from extension of CAA Utility Bldg.
May include ACM pipe
Viewed power cables parts vechicle, wood,
Diamentions
45' x 45' x 5' high

Begn

ADD TASK Items

1. Reburied debris from School Expansion (land fill area)
2. Water pump foundation
3. Water pump septem piping
4. Water treatment diamatous earth
5. Manolen matting — covered w/ gravel running length of air strip
6. Masten matting — general P/U along roads & trails 2 dump — 4,000 #
7. Concrete slabs (4 S) concrete piles (2)
8. Trautman LAKE (in WATER)

8 (cont) matting piping (see results of Earthtech survey)

APPENDIX D

Future Construction Information

Native Village of Gambell

Memo

To: Bonnie McLean

From: Michael Apatiki, DoD/NVG CA Manager MA

CC:

Date: 2/22/00

Re: Planned Projects in the Village of Gambell

The following is a list of planned projects in Gambell:

1. City of Gambell: Fire Hall Construction near Qerngughvik Building, possibly the summer of 2000. (See map for location.)

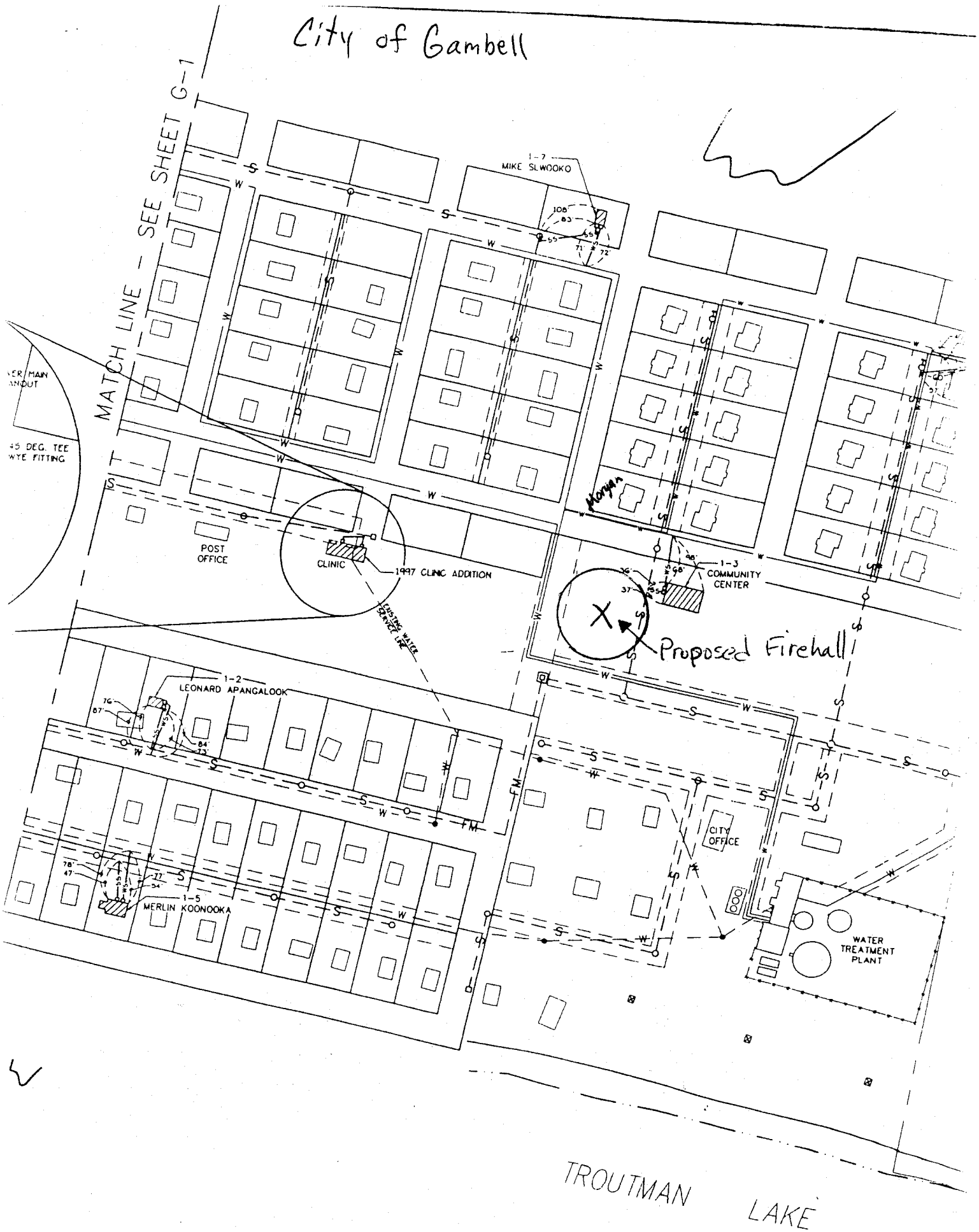
2. City of Gambell: Water Feasibility Study-drilling north new Pump House.
   Council member said drilling might start in June

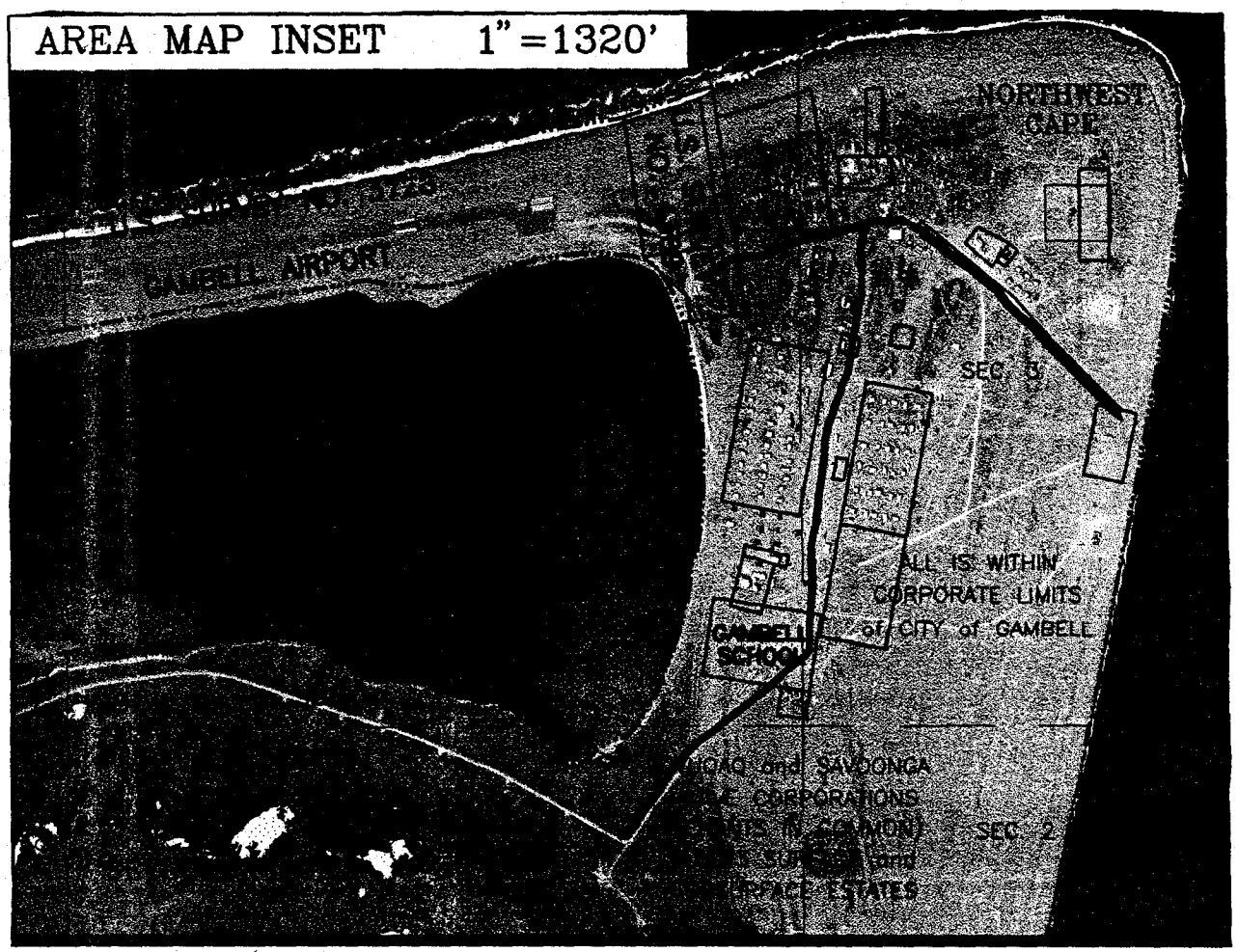
3. BIA/IRR: Roads inside the village. (See map) Third in the priority List
   Few years in the future

4. FAA: no plans

5. Bering Straits Regional Housing Authority: 8-10 more houses built east of the prior houses already built.

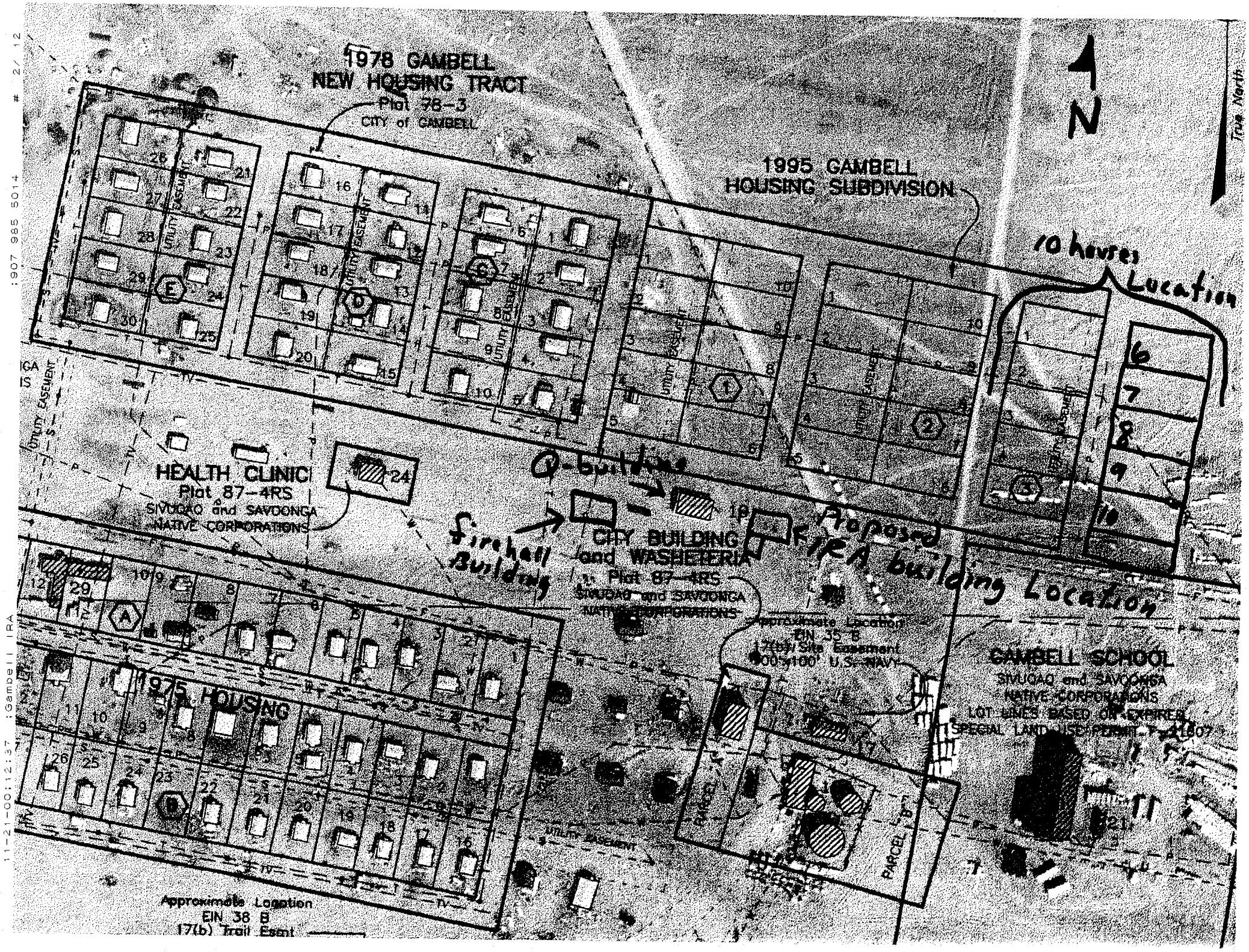
6. VSW: no plans.


City of Gambell
MATCH LINE - SEE SHEET G-1
1-7
MIKE SLWOOKO
POST OFFICE
CLINIC
1997 CLINIC ADDITION
EXISTING WATER SERVICE LINE
1-3
COMMUNITY CENTER
Proposed Firehall
1-2
LEONARD APANGALOOK
1-5
MERLIN KOONOOKA
CITY OFFICE
WATER TREATMENT PLANT
TROUTMAN LAKE
45 DEG. TEE
WYE FITTING



BIA/IRR

Proposed Road



APPENDIX E

Removal Cost Estimations

Native Village of Gambell
Strategic Project Implementation Plan
Cleanup of Former DOD Facilities
Cost Estimate Breakdown

Site or Location	Description	Military Impact	Desired Remediation	estimated length	estimated width	estimated depth	estimated volume by percentage	estimated total volume	estimated weight/by cubic foot	Estimated tonnage	Shared Equipment Costs*	Labor Cost by Removal Action*	Estimated Cost for Remediation[1]
18	Former main camp	Buried metallic debris, potentially buried tanks.	Excavate buried debris and recycle off site.	100	200	3	10%	6000	30,000	15.00	$40,771	$94,390	$140,000
8A	Eastern edge of runway	Exposed Marsten matting	Excavate buried debris and recycle off site.					0	65,000	32.50	$88,337	$204,512	$300,000
2	Former military housing/operation burial site	Buried concrete slab.	Excavate concrete slab and dispose off site.	10	10	0.5	100%	50	7,500	3.75	$7,078	$19,665	$30,000
7, 16, & 7	Former military power facility (includes geophysical survey area L)	Buried metallic debris	Excavate buried debris and recycle off site.	50	50	5	20%	2500	12,500	6.25	$16,988	$39,329	$145,000
	Army Landfills			20	15	0.5	100%	150	22,500	11.25	$21,235	$58,994	
1A	Army landing area	Buried metallic debris and one half buried crane.	Excavate buried debris, remove crane and recycle off site.	40	15	5	20%	600	3,000	1.50	$4,077	$9,439	$280,000
16 & 25	Gambell municipal building site, South Housing Units	Petroleum contaminated soils, potential buried debris.	Excavate buried debris, and treat contaminated soil	50	100	5	-	-	-	-	-	-	$1,260,000[2]
6 & 17	Military landfill & army landfill (includes geophysical surveys H, K, &	Buried metallic debris.	Excavate buried debris and recycle off site.	100	350	3	5%	5250	26,250	13.13	$35,675	$82,591	$120,000
8	Small arms ammunition burial site	Buried small arms munitions and associated metallic debris.	Excavate buried debris and dispose/recycle off-site	10	10	3	5%	15	75	1.00	$2,718	$6,293	$10,000
1B	North beach/ Air Force landing area	Buried metallic debris.	Excavate buried debris and recycle off site.	25	50	3	10%	375	1,875	0.94	$2,548	$5,899	$30,000
5	Former tramway site	Buried Debris and possible transformers in close proximity to village water supply	Excavate buried debris and recycle off site.	10	10	3	50%	150	750	0.38	$1,019	$2,360	$37,000[3]
13	Former radar power station	Buried metallic debris.	Excavate buried debris and recycle off site.	50	50	3	10%	750	3,750	1.88	$5,096	$11,799	$20,000
3A	Former communication facility/ burial area	Buried metallic debris.	Excavate buried debris and recycle off site.	-	-	-	-	-	200	0.10	$272	$629	$5,000
15	Troutman Lake ordnance and debris burial site	Debris in Troutman lake (separate from ordnance)	Raise underwater metallic debris and recycle off-site	-	-	-	-	-	-	2.00	$5,436	$12,585	$20,000
1C	North beach (underwater debris)	Underwater metallic debris, primarily Marsten matting.	Raise underwater metallic debris and recycle off-site	-	-	-	-	-	-	4.00	$10,872	$25,171	$40,000
4E	Western edge of Sevuokuk mountain	Surface cables running along mountainside.	Remove cable and recycle off site.	2100	-	-	-	-	10,500	5.25	$14,270	$33,037	$50,000
19	Diatomaceous earth east of site 18	Diatomaceous earth	Excavate diatomaceous earth and dispose off site.	-	-	-	-	-	600	0.30	$815	$1,888	$5,000
20	Schoolyard	Concrete rubble debris piles with protruding rebar and partially buried concrete slab.	Remove mixed concrete debris and dispose off-site.	-	-	-	-	-	-	-	-	-	$195,000
	concrete slab			25	12	0.67	100%	201	30,150	15.08	$40,975	$94,862	
	concrete pile			18	1	1.5	100%	27	4,050	2.03	$5,504	$12,743	
	rubble with rebar			13	14	3	30%	163.8	8,190	4.10	$11,130	$25,769	
21	Archaeological site at toe of Sevuokuk mountain	Buried metallic debris and cable.	Excavate buried debris and recycle off site.	-	-	-	-	-	500	0.25	$680	$1,573	$5,000
22	Former CAA housing	Potential asbestos containing material (PACM)	Inspection, sampling and analysis, and abatement of ACM.	-	-	-	-	-	-	-	$14,060	$32,550	$50,000
23	Debris from high school construction, east of the municipal landfill.	Metallic debris excavated during construction of the Gambell high school and reburied east of the municipal landfill.	Excavate buried debris and recycle off site.	70	150	20	5%	10500	52,500	26.25	$71,349	$165,183	$240,000
8B	West beach archaeological site	Buried and/or partially exposed metallic debris/jeep.	Excavate buried debris and recycle off site.	-	-	-	-	-	2,000	1.00	$2,718	$6,293	$10,000
8C	Navy landfill	Buried landfill material.	Excavate and dispose off site.	45	45	5	10%	1012.5	5,063	2.53	$6,880	$15,928	$25,000
24	South of city building, along north shore of Troutman Lake. (geophysical survey area J)	Buried Metallic debris.	Excavate buried debris and recycle off site.	-	-	-	-	-	1,000	0.50	$1,359	$3,146	$5,000
												Subtotal	$3,025,000

* Costs are based on shared resources over the different remedial activities.
if performed on an individual basis, the costs will be significantly higher

[1] costs have been rounded up to the neearest $5,000 incremen

[2] costs were calculated for removal of effected soils and off-site thermal treatment

[3] costs include $32,000 emergency response equipment for protection of water supply

Itemized Project Cost*	$3,025,000
Mobilization Cost*	$350,000
Training	$250,000
Total Cost	$3,625,000

TRANSMITTAL

MONTGOMERY WATSON

4100 Spenard Road
Anchorage, Alaska
99517-2901

Tel: 907 248 8883
Fax: 907 248 8884

Date: December 15, 2000

To: Richard Jackson
U.S. Army Engineer District, Alaska

From: Douglas Quist

Re: Gambell SPIP

The following items are:

☐ Requested ☒ Enclosed ☐ Sent Separately via _____

☐ Report ☐ Specification ☐ Cost Estimate ☐ Shop Drawings

☐ Test Result ☐ Prints ☐ Test Sample ☐ Other

No. of Copies	Description
15	Final Gambell SPIP (14 bound, 1 unbound)
1	Community Survey Forms
1	Review Comments

This data is submitted:

☐ At your request ☐ For your action

☐ For your approval ☒ For your files

☐ For your review ☐ For your information

REVIEW COMMENTS		PROJECT: DO: 18 Task 1 – Geophysical/Coop Support – Gambell, AK – NALEMP DOCUMENT: SPIP Draft and Geophysical Survey Investigation, September 2000 LOCATION: Gambell, Alaska			
U.S. ARMY CORPS OF ENGINEERS		DATE: December 8, 2000 REVIEWER: Richard Jackson PHONE: 907-753-5606	Action taken on comment by:___Bonnie McLean_____		
Item No.	**Drawing Sheet #, Specific Paragraph**	**COMMENTS**	**REVIEW CONFERENCE A – comment accepted W – comment withdrawn (if neither, explain)**	**DESIGN OFFICE C – correction made (if not, explain)**	**Back check by: (initials)**
1	General	Recommend that the geophysical survey report be included as an appendix.	A – See Appendix D The whole report will be column bound.		
2	General	Recommend including the completed interview forms, or a summary table of the information contained in the forms, as an appendix.	A – Summary table and maps will be in Appendix A.		
3	Table 1	Total costs are included, but no backup or justification for these costs is found anywhere in the SPIP. Recommend cost details be included as an appendix or as a supplemental table.	A – See Appendix E.		
4	General	Topographic Information Center prepared a historical photo analysis report which contains much visual information relevant to this SPIP. Recommend that it be at least referenced in the bibliography, or better to include some of the graphics it contains in the SPIP.	A – Referenced in bibliography.		
5	Site 6, p. 5	Paragraph indicates that BSRHA proposes to construct additional housing adjacent to site 6. Is there any documentation such as a master plan, site plans, utility layout plans, or correspondence regarding this? Information such as this could be included as an appendix, or could be referenced in the bibliography, to support recommendations for this site.	A – See Appendix C, includes: 1. Firehouse 2. Road 3. New Homes 4. IRA Office Building		

REVIEW COMMENTS		PROJECT: DO: 18 Task 1 – Geophysical/Coop Support – Gambell, AK – NALEMP DOCUMENT: SPIP Draft and Geophysical Survey Investigation, September 2000 LOCATION: Gambell, Alaska			
U.S. ARMY CORPS OF ENGINEERS		DATE: December 8, 2000 REVIEWER: Richard Jackson PHONE: 907-753-5606	Action taken on comment by: Bonnie McLean		
Item No.	**Drawing Sheet #, Specific Paragraph**	**COMMENTS**	**REVIEW CONFERENCE A – comment accepted W – comment withdrawn (if neither, explain)**	**DESIGN OFFICE C – correction made (if not, explain)**	**Back check by: (initials)**
6	General	Photographs would be helpful in depicting some of the sites and their potential hazards or possible interference with future construction.	A		
7	Site 16, p. 7	This area was investigated during the 1994 RI. Samples indicated contamination below cleanup levels, and the area was not subsequently included in the Phase II investigation. Is there new information which might support going for another look at this? Was the area more recently excavated, perhaps during utility installations?	Replace with Site 25. Eleven surveys indicated stained soils were observed during VSW improvements excavation between the homes located in the central southern area. This area will be referred to as Site 24. The Site 16 area includes the area around City Hall.		
8	Site 22, p. 8	Recommend that the field survey of the asbestos in the CAA housing be included in the SPIP as an appendix.	A – See Appendix B		
9	Site 8B, p. 6	See markup provided by COE Archaeologist, Diane Hanson	A		
10	Site 2I, p. 8	See markup provided by COE Archaeologist, Diane Hanson	A		
11	Figure 2	See markup provided by COE Archaeologist, Diane Hanson	A		
12	Figure 1 Geophysical Survey Report	Refer to comment (11) above	A		

REVIEW COMMENTS		PROJECT: DO: 18 Task 1 – Geophysical/Coop Support – Gambell DOCUMENT: SPIP Draft and Geophysical Survey Investigation LOCATION: Gambell, Alaska			
NATIVE VILLAGE OF GAMBELL		DATE: December 8, 2000 REVIEWER: Mike Apatiki, CA Manager NVG PHONE: 907-985-5346	Action taken on comment by:___Bonnie McLean_____		
Item No.	**Drawing Sheet #, Specific Paragraph**	**COMMENTS**	**REVIEW CONFERENCE A – comment accepted W – comment withdrawn (if neither, explain)**	**DESIGN OFFICE C – correction made (if not, explain)**	**Back check by: (initials)**
1	Table 1, page 11	Site or location number 5. Former Tramway Site. The comment on this was the cost which is $5000 seems small for a site which could contain dangerous transformers.	W – Transformer location was excavated in 1997. Reference to transformers deleted from Site 5.		
2	Table 1, page 11	Site or location number 3A, Former Communication Burial Area. The comment was the same as above. The $5000 seems small for a site which could contain dangerous toxic transformers.	A – Will recalculate to include spill response.		
3	Page 6, draft SPIP	One correction to be made is on page 6 of the draft SPIP	A – Corrected. Also the IRA new office building was added.		