DATE: September 5, 2008

TO: Mr. Carey Cossaboom, Project Manager, U.S. Army Corps of Engineers, Alaska District

FROM: Matthew Faust, Project Manager, Bristol Environmental Remediation Services, LLC

RE: Monitoring Well Decommissioning Report
   Contract No. W911KB-08-P-0074
   Gambell, Alaska

Bristol Environmental Remediation Services, LLC (Bristol) has prepared this Technical Memorandum (Tech Memo) at the request of the U.S. Army Corps of Engineers (USACE). The Tech Memo presents the results of the groundwater monitoring well decommissioning project that was conducted at the Gambell Formerly Used Defense Site (FUDS) by Bristol in August 2008.

SITE DESCRIPTION

The Gambell FUDS is located on the northwest tip of Saint Lawrence Island, near the village of Gambell. Gambell is located at latitude 63 degrees (°), 46 minutes (°), 49 seconds (") North, and longitude 171° 43' 46" West, approximately 200 miles southwest of Nome, Alaska, and 700 miles northwest of Anchorage, Alaska (Figure 1). The site was operated by the military as a radar and communications facility from 1948 until the late 1950s (USACE, 2005).

The Gambell FUDS encompasses approximately 2.7 square miles. The site includes areas around Troutman Lake and extends from the ocean to the top of Sevuokuk Mountain. Environmental investigation efforts have been conducted at the site from the 1980s through the present (USACE, 2005). Environmental remediation efforts under the FUDS program have been completed at the site.
SCOPE OF WORK

The scope of work for this project was to properly abandon and decommission all remaining groundwater monitoring wells located at the Gambell FUDS in accordance with applicable Alaska Department of Environmental Conservation (ADEC) guidance (ADEC, 1992). Approximately 21 monitoring wells were reportedly located at the site at the beginning of site activities. Monitoring well locations are listed on Table 1 and are shown on Figure 2.

COMPLETED TASKS

Bristol personnel mobilized to Gambell from Anchorage, Alaska on August 19 and met with personnel from Bristol’s subcontractor, the Native Village of Gambell (NVG), to go over the Work Plan and the Site Health and Safety Plan (Bristol, 2008). On August 20 and 21, Bristol and the NVG crew located and decommissioned 17 monitoring wells. On August 22, the NVG crew consolidated well construction materials accumulated during the decommissioning activities, and Bristol personnel demobilized from Gambell back to Anchorage. All well construction materials have been temporarily staged in Conexes along with other debris from Gambell, and will be transported to the Columbia Ridge Landfill in Arlington, Oregon for disposal.

Monitoring wells were located using a global positioning system (GPS) unit and aerial photographs. Bristol’s procedure for decommissioning the wells was to first pull the protective steel casing from the ground using a chain attached to a loader bucket. Once the protective casing had been removed, the polyvinyl chloride (PVC) well casing was removed using the same method. Once the PVC had been removed, each bore hole was backfilled with bentonite pellets, taking care to minimize void spaces. The bentonite was then hydrated to plug the bore hole.

Photographs illustrating site activities are included as Attachment 1. Field notes detailing site activities are included as Attachment 2.

Bristol and the NVG crew were unable to locate four of the 21 monitoring wells reported to be located at the site. Two of these wells (MW-5 and MW-7) were located on the North Beach of the gravel spit on the northeastern tip of Saint Lawrence Island, while the other two (MW-25 and MW-27) were located within the community of Gambell (Figure 2).
Monitoring wells MW-5 and MW-7 appear to have been located below the storm surge line on the North Beach (Figure 2). This determination was made by Bristol personnel using aerial photographs and a GPS unit. The monitoring wells were reported to have been constructed as aboveground completions protected by stick-up steel casings. For each of the two wells, a search grid with dimensions of 100-feet by 100-feet was established. Each grid was centered on the reported location of the well (as determined using the GPS unit) and was screened using a metal detector in east to west and north to south passes. All anomalies indicated by the metal detector were investigated by hand-digging and determined to be metal debris unrelated to the monitoring wells. Each grid was also investigated by using a backhoe to dig down approximately one to two feet below the ground surface at the reported location of the well. No evidence of either monitoring well was found.

Monitoring wells MW-25 and MW-27 were located within the community of Gambell (Figure 2). The monitoring wells were reported to have been constructed as flush-mount completions protected by steel covers. For each of the two wells, a search grid with dimensions of 120 feet by 120 feet was established. Each grid was centered on the reported location of the well (as determined using the GPS unit) and was screened using a metal detector in east to west and north to south passes. All anomalies indicated by the metal detector were investigated by hand-digging and determined to be metal debris unrelated to the monitoring wells. Due to the presence of shallow utilities in the area, a decision was made by Bristol to not investigate the area using heavy equipment. No evidence of either monitoring well was found.

**SUMMARY**

Between August 20 and 21, 2008, Bristol and the NVG crew decommissioned 17 monitoring wells at the Gambell FUDS. Bristol and the NVG crew looked for four other monitoring wells, but was unable to locate them. All accumulated debris will be disposed of at the Columbia Ridge Landfill in Arlington, Oregon.
REFERENCES


Bristol Environmental Remediation Services, LLC. 2008 (June 20). Technical Memorandum, Contract No. W911KB-08-P-0074, Monitoring Well Decommissioning, Gambell, Alaska, Work Plan

FIGURE 1
GAMBELL, ST. LAWRENCE ISLAND, ALASKA
MONITORING WELL DECOMMISSIONING
VICINITY MAP

Source: USGS National Atlas Sheet Number 42-43
NOTES:
2. Contour interval varies 5/100 ft.

LEGEND
- APPROXIMATE LOCATION OF MONITORING WELL DECOMMISSIONED IN AUGUST 2008
- APPROXIMATE LOCATION OF MONITORING WELL NOT LOCATED IN AUGUST 2008

SOURCE: U.S. ARMY ENGINEERING DISTRICT, ALASKA
ST. LAWRENCE ISLAND, AK
FIGURE 1-3, GAMBELL REMEDIAL INVESTIGATION
(SITE 5)-MWH MONTGOMERY WATSON, INC.
### Table 1 - Approximate Monitoring Well Locations

<table>
<thead>
<tr>
<th>Well ID</th>
<th>North Latitude</th>
<th>West Longitude</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>MW-1</td>
<td>63.781356°</td>
<td>171.7149255°</td>
<td>Decommissioned</td>
</tr>
<tr>
<td>MW-2</td>
<td>63.781983°</td>
<td>171.7136754°</td>
<td>Decommissioned</td>
</tr>
<tr>
<td>MW-3</td>
<td>63.782303°</td>
<td>171.7167222°</td>
<td>Decommissioned</td>
</tr>
<tr>
<td>MW-4</td>
<td>63.782614°</td>
<td>171.7157427°</td>
<td>Decommissioned</td>
</tr>
<tr>
<td>MW-5</td>
<td>63.782632°</td>
<td>171.7142623°</td>
<td>Not found during August 2008 site activities</td>
</tr>
<tr>
<td>MW-6</td>
<td>63.781235°</td>
<td>171.6986545°</td>
<td>Not found during August 2008 site activities</td>
</tr>
<tr>
<td>MW-7</td>
<td>63.781432°</td>
<td>171.697668°</td>
<td>Decommissioned</td>
</tr>
<tr>
<td>MW-8</td>
<td>63.781016°</td>
<td>171.6978684°</td>
<td>Decommissioned</td>
</tr>
<tr>
<td>MW-9</td>
<td>63.779763°</td>
<td>171.6953778°</td>
<td>Decommissioned</td>
</tr>
<tr>
<td>MW-10</td>
<td>63.779493°</td>
<td>171.696521°</td>
<td>Decommissioned</td>
</tr>
<tr>
<td>MW-11</td>
<td>63.779979°</td>
<td>171.6976435°</td>
<td>Decommissioned</td>
</tr>
<tr>
<td>MW-12</td>
<td>63.780023°</td>
<td>171.6995515°</td>
<td>Decommissioned</td>
</tr>
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<td>MW-13</td>
<td>63.77942°</td>
<td>171.6999017°</td>
<td>Decommissioned</td>
</tr>
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<td>MW-17</td>
<td>63.741088°</td>
<td>171.7076646°</td>
<td>Decommissioned</td>
</tr>
<tr>
<td>MW-18</td>
<td>63.741363°</td>
<td>171.7085022°</td>
<td>Decommissioned</td>
</tr>
<tr>
<td>MW-19</td>
<td>63.737655°</td>
<td>171.7164491°</td>
<td>Decommissioned</td>
</tr>
<tr>
<td>MW-20</td>
<td>63.744871°</td>
<td>171.7115767°</td>
<td>Decommissioned</td>
</tr>
<tr>
<td>MW-21</td>
<td>63.745254°</td>
<td>171.7108938°</td>
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</tr>
<tr>
<td>MW-22</td>
<td>63.744751°</td>
<td>171.7100725°</td>
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</tr>
<tr>
<td>MW-25</td>
<td>63.777664°</td>
<td>171.7174244°</td>
<td>Not found during August 2008 site activities</td>
</tr>
<tr>
<td>MW-27</td>
<td>63.777449°</td>
<td>171.7185506°</td>
<td>Not found during August 2008 site activities</td>
</tr>
</tbody>
</table>

**Notes:**

° = degrees

ID = identification
ATTACHMENT 1

Site Photographs
Photograph No. 1  
Direction: South  
Date: 8/20/08  
Photographer: L. MacDonald  
Description: Removing protective well cover from MW-12.

Photograph No. 2  
Direction: West  
Date: 8/20/08  
Photographer: L. MacDonald  
Description: Pulling PVC well casing from MW-22.
Photograph No. 3

Direction: NA

Date: 8/20/08

Photographer: L. MacDonald

Description: Bentonite pellets in MW-3 (prior to hydration of pellets) following removal of well casing.

Photograph No. 4

Direction: East

Date: 8/20/08

Photographer: L. MacDonald

Description: NVG personnel looking for MW-7. Crew utilized a metal detector, heavy equipment, and hand-digging while attempting to find MW-5 and MW-7.
Photograph No. 5
Direction: West
Date: 8/21/08
Photographer: L. MacDonald
Description: NVG personnel looking for MW-27. Crew utilized a metal detector and hand-digging while attempting to find MW-25 and MW-27.

Photograph No. 6
Direction: East
Date: 8/21/08
Photographer: L. MacDonald
Description: NVG heavy-equipment operator consolidating well construction materials at the end of the monitoring well decommissioning effort.
ATTACHMENT 2

Field Notes
<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
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<tbody>
<tr>
<td>8-18-08</td>
<td>Work with Matt. Shop for &quot;Stain&quot; (8)</td>
</tr>
</tbody>
</table>
8-21-08 Cond'd
Site Fly-e on Beach
Area. No Reference except
GPS. MW-05=100 ft sq search
For well no Luck Range twice
Only manston Matt's
And 22 shell
Good Grid PICS
Site MW-07= Set up
100'50 Grid on GPS like
On MW-05= manston Matt's
Range GPS twice. No Luck
Just pieces of Matt
Pics - Start to pick
Up Debris from Matts

8-22-08 Pick-up Debris
Det to Nale up Site
Re-package Loose stuff
in Super Sac's
All Debris Pick'd up
AAll All sites back
to original levels.
Catch Bearing Air at 11 AM
Day 00 Cond
Filled all holes that did not cave in with bentonite.
The 17 MWS were completely removed. All wells were kept intact while being removed.
Will spend more time on MWS #5, 7, 25 & 27. Trying to find in the A.M. 8-21-08

8-21-08 started meeting with NALEMP crew.
Grid up MWS 27, 120' SQ.
Also follow old road, North side 150'. Found drum with bolts. Ran GPS twice.
Grid up 23, 120' SQ.
Same stuff and a fuel line. Ran GPS twice.
2 Schneiders used before Corps. Stopped at 1pm.
Going to MWS 17, 18, 19, 20, 21, 22
Pick up debris.
NORTH BEACH

APPX 100' \\

1ST GPS SPOT

APPX 100'

2ND GPS SPOT

N.L. 63.781 432°
W.L. 171.697 68°

NO REFERENCE POINTS EXCEPT GPS.

THIS GRID WAS SWEEP EAST/WEST AND NORTH/SOUTH WITH METAL DETECTORS.
Project: Gambell Monitoring Wells
Subject: MW-05
Task: Try to locate MW-05

NORTH BEACH

Approx 100'

N.L. 63.782632°
W.L. 171.7142623°

No reference points except GPS

This grid was swept east/west and north/south with metal detectors

NOT TO SCALE
Project: Gambell Monitoring Wells
Subject: MW-25
Task: Try to Locate MW-25

N.L. 63.777664°  W.L 171.7174244°
SWING SET
1st GPS Spot
2nd GPS Spot
APPROX 120'

PHONE POLE
BLUE HOUSE

NOT TO SCALE

THIS GRID WAS SWEPT EAST/WEST
AND NORTH/SOUTH WITH METAL DETECTORS

N

Sheet 1 of 1
Project: GALLAGHER MONITORING WELLS
Subject: MW-27
Task: TRY TO LOCATE MW-27

CITY HALL

RAT NET DISH

APPROX 120'

OLD ROAD BED

N.L. 63,7774490
W.L. 171,7185506

THIS GRID WAS SWEEP EAST/WEST
AND NORTH/SOUTH WITH METAL DETECTORS

NOT TO SCALE