Nevada
Environmental
Restoration
Project

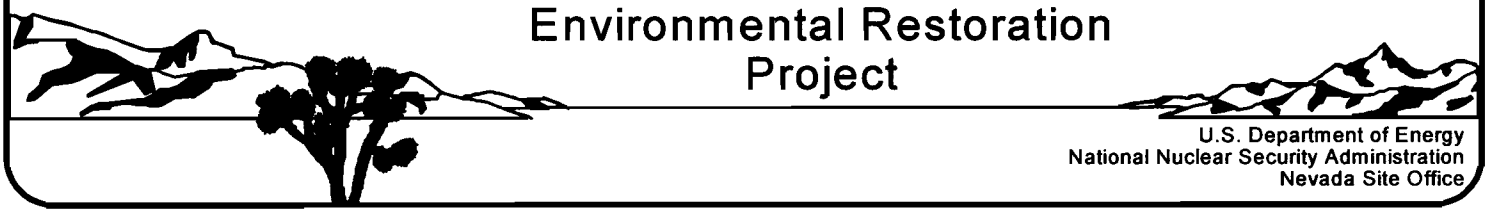
DOE/NV--1170

National Nuclear Security Administration

Amchitka Mud Pit Sites 2006 Post-Closure Monitoring and Inspection Report Amchitka Island, Alaska

Revision No.: 0

September 2006



Environmental Restoration
Project

U.S. Department of Energy
National Nuclear Security Administration
Nevada Site Office

Available for public sale, in paper, from:

U.S. Department of Commerce
National Technical Information Service
5285 Port Royal Road
Springfield, VA 22161
Phone: 800.553.6847
Fax: 703.605.6900
Email: *orders@ntis.gov*
Online ordering: *http://www.ntis.gov/ordering.htm*

Available electronically at *http://www.osti.gov/bridge*

Available for a processing fee to U.S. Department of Energy and its contractors, in paper, from:

U.S. Department of Energy
Office of Scientific and Technical Information
P.O. Box 62
Oak Ridge, TN 37831-0062
Phone: 865.576.8401
Fax: 865.576.5728
Email: *reports@adonis.osti.gov*

DOE/NV--1170

AMCHITKA MUD PIT SITES 2006 POST-CLOSURE MONITORING AND INSPECTION REPORT AMCHITKA ISLAND, ALASKA

U.S. Department of Energy
National Nuclear Security Administration
Nevada Site Office
Las Vegas, Nevada

Prepared by Stoller-Navarro Joint Venture

Revision No.: 0

September 2006

AMCHITKA MUD PIT SITES
2006 POST-CLOSURE MONITORING AND INSPECTION REPORT
AMCHITKA ISLAND, ALASKA

Approved by: _____ Date: 10/19/06

John B. Jones
Acting Federal Project Director
Environmental Restoration Project

Table of Contents

AMCHITKA MUD PIT SITES
2006 POST-CLOSURE MONITORING AND INSPECTION REPORT

1.0 Introduction

In 2001, the U.S. Department of Energy (DOE), National Nuclear Security Administration (NNSA/NSO) remediated six areas associated with Amchitka mud pit release sites located on Amchitka Island, Alaska. This included the construction of seven closure caps. To ensure the integrity and effectiveness of remedial action, the mud pit sites are to be inspected every five years as part of DOE's long-term monitoring and surveillance program. In August of 2006, the closure caps were inspected in accordance with the *Post-Closure Monitoring and Inspection Plan for Amchitka Island Mud Pit Release Sites* (Rev. 0, November 2005). This post-closure monitoring report provides the 2006 cap inspection results.

1.1 Mobilization/Demobilization

The inspection crew arrived on Amchitka Island in the morning of August 1, 2006, via the Fairweather Marine vessel, Arctic Wolf. Upon arrival, equipment and vehicles were unloaded and the survey crew traveled to each of the inspection sites to ensure accessibility. Cap inspections began in the early morning of August 2. Island activities were concluded on August 6, and equipment and vehicles were loaded onto the Arctic Wolf. The crew and vessel departed the Island on August 7.

1.2 Key Personnel

The inspection crew consisted of the following personnel:

Pete Sanders, NNSA/NSO, Offsites Project Lead
Patrick Matthews, Stoller-Navarro Joint Venture (SNJV), Task Manager
Richard Marty, SNJV, Biologist
Amy Forman, Stoller, Biologist
Richard Deshler, SNJV, Geologist and GPS Specialist
Robert Moore, SNJV, Field Technician
Greg Studley, Stoller, Geologist, Heavy Equipment Operator
Paul Darr, Stoller, Legacy Management Representative
Ian Buness, Fairweather Marine, Emergency Medical Technician

1.3 Island Overview

The dock appeared to be in good condition, and the roads were accessible except Infantry Road has severe undercutting at Mile Marker 8 where a culvert is being washed out. Continued erosion will eventually cause the road impassable. The culvert is approximately 25 feet long and is located eight feet below the road grade. The existing undercut extends approximately five feet under the road surface leaving about a 10-foot width of passable road. An existing borrow pit area is located within 500 feet of the damaged road; north of the damaged area. Future inspection activities may require that the road be repaired to gain access to all of the caps except the Rifle Range and Longshot

caps. All Terrain Vehicles may have the capability to drive around the damaged area; large vehicles would not be able to overcome the tundra.

1.4 Cap Survey Methodology

Transect points were located and flagged using GPS. Coordinates were recorded using Alaska State Plane, Zone 10 NAD 27. Permanent transect point stakes were not installed. Coordinates of transect points for each closure cap are provided in each of the seven attachments.

1.5 Visual Inspection Methodology

Visual inspections were conducted for each closure cap by walkover surveys paralleling the transect lines at approximately 20 foot intervals. The circumference and associated ancillary structures were also inspected. Results of the visual inspections are on the Monitoring Checklists provided in each of the seven attachments.

1.6 Photographic Documentation Methodology

Photopoints of the cap (unless otherwise noted) were taken from the transect points toward the middle of the cap. Each of the seven attachments contain a photographic log indicating the location of the photopoint (i.e., transect point) and corresponding photographs. In addition, a compact disc is provided with electronic images.

1.7 Vegetation Sampling Methodology

Objective vegetation cover sampling methods using line interception and point interception were used in estimating the vegetation cover on the Amchitka landfill caps. A 1.0- by 0.5-meter point frame, with a 36-point grid, was placed along the permanent transects , according to a stratified random sampling design, such that approximately 1 out of every 4 meters of each transect was sampled The number of frames sampled on each cap ranged from approximately 30 to over 200. Thus, the total number of points sampled on each cap ranged from approximately 900 to over 7,000, depending on the size of the cap.

Line intercept data was also collected on two of the caps along the length of each permanent transect according to standard methods. This sampling method was later abandoned, because in the field, the efficiency and precision of the point interception method was much greater.

2.0 Vegetation Discussion

This section summarizes the Amchitka Island vegetation survey results and presents recommendations regarding vegetative cover on the caps. Survey results are discussed in detail individually in the attachments.

2.1 Total Vegetative Cover

Total vegetative cover varied inversely with the elevation of the cap (Figure 2.1). The lowest total vegetative cover (50 percent) found on Cap Longshot (LS) and the lowest

vegetative cover (8.0 and 7.9 percent, respectively) found on Caps E and F. When the contribution of planted species is removed, all caps higher than 200 feet showed between 3 and 11 percent cover with invading species (Figure 2.2). The two caps below 200 feet elevation showed much higher levels of cover from invading plant species with 32 and 22 percent cover of invading species at caps LS and Rifle Range (RR), respectively.

2.2 Planted Vegetation

Two species were planted on the caps on Amchitka Island: Deschampsia behringensis and Festuca rubra. Both seeded species and invading species had difficulty in becoming established during the first five years following cap installation (Table 2.1). The success of these species in becoming established is inversely correlated to the elevation of the cap (Figure 2.3). The lowest cover is associated with Caps E and F, which had 2.2 and 0.6 percent planted covers, respectively. The highest cover was found on Caps Cannikin North/South (CNS) and LS, which are two of the four lowest elevation caps on the island (18.6 and 16.7 percent, respectively). Caps Cannikin Ground Zero (CGZ) and RR, however, are the other two low elevation caps on the island and showed considerably less planted cover (8.1 and 8.8 percent).

The caps with the least cover of planted vegetation fall into the Crowberry Stripe Community (Caps E and F) of Amundsen (1972). This community is characterized by alternating stripes of tundra and barren mineral soil. The caps with the highest vegetation cover (Caps CGZ, CNS, LS, RR) belong to the Crowberry Meadow Community of Amundsen (1972). Cap D is in a zone transitional between the Crowberry Stripe and Crowberry Meadows Communities. The Crowberry Stripe Community is characterized by harsher growing conditions brought about by higher elevations, and Amundsen (1977) attribute the lack of vegetative cover on mineral soil stripes in the tundra stripe community to frost heaving, which disturbs the roots of seedlings.

Table 2.1. Summary of Plant Cover on Caps

Cap	Distance from Constantine Harbor	Elevation Midpoint	Vegetation Cover %	Species Count	F. rubra and D. behringensis		Litter Cover
	miles				cover	percentage of total plant cover	
CGZ	11	208	13.4%	12	8.1%	60.1%	12.7%
CNS	11	235	21.9%	10	18.6%	84.8%	12.0%
D	16	303	16.6%	8	5.5%	33.0%	30.2%
E	21	475	8.0%	4	2.2%	27.9%	20.2%
F	19	473	7.9%	5	0.6%	7.0%	20.0%
LS	4.5	152	49.0%	13	16.7%	34.0%	16.6%
RR	3	57	30.5%	14	8.8%	28.9%	9.7%

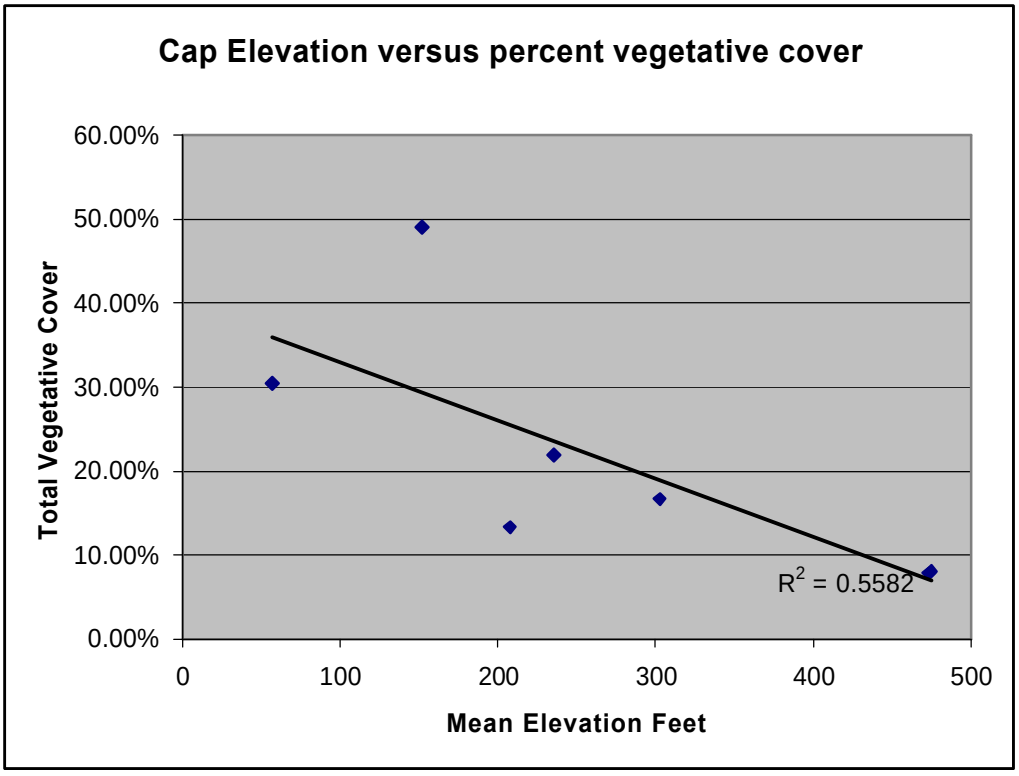


Figure 2.1

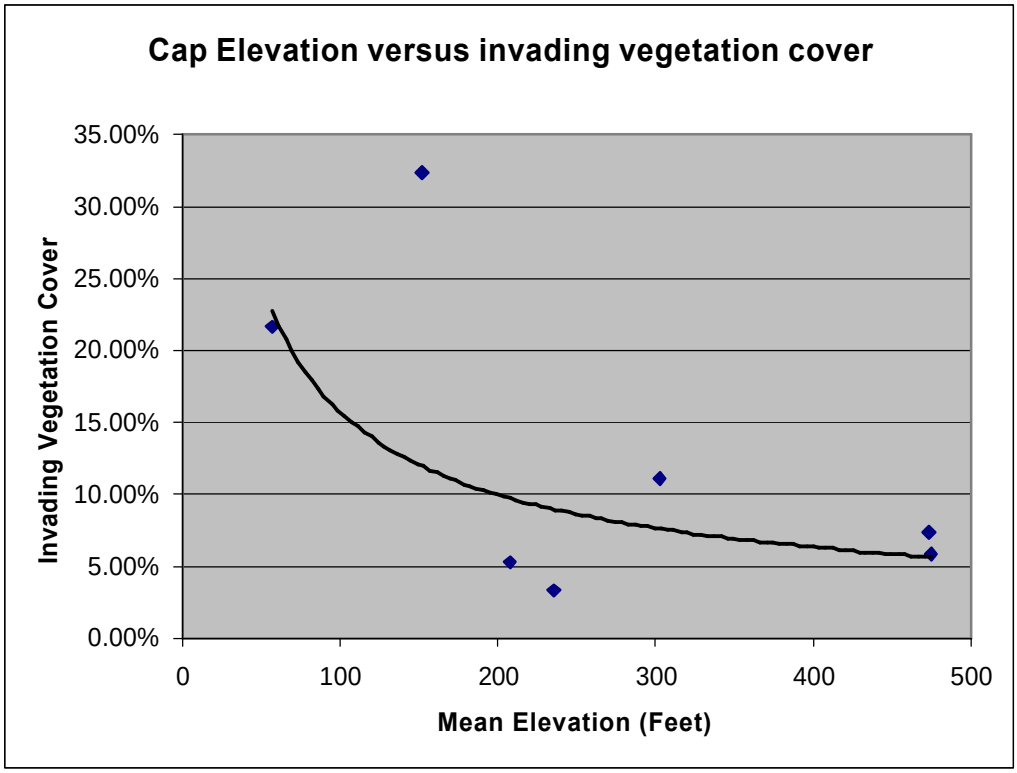


Figure 2.2

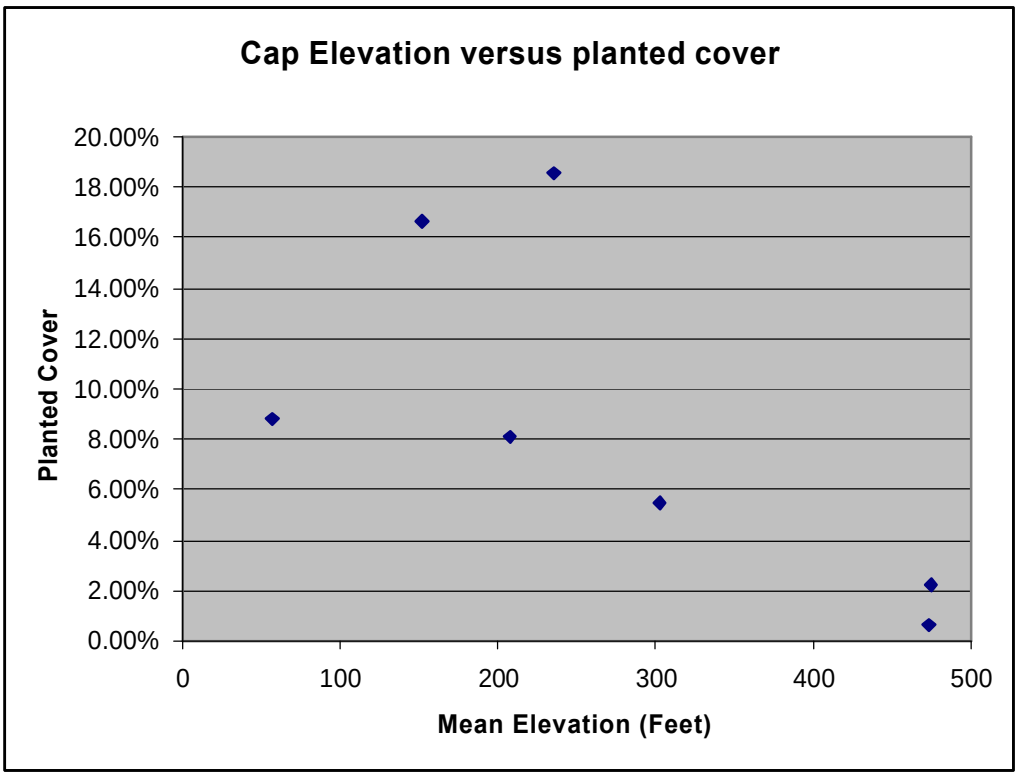


Figure 2.3

The scarcity of F. rubra and D. behringensis at the higher elevation caps may have been exacerbated by late completion of the highest elevation caps in 2001 (P. Sanders, personal communication, 2006). Late completion would have limited the initial growth of plants and hindered their establishment on the caps.

Seeds were emplaced in a vegetative mat, which provided a thin layer of organic material, but this layer was largely removed from the site at the time of the follow-up survey (litter which includes left over seed mat and other forms of dead plant material was found only at 20 percent of locations as thin deposits), leaving behind bare mineral soil. The limited amount of mulch emplaced over mineral soils during planting may have contributed to the low cover of seeded species five years after completion.

The value of thick mulch covers is shown by the vegetation growing around a flow damping structure formed of approximately 18 inches of piled SC150 mat at the base of Cap D. The structure was not sampled for vegetation cover, but vegetation at the structure was considerably more abundant, diverse, and taller than the vegetation on adjoining barren areas. The increased vegetation success occurred for both seeded species (F. rubra and D. behringensis; and for non-seeded species such as Epilobium latifolium) was probably produced by some combination of trapping of seeds, protection from winds, shelter from frost heaving, or moisture trapping. Increased vegetation success also was noted at similar structures around the caps.

2.3 Species Diversity

Species diversity showed inverse correlation with cap elevation (Figure 2.4). Cap E, the highest cap, had a total of only four observed taxa (moss, F. rubra, D. behringensis, and Lupinus nootkatensis) while Cap RR, the lowest cap, had a total of 14 taxa observed (including all four taxa observed at Cap E along with Achillea borealis, Agrostis borealis, Anaphalis margaritacea, Carex macrochaeta, Cerastium beeringianum, Conioselinum chinense, Epilobium latifolium, Equisetum arvense, Poa stenantha, and Rhinanthus minor). The higher diversity of taxa on the lower caps suggests that invading species are more readily established under the relatively hospitable conditions of the Crowberry Meadow Community of Amundsen (1972).

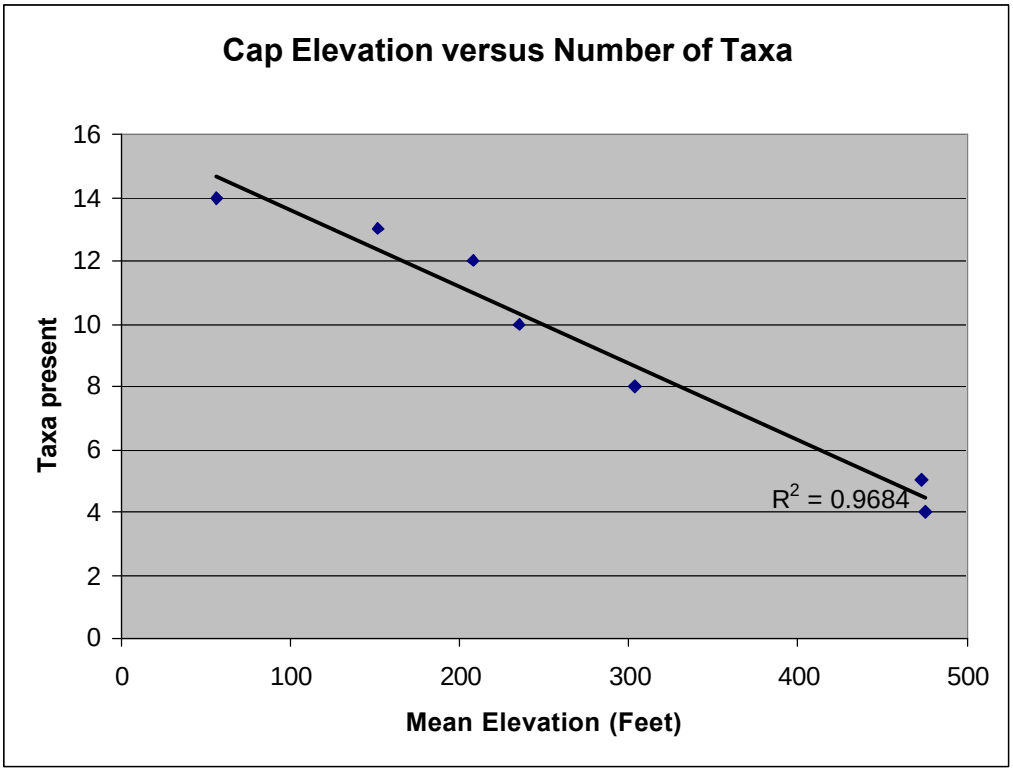


Figure 2.4

2.4 Recommendations

The success of seeded species and invading species varied with cap elevation. Both seeded species and invading species had difficulty in becoming established on the highest caps during the first five years following installation. Lower elevation caps had more success in vegetation establishment, with as many as twelve non-planted taxa becoming established on the lower caps, but in all cases, total vegetative cover was less than 50 percent. The Monitoring and Inspection Plan specifies that a deficient condition is identified where vegetative cover is less than 50 percent on grid. Therefore, deficient conditions exist on all of the caps on the island. These deficient conditions result largely from unrealistic expectations concerning the ease of establishing vegetation on disturbed areas of marine tundra, which were incorporated into the Monitoring and Inspection Plan.

The sparse vegetation cover results from the slow vegetation recovery, especially on the highest caps, which should be expected in this environment especially in the Tundra Stripe Community. The primary purpose of the vegetative cover on the caps is to hold the cap materials in place. Because there were no signs of major erosion on the caps, a corrective action of continued monitoring without intrusive revegetation measures is recommended for all caps on Amchitka Island.

If intrusive revegetation measures are desired for any cap, they should recognize the fragile nature of the vegetation that has become established on the caps. Attempts to increase vegetation cover on the caps must consider the slow recovery rates which are to

be expected even under optimum conditions. Such attempts should avoid setting back the fragile vegetation that has gained a foothold on the caps.

Approaches that might improve vegetative cover, should the sparse cover persist, include overseeding barren and sparsely vegetated areas, early in the growing season, with an approved seed mix; modifying seed mixes to include species such as lupines that invade early and survive even under harsh conditions; and increasing the amount of organic mulch covering the mineral soils. The effectiveness of organic mulch in promoting vegetation growth is illustrated by the water retention structure at Cap D (the high vegetation area in the drainage shown in Attachment 5 photographs P8030058 and P8030066). The retention structures were formed of approximately 50-centimeter thick stacks of seed mat that were staked in place. The structure was not sampled for vegetation cover, but vegetation at the structure was considerably more abundant, diverse, and taller than the vegetation on adjoining barren areas. The increased vegetation success occurred for both seeded species (F. rubra and D. behringensis; and non-seeded species such as Epilobium latifolium) and was apparently produced by a combination of trapping of seeds, protection of plants from winds, reduction of root disturbance by frost heaving, and moisture trapping. Increased vegetation success was noted at similar structures around other caps as well.

Future monitoring efforts should recognize that even undisturbed areas of the Tundra Stripe Community do not exhibit complete vegetative cover. Establishment and maintenance of 100 percent vegetative cover on caps falling into this community appears unrealistic and may be impossible.

3.0 Summary of Attachments

The detailed as-built drawing with transect coordinates, Monitoring Checklist with associated discussions, Vegetation Checklist, and Photographic Log and associated photographs for each of the seven closure caps are presented in Attachments 1 through 7. These attachments are arranged in geographic order starting with the Rifle Range Site (closest to Constantine Harbor) extending northwest to the furthest site, Drill Site E. Attachment 8 provides a compact disk with electronic photographs.

1.0 Rifle Range

E. 2,187,750

E. 2,188,000

E. 2,188,250

N. 187,000

USFWS MONUMENT
N. 187,163.93
E. 2,187,922.29
EL. 55.88

POND
ELEV.=52.9

BORROW AREA

RR-3 NE
E=2187917.9480
N=187097.7491

RR-4 NE
E=2187993.4610
N=187068.6661

RR-1 NW
E=2187814.4490
N=187075.4591

ENERGY DISSIPATOR

RR-2 NW
E=2187816.4350
N=187027.5371

CHANNEL RR2

RR-3 SW
E=2187843.4330
N=186940.9341

CHANNEL RR1

RR-4 SW
E=2187901.2180
N=186909.4951

RR-1 SE
E=2188040.5830
N=186993.1251

RR-2 SE
E=2187996.2940
N=186925.0241

POND
ELEV.=51.8

ENERGY DISSIPATOR

(RR-1) (RR-2) (RR-3) (RR-4)

Explanation

1. Vegetative Cover Grid Area
- Transect/Photopoint
- Starting Point
- Visual Inspection Route

Coordinates:
Alaska State Plane, Zone 10 NAD27

0 50 100 150 200
SCALE IN FEET

AS-BUILT OF

RIFLE RANGE

AMCHITKA MUDPITS

MUDPIT CLOSURE FINAL TOPOGRAPHY SURVEY

PREPARED BY
McCLINTOCK LAND ASSOCIATES, INC.
11940 BUSINESS BOULEVARD, SUITE 205
EAGLE RIVER, ALASKA 99577
(907) 694-4499

PREPARED FOR
BRICE INCORPORATED
3200 SHELL STREET
FAIRBANKS, ALASKA 99707
(907) 452-2512

PLOT: 1"=50'	CHK: GDK	JOB: 01-117	DWG: AS-BUILT	FB NO: JOB
SITE: RR	DWN: KQ	DATE: 10-25-01	DISK: DELL-E	SHEET: 1 OF 1

H: /Amchitka/GPS_Bases/AMrifle.dgn

AMCHITKA MUD PIT SITES POST-CLOSURE MONITORING CHECKLIST

Mud Pit Site: Rifle Range	Date of Inspection: August 4, 2006
Responsible Agency: National Nuclear Security Adm.	Project Manager: John Jones
Inspector (name, title, organization): Patrick Matthews, Task Manager, Stoller Navarro Joint Venture	

A. General Instructions

1. All checklist items must be completed and detailed comments made to document the results of the site inspection.
2. The completed checklist is part of the field record of the inspection. Additional pages should be used as necessary to ensure that a complete record is made. Number and attach the additional pages upon completion of the inspection.
3. Any checklist line item marked by an inspector in a SHADED BOX must be fully explained or an appropriate reference to previous reports provided. The explanation should include the inspector's rationale for conclusions and recommendations, if appropriate. Explanations are to be placed on additional attachments and cross-referenced appropriately, and may take the form of sketches, measurements, and/or annotated site maps.
4. The site inspection is a walking inspection of the entire site, including the perimeter and sufficient transects to be able to inspect the entire surface and all features specifically described in this checklist. Attach a drawing indicating the starting and ending points and the direction and pattern of the inspection.
5. A standard set of color 35 mm photographs (or equivalent) is required. In addition, all anomalous features or new features (such as changes in adjacent area land use) are to be photographed. A photo log entry will be made for each photograph taken.

B. Preparation (to be completed prior to site visit)	YES	NO	EXPLANATION
1. Site as-built plans and site base map reviewed	X		Amchitka Mud Pit Closure -As Built
2. Previous inspection reports reviewed		X	No previous inspections were performed
a. Were anomalies or trends detected on previous inspections?			Not Applicable
b. Was maintenance performed on areas with anomalies?			Not Applicable
3. Site maintenance and repair records reviewed		X	No previous maintenance activities were performed
a. Has site repair resulted in a change from as-built conditions?		X	No detectable changes from the as-builts were observed.
b. Are revised as-builts available that reflect repair changes?			Not Applicable: No repairs have occurred.

C. Site Inspection (to be completed during inspection)	YES	NO	EXPLANATION
1. Adjacent offsite features within mud pit site area			
a. Changes in use of adjacent area?		X	Wildlife refuge
b. Any new roads or trails?		X	Per previous photos and As-built Drawings
c. Change in the position of nearby washes?		X	None Detected
d. Erosion/deposition of nearby washes?		X	None Detected
e. New drainage channels?		X	None Detected
f. Change in surrounding vegetation?		X	None Detected
2. Security markers; signs			
a. Displacement of site markers, boundary markers, or monuments?		X	USFWS Monument was present / Good Condition
b. Signs damaged or removed?		X	No signs were present or noted in the As-builts
3. Cap			
a. Evidence of subsidence?		X	
b. Evidence of cracking?		X	
c. Evidence of erosion (wind or water)?		X	
d. Evidence of animal burrowing?		X	
e. Are site markers disturbed? By man?_____ By natural processes?_____		X	
f. Do natural processes threaten the integrity of cap or site marker?		X	

AMCHITKA MUD PIT SITES POST-CLOSURE MONITORING CHECKLIST (continued)

Mud Pit Site: Rifle Range	Date of Inspection: August 4, 2006

C. Site inspection (continued)	YES	NO	EXPLANATION
4. Vegetative cover			
a. Is plant cover adequate to prevent erosion?	X		See Discussion on Continuation Sheet
b. Are weedy annual plants present? Do they require removal?		X	See Discussion on Continuation Sheet
c. Evidence of animals on cap?		X	See Discussion on Continuation Sheet
d. Evidence of excessive plant mortality?		X	See Discussion on Continuation Sheet
e. Has a vegetative cover log been completed?	X		See attached log
5. Photo Documentation			
a. Has a photo log been prepared?	X		See attached log
b. How many photos were taken?			9 Photos as noted in the photographic log

D. Field Conclusions			
1. Imminent hazard to integrity of cap? (If yes, immediate report required. Note the person or agency the report will be made to.)		X	
2. Are more frequent inspections required?		X	
3. Are existing maintenance actions satisfactory?			N/A No maintenance was performed or required
4. Are existing repair actions satisfactory?			N/A No repairs were performed or required
5. Is other maintenance/repair necessary?		X	

6. Rationale for field conclusions: Conclusions were based on walkover visual inspections and plant counts.

7. Factors contributing to or impacting inspection: None noted

E. Certification

I certify that I have conducted an inspection of the Rifle Range Mud Pit Site cap in accordance with the Monitoring and Inspection Plan for the Amchitka Mud Pit Release Sites, Rev. 0, dated November 2005, as recorded on this checklist, attached sheets, field notes, vegetative cover log, photo logs, and photographs.

Inspector Printed Name:	Inspector Signature:
Patrick Matthews	
Title:	Date:
TASK Manager	9/12/06

AMCHITKA MUD PIT SITES POST-CLOSURE MONITORING CHECKLIST
Continuation Sheet
Rifle Range (RR)

Cap RR is located approximately three miles northwest of Constantine Harbor with an elevation of 54 to 59 feet. The cap is located in the Crowberry Meadow Community of Amundsen (1972). Vegetation cover on this cap (30.5 % cover) was approximately four times the levels found at Cap F. The cover of species other than *F. rubra* and *D. behringensis* is consistent with the elevation trend observed among the caps (Figure 2.1). Species diversity also was consistent with the elevation with a total of 14 taxa observed (Figure 2.2). This is the largest number of taxa observed at any cap. The abundance of *F. rubra* and *D. behringensis* (8.8 % cover) also is consistent with the expected value for the elevation of the cap.

Cap RR had a litter cover of approximately 10 % which is the lowest value found among the caps surveyed. This may suggest that the effects of elevation outweigh the effects of organic mulches on plant survival.

The vegetation cover on Cap RR is consistent with the vegetation recovery expected for its elevation and location in the Crowberry Meadow Community. The vegetation cover represents five years of growth, and any attempt to increase vegetative cover on the cap should avoid setting back vegetation recovery which is well underway.

References Cited

Amundsen, C.C. 1972. Amchitka Bioenvironmental Program. Plant Ecology of Amchitka Island: USAEC Report BMI-171-139. Battelle Memorial Institute.

Vegetative Cover Log

Mud Pit Site: Rifle Range

Cap Section	% Vegetative Cover (check one)				Comments
	0-25	25-50	50-75	75-100	
RR1-1 2 feet	0%				
RR1-2 8 feet	11%				*Lupinus nootkatensis*; *Festuca rubra.*
RR1-3 11 feet	11%				*Carex macrochaeta*; *Festuca rubra.*
RR1-4 15 feet	19%				*Epilobium latifolium*; *Festuca rubra*; moss.
RR1-5 29 feet		44%			*Lupinus nootkatensis*; *Festuca rubra.*
RR1-6 32 feet				78%	*Lupinus nootkatensis*; *Festuca rubra.*
RR1-7 40 feet			50%		*Lupinus nootkatensis*; *Festuca rubra.*
RR1-8 50 feet	0%				
RR1-9 53 feet	22%				*Lupinus nootkatensis.*
RR1-10 70 feet	0%				
RR1-11 122 feet			56%		*Lupinus nootkatensis.*
RR1-12 138 feet			69%		*Lupinus nootkatensis.*
RR1-13 155 feet	8%				*Deschampsia beringensis.*

Vegetative Cover Log

Mud Pit Site: Rifle Range

Cap Section	% Vegetative Cover (check one)				Comments
	0-25	25-50	50-75	75-100	
RR1-14 170 feet	6%				*Festuca rubra.*
RR1-15 175 feet	3%				*Deschampsia beringensis.*
RR1-16 181 feet	6%				*Lupinus nootkatensis*; *Festuca rubra.*
RR1-17 184 feet	8%				*Lupinus nootkatensis*; *Deschampsia beringensis.*
RR1-18 207 feet	0%				
RR1-19 212 feet	0%				
RR1-20 225 feet	14%				*Deschampsia beringensis.*
RR2-1 11 feet		33%			*Lupinus nootkatensis*; *Festuca rubra*; *Achillea borealis*; *Carex macrochaeta*; *Equisetum arvense.*
RR2-2 19 feet			56%		*Lupinus nootkatensis*; *Achillea borealis.*
RR2-3 25 feet	8%				*Lupinus nootkatensis*; *Achillea borealis*; *Deschampsia beringensis.*
RR2-4 29 feet	8%				*Deschampsia beringensis.*
RR2-5 34 feet		28%			*Festuca rubra*; *Lupinus nootkatensis*; *Deschampsia beringensis.*
RR2-6 46 feet	6%				*Festuca rubra*; *Deschampsia beringensis.*

Vegetative Cover Log

Mud Pit Site: Rifle Range

Cap Section	% Vegetative Cover (check one)				Comments
	0-25	25-50	50-75	75-100	
RR2-7 53 feet	3%				*Deschampsia beringensis.*
RR2-8 67 feet	6%				*Festuca rubra*; *Deschampsia beringensis.*
RR2-9 90 feet		42%			*Festuca rubra*; *Lupinus nootkatensis*; *Deschampsia beringensis.*
RR2-10 97 feet		44%			*Lupinus nootkatensis*; *Festuca rubra.*
RR2-11 109 feet	11%				*Lupinus nootkatensis.*
RR2-12 116 feet	22%				*Deschampsia beringensis.*
RR2-13 127 feet	17%				*Deschampsia beringensis*; *Festuca rubra.*
RR2-14 130 feet	14%				*Deschampsia beringensis.*
RR2-15 139 feet		25%			*Festuca rubra*; *Deschampsia beringensis.*
RR2-16 164 feet	3%				*Festuca rubra.*
RR2-17 174 feet		25%			*Deschampsia beringensis*; *Lupinus nootkatensis.*
RR2-18 179 feet		25%			*Deschampsia beringensis.*
RR2-19 193 feet	11%				*Festuca rubra*; *Deschampsia beringensis*; *Lupinus nootkatensis.*

Vegetative Cover Log

Mud Pit Site: Rifle Range

Cap Section	% Vegetative Cover (check one)				Comments
	0-25	25-50	50-75	75-100	
RR2-20 197 feet	14%				*Festuca rubra.*
RR3-1 1 feet				89%	Moss; *Deschampsia beringensis.*
RR3-2 6 feet	8%				*Deschampsia beringensis*; moss.
RR3-3 10 feet	3%				*Deschampsia beringensis.*
RR3-4 17 feet	0%				
RR3-5 41 feet	0%				
RR3-6 46 feet	0%				
RR3-7 55 feet	6%				*Festuca rubra.*
RR3-8 66 feet		28%			*Lupinus nootkatensis*; *Deschampsia beringensis*; *Anaphalis margaritacea.*
RR3-9 75 feet	3%				*Deschampsia beringensis.*
RR3-10 87 feet	0%				
RR3-11 92 feet	22%				*Lupinus nootkatensis.*
RR3-12 95 feet	14%				*Lupinus nootkatensis.*

Vegetative Cover Log

Mud Pit Site: Rifle Range

Cap Section	% Vegetative Cover (check one)				Comments
	0-25	25-50	50-75	75-100	
RR3-13 104 feet		39%			*Deschampsia beringensis*; *Carex macrochaeta*; *Lupinus nootkatensis*; *Equisetum arvense*.
RR3-14 107 feet	6%				*Deschampsia beringensis*.
RR3-15 118 feet	19%				*Deschampsia beringensis*; *Equisetum arvense*.
RR3-16 126 feet				100%	*Lupinus nootkatensis*; *Anaphalis margaritacea*; *Carex macrochaeta*; *Conioselinum chinense*.
RR3-17 146 feet			61%		*Lupinus nootkatensis*; *Achillea borealis*; *Carex macrochaeta*; *Conioselinum chinense*; *Festuca rubra*.
RR3-18 156 feet				78%	*Lupinus nootkatensis*; *Festuca rubra*; *Agrostis borealis*; *Deschampsia beringensis*; *Achillea borealis*; *Rhinanthus minor*.
RR3-19 161 feet				100%	*Lupinus nootkatensis*; *Festuca rubra*; *Carex macrochaeta*; *Achillea borealis*; *Conioselinum chinense*; *Poa stenantha*.
RR3-20 169 feet			56%		*Lupinus nootkatensis*; *Festuca rubra*; *Agrostis borealis*; *Anaphalis margaritacea*.
RR4-1 2 feet				94%	Moss; *Festuca rubra*; *Achillea borealis*.
RR4-2 7 feet				92%	Moss; *Lupinus nootkatensis*; *Festuca rubra*; *Cerastium beeringianum*; *Epilobium latifolium*.
RR4-3 15 feet				100%	*Lupinus nootkatensis*; moss; *Festuca rubra*; *Cerastium beeringianum*.

Vegetative Cover Log

Mud Pit Site: Rifle Range

Cap Section	% Vegetative Cover (check one)				Comments
	0-25	25-50	50-75	75-100	
RR4-4 26 feet				83%	*Lupinus nootkatensis*; *Achillea borealis*; moss; *Festuca rubra*; *Deschampsia beringensis*; *Epilobium latifolium.*
RR4-5 31 feet	8%				*Achillea borealis*; *Festuca rubra.*
RR4-6 36 feet		31%			*Lupinus nootkatensis.*
RR4-7 48 feet		39%			*Lupinus nootkatensis*; *Festuca rubra.*
RR4-8 51 feet		39%			*Lupinus nootkatensis*; *Festuca rubra.*
RR4-9 63 feet		25%			*Festuca rubra*; *Lupinus nootkatensis*; moss; *Conioselinum chinense.*
RR4-10 73 feet			72%		*Festuca rubra*; *Lupinus nootkatensis*; *Achillea borealis*; *Cerastium beeringianum*; *Deschampsia beringensis.*
RR4-11 90 feet		31%			*Lupinus nootkatensis*; *Festuca rubra.*
RR4-12 97 feet	17%				*Festuca rubra*; *Deschampsia beringensis.*
RR4-13 101 feet	8%				*Festuca rubra*; *Deschampsia beringensis.*
RR4-14 104 feet		25%			*Deschampsia beringensis.*
RR4-15 113 feet	17%				*Festuca rubra*; *Deschampsia beringensis*; *Lupinus nootkatensis.*

Vegetative Cover Log

Mud Pit Site: Rifle Range

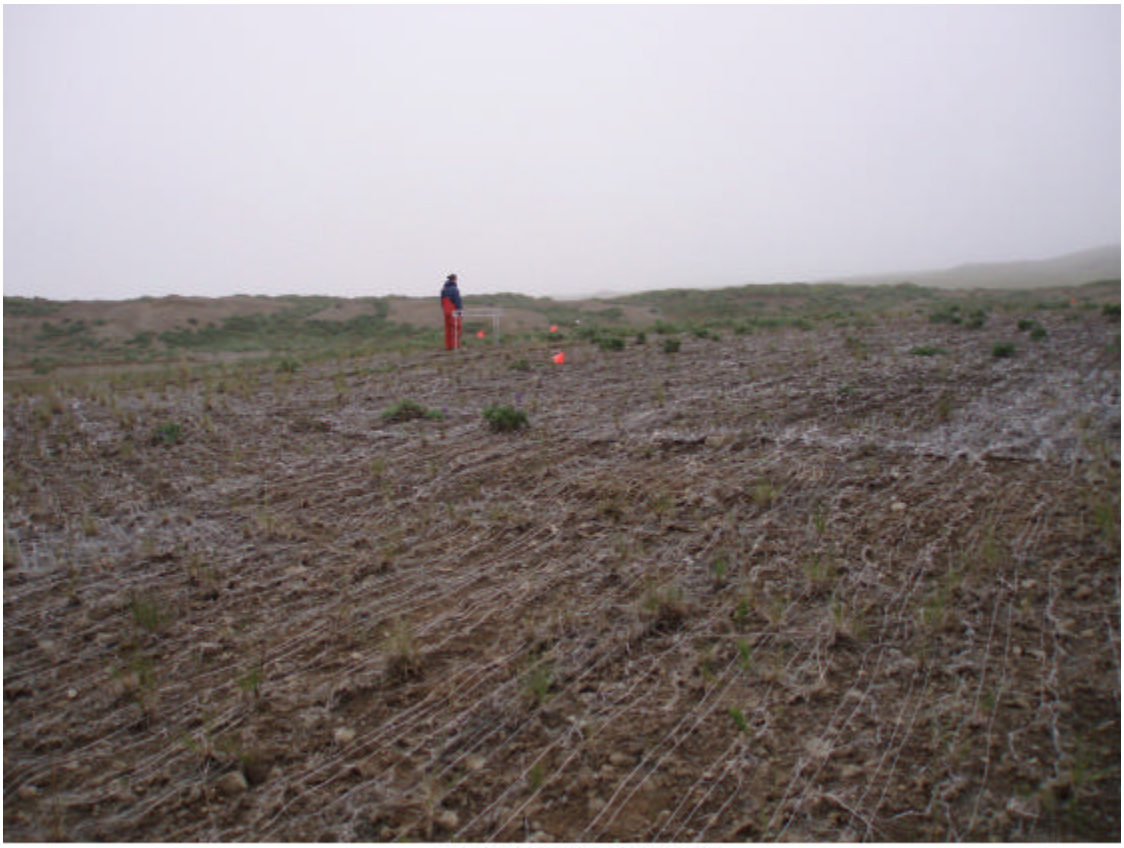
Cap Section	% Vegetative Cover (check one)				Comments
	0-25	25-50	50-75	75-100	
RR4-16 131 feet	11%				*Deschampsia beringensis*; *Festuca rubra.*
RR4-17 135 feet	11%				*Deschampsia beringensis*; *Conioselinum chinense.*
RR4-18 153 feet		31%			*Festuca rubra*; *Agrostis borealis*; *Lupinus nootkatensis.*
RR4-19 164 feet			69%		*Lupinus nootkatensis*; *Festuca rubra*; *Achillea borealis*, *Agrostis borealis.*
RR4-20 167 feet				92%	*Lupinus nootkatensis*; *Festuca rubra*; *Carex macrochaeta*; *Agrostis borealis*; *Cerastium beeringianum*; *Epilobium latifolium.*

Photograph Log

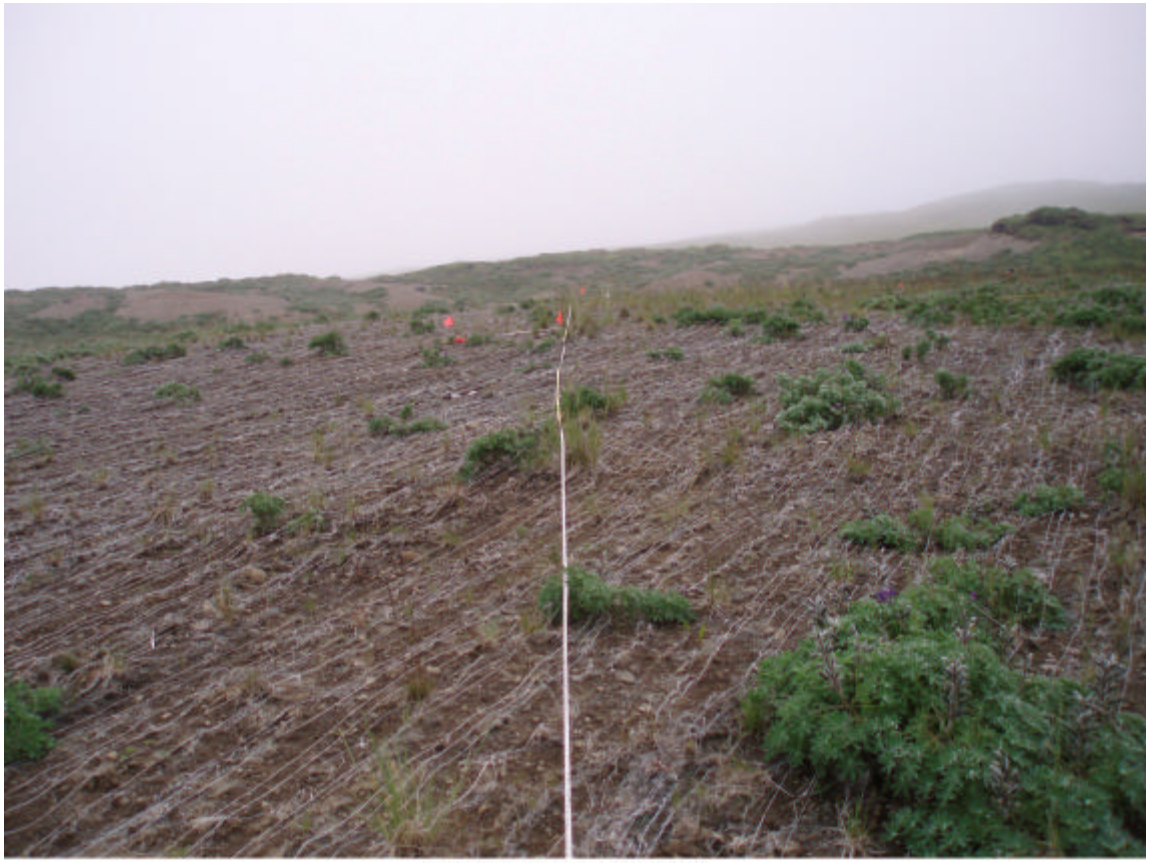
Mud Pit Site: Rifle Range (RR)

Date	Photo #	GPS Location	Direction of Photo	DESCRIPTION
8/4/06	P8040031	See Figure	NA	USFWS Monument
8/4/06	P8040032	See Figure	East	Transect RR-1 W
8/4/06	P8040033	See Figure	East	Transect RR-2 W
8/4/06	P8040034	See Figure	North	Transect RR-3 S
8/4/06	P8040035	See Figure	North	Transect RR-4 S
8/4/06	P8040036	See Figure	West	Transect RR-2 E
8/4/06	P8040037	See Figure	West	Transect RR-1 E
8/4/06	P8040038	See Figure	South	Transect RR-4 N
8/4/06	P8040039	See Figure	South	Transect RR-3 N

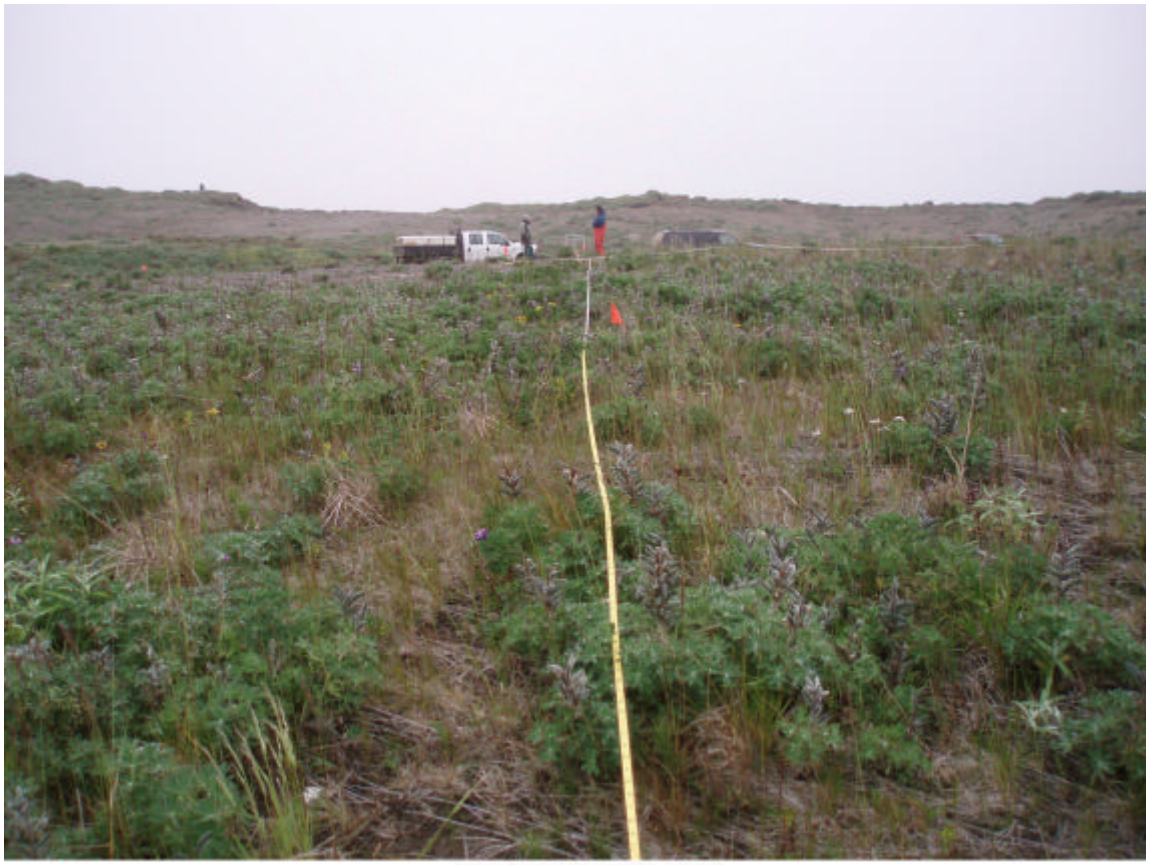
P8040031 Rifle Range USFWS Monument



P8040032 RR-1 W Looking E

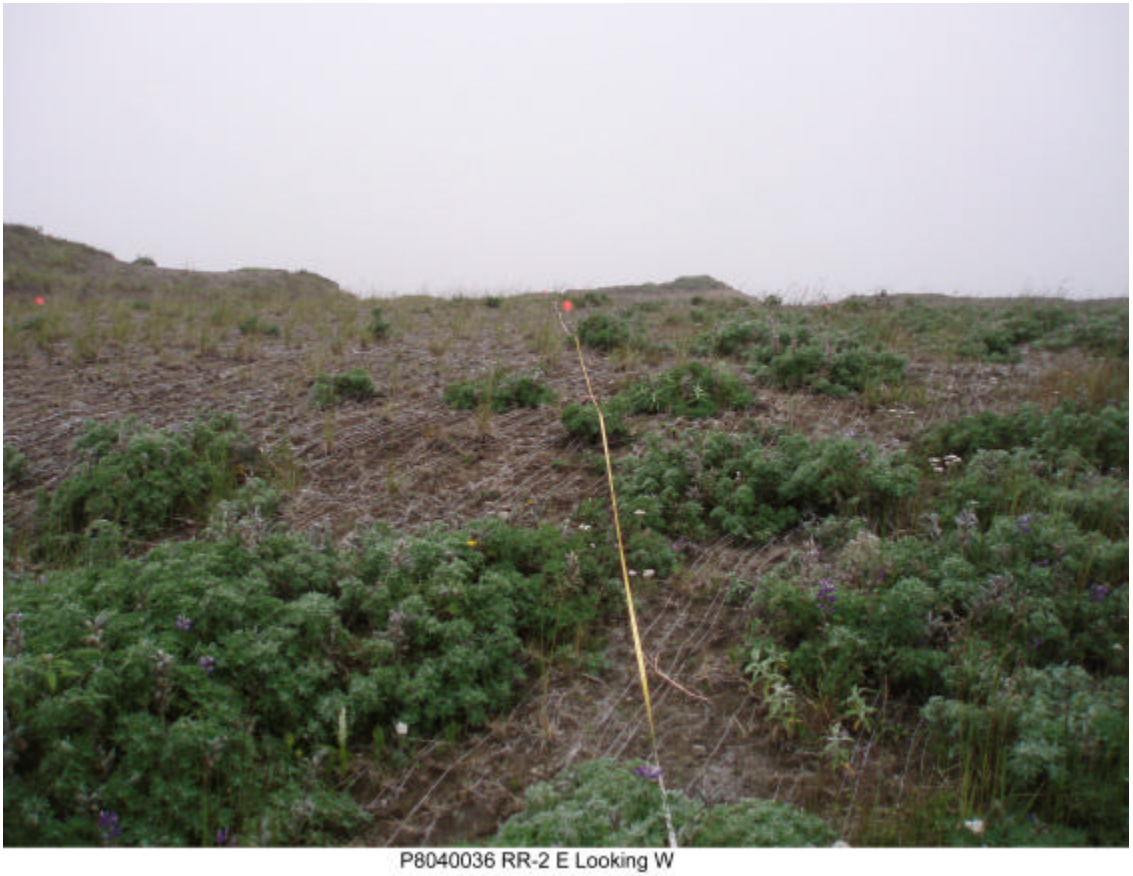


P8040033 RR-2 W Looking E

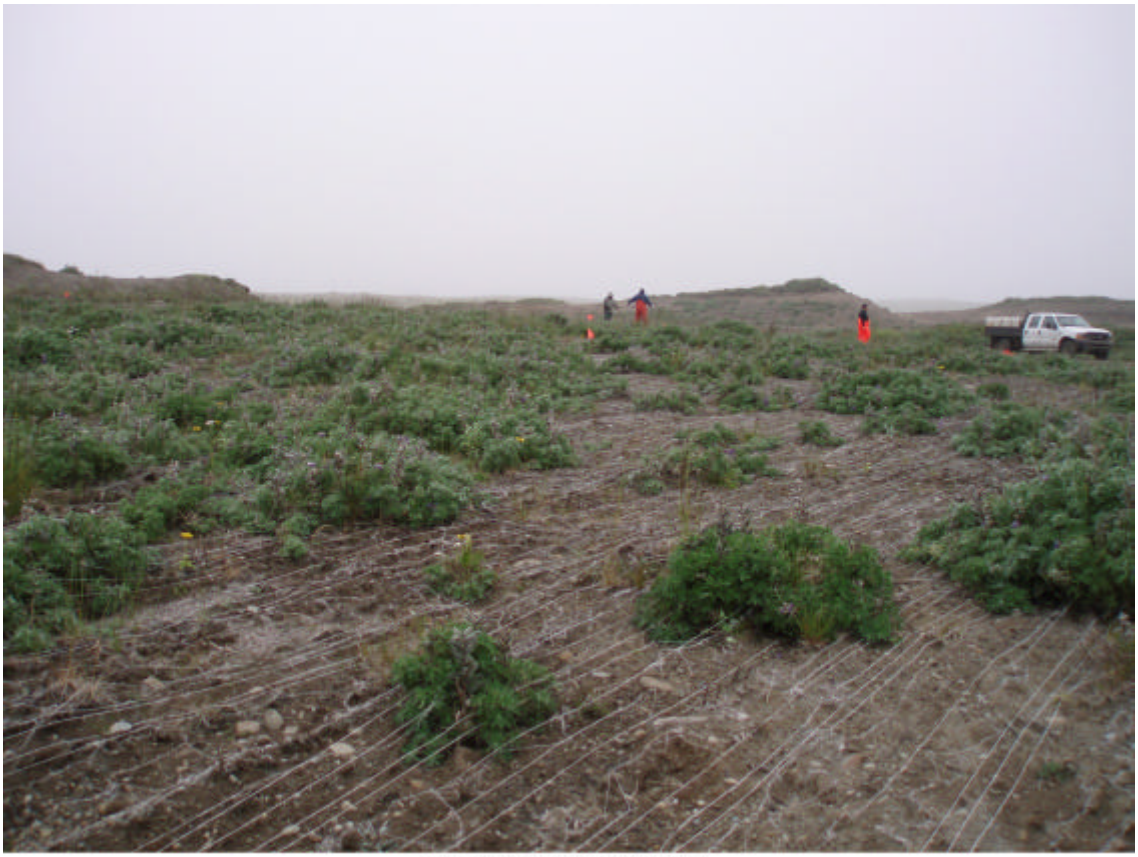


P8040034 RR-3 S Looking N

P8040035 RR-4 S Looking N

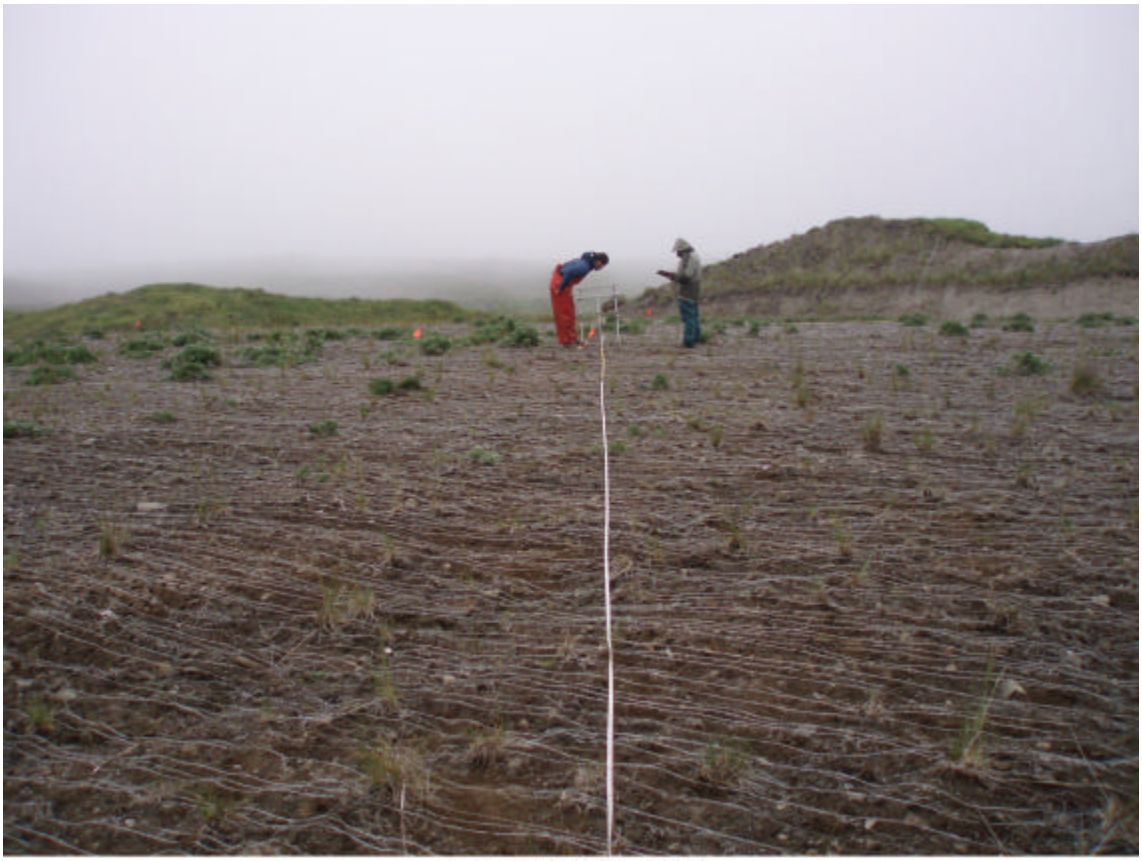


P8040036 RR-2 E Looking W



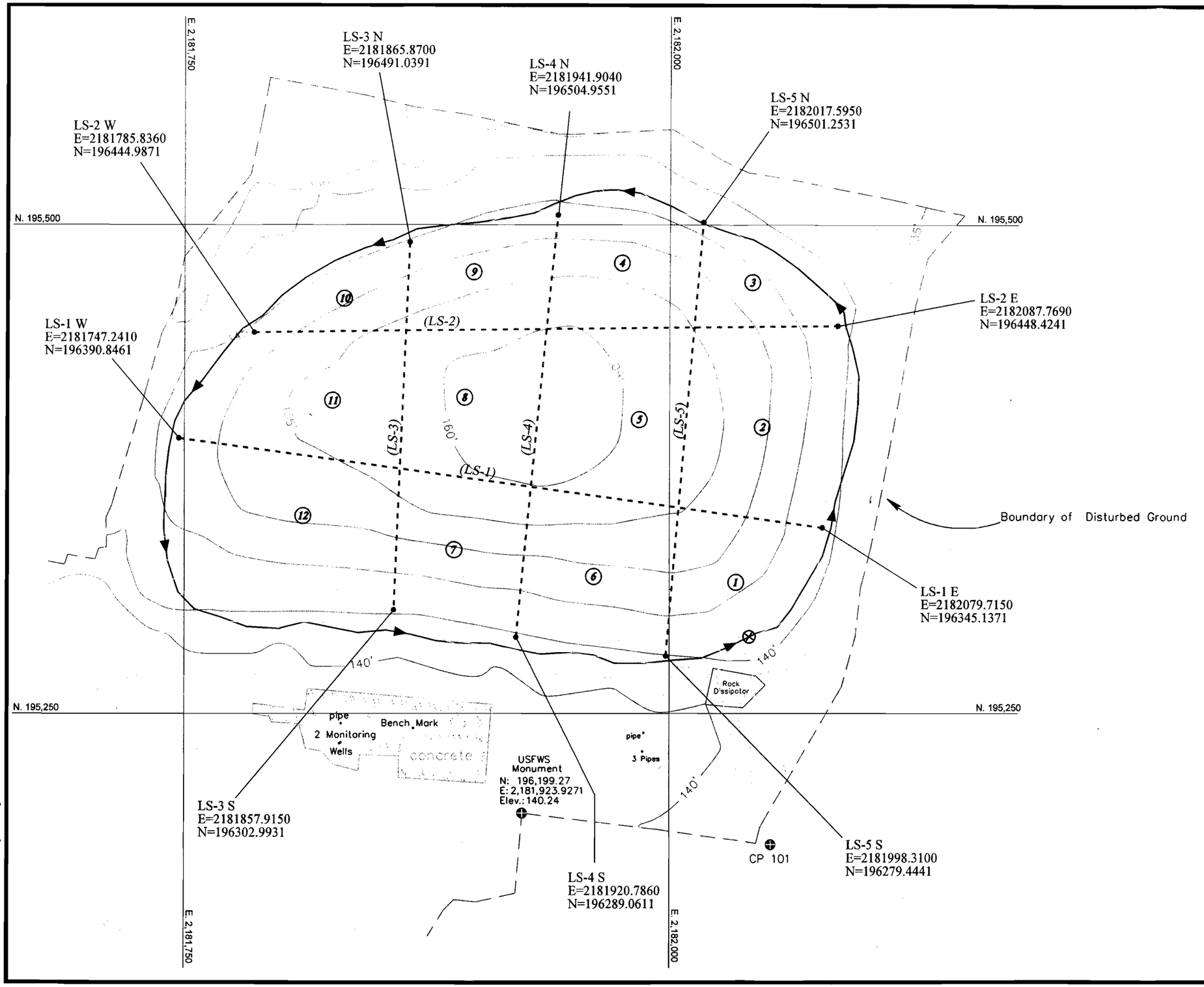
P8040037 RR-1 E Looking W

P8040038 RR-4 N Looking S



P8040039 RR-3 N Looking S

2.0 Longshot



Explanation

(1) Vegetative Cover Grid Area

• Transect/Photopoint

⊗ Starting Point

Visual Inspection Route

Coordinates:
Alaska State Plane, Zone 10 NAD27

AS-BUILT OF

LONGSHOT

AMCHITKA MUDPITS

MUDPIT CLOSURE FINAL TOPOGRAPHY SURVEY

PREPARED BY
McCLINTOCK LAND ASSOCIATES, INC.
11940 BUSINESS BOULEVARD, SUITE 205
EAGLE RIVER, ALASKA 99577
(907) 694-4499

PREPARED FOR
BRICE INCORPORATED
3200 SHELL STREET
FAIRBANKS, ALASKA 99707
(907) 452-2512

PLOT: 1"=50'	CHK: GDK	JOB: 01-117	DWG: AS-BUILT	FB NO: JOB
SITE: Longshot	DWN: KO	DATE: 10-25-01	DISK: DELL-E	SHEET: 1 OF 1

H:/Amchitka/GPS_Bases/AMIongshot.dgn

AMCHITKA MUD PIT SITES POST-CLOSURE MONITORING CHECKLIST

Mud Pit Site: Longshot	Date of Inspection: August 5, 2006
Responsible Agency: National Nuclear Security Adm.	Project Manager: John Jones
Inspector (name, title, organization): Patrick Matthews, Task Manager, Stoller Navarro Joint Venture	

A. General Instructions

1. All checklist items must be completed and detailed comments made to document the results of the site inspection.
2. The completed checklist is part of the field record of the inspection. Additional pages should be used as necessary to ensure that a complete record is made. Number and attach the additional pages upon completion of the inspection.
3. Any checklist line item marked by an inspector in a SHADED BOX must be fully explained or an appropriate reference to previous reports provided. The explanation should include the inspector's rationale for conclusions and recommendations, if appropriate. Explanations are to be placed on additional attachments and cross-referenced appropriately, and may take the form of sketches, measurements, and/or annotated site maps.
4. The site inspection is a walking inspection of the entire site, including the perimeter and sufficient transects to be able to inspect the entire surface and all features specifically described in this checklist. Attach a drawing indicating the starting and ending points and the direction and pattern of the inspection.
5. A standard set of color 35 mm photographs (or equivalent) is required. In addition, all anomalous features or new features (such as changes in adjacent area land use) are to be photographed. A photo log entry will be made for each photograph taken.

B. Preparation (to be completed prior to site visit)	YES	NO	EXPLANATION
1. Site as-built plans and site base map reviewed	X		Amchitka Mud Pit Closure -As Built
2. Previous inspection reports reviewed		X	No previous inspections were performed
a. Were anomalies or trends detected on previous inspections?			Not Applicable
b. Was maintenance performed on areas with anomalies?			Not Applicable
3. Site maintenance and repair records reviewed		X	No previous maintenance activities were performed
a. Has site repair resulted in a change from as-built conditions?		X	No detectable changes from the as-builts were observed.
b. Are revised as-builts available that reflect repair changes?			Not Applicable: No repairs have occurred.

C. Site Inspection (to be completed during inspection)	YES	NO	EXPLANATION
1. Adjacent offsite features within mud pit site area			
a. Changes in use of adjacent area?		X	Wildlife refuge
b. Any new roads or trails?		X	Per previous photos and As-built Drawings
c. Change in the position of nearby washes?		X	None Detected
d. Erosion/deposition of nearby washes?		X	None Detected
e. New drainage channels?		X	None Detected
f. Change in surrounding vegetation?		X	None Detected
2. Security markers; signs			
a. Displacement of site markers, boundary markers, or monuments?		X	USFWS Monument was present / Good Condition Ground Zero Monument was Intact
b. Signs damaged or removed?		X	No signs were present or noted in the As-builts
3. Cap			
a. Evidence of subsidence?		X	
b. Evidence of cracking?		X	
c. Evidence of erosion (wind or water)?		X	
d. Evidence of animal burrowing?		X	
e. Are site markers disturbed? By man?_____ By natural processes?_____		X	
f. Do natural processes threaten the integrity of cap or site marker?		X	

AMCHITKA MUD PIT SITES POST-CLOSURE MONITORING CHECKLIST (continued)

Mud Pit Site: Longshot	Date of Inspection: August 5, 2006

C. Site inspection (continued)	YES	NO	EXPLANATION
4. Vegetative cover			
a. Is plant cover adequate to prevent erosion?	X		See Discussion on Continuation Sheet
b. Are weedy annual plants present? Do they require removal?		X	See Discussion on Continuation Sheet
c. Evidence of animals on cap?		X	See Discussion on Continuation Sheet
d. Evidence of excessive plant mortality?		X	See Discussion on Continuation Sheet
e. Has a vegetative cover log been completed?	X		See attached log
5. Photo Documentation			
a. Has a photo log been prepared?	X		See attached log
b. How many photos were taken?			12 Photos as noted in the photographic log

D. Field Conclusions			
1. Imminent hazard to integrity of cap? (If yes, immediate report required. Note the person or agency the report will be made to.)		X	
2. Are more frequent inspections required?		X	
3. Are existing maintenance actions satisfactory?			N/A No maintenance was performed or required
4. Are existing repair actions satisfactory?			N/A No repairs were performed or required
5. Is other maintenance/repair necessary?		X	

6. Rationale for field conclusions: Conclusions were based on walkover visual inspections and plant counts.

7. Factors contributing to or impacting inspection: None noted

E. Certification

I certify that I have conducted an inspection of the Longshot Mud Pit Site cap in accordance with the Monitoring and Inspection Plan for the Amchitka Mud Pit Release Sites, Rev. 0, dated November 2005, as recorded on this checklist, attached sheets, field notes, vegetative cover log, photo logs, and photographs.

Inspector Printed Name:	Inspector Signature:
Patrick Matthews	
Title:	Date:
Task Manager	9/12/06

AMCHITKA MUD PIT SITES POST-CLOSURE MONITORING CHECKLIST
Continuation Sheet
Longshot (LS)

Cap LS is located approximately four and a half miles northwest of Constantine Harbor with an elevation of 140 to 165 feet. The cap is located in the Crowberry Meadow Community of Amundsen (1972), and vegetation cover on this cap (49 % cover) was approximately six times the levels found at Cap F as would be expected from the low elevation of this site (Figure 2.1). *F. rubra* and *D. behringensis* covers 17 % of the cover and represents 34% of the vegetation cover. Species diversity is high on the cap with 13 separate taxa as would be expected from the low elevation of the site (Figure 2.2).

Cap LS had a litter cover of 17 % which is in the middle of the range found among the caps surveyed.

The vegetation cover on Cap LS is consistent with the vegetation recovery expected for its location in the Crowberry Meadow Community. As with all of the caps, the vegetation cover represents five years of growth, and any attempt to increase vegetative cover on the cap should avoid setting back recovery.

References Cited

Amundsen, C.C. 1972. Amchitka Bioenvironmental Program. Plant Ecology of Amchitka Island: USAEC Report BMI-171-139. Battelle Memorial Institute.

Vegetative Cover Log

Mud Pit Site: Longshot Site

Cap Section	% Vegetative Cover (check one)				Comments
	0-25	25-50	50-75	75-100	
LS1-1 17 feet			69%		Moss; *Festuca rubra*; *Empetrum nigrum*; *Epilobium latifolium.*
LS1-2 24 feet			67%		Moss; *Empetrum nigrum*; *Festuca rubra*
LS1-3 31 feet			53%		Moss; *Festuca rubra*; *Empetrum nigrum*
LS1-4 37 feet	17%				*Festuca rubra*; moss.
LS1-5 41 feet		25%			*Festuca rubra*; *Empetrum nigrum*; foliose lichen.
LS1-6 44 feet	14%				*Festuca rubra.*
LS1-7 51 feet	8%				*Festuca rubra*; *Empetrum nigrum.*
LS1-8 54 feet	6%				*Festuca rubra*
LS1-9 57 feet	11%				*Festuca rubra*
LS1-10 61 feet	0%				
LS1-11 73 feet	3%				*Festuca rubra*
LS1-12 91 feet				94%	Moss; *Festuca rubra*; *Draba* cf. *stenopetala*; *Empetrum nigrum.*
LS1-13 126 feet				89%	Moss; *Festuca rubra*; foliose lichen
LS1-14 160 feet				81%	Moss; *Lupinus nootkatensis*; *Festuca rubra*; foliose lichen.
LS1-15 189 feet				100%	Moss; *Festuca rubra*; *Empetrum nigrum*

Vegetative Cover Log

Mud Pit Site: Longshot Site

Cap Section	% Vegetative Cover (check one)				Comments
	0-25	25-50	50-75	75-100	
LS1-16 196 feet				92%	Moss; *Festuca rubra*; *Draba* cf. *stenopetala.*
LS1-17 230 feet		36%			Moss; *Festuca rubra*; *Draba* cf. *stenopetala.*
LS1-18 235 feet				97%	Moss; *Festuca rubra*; foliose lichen; *Juncus mertensianus.*
LS1-21 274 feet				97%	Moss; foliose lichen; *Festuca rubra*; *Draba* cf. *stenopetala.*
LS1-22 279 feet				72%	Moss; *Festuca rubra*; *Draba* cf. *stenopetala*; foliose lichen; *Cerastium beeringianum.*
LS1-23 310 feet			50%		*Festuca rubra*; foliose lichen
LS1-24 323 feet			61%		*Festuca rubra*; moss.
LS1-25 338 feet			72%		Moss; *Festuca rubra*; *Empetrum nigrum*; *Draba* cf. *stenopetala.*
LS2-1 11 feet				94%	Moss; *Festuca rubra*
LS2-2 15 feet				97%	Moss; *Festuca rubra*; *Empetrum nigrum*
LS2-3 23 feet				75%	*Festuca rubra*; moss; foliose lichen; *Empetrum nigrum*
LS2-4 29 feet		25%			*Deschampsia beringensis*; *Festuca rubra*; *Empetrum nigrum*; moss.
LS2-5 39 feet	22%				*Festuca rubra*; *Empetrum nigrum.*
LS2-6 42 feet		25%			*Festuca rubra*
LS2-7 52 feet		25%			*Festuca rubra*; *Empetrum nigrum*; *Deschampsia beringensis.*

Vegetative Cover Log

Mud Pit Site: Longshot Site

Cap Section	% Vegetative Cover (check one)				Comments
	0-25	25-50	50-75	75-100	
LS2-8 109 feet			50%		*Lupinus nootkatensis*; *Festuca rubra*
LS2-9 115 feet	0%				
LS2-10 130 feet	8%				*Festuca rubra*; moss.
LS2-11 133 feet	0%				
LS2-12 135 feet	14%				*Festuca rubra*
LS2-13 141 feet	0%				
LS2-14 144 feet	0%				
LS2-15 160 feet				83%	*Lupinus nootkatensis*; *Festuca rubra.*
LS2-16 176 feet				53%	*Festuca rubra*; *Empetrum nigrum*; moss.
LS2-17 180 feet				31%	*Festuca rubra*; *Empetrum nigrum*; *Deschampsia beringensis.*
LS2-18 195 feet		28%			*Festuca rubra*; *Empetrum nigrum*; moss.
LS2-19 211 feet			56%		*Empetrum nigrum*; *Festuca rubra*; moss.
LS2-20 216 feet				81%	*Empetrum nigrum*; *Festuca rubra*; moss.
LS2-21 253 feet	22%				*Festuca rubra*; *Empetrum nigrum.*
LS2-22 259 feet			50%		*Festuca rubra*; *Lupinus nootkatensis*; foliose lichen.

Vegetative Cover Log

Mud Pit Site: Longshot Site

Cap Section	% Vegetative Cover (check one)				Comments
	0-25	25-50	50-75	75-100	
LS2-23 270 feet	14%				*Empetrum nigrum*; *Festuca rubra*; moss.
LS2-24 281 feet		31%			*Festuca rubra*; moss; *Empetrum nigrum.*
LS2-25 307 feet				81%	moss; *Festuca rubra*; *Empetrum nigrum*; *Epilobium latifolium.*
LS3-1 8 feet				89%	Moss; *Festuca rubra*; *Draba* cf. *stenopetala*; VILA
LS3-2 26 feet				81%	Moss; *Festuca rubra*; *Empetrum nigrum*; *Draba* cf. *stenopetala.*
LS3-3 29 feet				94%	Moss; *Festuca rubra*; *Empetrum nigrum*; *Epilobium latifolium*
LS3-4 33 feet				89%	Moss; *Festuca rubra*; *Empetrum nigrum.*
LS3-5 36 feet				83%	Moss; *Festuca rubra*; foliose lichen
LS3-6 39 feet			64%		Moss; foliose lichen; *Festuca rubra*
LS3-7 48 feet				94%	Moss; foliose lichen; *Festuca rubra*; *Empetrum nigrum*; *Draba* cf. *stenopetala*
LS3-8 51 feet				100%	Moss; *Draba* cf. *stenopetala*; *Festuca rubra*; foliose lichen
LS3-9 54 feet				97%	Moss; *Festuca rubra*; *Draba* cf. *stenopetala*; VILA; foliose lichen
LS3-10 61 feet				92%	Moss; *Festuca rubra*; foliose lichen; *Draba* cf. *stenopetala*; *Juncus mertensianus*; *Empetrum nigrum.*
LS3-11 82 feet	19%				*Festuca rubra*; moss.
LS3-12 85 feet	8%				*Festuca rubra.*

Vegetative Cover Log

Mud Pit Site: Longshot Site

Cap Section	% Vegetative Cover (check one)				Comments
	0-25	25-50	50-75	75-100	
LS3-13 110 feet			72%		Moss; *Festuca rubra*; *Draba* cf. *stenopetala*; foliose lichen
LS3-14 119 feet				86%	Moss; *Festuca rubra*; foliose lichen; *Draba* cf. *stenopetala.*
LS3-15 127 feet				97%	*Lupinus nootkatensis*; *Empetrum nigrum*; *Festuca rubra*; moss; foliose lichen; *Draba* cf. *stenopetala.*
LS3-16 131 feet			58%		Foliose lichen; *Empetrum nigrum*; moss; *Festuca rubra.*
LS3-17 138 feet			69%		*Lupinus nootkatensis*; moss; foliose lichen; *Empetrum nigrum*; *Festuca rubra.*
LS3-18 156 feet	22%				Moss; foliose lichen; *Festuca rubra.*
LS3-19 165 feet	19%				Moss; *Festuca rubra.*
LS3-20 168 feet	6%				Moss; *Festuca rubra.*
LS3-21 171 feet		47%			Moss.
LS3-22 176 feet		39%			Moss; *Festuca rubra.*
LS3-23 179 feet			58%		Moss; *Festuca rubra.*
LS3-24 182 feet		28%			Moss; *Empetrum nigrum.*
LS3-25 185 feet	17%				*Empetrum nigrum*; moss; *Festuca rubra.*
LS4-1 0 feet			61%		Moss; *Festuca rubra*; *Draba* cf. *stenopetala.*
LS4-2 8 feet				86%	Moss; *Draba* cf. *stenopetala*; *Festuca rubra.*

Vegetative Cover Log

Mud Pit Site: Longshot Site

Cap Section	% Vegetative Cover (check one)				Comments
	0-25	25-50	50-75	75-100	
LS4-3 21 feet				86%	*Festuca rubra*; moss; *Draba* cf. *stenopetala.*
LS4-4 24 feet				86%	Moss; *Festuca rubra*; *Draba* cf. *stenopetala.*
LS4-5 27 feet				94%	Moss; *Festuca rubra*; *Draba* cf. *stenopetala.*
LS4-6 31 feet				86%	Moss; *Festuca rubra*; *Draba* cf. *stenopetala.*
LS4-7 40 feet				75%	Moss; foliose lichen; *Lupinus nootkatensis*; *Festuca rubra*; *Empetrum nigrum*; *Draba* cf. *stenopetala*
LS4-8 58 feet				94%	Moss; *Draba* cf. *stenopetala*; foliose lichen; *Festuca rubra*; *Epilobium latifolium*; *Lupinus nootkatensis*; *Pinguicula vulgaris.*
LS4-9 66 feet				94%	Moss; *Festuca rubra*; *Empetrum nigrum*; *Draba* cf. *stenopetala*; foliose lichen
LS4-10 91 feet		28%			*Festuca rubra*; moss.
LS4-11 97 feet			56%		Moss; *Festuca rubra*; *Draba* cf. *stenopetala*; *Empetrum nigrum.*
LS4-12 103 feet		25%			Moss; *Festuca rubra*; *Draba* cf. *stenopetala*
LS4-13 118 feet		36%			Moss; *Festuca rubra*; *Draba* cf. *stenopetala*
LS4-14 123 feet		31%			*Festuca rubra*; Moss; foliose lichen; *Deschampsia beringensis.*
LS4-15 134 feet	11%				*Festuca rubra*; moss.
LS4-16 137 feet	17%				*Festuca rubra*; foliose lichen; moss.

Vegetative Cover Log

Mud Pit Site: Longshot Site

Cap Section	% Vegetative Cover (check one)				Comments
	0-25	25-50	50-75	75-100	
LS4-17 140 feet	14%				*Festuca rubra*
LS4-18 151 feet	8%				*Festuca rubra*; foliose lichen.
LS4-19 156 feet	8%				*Festuca rubra*; moss.
LS4-20 159 feet	8%				*Festuca rubra*; *Empetrum nigrum.*
LS4-21 172 feet	0%				
LS4-22 200 feet	22%				Moss; *Festuca rubra*; *Empetrum nigrum.*
LS4-23 213 feet			56%		Moss; *Festuca rubra*; *Empetrum nigrum*; *Epilobium latifolium*; *Lupinus nootkatensis.*
LS4-24 216 feet				78%	Moss; *Lupinus nootkatensis*; *Empetrum nigrum*; *Draba* cf. *stenopetala.*
LS4-25 219 feet				75%	Moss; *Lupinus nootkatensis*; *Empetrum nigrum*; *Festuca rubra*; *Draba* cf. *stenopetala*; *Rhinanthus minor.*
LS5-1 0 feet				97%	Moss; *Festuca rubra*; *Empetrum nigrum.*
LS5-2 3 feet				100%	*Festuca rubra*; moss; *Empetrum nigrum*; *Draba* cf. *stenopetala.*
LS5-3 19 feet			67%		*Lupinus nootkatensis*; *Festuca rubra*; moss; *Epilobium latifolium.*
LS5-4 24 feet		25%			*Festuca rubra*; moss.
LS5-5 35 feet		33%			*Festuca rubra*; *Draba* cf. *stenopetala.*

Vegetative Cover Log

Mud Pit Site: Longshot Site

Cap Section	% Vegetative Cover (check one)				Comments
	0-25	25-50	50-75	75-100	
LS5-6 44 feet		25%			*Festuca rubra*; *Draba* cf. *stenopetala*; moss.
LS5-7 48 feet	22%				*Festuca rubra*; *Draba* cf. *stenopetala.*
LS5-8 51 feet		42%			*Festuca rubra*; moss; *Draba* cf. *stenopetala*
LS5-9 57 feet	19%				*Festuca rubra.*
LS5-10 64 feet	22%				*Festuca rubra*; *Draba* cf. *stenopetala.*
LS5-11 67 feet		42%			*Festuca rubra*; *Empetrum nigrum.*
LS5-12 84 feet		28%			*Festuca rubra*; moss.
LS5-3 19 feet			67%		*Lupinus nootkatensis*; *Festuca rubra*; moss; *Epilobium latifolium.*
LS5-4 24 feet		25%			*Festuca rubra*; moss.
LS5-5 35 feet		33%			*Festuca rubra*; *Draba* cf. *stenopetala.*
LS5-6 44 feet		25%			*Festuca rubra*; *Draba* cf. *stenopetala*; moss.
LS5-7 48 feet	22%				*Festuca rubra*; *Draba* cf. *stenopetala.*
LS5-8 51 feet		42%			*Festuca rubra*; moss; *Draba* cf. *stenopetala*
LS5-9 57 feet	19%				*Festuca rubra.*
LS5-10 64 feet	22%				*Festuca rubra*; *Draba* cf. *stenopetala.*

Vegetative Cover Log

Mud Pit Site: Longshot Site

Cap Section	% Vegetative Cover (check one)				Comments
	0-25	25-50	50-75	75-100	
LS5-11 67 feet		42%			*Festuca rubra*; *Empetrum nigrum.*
LS5-12 84 feet		28%			*Festuca rubra*; moss.
LS5-13 94 feet		25%			*Festuca rubra.*
LS5-14 101 feet		47%			*Festuca rubra*; *Empetrum nigrum*, foliose lichen.
LS5-15 116 feet			69%		Moss; *Empetrum nigrum*, *Festuca rubra*, foliose lichen.
LS5-16 119 feet				75%	Moss, *Festuca rubra*, foliose lichen, *Draba* cf. *stenopetala.*
LS5-17 139 feet			56%		*Festuca rubra*; *Empetrum nigrum*; foliose lichen; moss.
LS5-18 152 feet		33%			*Festuca rubra.*
LS5-19 155 feet		42%			*Festuca rubra.*
LS5-20 163 feet			64%		*Festuca rubra*; *Lupinus nootkatensis.*
LS5-21 174 feet	14%				*Festuca rubra.*
LS5-22 178 feet	17%				*Festuca rubra*
LS5-23 183 feet		42%			*Lupinus nootkatensis*; *Festuca rubra.*
LS5-24 198 feet	19%				*Festuca rubra*; Moss.
LS5-25 203 feet		25%			*Festuca rubra*; moss; *Empetrum nigrum.*

Photograph Log

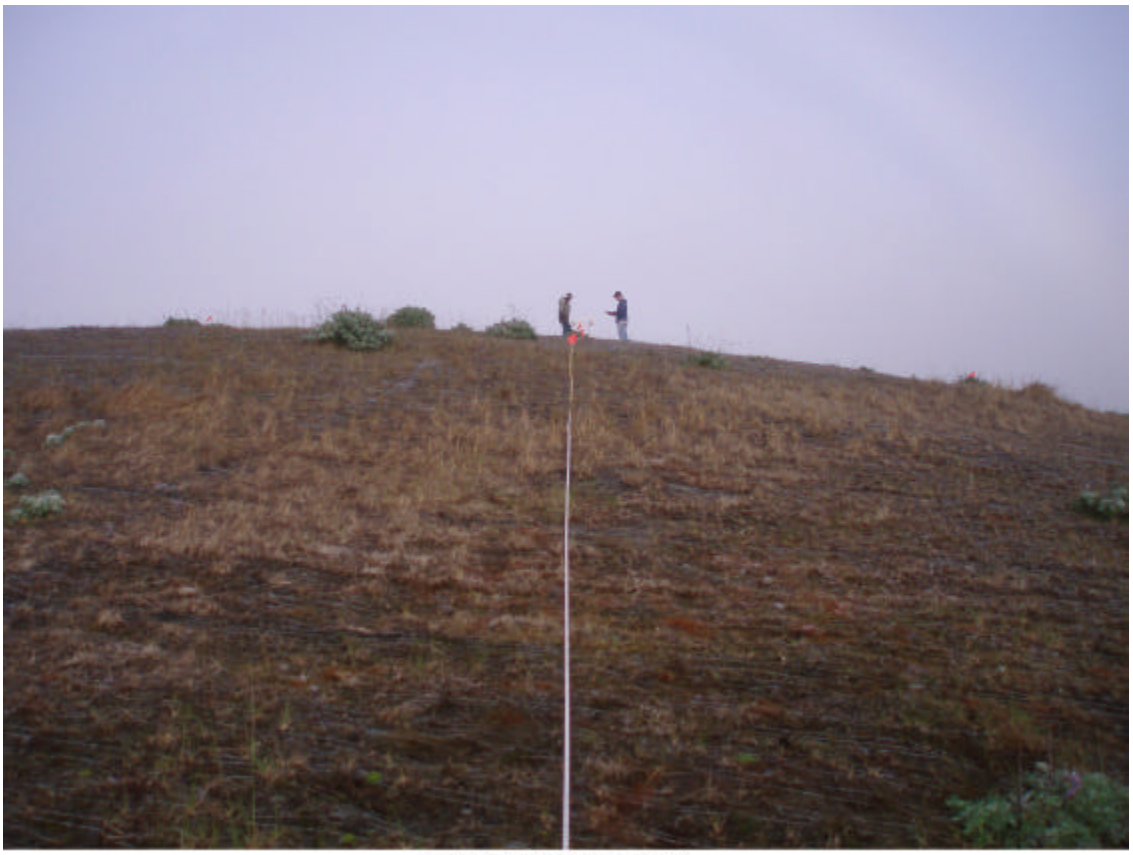
Mud Pit Site: Longshot

Date	Photo #	GPS Location	Direction of Photo	DESCRIPTION
8/5/06	P8050034	See Figure	NA	USFWS Monument
8/5/06	P8050035	See Figure	North	Longshot closure cap from USFWS Monument
8/5/06	P8050036	See Figure	West	Transect LS-1 E
8/5/06	P8050037	See Figure	West	Transect LS-2 E
8/5/06	P8050038	See Figure	South	Transect LS-5 N
8/5/06	P8050039	See Figure	South	Transect LS-4 N
8/5/06	P8050040	See Figure	South	Transect LS-3 N
8/5/06	P8050041	See Figure	East	Transect LS-2 W
8/5/06	P8050042	See Figure	East	Transect LS-1 W
8/5/06	P8050043	See Figure	North	Transect LS-3 S
8/5/06	P8050044	See Figure	North	Transect LS-4 S
8/5/06	P8050045	See Figure	North	Transect LS-5 S

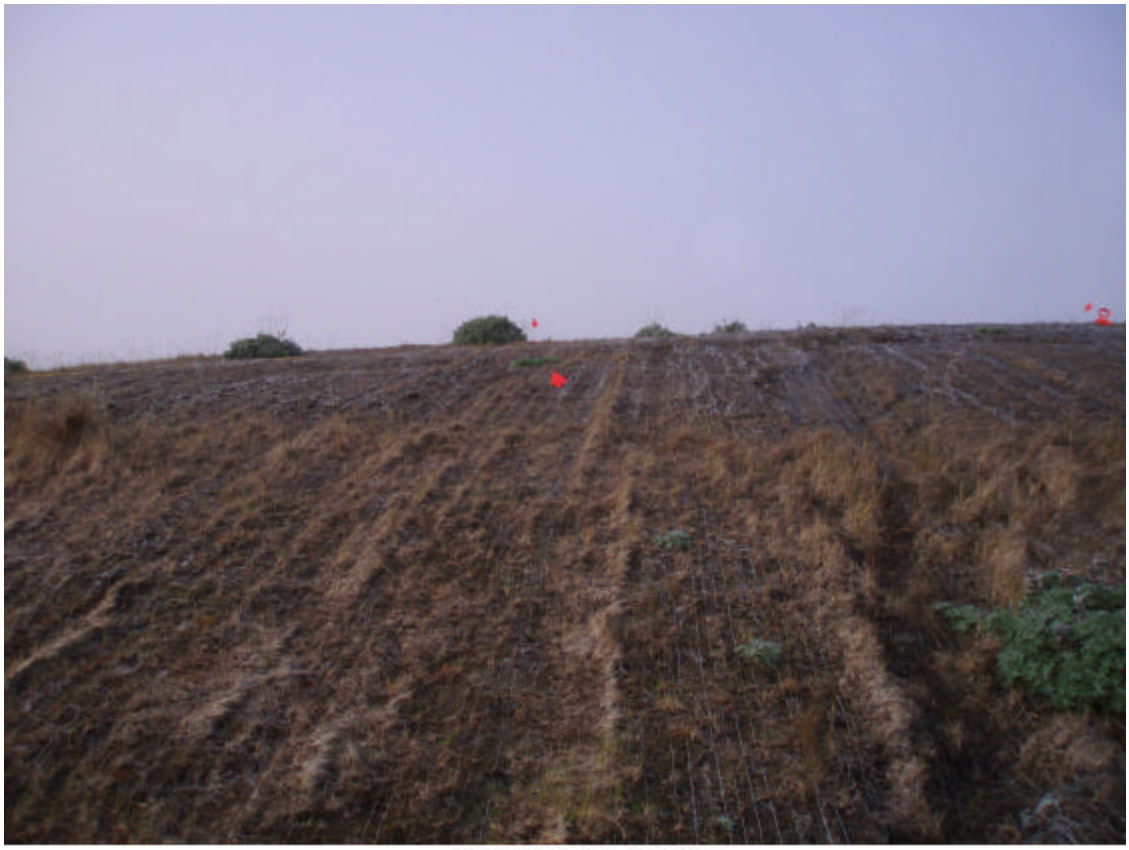
P8050034 Longshot USFWS Monument

P8050035 LS Cap from USFWS Monument

P8050036 LS-1 E Looking W

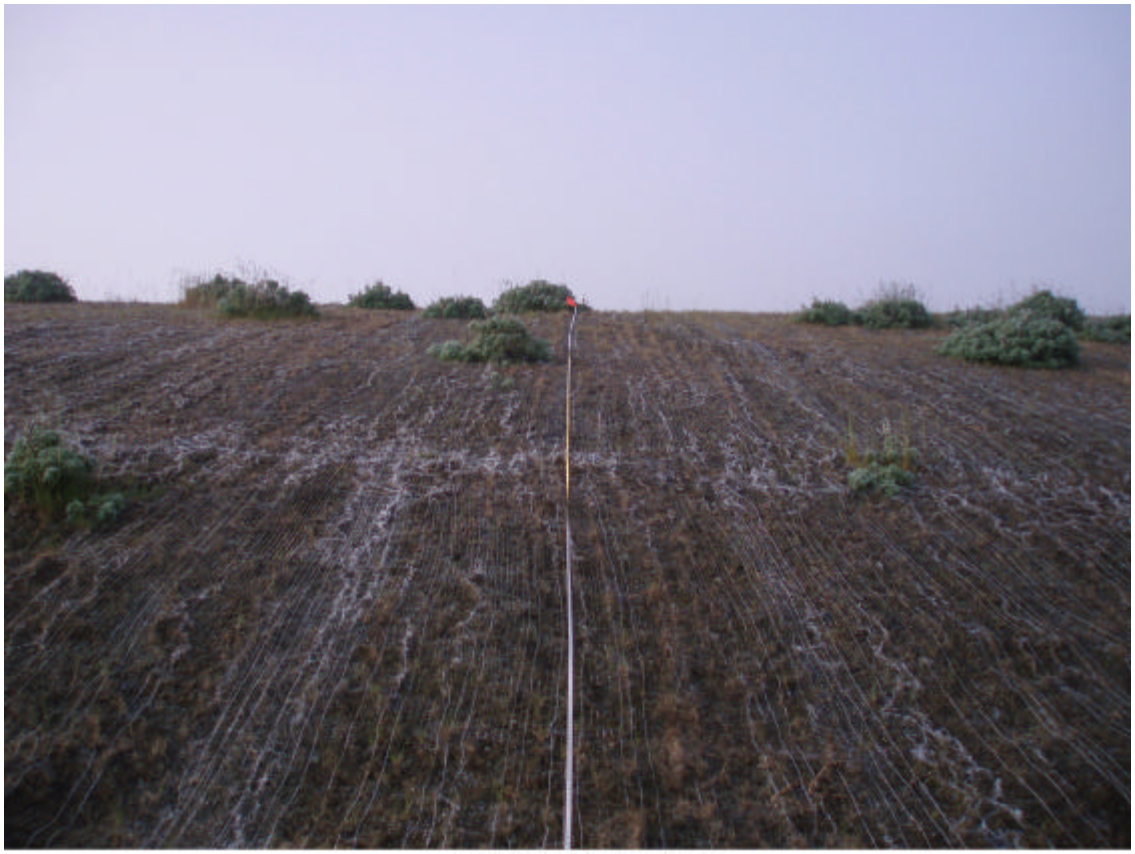


P8050037 LS-2 E Looking W

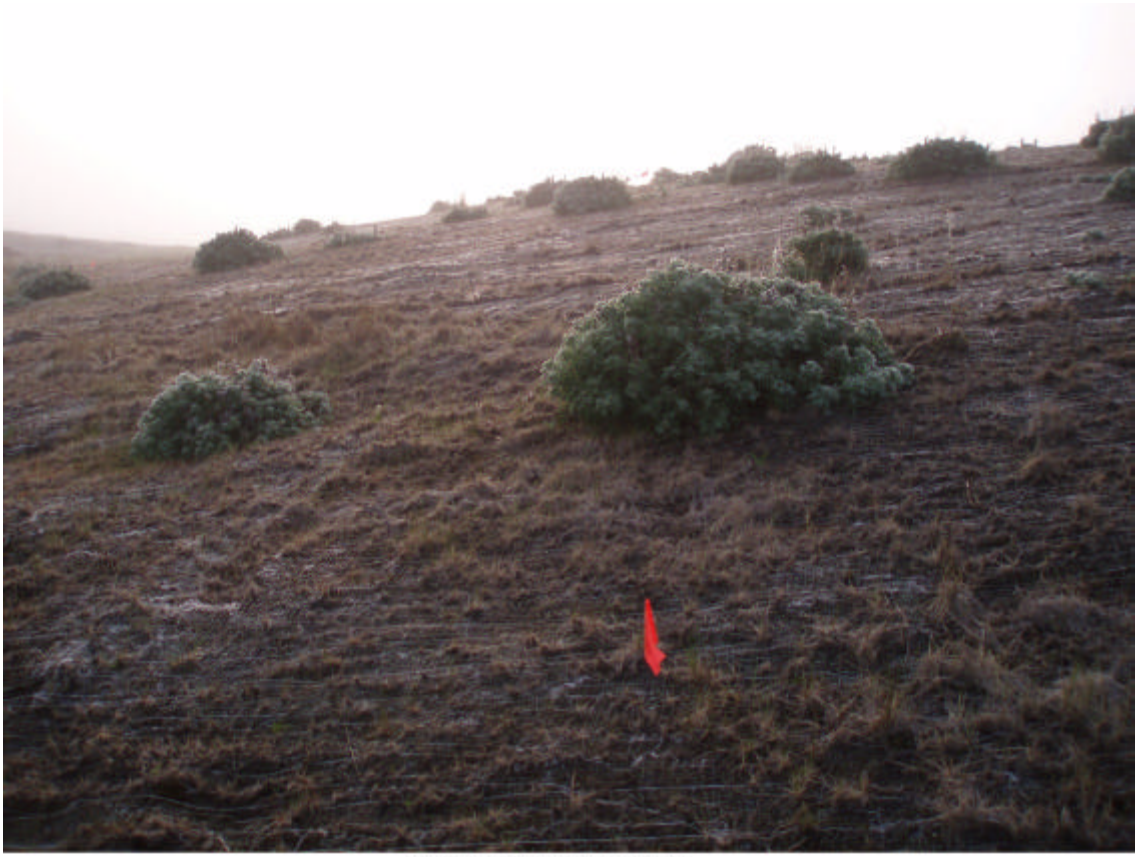


P8050038 LS-5 N Looking S

P8050039 LS-4 N Looking S

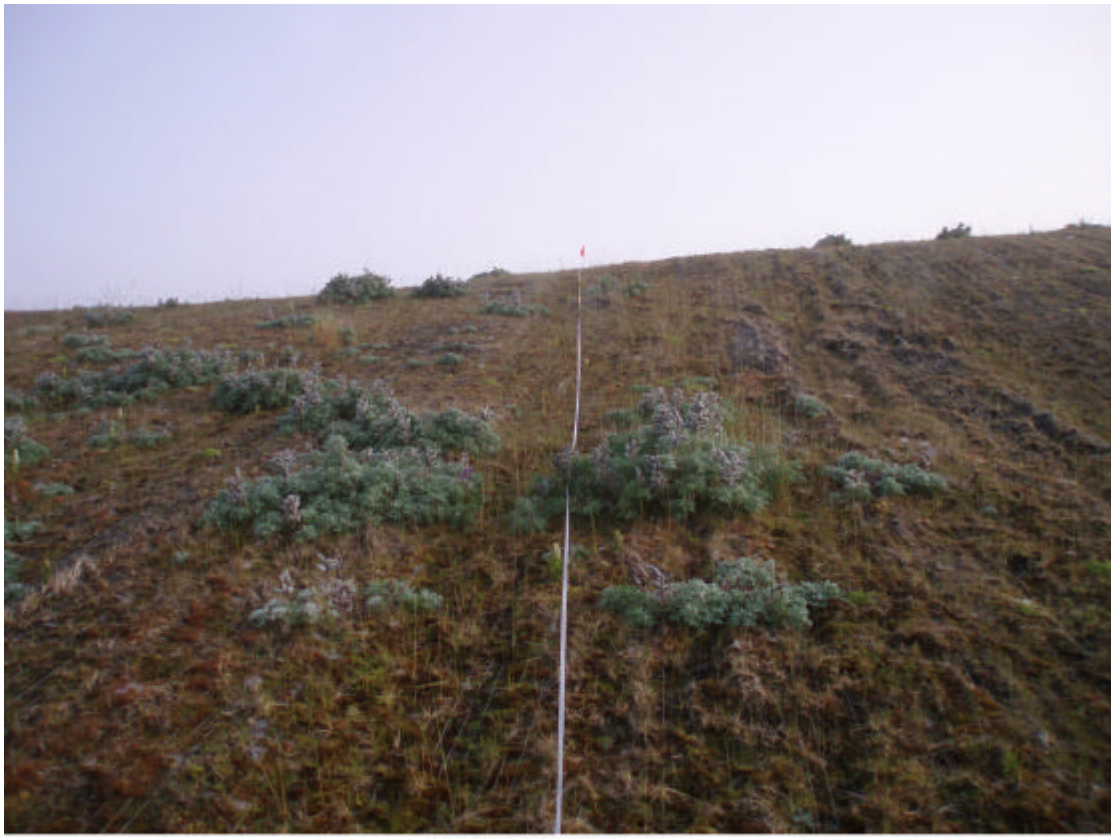


P8050040 LS-3 N Looking S

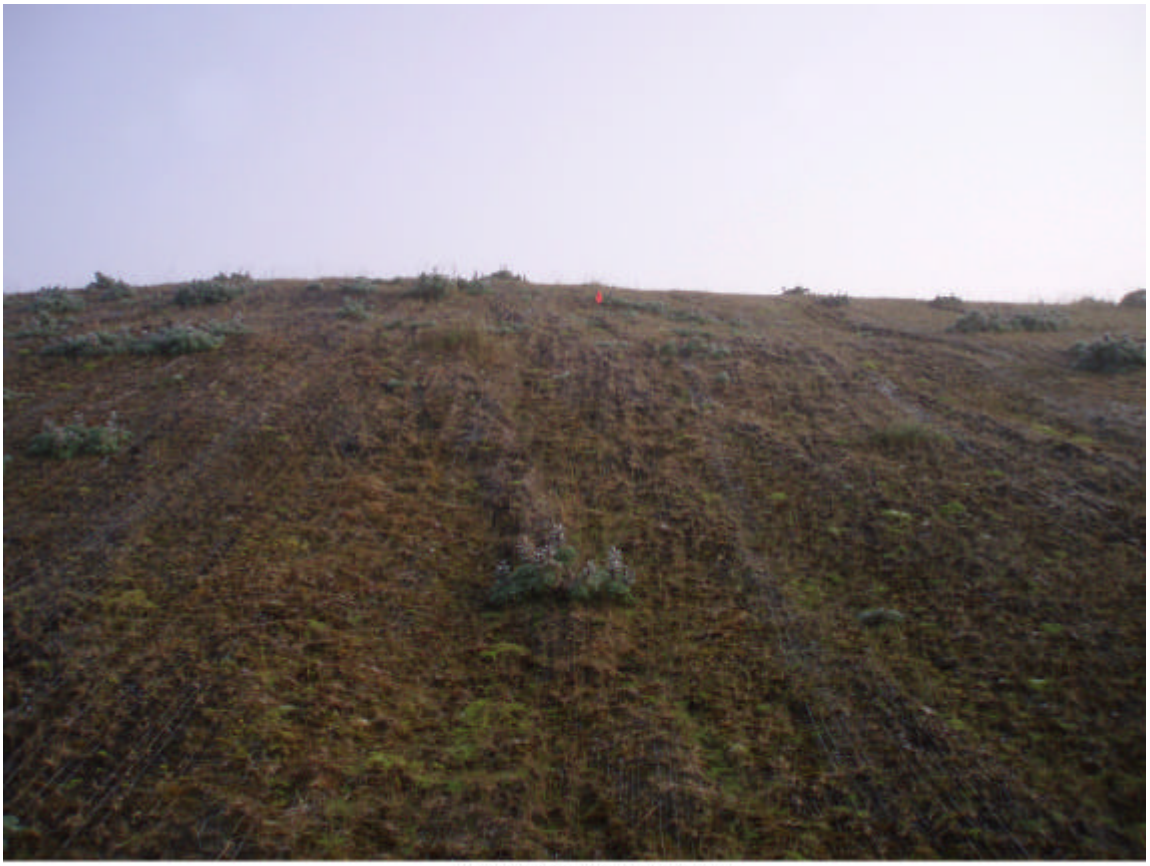


P8050041 LS-2 W Looking E

P8050042 LS-1 W Looking E



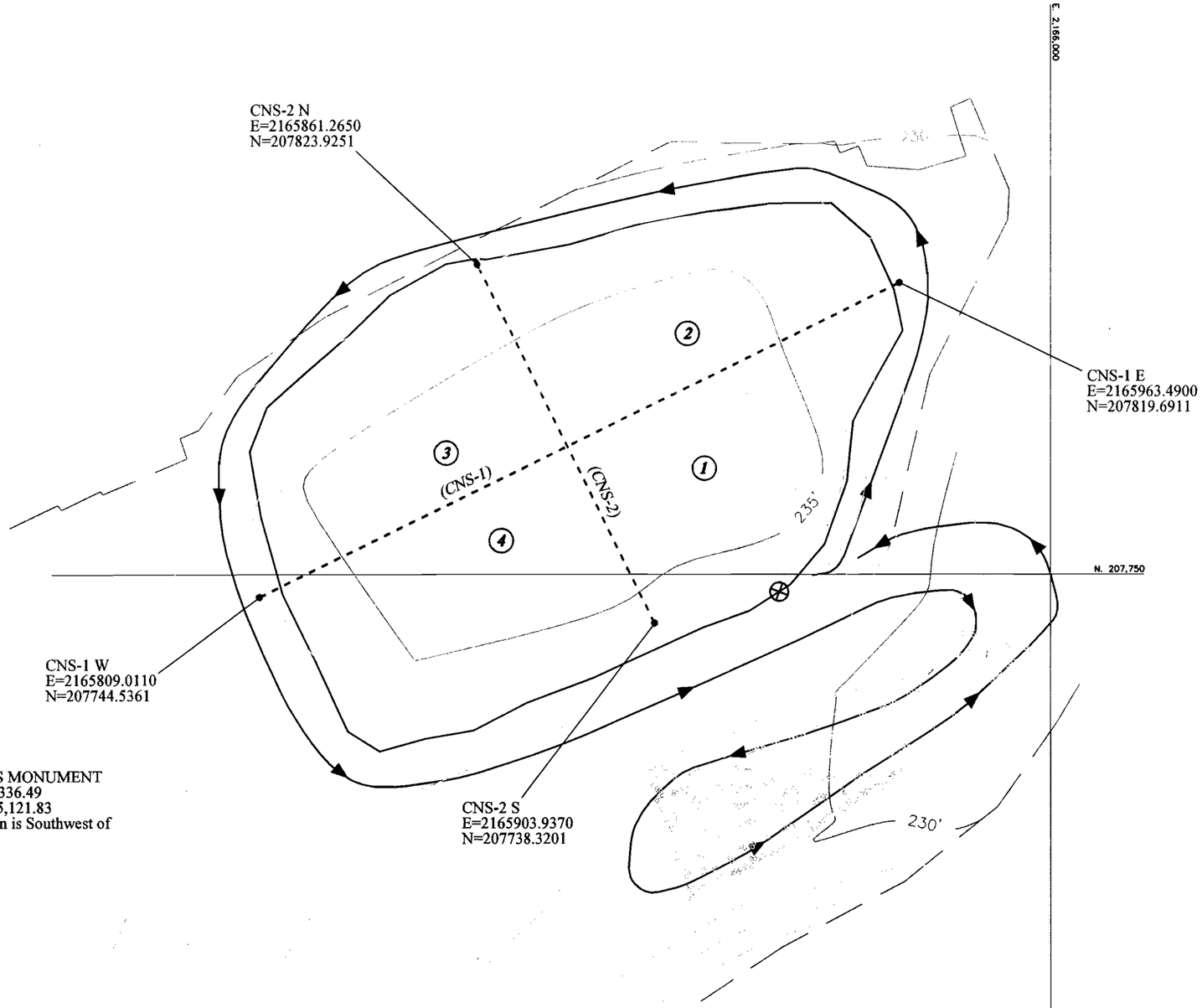
P8050043 LS-3 S Looking N



P8050044 LS-4 S Looking N

P8050045 LS-5 S Looking N

3.0 Cannikin
North/South



Explanation

- (1) Vegetative Cover Grid Area
- • Transect/Photopoint
- ⊗ Starting Point
- Visual Inspection Route

Coordinates:
Alaska State Plane, Zone 10 NAD27

0 20 40 60 80
SCALE IN FEET

AS-BUILT OF

CANNIKAN NORTH/SOUTH

AMCHITKA MUDPITS

MUDPIT CLOSURE FINAL TOPOGRAPHY SURVEY

PREPARED BY
McCLINTOCK LAND ASSOCIATES, INC.
11940 BUSINESS BOULEVARD, SUITE 205
EAGLE RIVER, ALASKA 99577
(907) 694-4499

PREPARED FOR
BRICE INCORPORATED
3300 SHELL STREET
FAIRBANKS, ALASKA 99707
(907) 452-2512

PLOT: 1"=40'	CHK: GDK	JOB: 01-117	DWG: AS-BUILT	FB NO: JOB
SITE: RR	DWN: KQ	DATE: 10-25-01	DISK: DELL-E	SHEET: 1 OF 1

H:/Amchitka/GPS_Bases/AMconnikin.dgn

AMCHITKA MUD PIT SITES POST-CLOSURE MONITORING CHECKLIST

Mud Pit Site: Cannikin North/South (CNS)	Date of Inspection: August 4, 2006
Responsible Agency: National Nuclear Security Adm.	Project Manager: John Jones
Inspector (name, title, organization): Patrick Matthews, Task Manager, Stoller Navarro Joint Venture	

A. General Instructions

1. All checklist items must be completed and detailed comments made to document the results of the site inspection.
2. The completed checklist is part of the field record of the inspection. Additional pages should be used as necessary to ensure that a complete record is made. Number and attach the additional pages upon completion of the inspection.
3. Any checklist line item marked by an inspector in a SHADED BOX must be fully explained or an appropriate reference to previous reports provided. The explanation should include the inspector's rationale for conclusions and recommendations, if appropriate. Explanations are to be placed on additional attachments and cross-referenced appropriately, and may take the form of sketches, measurements, and/or annotated site maps.
4. The site inspection is a walking inspection of the entire site, including the perimeter and sufficient transects to be able to inspect the entire surface and all features specifically described in this checklist. Attach a drawing indicating the starting and ending points and the direction and pattern of the inspection.
5. A standard set of color 35 mm photographs (or equivalent) is required. In addition, all anomalous features or new features (such as changes in adjacent area land use) are to be photographed. A photo log entry will be made for each photograph taken.

B. Preparation (to be completed prior to site visit)	YES	NO	EXPLANATION
1. Site as-built plans and site base map reviewed	X		Amchitka Mud Pit Closure -As Built
2. Previous inspection reports reviewed		X	No previous inspections were performed
a. Were anomalies or trends detected on previous inspections?			Not Applicable
b. Was maintenance performed on areas with anomalies?			Not Applicable
3. Site maintenance and repair records reviewed		X	No previous maintenance activities were performed
a. Has site repair resulted in a change from as-built conditions?		X	No detectable changes from the as-builts were observed.
b. Are revised as-builts available that reflect repair changes?			Not Applicable: No repairs have occurred.

C. Site Inspection (to be completed during inspection)	YES	NO	EXPLANATION
1. Adjacent offsite features within mud pit site area			
a. Changes in use of adjacent area?		X	Wildlife refuge
b. Any new roads or trails?		X	Per previous photos and As-built Drawings
c. Change in the position of nearby washes?		X	None Detected
d. Erosion/deposition of nearby washes?		X	None Detected
e. New drainage channels?		X	None Detected
f. Change in surrounding vegetation?		X	None Detected
2. Security markers; signs			
a. Displacement of site markers, boundary markers, or monuments?		X	USFWS Monument was present / Good Condition
b. Signs damaged or removed?		X	No signs were present or noted in the As-builts
3. Cap			
a. Evidence of subsidence?		X	
b. Evidence of cracking?		X	
c. Evidence of erosion (wind or water)?		X	
d. Evidence of animal burrowing?		X	
e. Are site markers disturbed? By man?_____ By natural processes?_____		X	
f. Do natural processes threaten the integrity of cap or site marker?		X	

AMCHITKA MUD PIT SITES POST-CLOSURE MONITORING CHECKLIST (continued)

Mud Pit Site: Cannikin North/South (CNS)	Date of Inspection: August 4, 2006

C. Site inspection (continued)	YES	NO	EXPLANATION
4. Vegetative cover			
a. Is plant cover adequate to prevent erosion?	X		See Discussion on Continuation Sheet
b. Are weedy annual plants present? Do they require removal?		X	See Discussion on Continuation Sheet
c. Evidence of animals on cap?		X	See Discussion on Continuation Sheet
d. Evidence of excessive plant mortality?		X	See Discussion on Continuation Sheet
e. Has a vegetative cover log been completed?	X		See attached log
5. Photo Documentation			
a. Has a photo log been prepared?	X		See attached log
b. How many photos were taken?			5 Photos as noted in the photographic log

D. Field Conclusions			
1. Imminent hazard to integrity of cap? (If yes, immediate report required. Note the person or agency the report will be made to.)		X	
2. Are more frequent inspections required?		X	
3. Are existing maintenance actions satisfactory?			N/A No maintenance was performed or required
4. Are existing repair actions satisfactory?			N/A No repairs were performed or required
5. Is other maintenance/repair necessary?		X	

6. Rationale for field conclusions: Conclusions were based on walkover visual inspections and plant counts.

7. Factors contributing to or impacting inspection: None noted

E. Certification

I certify that I have conducted an inspection of the Cannikin North Sout Mud Pit Site cap in accordance with the Monitoring and Inspection Plan for the Amchitka Mud Pit Release Sites, Rev. 0, dated November 2005, as recorded on this checklist, attached sheets, field notes, vegetative cover log, photo logs, and photographs.

Inspector Printed Name:	Inspector Signature:
Patrick Matthews	
Title:	Date:
Task Manager	9/12/06

AMCHITKA MUD PIT SITES POST-CLOSURE MONITORING CHECKLIST
Continuation Sheet
Cannikin North/South (CNS)

Cap CNS is located approximately eleven miles northwest of Constantine Harbor at an elevation of between 232 and 237 feet. The cap is located in the Crowberry Meadow community of Amundsen (1972). Vegetation cover on this cap was approximately three times the levels found at Cap F (21.9 % cover at Cap CNS) as would be expected from its elevation (Figure 2.1). Species diversity (10 separate taxa) was approximately twice the diversity found at Cap F and is representative of the higher diversity found at the lower elevation in the Crowberry Meadow Community (Figure 2.2). *F. rubra* and *D. behringensis* covered approximately 19% of the cap and represented almost 85% of all vegetation cover on the cap. Both of these values represent maximum values for caps surveyed on Amchitka and are higher than would be predicted from the elevation of the Cap (Figure 2.3). The higher abundance of *F. rubra* and *D. behringensis* might represent the effects of a longer initial growing season at this location, but the exact dates of cap completion could not be determined from available documents.

Cap CNS had a litter cover of 12 % which was lower than the cover at most other caps.

The vegetation cover on Cap CNS is consistent with the vegetation recovery expected for its elevation and location in the Crowberry Meadow Community. The vegetation cover represents five years of growth, and any attempt to increase vegetative cover on the cap should avoid setting back vegetation which has become established.

References Cited

Amundsen, C.C. 1972. Amchitka Bioenvironmental Program. Plant Ecology of Amchitka Island: USAEC Report BMI-171-139. Battelle Memorial Institute.

Vegetative Cover Log

Mud Pit Site: Cannikin North South Cap

Cap Transect	% Vegetative Cover (check one)				Comments
	0-25	25-50	50-75	75-100	
CNS1-1 7 feet	8%				*Festuca rubra.*
CNS1-2 14 feet	6%				*Festuca rubra.*
CNS1-3 23 feet	8%				*Festuca rubra*; *Deschampsia beringensis.*
CNS1-4 27 feet	22%				*Lupinus nootkatensis*; *Deschampsia beringensis.*
CNS1-5 41 feet	6%				*Phleum commutatum*; *Festuca rubra.*
CNS1-6 62 feet	19%				*Festuca rubra*
CNS1-7 75 feet		44%			*Festuca rubra*; *Lupinus nootkatensis.*
CNS1-8 88 feet		39%			*Festuca rubra*; *Poa stenantha*; *Juncus mertensianus*; *Rhinanthus minor.*
CNS1-9 99 feet		28%			*Festuca rubra*; *Deschampsia beringensis.*
CNS1-10 106 feet	22%				*Festuca rubra*; *Deschampsia beringensis*; *Lupinus nootkatensis.*
CNS1-11 125 feet		42%			*Deschampsia beringensis*; *Festuca rubra.*
CNS1-12 132 feet		44%			*Festuca rubra*; *Deschampsia beringensis*; *Rhinanthus minor.*
CNS1-13 153 feet	11%				*Festuca rubra.*
CNS1-14 165 feet		28%			*Festuca rubra*; *Deschampsia beringensis*; *Juncus mertensianus.*
CNS1-15 173 feet		36%			*Festuca rubra*; *Deschampsia beringensis*; *Epilobium latifolium*; moss.

Vegetative Cover Log

Mud Pit Site: Cannikin North South Cap

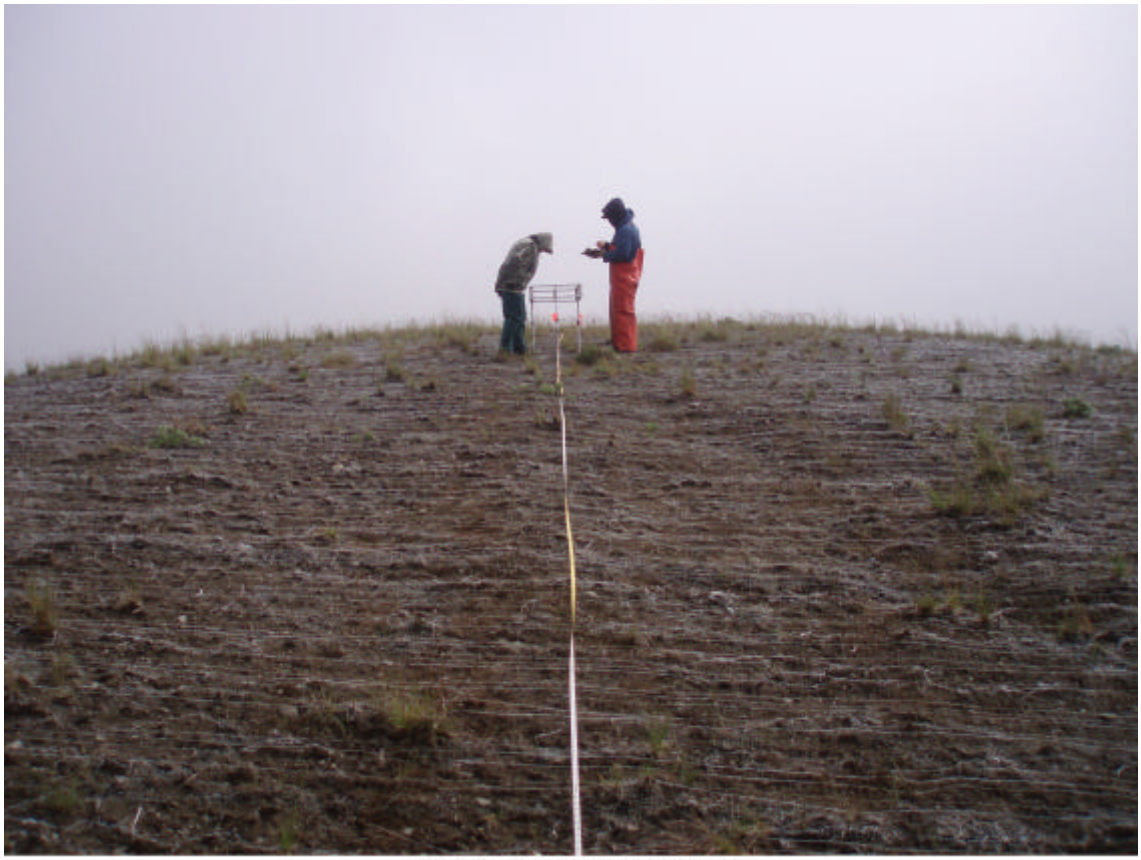
Cap Transect	% Vegetative Cover (check one)				Comments
	0-25	25-50	50-75	75-100	
CNS2-1 6 feet	6%				*Deschampsia beringensis.*
CNS2-2 9 feet	17%				*Deschampsia beringensis*; *Lupinus nootkatensis*; *Festuca rubra.*
CNS2-3 12 feet	19%				*Festuca rubra*; *Deschampsia beringensis*; *Lupinus nootkatensis.*
CNS2-4 15 feet	22%				*Lupinus nootkatensis*; *Festuca rubra.*
CNS2-5 19 feet	8%				*Deschampsia beringensis*; *Festuca rubra.*
CNS2-6 30 feet	8%				*Deschampsia beringensis.*
CNS2-7 39 feet		25%			*Festuca rubra*; *Deschampsia beringensis.*
CNS2-8 43 feet	19%				*Festuca rubra*; *Deschampsia beringensis.*
CNS2-9 46 feet	19%				*Festuca rubra*; *Deschampsia beringensis*; *Lupinus nootkatensis.*
CNS2-10 49 feet		47%			*Deschampsia beringensis*; *Festuca rubra.*
CNS2-11 62 feet	17%				*Deschampsia beringensis*; *Festuca rubra.*
CNS2-12 68 feet	22%				*Deschampsia beringensis*; *Festuca rubra.*
CNS2-13 73 feet	22%				*Festuca rubra*; *Deschampsia beringensis*; moss.
CNS2-14 79 feet	19%				*Festuca rubra*; *Deschampsia beringensis.*
CNS2-15 92 feet	19%				*Deschampsia beringensis*; *Festuca rubra*; *Achillea borealis*; *Phleum commutatum.*

Photograph Log

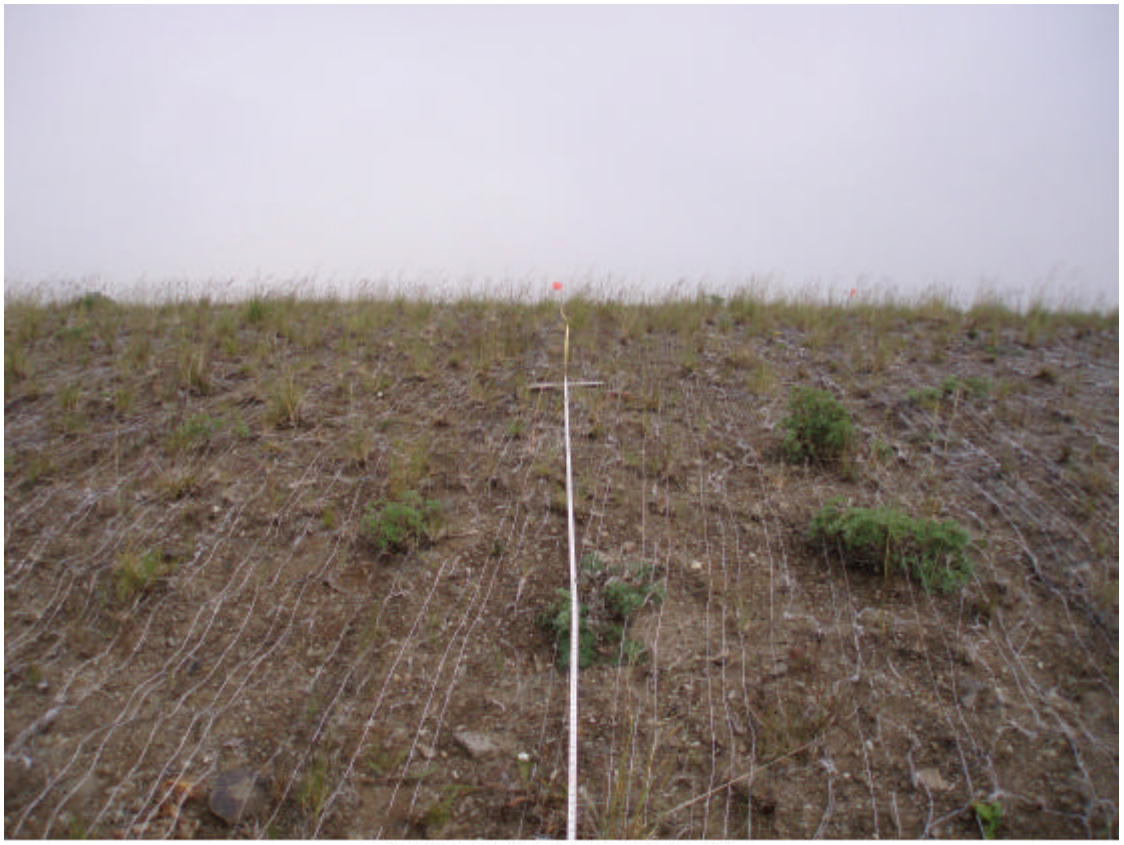
Mud Pit Site: Cannikin North/South Site Mud Pit (CNS)

Date	Photo #	GPS Location	Direction of Photo	DESCRIPTION
8/4/06	P8040016	See Figure	N/A	USFWS Monument
8/4/06	P8040018	See Figure	East	Transect CNS-1 West
8/4/06	P8040019	See Figure	North	Transect CNS-2 South
8/4/06	P8040020	See Figure	West	Transect CNS-1 East
8/4/06	P8040021	See Figure	South	Transect CNS-2 North

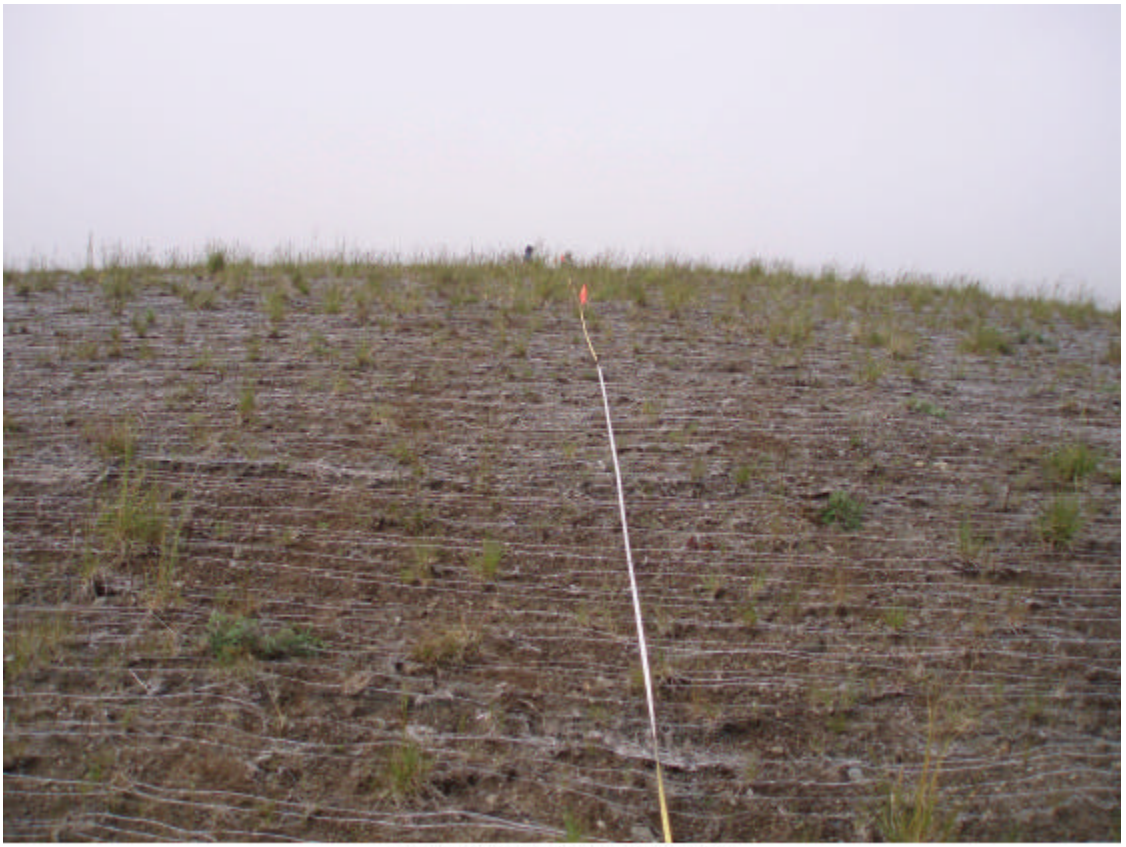
P8040016 CNS USFWS Monument



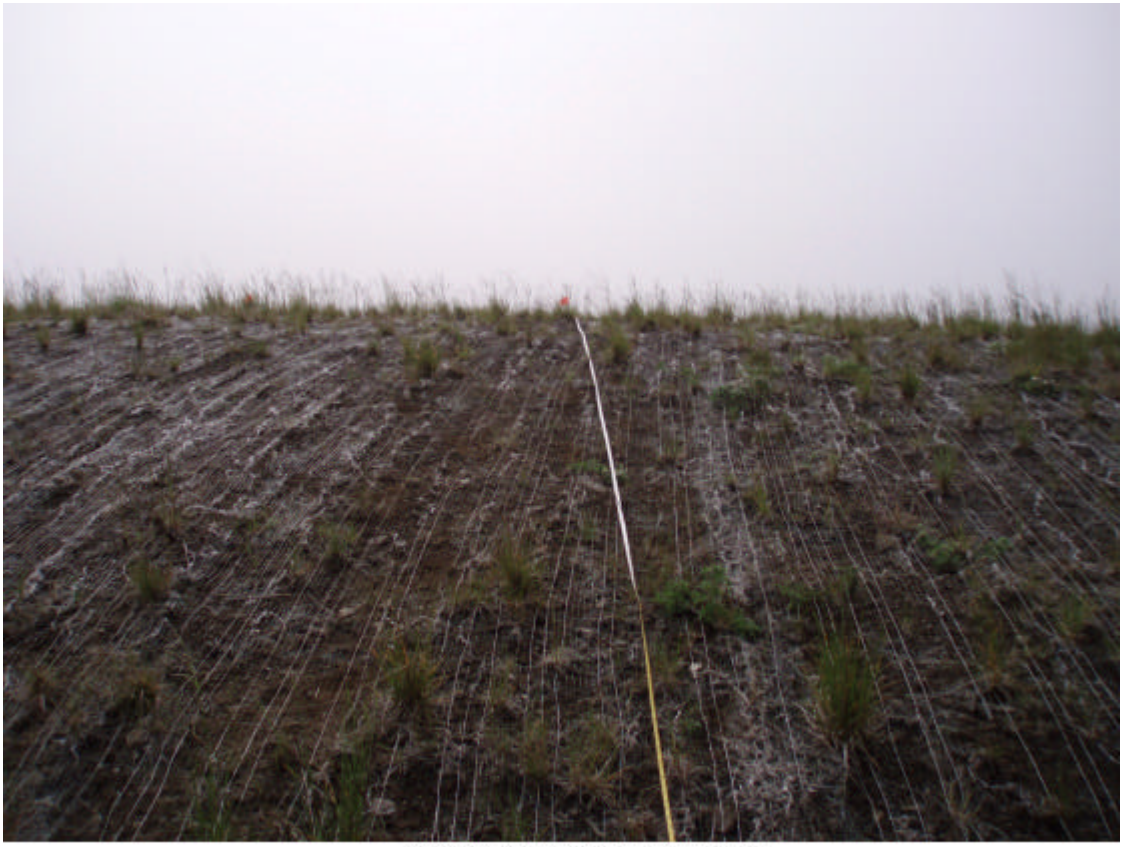
P8040018 CNS-1 West Looking East



P8040019 CNS-2 South Looking North

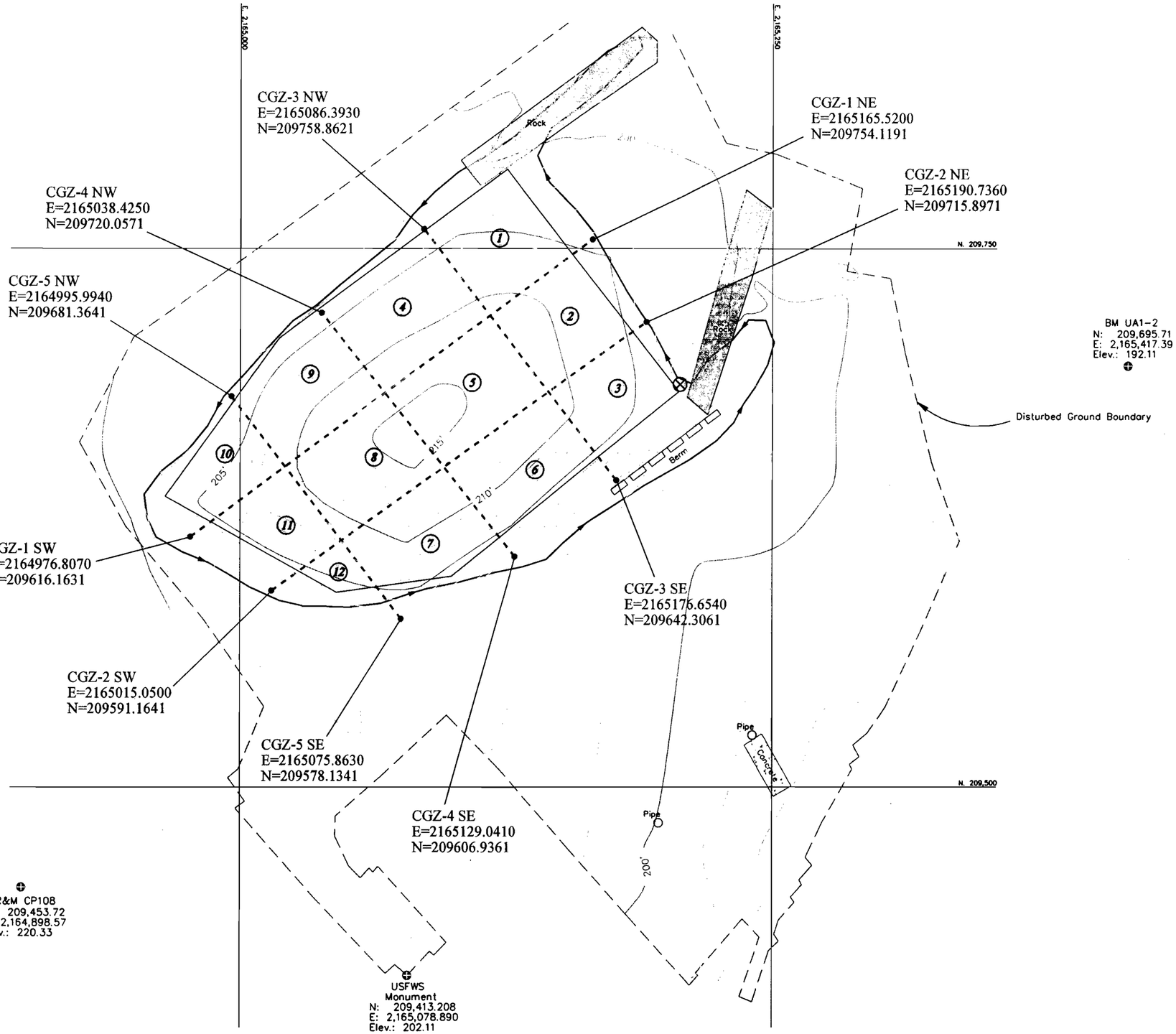


P8040020 CNS-1 East Looking West



P8040021 CNS-2 North Looking South

4.0 Cannikin
Ground Zero



AS-BUILT OF

CANNIKAN "Ground Zero"

AMCHITKA MUDPITS

MUDPIT CLOSURE FINAL TOPOGRAPHY SURVEY

PREPARED BY
McCLINTOCK LAND ASSOCIATES, INC.
11940 BUSINESS BOULEVARD, SUITE 205
EAGLE RIVER, ALASKA 99577
(907) 694-4699

PREPARED FOR
BRICE INCORPORATED
3200 SHELL STREET
FAIRBANKS, ALASKA 99707
(907) 452-2512

PLOT: 1"=50'	CHK: GDK	JOB: 01-117	DWG: AS-BUILT	FB NO: JOB
SITE: Cannakin	DWN: KO	DATE: 10-25-01	DISK: DELL-E	SHEET: 1 OF 1

H:/Amchitka/GPS_Bases/Mgmdzero.dgn

AMCHITKA MUD PIT SITES POST-CLOSURE MONITORING CHECKLIST

Mud Pit Site: Cannikin Ground Zero (CGZ)	Date of Inspection: August 4, 2006
Responsible Agency: National Nuclear Security Adm.	Project Manager: John Jones
Inspector (name, title, organization): Patrick Matthews, Task Manager, Stoller Navarro Joint Venture	

A. General Instructions

1. All checklist items must be completed and detailed comments made to document the results of the site inspection.
2. The completed checklist is part of the field record of the inspection. Additional pages should be used as necessary to ensure that a complete record is made. Number and attach the additional pages upon completion of the inspection.
3. Any checklist line item marked by an inspector in a SHADED BOX must be fully explained or an appropriate reference to previous reports provided. The explanation should include the inspector's rationale for conclusions and recommendations, if appropriate. Explanations are to be placed on additional attachments and cross-referenced appropriately, and may take the form of sketches, measurements, and/or annotated site maps.
4. The site inspection is a walking inspection of the entire site, including the perimeter and sufficient transects to be able to inspect the entire surface and all features specifically described in this checklist. Attach a drawing indicating the starting and ending points and the direction and pattern of the inspection.
5. A standard set of color 35 mm photographs (or equivalent) is required. In addition, all anomalous features or new features (such as changes in adjacent area land use) are to be photographed. A photo log entry will be made for each photograph taken.

B. Preparation (to be completed prior to site visit)	YES	NO	EXPLANATION
1. Site as-built plans and site base map reviewed	X		Amchitka Mud Pit Closure -As Built
2. Previous inspection reports reviewed		X	No previous inspections were performed
a. Were anomalies or trends detected on previous inspections?			Not Applicable
b. Was maintenance performed on areas with anomalies?			Not Applicable
3. Site maintenance and repair records reviewed		X	No previous maintenance activities were performed
a. Has site repair resulted in a change from as-built conditions?		X	No detectable changes from the as-builts were observed.
b. Are revised as-builts available that reflect repair changes?			Not Applicable: No repairs have occurred.

C. Site Inspection (to be completed during inspection)	YES	NO	EXPLANATION
1. Adjacent offsite features within mud pit site area			
a. Changes in use of adjacent area?		X	Wildlife refuge
b. Any new roads or trails?		X	Per previous photos and As-built Drawings
c. Change in the position of nearby washes?		X	None Detected
d. Erosion/deposition of nearby washes?		X	None Detected
e. New drainage channels?		X	None Detected
f. Change in surrounding vegetation?		X	None Detected
2. Security markers; signs			
a. Displacement of site markers, boundary markers, or monuments?		X	USFWS Monument was present / Good Condition Ground Zero Monument was Intact
b. Signs damaged or removed?		X	No signs were present or noted in the As-builts
3. Cap			
a. Evidence of subsidence?		X	
b. Evidence of cracking?		X	
c. Evidence of erosion (wind or water)?		X	
d. Evidence of animal burrowing?		X	
e. Are site markers disturbed? By man?_____ By natural processes?_____		X	
f. Do natural processes threaten the integrity of cap or site marker?		X	

AMCHITKA MUD PIT SITES POST-CLOSURE MONITORING CHECKLIST (continued)

Mud Pit Site: Cannikin Ground Zero (CGZ)	Date of Inspection: August 4, 2006

C. Site inspection (continued)	YES	NO	EXPLANATION
4. Vegetative cover			
a. Is plant cover adequate to prevent erosion?	X		See Discussion on Continuation Sheet
b. Are weedy annual plants present? Do they require removal?		X	See Discussion on Continuation Sheet
c. Evidence of animals on cap?		X	See Discussion on Continuation Sheet
d. Evidence of excessive plant mortality?		X	See Discussion on Continuation Sheet
e. Has a vegetative cover log been completed?	X		See attached log
5. Photo Documentation			
a. Has a photo log been prepared?	X		See attached log
b. How many photos were taken?			13 Photos as noted in the photographic log

D. Field Conclusions			
1. Imminent hazard to integrity of cap? (If yes, immediate report required. Note the person or agency the report will be made to.)		X	
2. Are more frequent inspections required?		X	
3. Are existing maintenance actions satisfactory?			N/A No maintenance was performed or required
4. Are existing repair actions satisfactory?			N/A No repairs were performed or required
5. Is other maintenance/repair necessary?		X	

6. Rationale for field conclusions: Conclusions were based on walkover visual inspections and plant counts.

7. Factors contributing to or impacting inspection: None noted

E. Certification

I certify that I have conducted an inspection of the Cannikin Ground Zero Mud Pit Site cap in accordance with the Monitoring and Inspection Plan for the Amchitka Mud Pit Release Sites, Rev. 0, dated November 2005, as recorded on this checklist, attached sheets, field notes, vegetative cover log, photo logs, and photographs.

Inspector Printed Name:	Inspector Signature:
Patrick Matthews	
Title:	Date:
Task Manager	9/12/06

AMCHITKA MUD PIT SITES POST-CLOSURE MONITORING CHECKLIST
Continuation Sheet
Cannikin Ground Zero (CGZ)

Cap CGZ is located approximately eleven miles northwest of Constantine Harbor with an elevation of 200 to 215 feet. The cap is located in the Crowberry Meadow Community of Amundsen (1972), and vegetation cover on this cap was approximately one and a half times the levels found at Cap F (13.4 % cover) which is somewhat less than would be expected based on the elevation of the cap (Figure 2.1). Vegetation cover is only half the level found at the neighboring Cap CNS. The cover of species other than *F. rubra* and *D. behringensis* actually is higher on cap CGZ than at the neighboring Cap CNS and species diversity is higher as well with 12 separate taxa which is consistent with the caps elevation (Figure 2.2). The difference between the caps is entirely in the abundance of *F. rubra* and *D. behringensis*. These species cover approximately 19% of the cap and represented almost 85% of all vegetation cover on cap CNS both of which are a departure from the levels expected for its elevation and account for the higher cover at cap CNS in comparison to Cap CGZ.

Cap CGZ had a litter cover of 13 % which is very similar to the 12% found at Cap CNS but is lower than the cover at most other caps.

The vegetation cover on Cap CGZ is consistent with the vegetation recovery expected for its location between the Crowberry Meadow Community. The vegetation cover represents five years of growth, and as with the other caps any attempt to increase vegetative cover on the cap should avoid setting back vegetation recovery.

References Cited

Amundsen, C.C. 1972. Amchitka Bioenvironmental Program. Plant Ecology of Amchitka Island: USAEC Report BMI-171-139. Battelle Memorial Institute.

Vegetative Cover Log

Mud Pit Site: Cannikin Ground Zero Cap

Cap Transect	% Vegetative Cover (check one)				Comments
	0-25	25-50	50-75	75-100	
CGZ1-1 2 feet	3%				*Festuca rubra.*
CGZ1-2 37 feet	8%				*Festuca rubra.*
CGZ1-3 53 feet	0%				
CGZ1-4 59 feet	0%				
CGZ1-5 67 feet	3%				*Festuca rubra.*
CGZ1-6 71 feet	0%				
CGZ1-7 80 feet	0%				
CGZ1-8 105 feet	17%				*Deschampsia beringensis*; *Festuca rubra.*
CGZ1-9 108 feet	14%				*Festuca rubra*; *Deschampsia beringensis.*
CGZ1-10 138 feet	14%				*Deschampsia beringensis.*
CGZ1-11 150 feet		25%			*Festuca rubra*; *Lupinus nootkatensis.*
CGZ1-12 160 feet		25%			*Festuca rubra*; moss; *Juncus mertensianus.*
CGZ1-13 166 feet	17%				*Deschampsia beringensis*; moss.
CGZ1-14 185 feet	19%				*Festuca rubra*; moss; *Deschampsia beringensis.*

Vegetative Cover Log

Mud Pit Site: Cannikin Ground Zero Cap

Cap Transect	% Vegetative Cover (check one)				Comments
	0-25	25-50	50-75	75-100	
CGZ1-15 190 feet		25%			*Lupinus nootkatensis*; *Poa stenantha*; *Festuca rubra*; moss; *Juncus mertensianus.*
CGZ1-16 225 feet		47%			*Equisetum arvense*; *Festuca rubra*; *Deschampsia beringensis*; *Lupinus nootkatensis.*
CGZ1-17 230 feet				97%	*Equisetum arvense*; *Festuca rubra*; *Deschampsia beringensis*; *Epilobium latifolium*; *Achillea borealis.*
CGZ2-1 4 feet	3%				*Festuca rubra.*
CGZ2-2 35 feet	3%				*Deschampsia beringensis.*
CGZ2-3 72 feet	6%				*Lupinus nootkatensis.*
CGZ2-4 100 feet	3%				*Deschampsia beringensis.*
CGZ2-5 118 feet		36%			*Lupinus nootkatensis*; *Festuca rubra*; *Deschampsia beringensis.*
CGZ2-6 126 feet	11%				*Deschampsia beringensis*; *Equisetum arvense.*
CGZ2-7 132 feet	3%				*Cerastium beeringianum.*
CGZ2-8 142 feet	17%				*Deschampsia beringensis*; *Festuca rubra*; *Lupinus nootkatensis.*
CGZ2-9 158 feet			53%		*Deschampsia beringensis*; *Festuca rubra.*
CGZ2-10 176 feet	11%				*Lupinus nootkatensis*; *Festuca rubra.*
CGZ2-11 181 feet	0%				

Vegetative Cover Log

Mud Pit Site: Cannikin Ground Zero Cap

Cap Transect	% Vegetative Cover (check one)				Comments
	0-25	25-50	50-75	75-100	
CGZ2-12 187 feet	14%				*Lupinus nootkatensis*; *Deschampsia beringensis*.
CGZ2-13 194 feet		31%			*Lupinus nootkatensis*; *Festuca rubra*.
CGZ2-14 198 feet	17%				*Festuca rubra*; *Lupinus nootkatensis*; *Equisetum arvense*.
CGZ2-15 204 feet	19%				*Festuca rubra*.
CGZ3-1 14 feet	0%				
CGZ3-2 21 feet	0%				
CGZ3-3 36 feet	0%				
CGZ3-4 47 feet	3%				*Festuca rubra*.
CGZ3-5 54 feet	6%				*Festuca rubra*; moss.
CGZ3-6 71 feet	0%				
CGZ3-7 107 feet	6%				*Festuca rubra*.
CGZ3-8 138 feet		36%			*Festuca rubra*; *Deschampsia beringensis*.
CGZ3- 9 142 feet	19%				*Festuca rubra*; *Deschampsia beringensis*.
CGZ3-10 146 feet	6%				*Festuca rubra*.
CGZ4-1 17 feet	0%				

Vegetative Cover Log

Mud Pit Site: Cannikin Ground Zero Cap

Cap Transect	% Vegetative Cover (check one)				Comments
	0-25	25-50	50-75	75-100	
CGZ4-2 21 feet	0%				
CGZ4-3 25 feet	0%				
CGZ4-4 33 feet	3%				*Festuca rubra.*
CGZ4-5 62 feet	3%				*Festuca rubra.*
CGZ4-6 84 feet	3%				*Festuca rubra.*
CGZ4-7 122 feet	19%				*Festuca rubra*; *Lupinus nootkatensis*; moss.
CGZ4-8 132 feet	14%				*Festuca rubra*; *Lupinus nootkatensis.*
CGZ4-9 137 feet	8%				*Lupinus nootkatensis*; moss; *Festuca rubra.*
CGZ4-1 142 feet	3%				Moss.
CGZ5-1 6 feet	17%				*Lupinus nootkatensis*; *Festuca rubra.*
CGZ5-2 15 feet	0%				
CGZ5-3 36 feet	17%				*Deschampsia beringensis*; *Festuca rubra.*
CGZ5-4 58 feet	22%				*Lupinus nootkatensis.*
CGZ5-5 66 feet	6%				*Deschampsia beringensis.*
CGZ5-6 74 feet		28%			*Lupinus nootkatensis*; *Festuca rubra*; *Deschampsia beringensis.*

Vegetative Cover Log

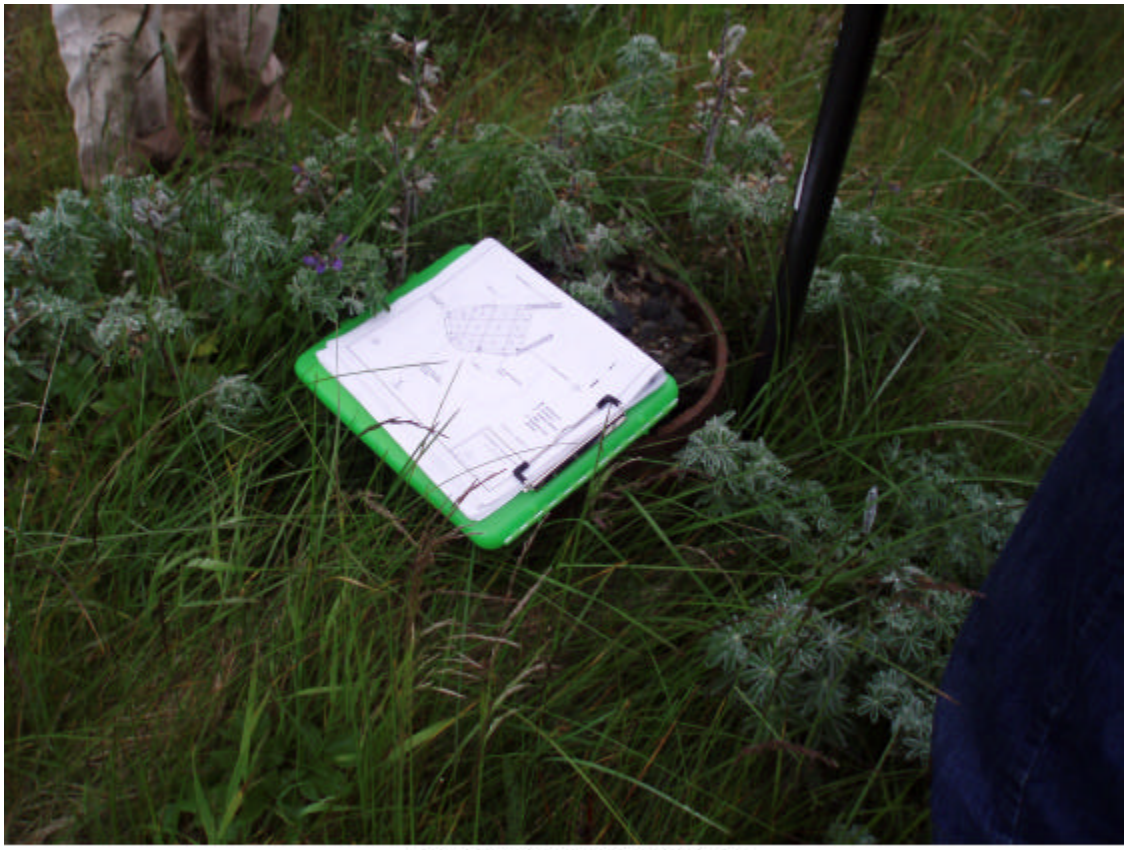
Mud Pit Site: Cannikin Ground Zero Cap

Cap Transect	% Vegetative Cover (check one)				Comments
	0-25	25-50	50-75	75-100	
CGZ5-7 77 feet		33%			*Lupinus nootkatensis.*
CGZ5-8 86 feet	8%				*Lupinus nootkatensis.*
CGZ5-9 107 feet	3%				*Lupinus nootkatensis.*
CGZ5-10 129 feet	11%				*Festuca rubra*; moss; *Deschampsia beringensis.*

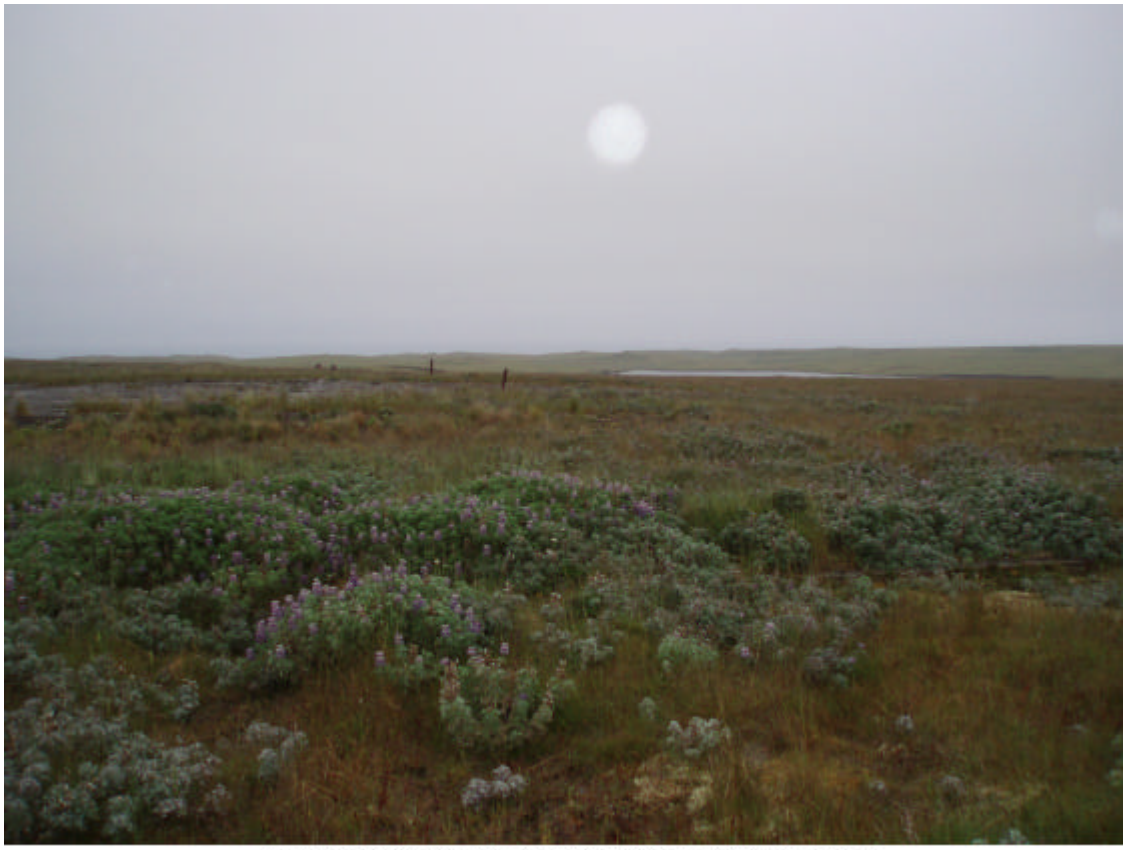
Photograph Log

Mud Pit Site: Cannikin Ground Zero (CGZ)

Date	Photo #	GPS Location	Direction of Photo	DESCRIPTION
8/4/06	P8040002	See Figure	Northwest	USFWS Monument
8/4/06	P8040003	See Figure	Northeast	CGZ Aux Pipes from USFWS Monument
8/4/06	P8040004	See Figure	North	CGZ from USFWS Monument
8/4/06	P8040005	See Figure	Southwest	Transect CGZ-1 NE
8/4/06	P8040006	See Figure	Southeast	Transect CGZ-3 NW
8/4/06	P8040007	See Figure	Southeast	Transect CGZ-4 NW
8/4/06	P8040008	See Figure	Southeast	Transect CGZ-5 NW
8/4/06	P8040009	See Figure	Northeast	Transect CGZ-1 SW
8/4/06	P8040010	See Figure	Northeast	Transect CGZ-2 SW
8/4/06	P8040011	See Figure	Northwest	Transect CGZ-5 SE
8/4/06	P8040012	See Figure	Northwest	Transect CGZ-4 SE
8/4/06	P8040013	See Figure	Northwest	Transect CGZ-3 SE
8/4/06	P8040014	See Figure	Southwest	Transect CGZ-2 NE

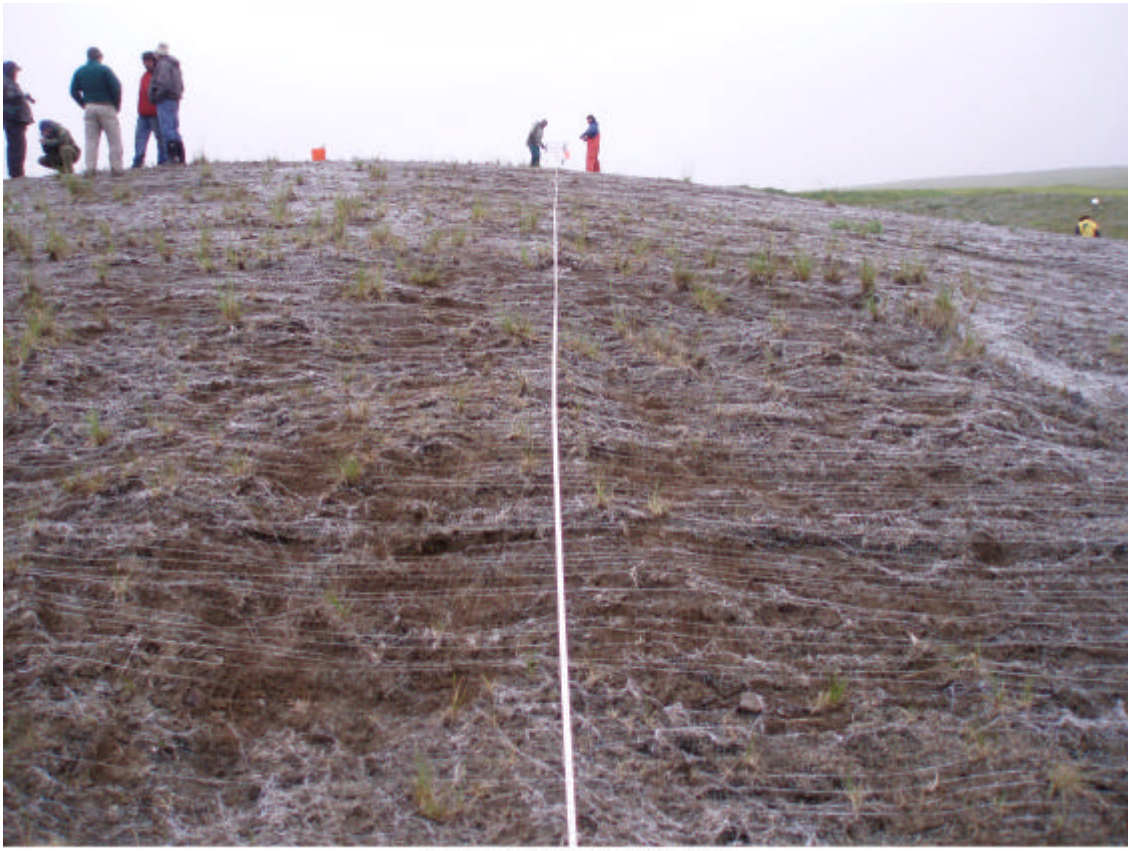


P8040002 CGZ USFWS Monument



P8040003 CGZ aux pipes from USFWS Monument Facing N 57 E

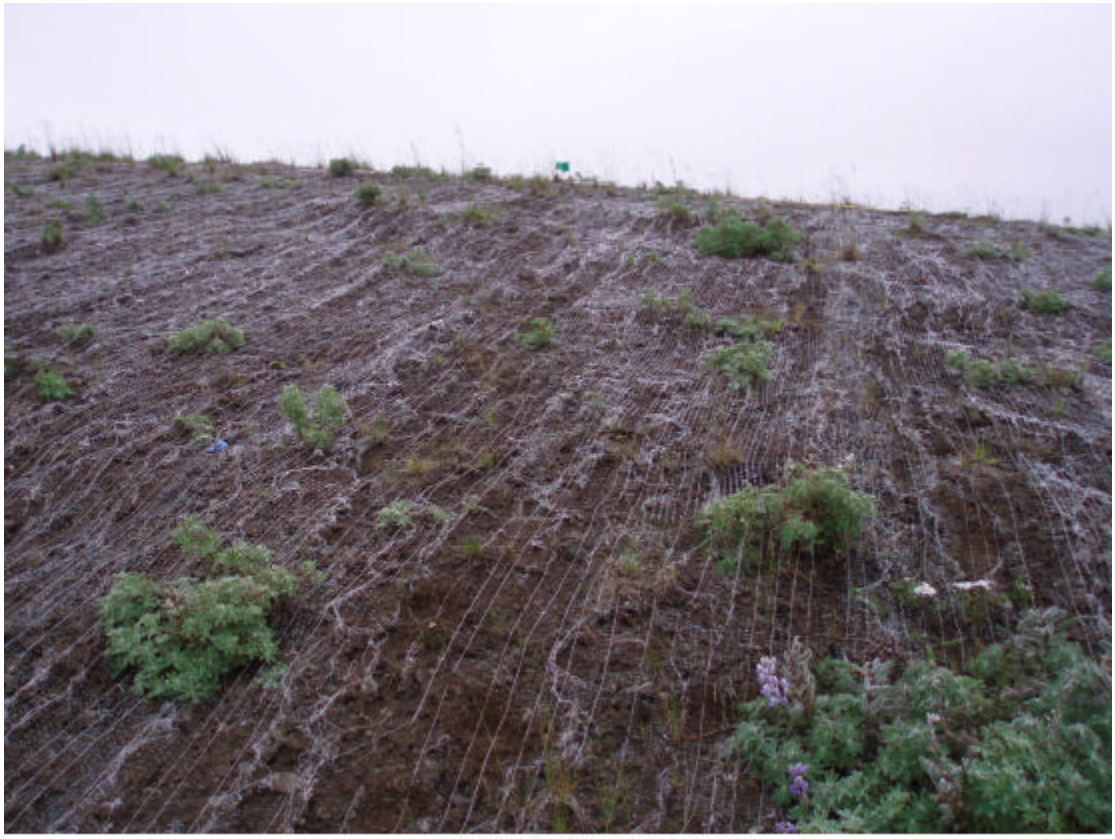
P8040004 CGZ from USGS Monument



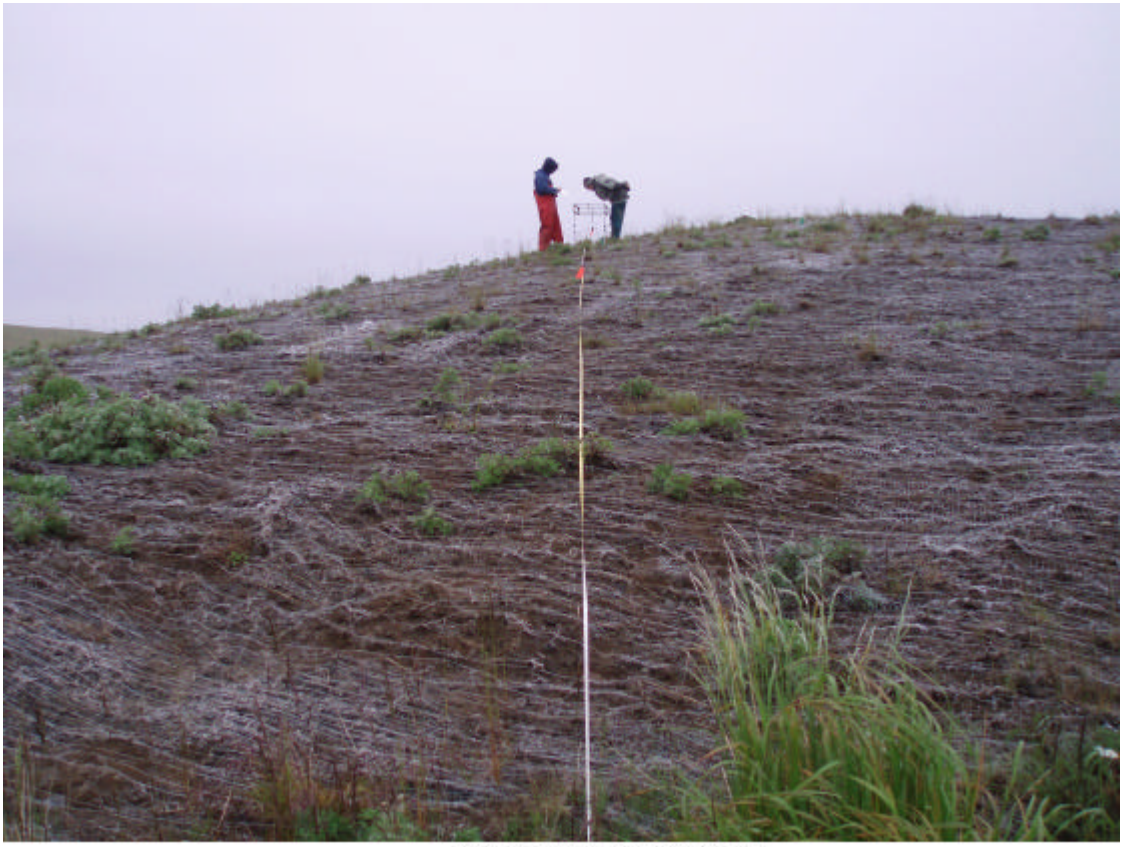
P8040005 CGZ-1 NE looking SW

P8040006 CGZ-3 NW looking SE

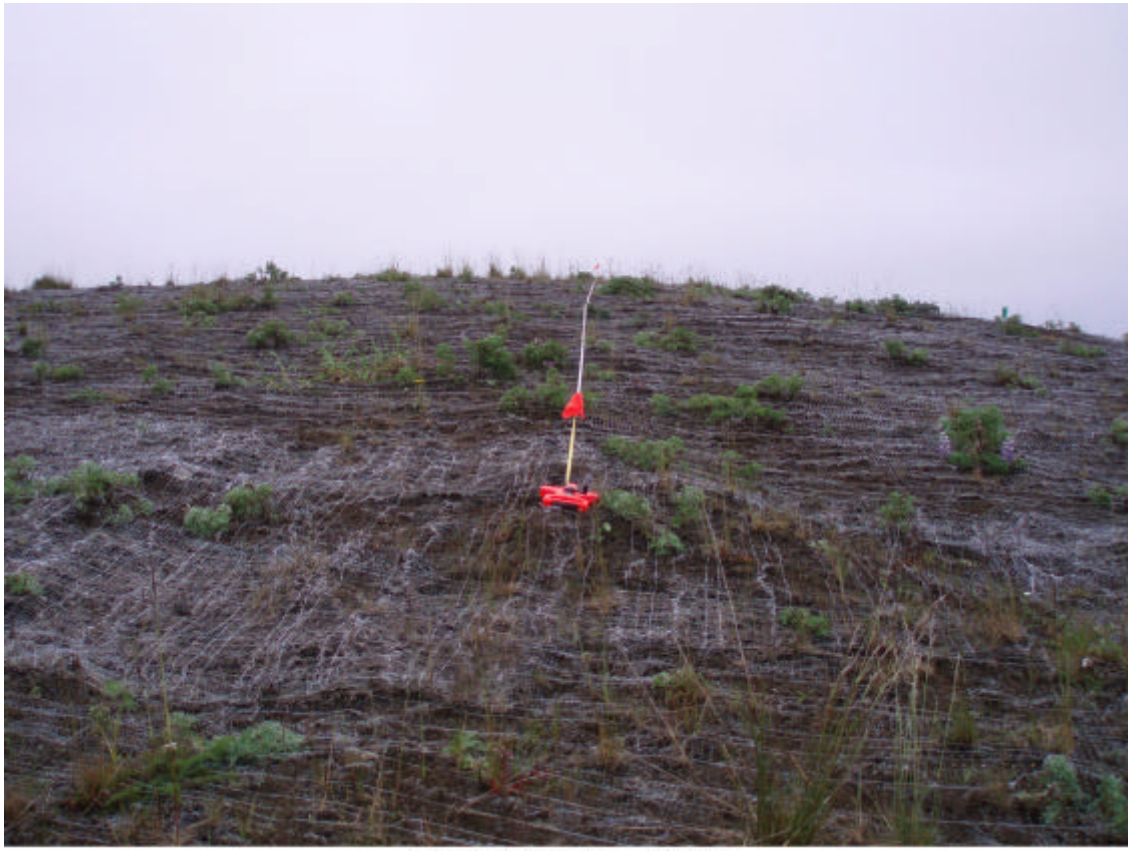
P8040007 CGZ-4 NW looking SE



P8040008 CGZ-5 NW looking SE

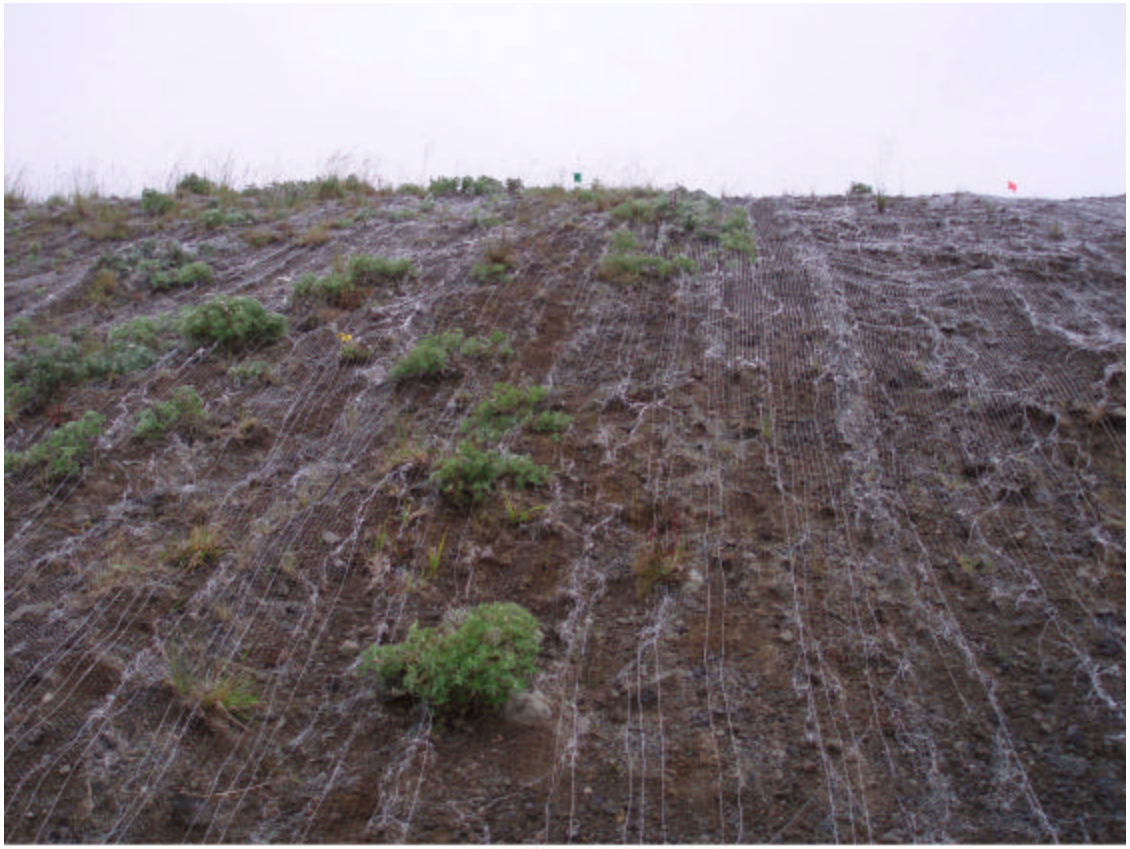


P8040009 CGZ-1 SW looking NE

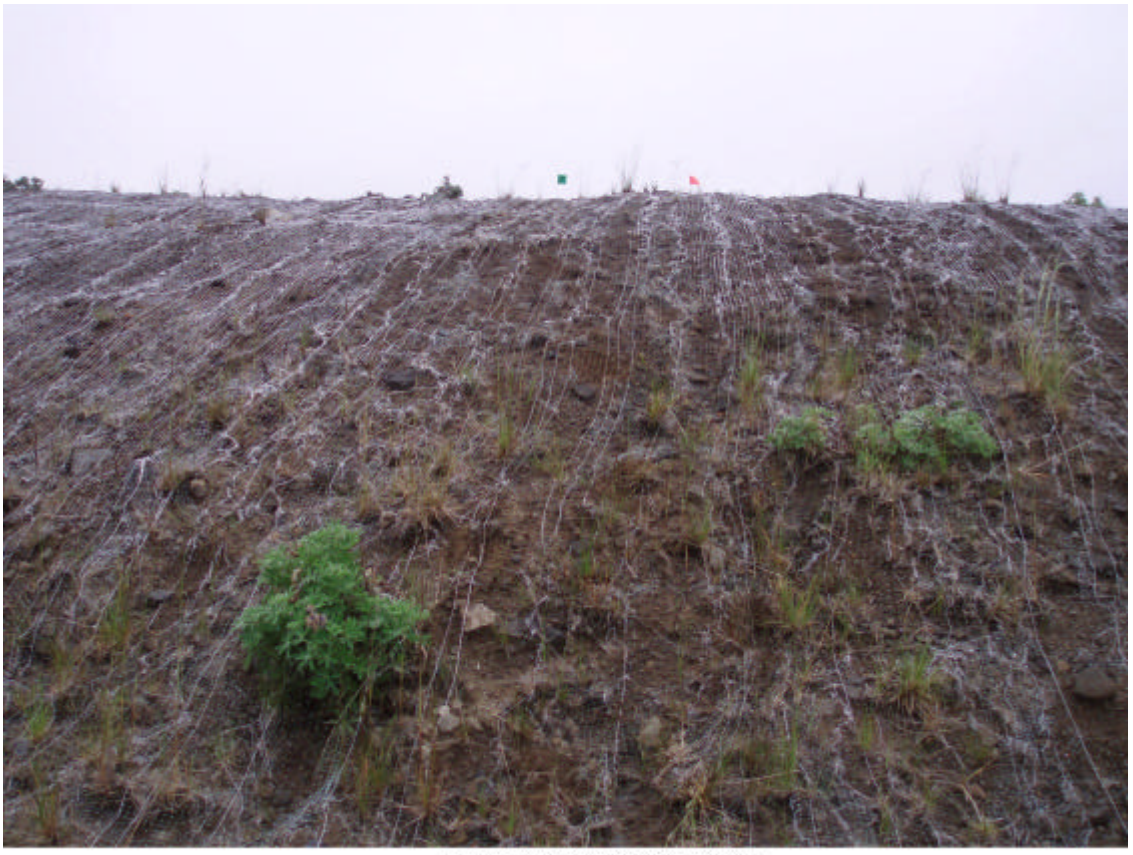


P8040010 CGZ-2 SW looking NE

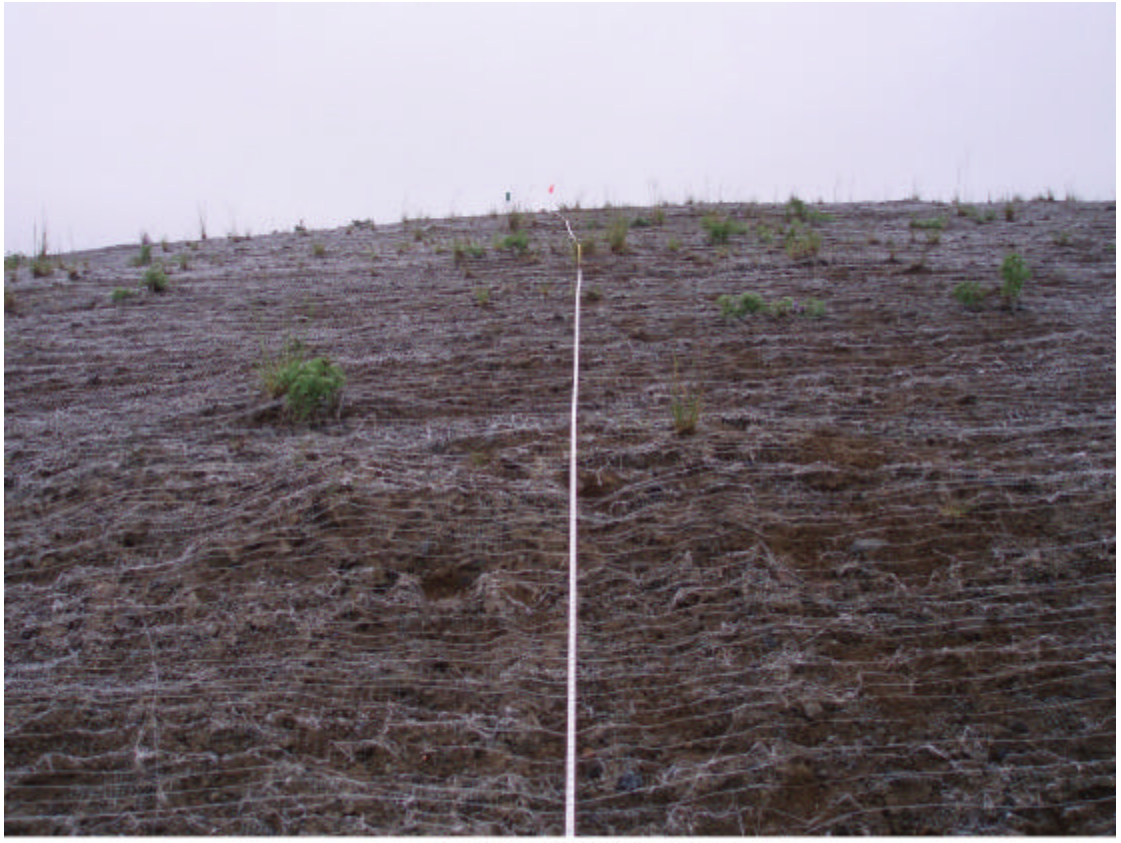
P8040011 CGZ-5 SE looking NW



P8040012 CGZ-4 SE looking NW

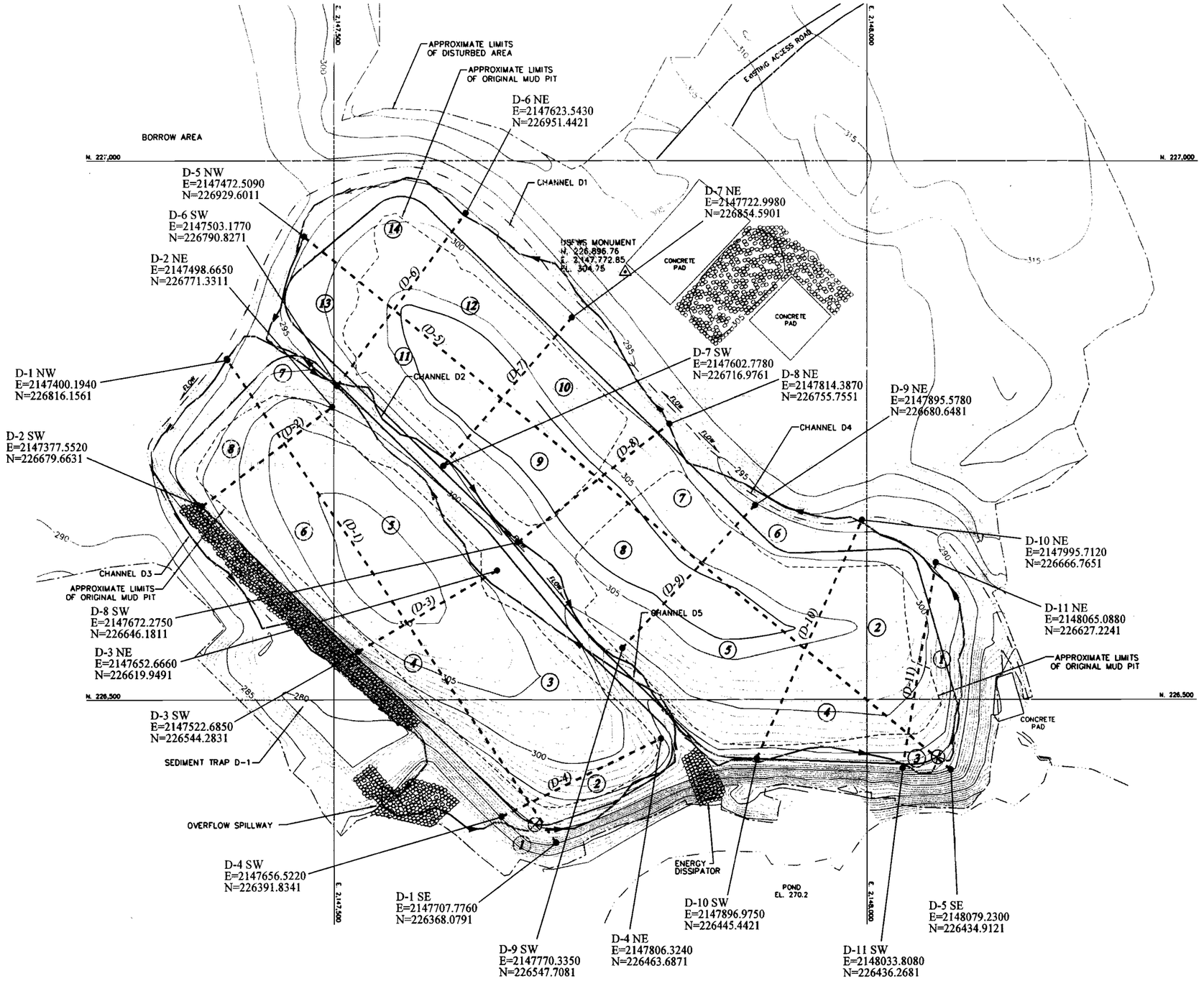


P8040013 CGZ-3 SE looking NW



P8040014 CGZ-2 NE looking SW

5.0 Drill Site D



Explanation

- (1) Vegetative Cover Grid Area
- • Transect/Photopoint
- ⊗ Starting Point
- Visual Inspection Route

Coordinates:
Alaska State Plane, Zone 10 NAD27

0 50 100 150 200
SCALE IN FEET

AS-BUILT OF

Site D

AMCHITKA MUDPITS

MUDPIT CLOSURE FINAL TOPOGRAPHY SURVEY

PREPARED BY
McCLINTOCK LAND ASSOCIATES, INC.
11940 BUSINESS BOULEVARD, SUITE 205
EAGLE RIVER, ALASKA 99577
(907) 694-4499

PREPARED FOR
BRICE INCORPORATED
3200 SHELL STREET
FAIRBANKS, ALASKA 99707
(907) 452-2512

PLOT: 1"=50'	CHK: GDK	JOB: 01-117	DWG: AS-BUILT	FB NO: JOB
SITE: D	DWN: KO	DATE: 10-25-01	DISK: DELL-E	SHEET: 1 OF 1

H: /Amchitka/GPS_Bases/AMsiteD.dgn

AMCHITKA MUD PIT SITES POST-CLOSURE MONITORING CHECKLIST

Mud Pit Site: Drill Site D	Date of Inspection: August 3, 2006
Responsible Agency: National Nuclear Security Adm.	Project Manager: John Jones
Inspector (name, title, organization): Patrick Matthews, Task Manager, Stoller Navarro Joint Venture	

A. General Instructions

1. All checklist items must be completed and detailed comments made to document the results of the site inspection.
2. The completed checklist is part of the field record of the inspection. Additional pages should be used as necessary to ensure that a complete record is made. Number and attach the additional pages upon completion of the inspection.
3. Any checklist line item marked by an inspector in a SHADED BOX must be fully explained or an appropriate reference to previous reports provided. The explanation should include the inspector's rationale for conclusions and recommendations, if appropriate. Explanations are to be placed on additional attachments and cross-referenced appropriately, and may take the form of sketches, measurements, and/or annotated site maps.
4. The site inspection is a walking inspection of the entire site, including the perimeter and sufficient transects to be able to inspect the entire surface and all features specifically described in this checklist. Attach a drawing indicating the starting and ending points and the direction and pattern of the inspection.
5. A standard set of color 35 mm photographs (or equivalent) is required. In addition, all anomalous features or new features (such as changes in adjacent area land use) are to be photographed. A photo log entry will be made for each photograph taken.

B. Preparation (to be completed prior to site visit)	YES	NO	EXPLANATION
1. Site as-built plans and site base map reviewed	X		Amchitka Mud Pit Closure -As Built
2. Previous inspection reports reviewed		X	No previous inspections were performed
a. Were anomalies or trends detected on previous inspections?			Not Applicable
b. Was maintenance performed on areas with anomalies?			Not Applicable
3. Site maintenance and repair records reviewed		X	No previous maintenance activities were performed
a. Has site repair resulted in a change from as-built conditions?		X	No detectable changes from the as-builts were observed.
b. Are revised as-builts available that reflect repair changes?			Not Applicable: No repairs have occurred.

C. Site Inspection (to be completed during inspection)	YES	NO	EXPLANATION
1. Adjacent offsite features within mud pit site area			
a. Changes in use of adjacent area?		X	Wildlife refuge
b. Any new roads or trails?		X	Per previous photos and As-built Drawings
c. Change in the position of nearby washes?		X	None Detected
d. Erosion/deposition of nearby washes?		X	None Detected
e. New drainage channels?		X	None Detected
f. Change in surrounding vegetation?		X	None Detected
2. Security markers; signs			
a. Displacement of site markers, boundary markers, or monuments?		X	USFWS Monument was present / Good Condition
b. Signs damaged or removed?		X	No signs were present or noted in the As-builts
3. Cap			
a. Evidence of subsidence?		X	
b. Evidence of cracking?		X	
c. Evidence of erosion (wind or water)?	X		Minor areas as noted below.
d. Evidence of animal burrowing?		X	
e. Are site markers disturbed? By man?____ By natural processes?____		X	
f. Do natural processes threaten the integrity of cap or site marker?		X	

AMCHITKA MUD PIT SITES POST-CLOSURE MONITORING CHECKLIST (continued)

Mud Pit Site: Drill Site D	Date of Inspection: August 3, 2006

C. Site inspection (continued)	YES	NO	EXPLANATION
4. Vegetative cover			
a. Is plant cover adequate to prevent erosion?	X		See Discussion on Continuation Sheet
b. Are weedy annual plants present? Do they require removal?		X	See Discussion on Continuation Sheet
c. Evidence of animals on cap?		X	See Discussion on Continuation Sheet
d. Evidence of excessive plant mortality?		X	See Discussion on Continuation Sheet
e. Has a vegetative cover log been completed?	X		See attached log
5. Photo Documentation			
a. Has a photo log been prepared?	X		See attached log
b. How many photos were taken?			24 Photos as noted in the photographic log

D. Field Conclusions			
1. Imminent hazard to integrity of cap? (If yes, immediate report required. Note the person or agency the report will be made to.)		X	
2. Are more frequent inspections required?		X	
3. Are existing maintenance actions satisfactory?			N/A No maintenance was performed or required
4. Are existing repair actions satisfactory?			N/A No repairs were performed or required
5. Is other maintenance/repair necessary?		X	

6. Rationale for field conclusions: Conclusions were based on walkover visual inspections and plant counts.

Water erosion was minimal (i.e. no more than two inches of top soil) and did not expose the geomembrane liner. The overlain vegetation netting was present on the cap and may aid in minimizing wind erosion and a deterrent to birds nesting or accumulating on the cap.

Transect lines were established in the field and associated GPS Coordinates are provided on the attached figure. No permanent stakes were set.

7. Factors contributing to or impacting inspection: None noted

E. Certification

I certify that I have conducted an inspection of the Drill Site D Mud Pit Site cap in accordance with the Monitoring and Inspection Plan for the Amchitka Mud Pit Release Sites, Rev. 0, dated November 2005, as recorded on this checklist, attached sheets, field notes, vegetative cover log, photo logs, and photographs.

Inspector Printed Name: Patrick Matthews	Inspector Signature:
Title: Task Manager	Date: 9/12/06

AMCHITKA MUD PIT SITES POST-CLOSURE MONITORING CHECKLIST
Continuation Sheet
Drill Site D

Cap D is located approximately sixteen miles northwest of Constantine Harbor at an elevation of between 295 and 310 feet. The cap is located in a zone which is transitional between the Crowberry Stripe Community and the Crowberry Meadow Community of Amundsen (1972). Vegetation cover on this cap was over twice the levels found at Cap F and Cap E consistent with the lower elevation (16.6 % cover; Figure 2.1). The higher species diversity at Cap D (8 separate taxa identified) also was consistent with the lower elevation (Figure 2.2). *F. rubra* and *D. behringensis* were much more abundant than at Cap E and Cap F which also is consistent with the lower elevation of the cap (Figure 2.3). The higher abundance of invading species on Cap D relative to Caps E and F probably resulted from the less harsh growing conditions on Cap D.

Cap D had a litter cover of 30 % which was higher than the (20.2% and 20.0% at Caps E and F). The bare mineral soils were somewhat less abundant than at the two higher sites.

The vegetation cover on Cap D is consistent with the vegetation recovery expected for its location between the Crowberry Stripe and Crowberry Meadow Communities. The vegetation cover represents five years of growth, and any attempt to increase vegetative cover on Cap D should avoid destroying the vegetation which has already become established.

Photos P8030058 and P8030066 show the vegetation growing around a flow damping structure formed of approximately 18 inches of piled SC150 mat at the base of Cap D. The structure was not sampled for vegetation cover, but vegetation at the structure was considerably more abundant, taller, and more diverse than the vegetation on adjoining barren areas. The increased vegetation success occurred for both seeded species (*F. rubra* and *D. behringensis*; and for non-seeded species such as *Epilobium latifolium*) was probably produced by some combination of trapping of seeds, protection from winds, shelter from frost heaving, or trapping of moisture. Increased vegetation success was noted at similar structures constructed around the caps.

References Cited

Amundsen, C.C. 1972. Amchitka Bioenvironmental Program. Plant Ecology of Amchitka Island: USAEC Report BMI-171-139. Battelle Memorial Institute.

Vegetative Cover Log

Mud Pit Site: Drill Site D

Cap Section	% Vegetative Cover (check one)				Comments
	0-25	25-50	50-75	75-100	
D1-1 7 feet				86%	Moss; *Festuca rubra*; foliose lichen; *Empetrum nigrum*
D1-2 13 feet		31%			Moss; *Festuca rubra*; foliose lichen; fruticose lichen
D1-3 20 feet	19%				Moss; *Festuca rubra*
D1-4 46 feet			67%		Moss; *Festuca rubra*
D1-5 53 feet		31%			Moss; *Festuca rubra*
D1-6 63 feet	22%				*Festuca rubra*; moss; *Empetrum nigrum*
D1-7 77 feet	11%				*Festuca rubra*; moss; fruticose lichen; *Empetrum nigrum*
D1-8 110 feet	17%				*Festuca rubra*; moss
D1-9 125 feet	22%				*Festuca rubra*; moss
D1-10 145 feet		25%			*Festuca rubra*; moss
D1-11 148 feet		33%			Moss; *Festuca rubra.*
D1-12 154 feet	19%				*Festuca rubra*
D1-13 166 feet		36%			Moss; *Festuca rubra.*
D1-14 175 feet		47%			*Festuca rubra*; moss; foliose lichen; *Empetrum nigrum*
D1-15 180 feet			53%		Foliose lichen; *Festuca rubra*; moss; *Empetrum nigrum.*

Vegetative Cover Log

Mud Pit Site: Drill Site D

Cap Section	% Vegetative Cover (check one)				Comments
	0-25	25-50	50-75	75-100	
D1-16 206 feet	19%				*Festuca rubra*; moss; *Empetrum nigrum.*
D1-17 210 feet	11%				Moss; *Festuca rubra*
D1-18 218 feet		31%			*Festuca rubra*
D1-20 281 feet		25%			*Festuca rubra*; moss; foliose lichen.
D1-21 324 feet	22%				Foliose lichen, *Festuca rubra*; moss; *Deschampsia beringensis*
D1-22 345 feet		25%			Moss; *Festuca rubra*; foliose lichen
D1-24 388 feet		25%			Moss; foliose lichen; *Festuca rubra*
D1-25 411 feet	11%				*Festuca rubra*
D1-26 446 feet	14%				Foliose lichen; *Festuca rubra*
D1-27 481 feet	6%				*Festuca rubra*
D1-28 507 feet	14%				*Festuca rubra;* moss.
D1-29 513 feet	3%				Moss.
D1-30 525 feet	8%				*Festuca rubra*, foliose lichen
D2-1 15 feet				92%	Moss; *Empetrum nigrum*; *Festuca rubra*
D2-2 43 feet	22%				*Festuca rubra*; *Empetrum nigrum.*

Vegetative Cover Log

Mud Pit Site: Drill Site D

Cap Section	% Vegetative Cover (check one)				Comments
	0-25	25-50	50-75	75-100	
D2-3 55 feet	3%				*Festuca rubra.*
D2-4 67 feet	6%				*Festuca rubra.*
D2-5 81 feet	3%				*Festuca rubra.*
D2-6 84 feet	0%				
D2-7 106 feet	6%				*Festuca rubra*; *Empetrum nigrum.*
D2-8 126 feet		47%			Moss; *Festuca rubra*; foliose lichen; *Epilobium behringianum.*
D2-9 132 feet		28%			Moss; *Festuca rubra*; foliose lichen
D2-10 148 feet		31%			Moss; foliose lichen; *Festuca rubra.*
D3-1 2 feet	8%				*Festuca rubra*; moss; *Deschampsia beringensis*
D3-2 17 feet		36%			*Festuca rubra*; moss; foliose lichen
D3-3 28 feet		36%			*Festuca rubra*; moss
D3-4 32 feet		31%			Moss; *Festuca rubra*; foliose lichen
D3-5 77 feet				92%	Moss; *Festuca rubra*; *Epilobium behringianum.*
D3-6 90 feet				86%	Moss; *Festuca rubra*; foliose lichen
D3-7 107 feet		44%			Foliose lichen; moss, *Festuca rubra*, *Deschampsia beringensis*

Vegetative Cover Log

Mud Pit Site: Drill Site D

Cap Section	% Vegetative Cover (check one)				Comments
	0-25	25-50	50-75	75-100	
D3-8 115 feet			56%		Moss; *Festuca rubra*; *Empetrum nigrum;* foliose lichen
D3-9 132 feet				100%	Moss; *Deschampsia beringensis*; *Festuca rubra*; *Epilobium behringianum.*
D3-10 142 feet	17%				Moss; *Festuca rubra*; foliose lichen
D4-1 2 feet		28%			*Festuca rubra*; moss; *Deschampsia beringensis*; *Cerastium beeringianum.*
D4-2 37 feet	19%				*Festuca rubra*; *Cerastium beeringianum.*
D4-3 48 feet		25%			*Festuca rubra*; moss; foliose lichen; *Empetrum nigrum.*
D4-4 62 feet	3%				Foliose lichen
D4-5 67 feet	11%				*Festuca rubra*; foliose lichen.
D4-6 80 feet	3%				Moss
D4-7 149 feet		25%			Foliose lichen, *Festuca rubra*; moss; *Empetrum nigrum*
D4-8 154 feet	17%				Foliose lichen, Moss
D4-9 156 feet		28%			Foliose lichen, Moss
D4-10 167 feet			56%		Moss, *Empetrum nigrum*, *Festuca rubra*, *Cerastium beeringianum.*
D5-1 534 feet	0%				
D5-2 116 feet	3%				Moss

Vegetative Cover Log

Mud Pit Site: Drill Site D

Cap Section	% Vegetative Cover (check one)				Comments
	0-25	25-50	50-75	75-100	
D5-3 357 feet	22%				Foliose lichen; moss, *Deschampsia beringensis; Festuca rubra*
D5-4 250 feet	0%				
D5-5 652 feet	0%				
D5-6 245 feet	0%				
D5-7 480 feet	8%				*Festuca rubra*; moss.
D5-8 289 feet	14%				Moss.
D5-9 549 feet	0%				
D5-10 788 feet	6%				*Festuca rubra*
D5-11 21 feet	0%				
D5-12 41 feet	0%				
D5-13 48 feet	3%				*Festuca rubra*
D5-14 749 feet	6%				*Festuca rubra*
D5-15 715 feet	0%				
D5-16 741 feet	0%				
D6-1 24 feet	0%				

Vegetative Cover Log

Mud Pit Site: Drill Site D

Cap Section	% Vegetative Cover (check one)				Comments
	0-25	25-50	50-75	75-100	
D6-2 37 feet	0%				
D6-3 72 feet	0%				
D6-4 120 feet	0%				
D6-5 131 feet	0%				
D6-6 133 feet	0%				
D6-7 147 feet	0%				
D6-8 149 feet	0%				
D6-9 154 feet	0%				
D6-10 158 feet	0%				
D7-1 36 feet	0%				
D7-2 50 feet	0%				
D7-3 55 feet	0%				
D7-4 63 feet	0%				
D7-5 81 feet	0%				
D7-6 103 feet	3%				*Festuca rubra*

Vegetative Cover Log

Mud Pit Site: Drill Site D

Cap Section	% Vegetative Cover (check one)				Comments
	0-25	25-50	50-75	75-100	
D7-7 118 feet	0%				
D7-8 130 feet	0%				
D7-9 135 feet	0%				
D7-10 180 feet	14%				*Festuca rubra*; moss.
D8-1 33 feet	8%				*Festuca rubra.*
D8-2 50 feet	0%				
D8-3 64 feet	8%				*Festuca rubra.*
D8-4 78 feet	3%				*Festuca rubra.*
D8-5 81 feet	3%				*Festuca rubra.*
D8-6 135 feet				75%	Moss; *Festuca rubra*; foliose lichen.
D8-7 150 feet		39%			Moss; *Festuca rubra*
D8-8 155 feet	0%				
D8-9 170 feet			53%		Moss; *Festuca rubra*; foliose lichen.
D8-10 176 feet			58%		Moss; *Festuca rubra.*
D9-1 6 feet		31%			*Festuca rubra*; *Deschampsia beringensis*; moss.

Vegetative Cover Log

Mud Pit Site: Drill Site D

Cap Section	% Vegetative Cover (check one)				Comments
	0-25	25-50	50-75	75-100	
D9-2 15 feet				81%	Moss; *Festuca rubra*; foliose lichen.
D9-3 57 feet	0%				
D9-4 75 feet	6%				*Festuca rubra*
D9-5 96 feet	6%				*Deschampsia beringensis*
D9-6 99 feet	0%				
D9-7 115 feet	3%				Moss.
D9-8 136 feet	0%				
D9-9 177 feet	0%				
D9-10 188 feet		36%			*Deschampsia beringensis*; Moss; *Festuca rubra.*
D10-1 28 feet	0%				
D10-2 74 feet	3%				*Festuca rubra.*
D10-3 103 feet	6%				Moss.
D10-4 118 feet	0%				
D10-5 150 feet	3%				*Festuca rubra.*
D10-6 158 feet	6%				Moss.

Vegetative Cover Log

Mud Pit Site: Drill Site D

Cap Section	% Vegetative Cover (check one)				Comments
	0-25	25-50	50-75	75-100	
D10-7 182 feet	3%				Moss.
D10-8 185 feet	0%				
D10-9 202 feet	0%				
D10-10 218 feet	0%				
D11-1 30 feet	6%				Moss
D11-2 57 feet	0%				
D11-3 60 feet	0%				
D11-4 83 feet	0%				
D11-5 99 feet	0%				
D11-6 114 feet	0%				
D11-7 153 feet	0%				
D11-8 160 feet	0%				
D11-9 171 feet	0%				
D11-10 188 feet	19%				Moss; *Festuca rubra.*

Photograph Log

Mud Pit Site: Drill Site D

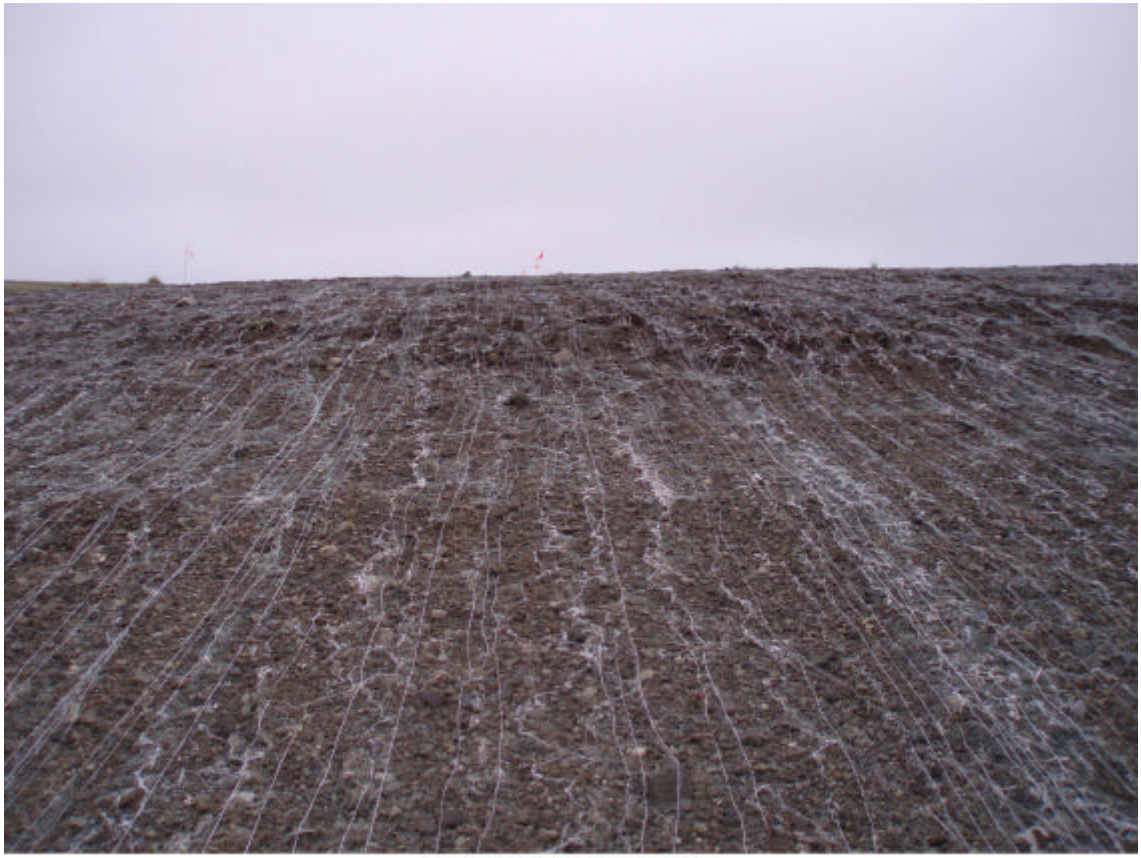
Date	Photo #	GPS Location	Direction of Photo	DESCRIPTION
8/3/06	P8030007	See Figure	Southeast	Transect D-5 NW
8/3/06	P8030008	See Figure	Northeast	Transect D-6 SW
8/3/06	P8030009	See Figure	Northeast	Transect D-7 SW
8/3/06	P8030010	See Figure	Northeast	Transect D-8 SW
8/3/06	P8030011	See Figure	Northeast	Transect D-9 SW
8/3/06	P8030012	See Figure	Northeast	Transect D-10 SW
8/3/06	P8030013	See Figure	Northeast	Transect D-11 SW
8/3/06	P8030014	See Figure	Northwest	Transect D-5 SE
8/3/06	P8030015	See Figure	Southwest	Transect D-11 NE
8/3/06	P8030016	See Figure	Southwest	Transect D-10 NE
8/3/06	P8030017	See Figure	Southwest	Transect D-9 NE
8/3/06	P8030018	See Figure	Southwest	Transect D-8 NE
8/3/06	P8030019	See Figure	Southwest	Transect D-7 NE
8/3/06	P8030020	See Figure	Southwest	Transect D-6 NE
8/3/06	P8030021	See Figure	Southwest	Transect D-1 NE

Photograph Log

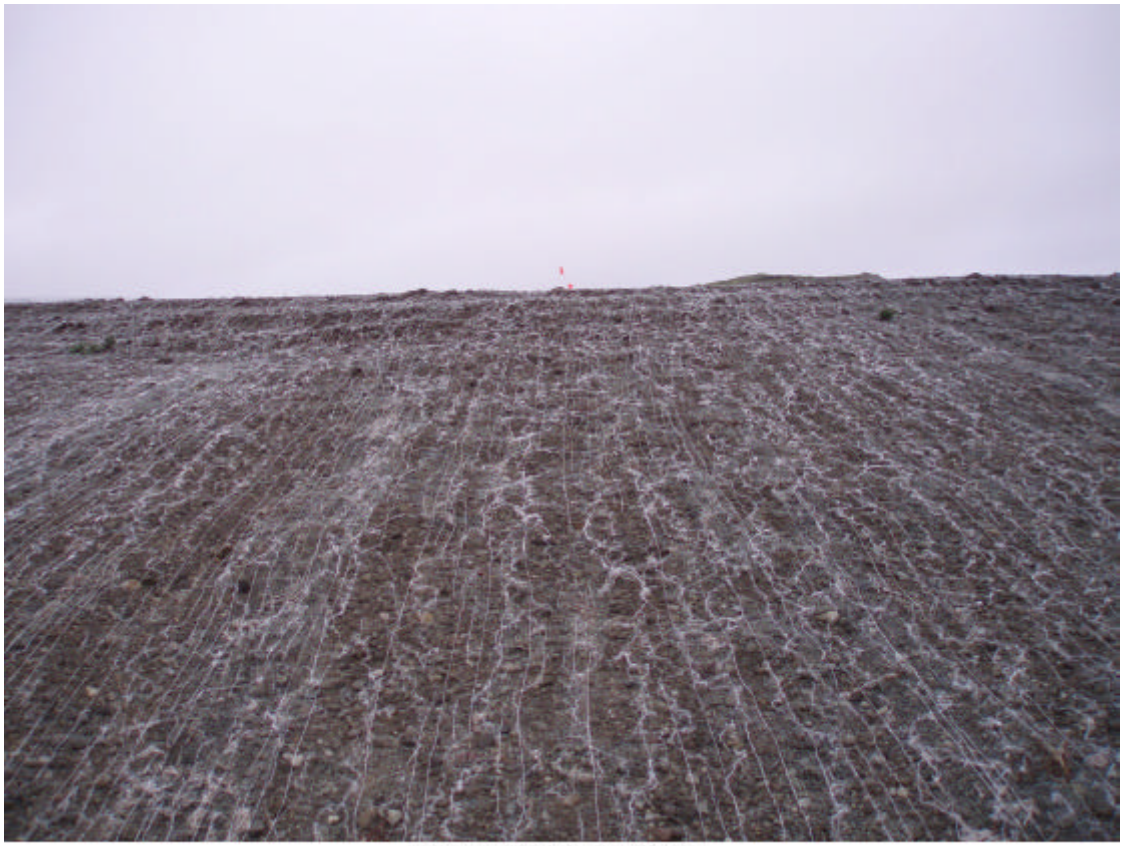
Mud Pit Site: Drill Site D (continued)

Date	Photo #	GPS Location	Direction of Photo	DESCRIPTION
8/3/06	P8030022	See Figure	Northeast	Transect D-2 SW
8/3/06	P8030023	See Figure	Northeast	Transect D-3 SW
8/3/06	P8030024	See Figure	Northeast	Transect D-4 SW
8/3/06	P8030025	See Figure	Northeast	Transect D-1 SW
8/3/06	P8030026	See Figure	Southwest	Transect D-4 NE
8/3/06	P8030027	See Figure	Southwest	Transect D-3 NE
8/3/06	P8030028	See Figure	Southwest	Transect D-2 NE
8/3/06	P8030058	See Figure	Northwest	Drill Site D runoff Restrictor
8/3/06	P8030066	See Figure	Northwest	Drill Site D runoff Restrictor

P8030007 D-5 NW Looking SE



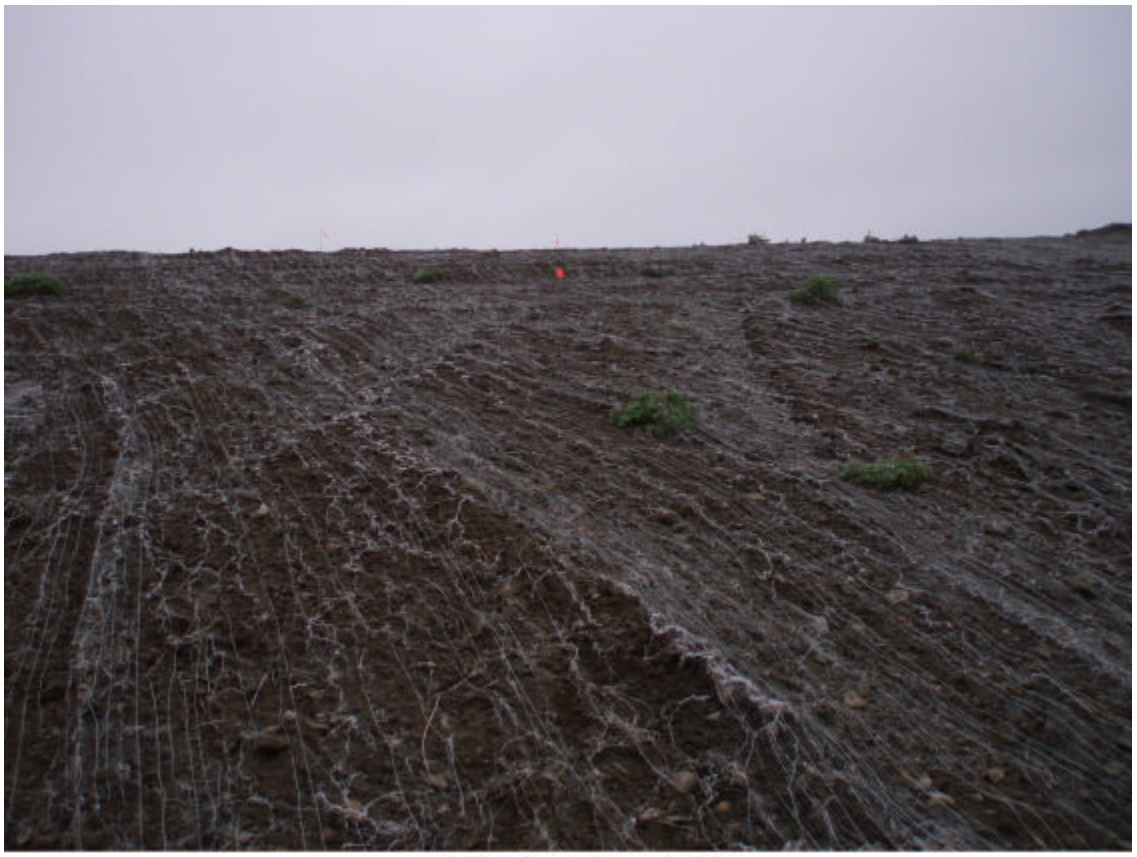
P8030008 D-6 SW Looking NE



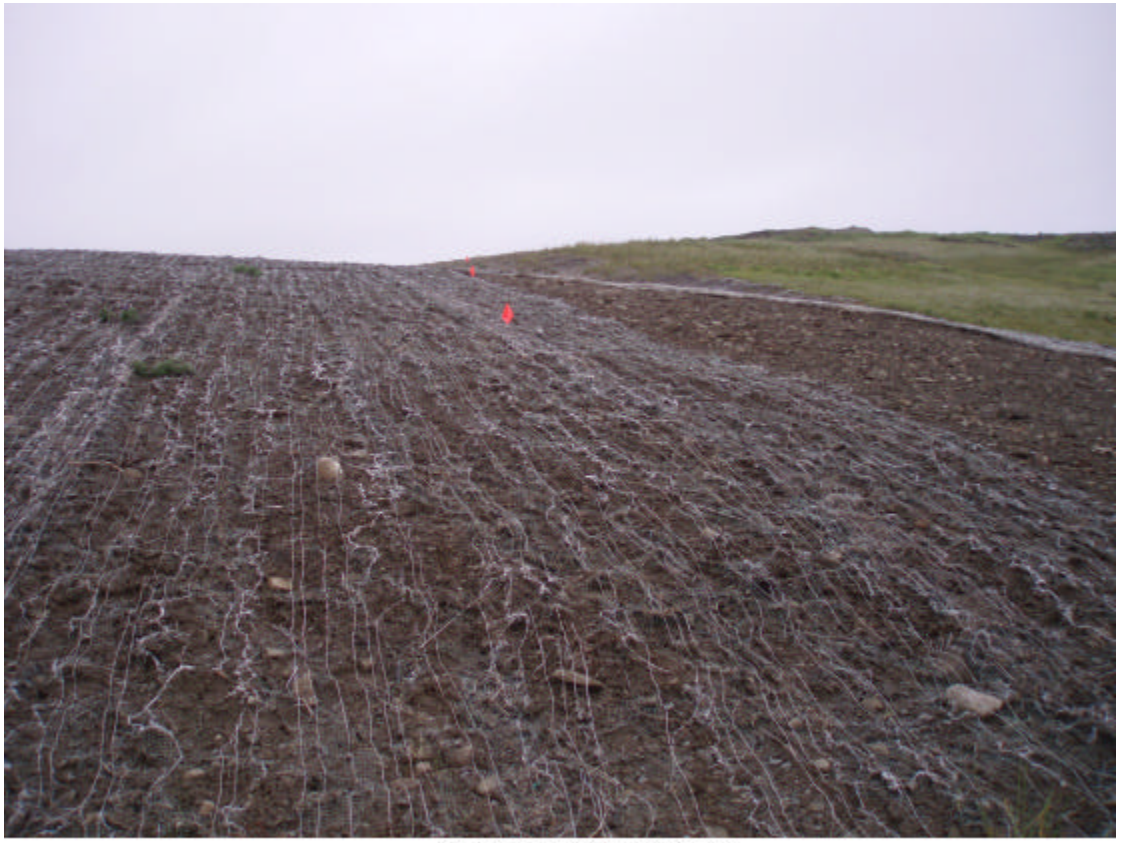
P8030009 D-7 SW Looking NE

P8030010 D-8 SW Looking NE

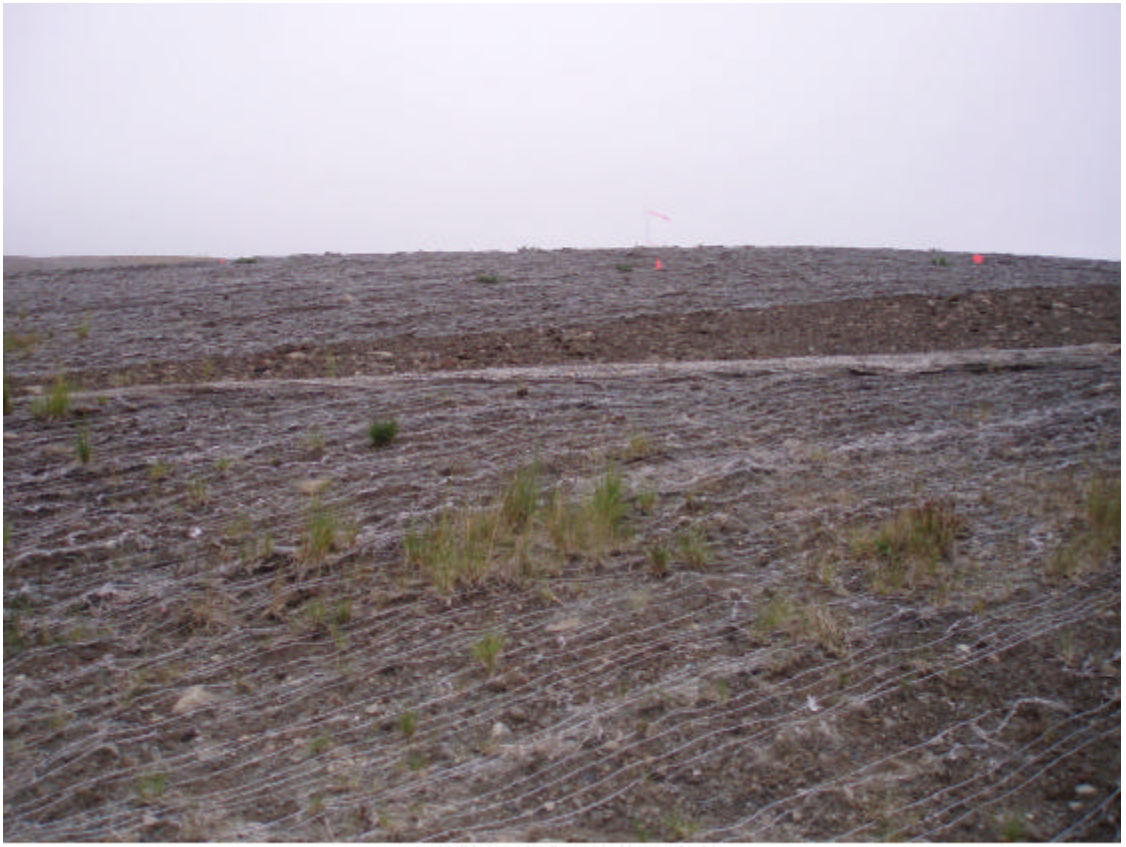
P8030011 D-9 SW Looking NE



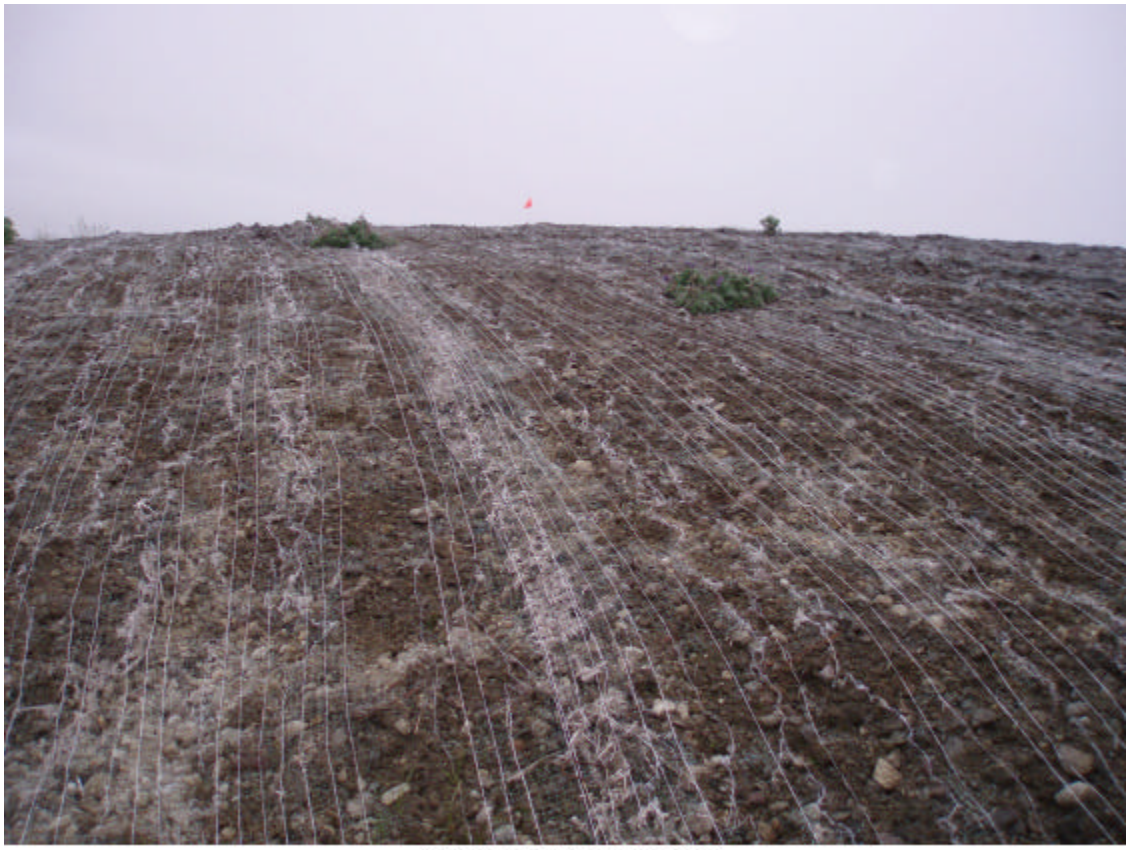
P8030012 D-10 SW Looking NE



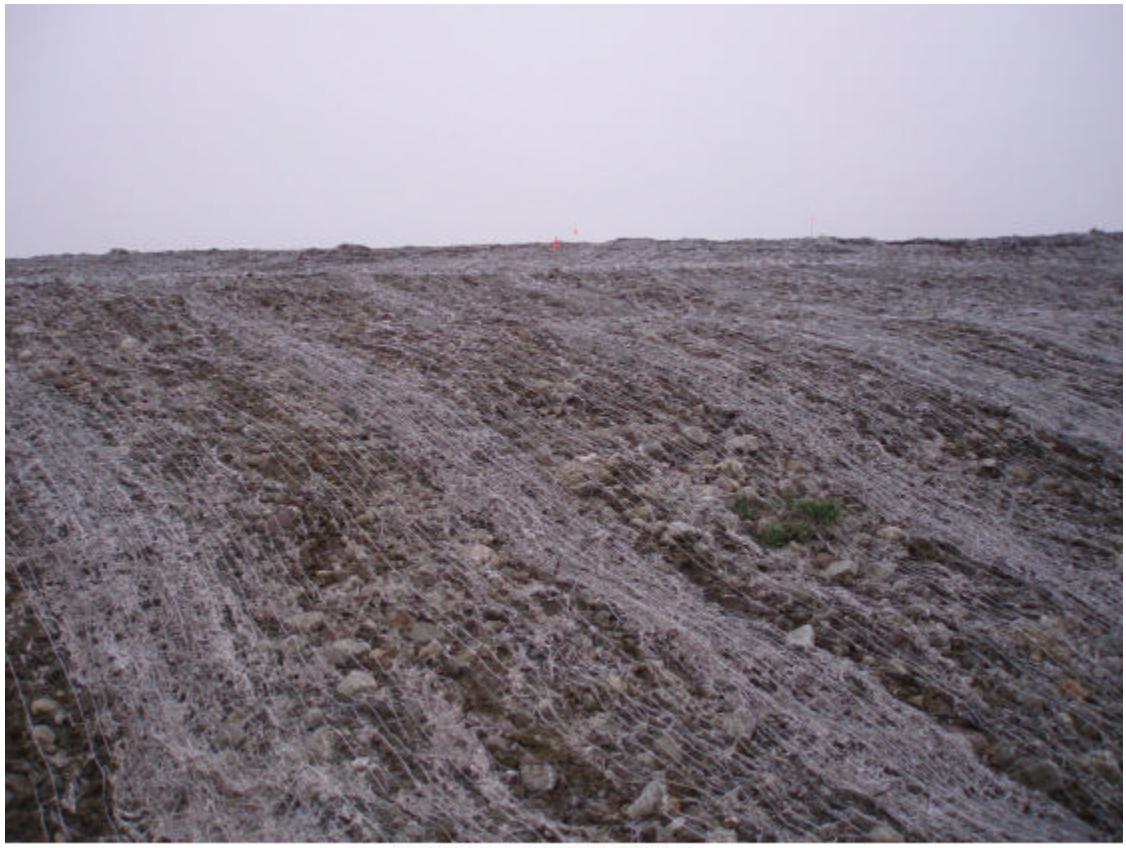
P8030013 D-11 SW Looking NE



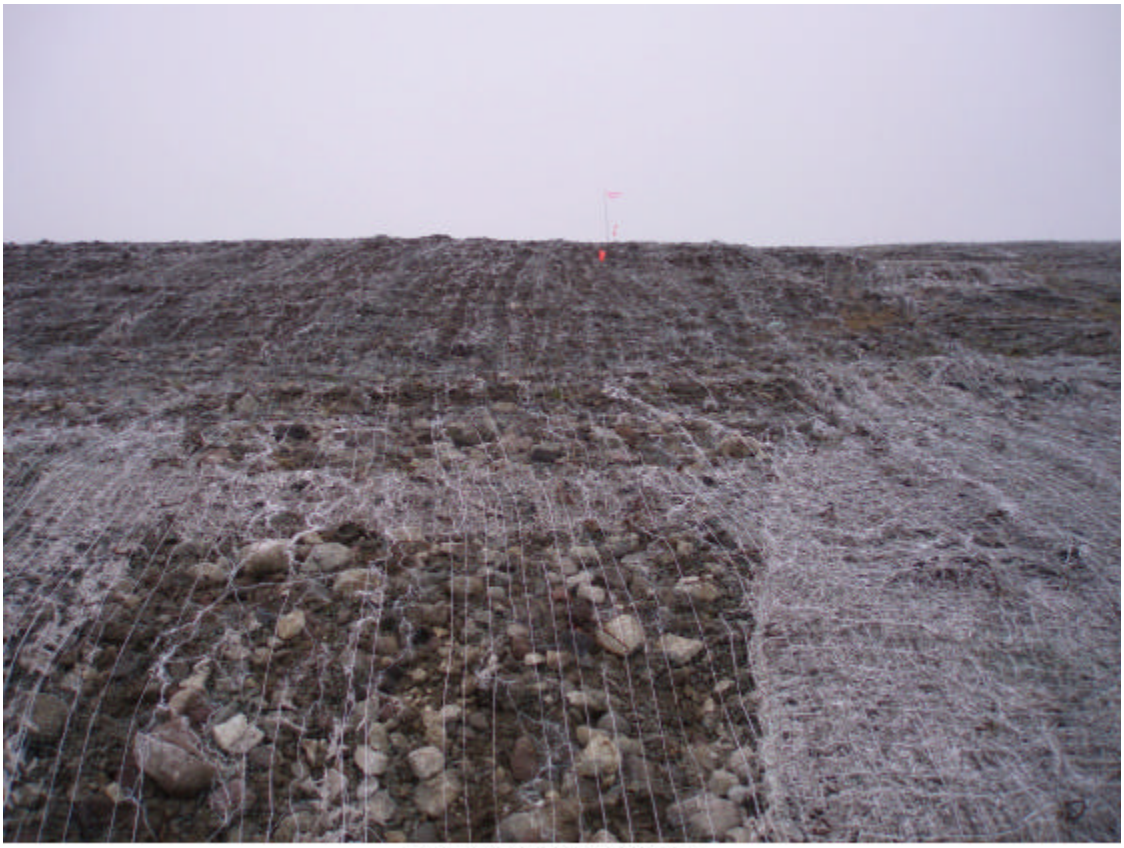
P8030014 D-5 SE Looking NW



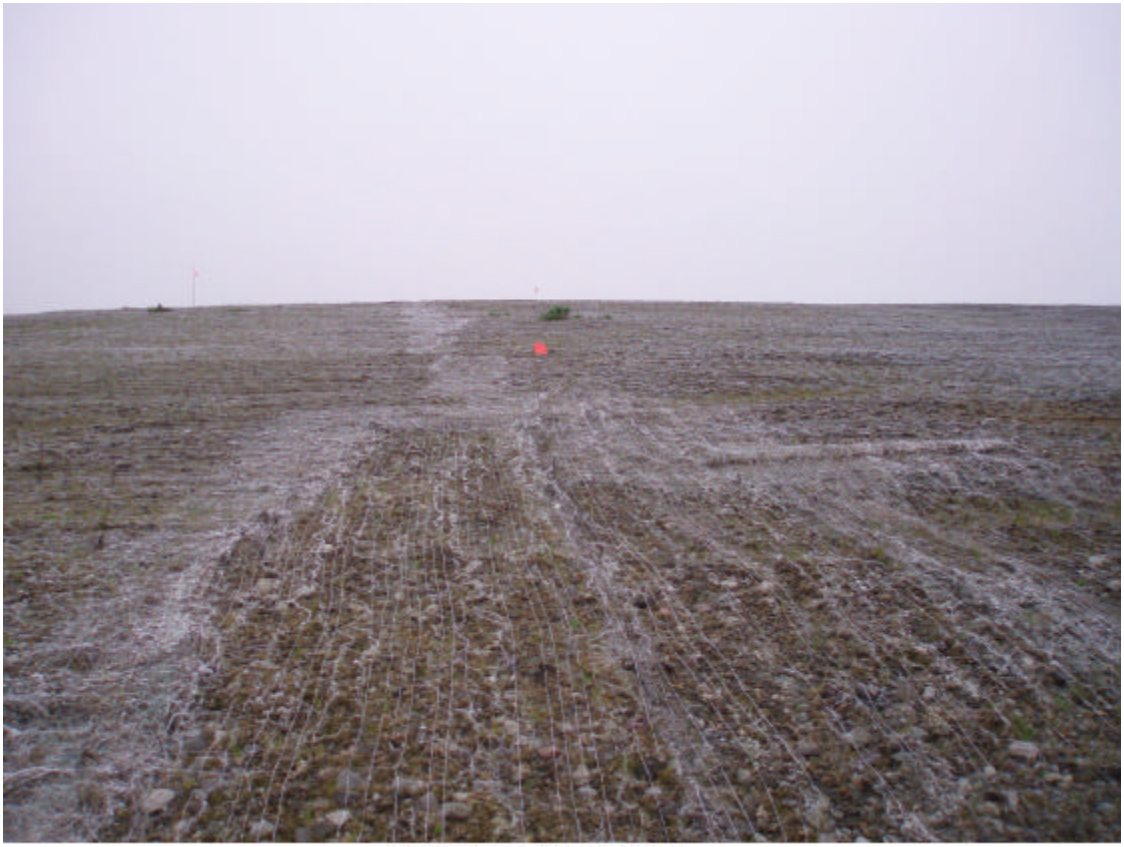
P8030015 D-11 NE Looking SW



P8030016 D-10 NE Looking SW



P8030017 D-9 NE Looking SW

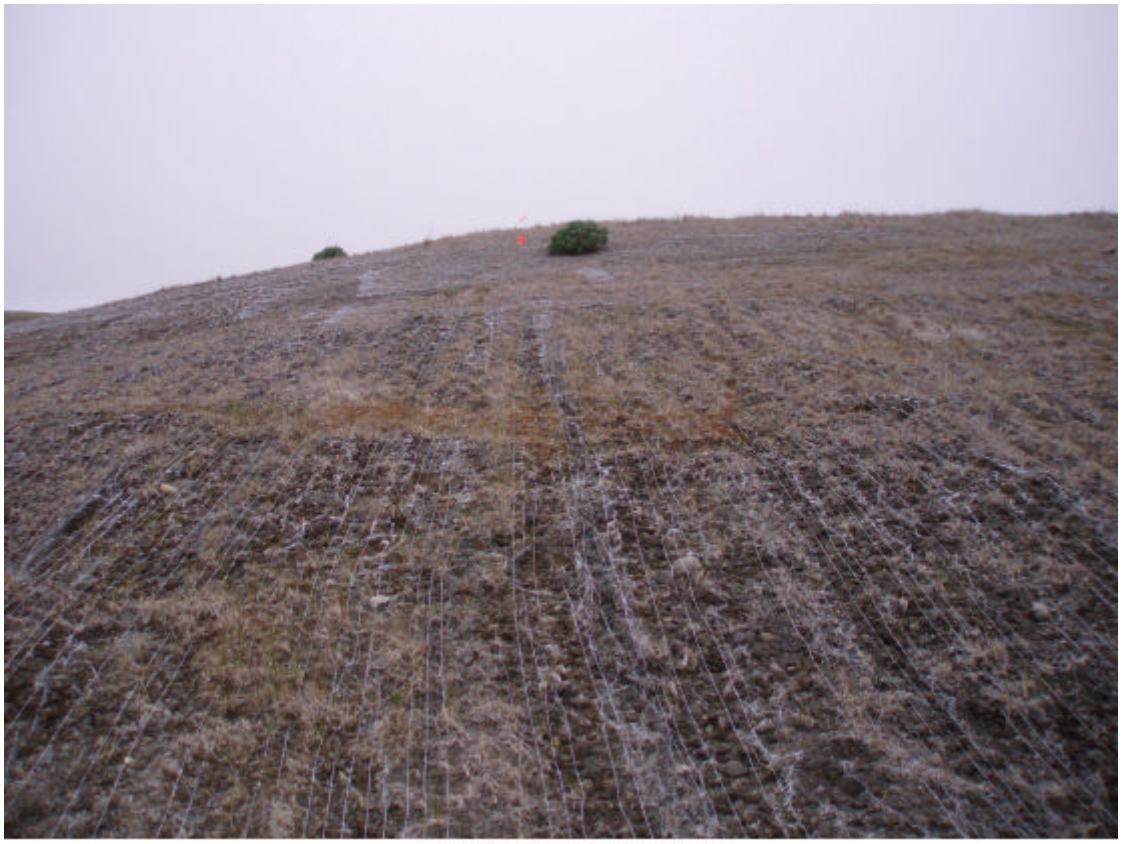


P8030018 D-8 NE Looking SW

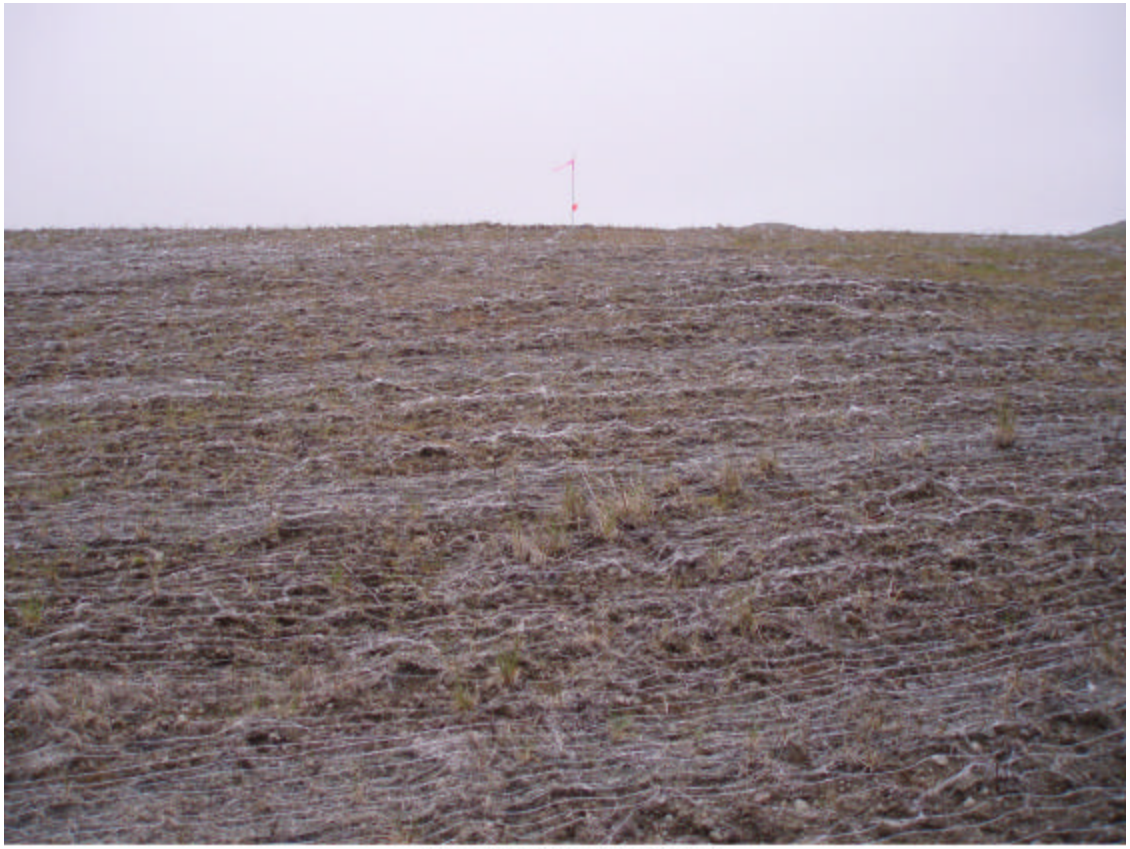
P8030019 D-7 NE Looking SW

P8030020 D-6 NE Looking SW

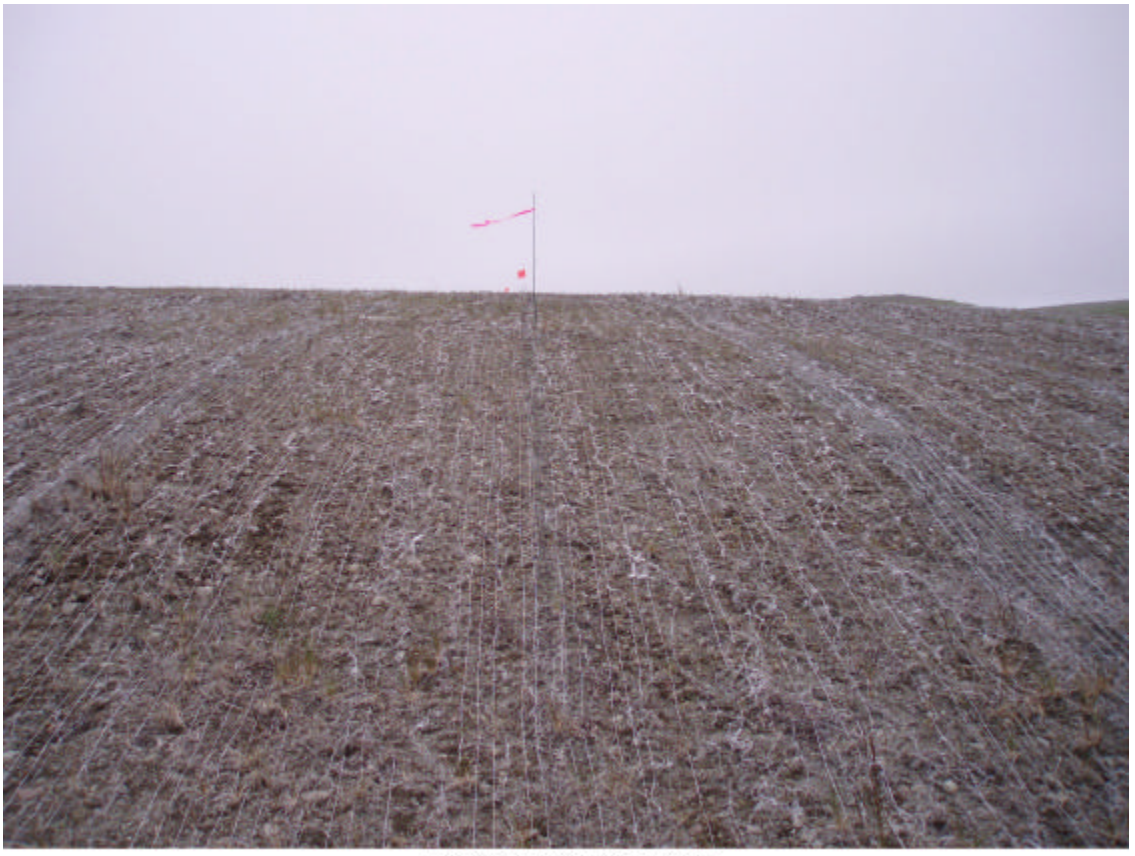
P8030021 D-1 NE Looking SW



P8030022 D-2 SW Looking NE

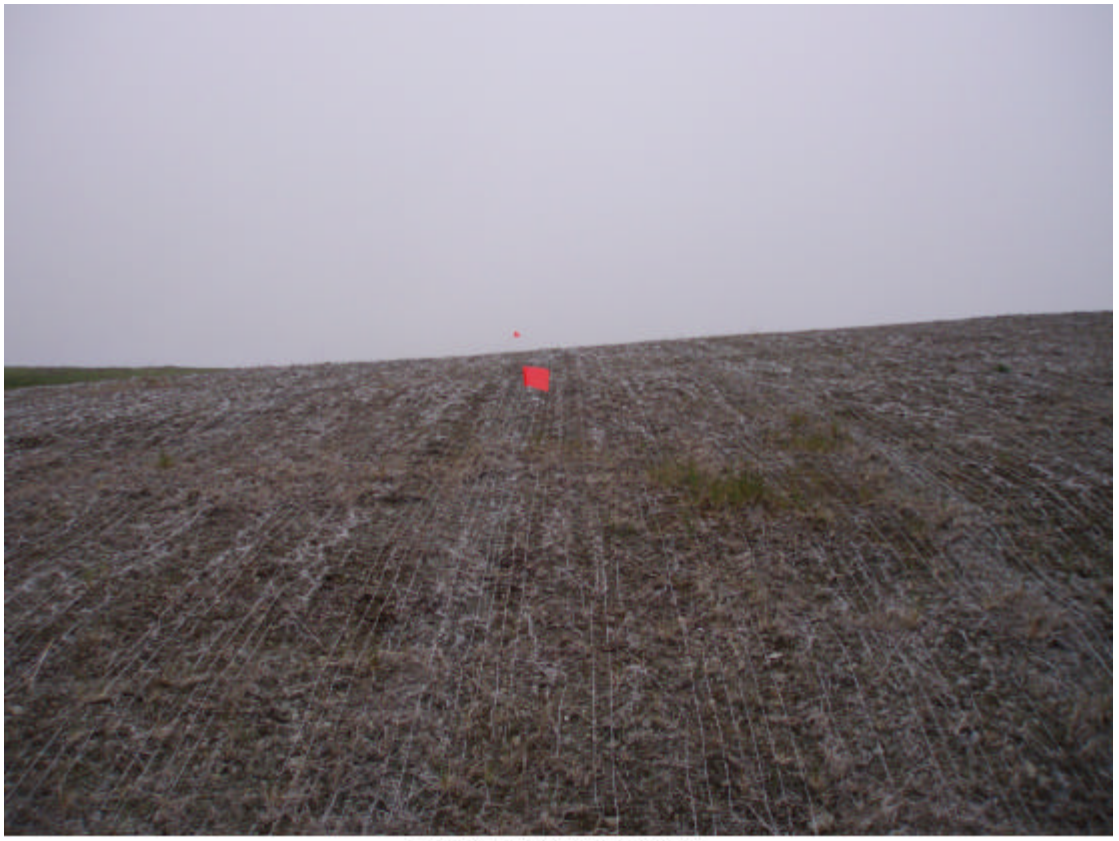


P8030023 D-3 SW Looking NE

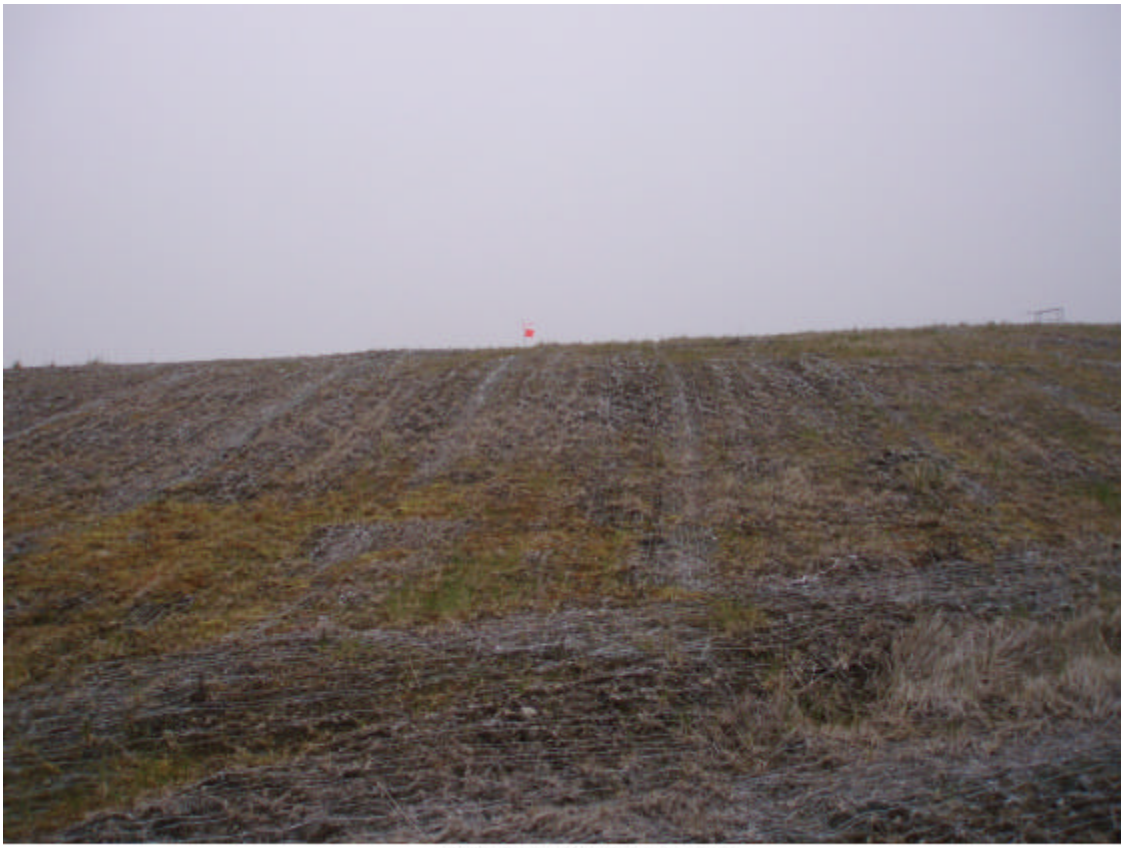


P8030024 D-4 SW Looking NE

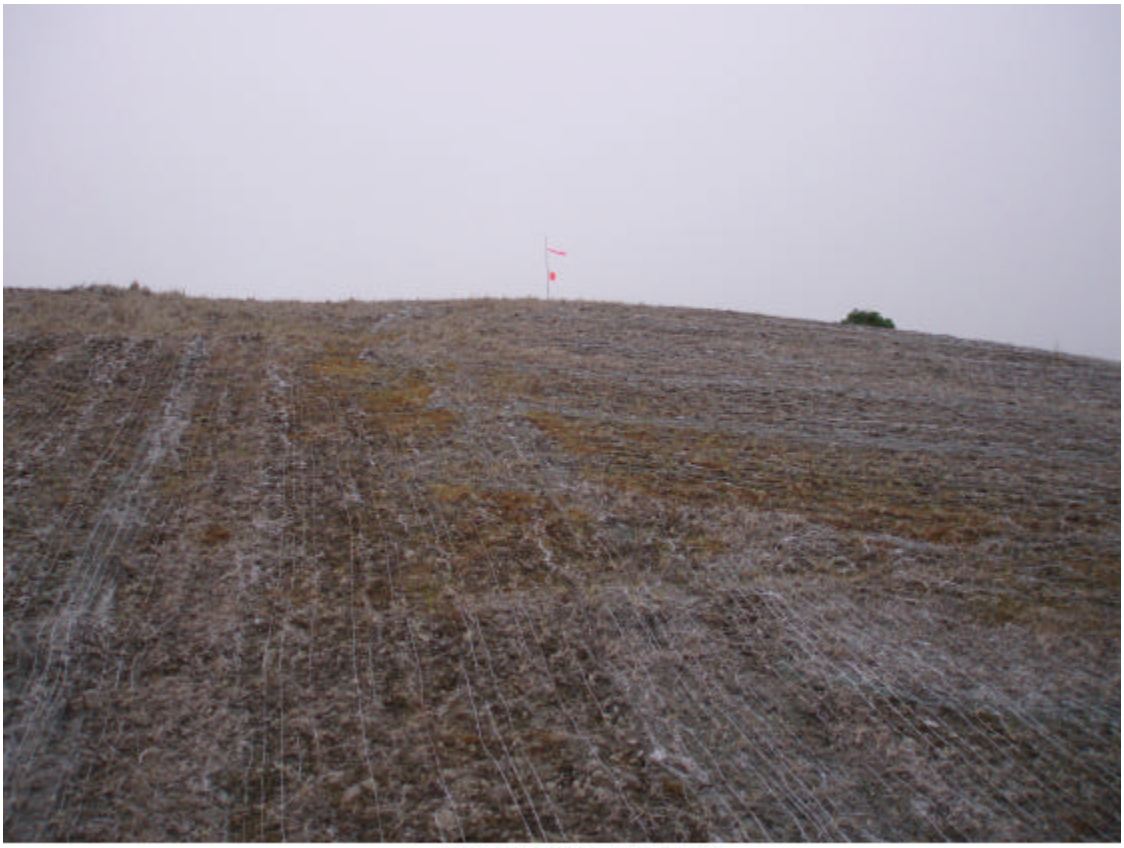
P8030025 D-1 SW Looking NE



P8030026 D-4 NE Looking SW



P8030027 D-3 NE Looking SW



P8030028 D-2 NE Looking SW

6.0 Drill Site F

USFWS Monument
N: 235,803.5
E: 2,139,216.9
Elev.: 480.96

Seed Boundary
Limit of disturbed area

Concrete

Grass

F-S N
E=2139349.8680
N=235548.1741

Photo
E=2139402.9650
N=235554.9471

F-3 N
E=2139448.9730
N=235564.1781

R&M CP-104
Monument
N: 235,621.68
E: 2,139,535.83
Elev.: 473.62

Grass

Rock

480'
475'
470'
465'
460'
455'
450'
445'
440'
435'

(F-1)
(F-2)
(F-3)

F-1 W
E=2139321.2470
N=235485.4011

F-2 S
E=2139362.9850
N=235479.8011

F-1 E
E=2139553.7880
N=235532.7061

F-3 S
E=2139458.6000
N=235498.4801

Photo
E=2139409.1400
N=235488.0771

Explanation

- (1) Vegetative Cover Grid Area
- Transect/Photopoint
- Starting Point
- Visual Inspection Route

Coordinates:
Alaska State Plane, Zone 10 NAD27

0 50 100 150 200
SCALE IN FEET

AS-BUILT OF

Site F

AMCHITKA MUDPITS

MUDPIT CLOSURE FINAL TOPOGRAPHY SURVEY

PREPARED BY
McCLINTOCK LAND ASSOCIATES, INC.
11940 BUSINESS BOULEVARD, SUITE 205
EAGLE RIVER, ALASKA 99577
(907) 694-4499

PREPARED FOR
BRICE INCORPORATED
3200 SHELL STREET
FAIRBANKS, ALASKA 99707
(907) 452-2512

PLOT: 1"=50'	CHK: GDK	JOB: 01-117	DWG: AS-BUILT	FB NO: JOB
SITE: F	DWN: KO	DATE: 10-25-01	DISK: DELL-E	SHEET: 1 OF 1

AMCHITKA MUD PIT SITES POST-CLOSURE MONITORING CHECKLIST

Mud Pit Site: Drill Site F	Date of Inspection: August 2, 2006
Responsible Agency: National Nuclear Security Adm.	Project Manager: John Jones
Inspector (name, title, organization): Patrick Matthews, Task Manager, Stoller Navarro Joint Venture	

A. General Instructions

1. All checklist items must be completed and detailed comments made to document the results of the site inspection.
2. The completed checklist is part of the field record of the inspection. Additional pages should be used as necessary to ensure that a complete record is made. Number and attach the additional pages upon completion of the inspection.
3. Any checklist line item marked by an inspector in a SHADED BOX must be fully explained or an appropriate reference to previous reports provided. The explanation should include the inspector's rationale for conclusions and recommendations, if appropriate. Explanations are to be placed on additional attachments and cross-referenced appropriately, and may take the form of sketches, measurements, and/or annotated site maps.
4. The site inspection is a walking inspection of the entire site, including the perimeter and sufficient transects to be able to inspect the entire surface and all features specifically described in this checklist. Attach a drawing indicating the starting and ending points and the direction and pattern of the inspection.
5. A standard set of color 35 mm photographs (or equivalent) is required. In addition, all anomalous features or new features (such as changes in adjacent area land use) are to be photographed. A photo log entry will be made for each photograph taken.

B. Preparation (to be completed prior to site visit)	YES	NO	EXPLANATION
1. Site as-built plans and site base map reviewed	X		Amchitka Mud Pit Closure -As Built
2. Previous inspection reports reviewed		X	No previous inspections were performed
a. Were anomalies or trends detected on previous inspections?			Not Applicable
b. Was maintenance performed on areas with anomalies?			Not Applicable
3. Site maintenance and repair records reviewed		X	No previous maintenance activities were performed
a. Has site repair resulted in a change from as-built conditions?		X	No detectable changes from the as-builts were observed.
b. Are revised as-builts available that reflect repair changes?			Not Applicable: No repairs have occurred.

C. Site Inspection (to be completed during inspection)	YES	NO	EXPLANATION
1. Adjacent offsite features within mud pit site area			
a. Changes in use of adjacent area?		X	Wildlife refuge
b. Any new roads or trails?		X	Per previous photos and As-built Drawings
c. Change in the position of nearby washes?		X	None Detected
d. Erosion/deposition of nearby washes?		X	None Detected
e. New drainage channels?		X	None Detected
f. Change in surrounding vegetation?		X	None Detected
2. Security markers; signs			
a. Displacement of site markers, boundary markers, or monuments?		X	USFWS Monument was present / Good Condition
b. Signs damaged or removed?		X	No signs were present or noted in the As-builts
3. Cap			
a. Evidence of subsidence?	X		See Explanation
b. Evidence of cracking?		X	
c. Evidence of erosion (wind or water)?	X		Minor areas as noted below.
d. Evidence of animal burrowing?		X	
e. Are site markers disturbed? By man?____ By natural processes?____		X	
f. Do natural processes threaten the integrity of cap or site marker?		X	

AMCHITKA MUD PIT SITES POST-CLOSURE MONITORING CHECKLIST (continued)

Mud Pit Site: Drill Site F	Date of Inspection: August 2, 2006

C. Site inspection (continued)	YES	NO	EXPLANATION
4. Vegetative cover			
a. Is plant cover adequate to prevent erosion?	X		See Discussion on Continuation Sheet
b. Are weedy annual plants present? Do they require removal?		X	See Discussion on Continuation Sheet
c. Evidence of animals on cap?		X	See Discussion on Continuation Sheet
d. Evidence of excessive plant mortality?		X	See Discussion on Continuation Sheet
e. Has a vegetative cover log been completed?	X		See attached log
5. Photo Documentation			
a. Has a photo log been prepared?	X		See attached log
b. How many photos were taken?			6 Photos as noted in the photographic log

D. Field Conclusions			
1. Imminent hazard to integrity of cap? (If yes, immediate report required. Note the person or agency the report will be made to.)		X	
2. Are more frequent inspections required?		X	
3. Are existing maintenance actions satisfactory?			N/A No maintenance was performed or required
4. Are existing repair actions satisfactory?			N/A No repairs were performed or required
5. Is other maintenance/repair necessary?		X	

6. Rationale for field conclusions: Conclusions were based on walkover visual inspections and plant counts.

Water erosion was minimal (i.e. no more than two inches of top soil) and did not expose the geomembrane liner. The overlain vegetation netting was present on the cap and may aid in minimizing wind erosion and a deterrent to birds nesting or accumulating on the cap. An area of subsidence was noted during the inspection in vegetation cover grid area 5. The subsidence is approximately 5 feet in diameter and is 1 foot at the deepest. No structural degredation of the liner was observed. (See Photograph P8020012)

Transect lines were established in the field and associated GPS Coordinates are provided on the attached figure. No permanent stakes were set.

7. Factors contributing to or impacting inspection: None noted

E. Certification

I certify that I have conducted an inspection of the Drill Site F Mud Pit Site cap in accordance with the Monitoring and Inspection Plan for the Amchitka Mud Pit Release Sites, Rev. 0, dated November 2005, as recorded on this checklist, attached sheets, field notes, vegetative cover log, photo logs, and photographs.

Inspector Printed Name:	Inspector Signature:
Patrick Matthews	
Title:	Date:
Task Manager	9/12/06

AMCHITKA MUD PIT SITES POST-CLOSURE MONITORING CHECKLIST
Continuation Sheet
Drill Site F

Cap F is located approximately nineteen miles northwest of Constantine Harbor at an elevation of between 470 and 475 feet. This cap falls within the Crowberry Stripe Community of Amundsen (1972) and had the lowest average cover of any of the seven caps surveyed on Amchitka (7.9 %). This low cover is consistent with the elevation of the cap (Figure 2.1). The low species diversity (five separate taxa observed including the four taxa found at Cap E plus CAMA) also was consistent with the relatively high elevation of the cap (Figure 2.2). Abundances of all taxa increased from levels found at Cap E except for *F. rubra* and *D. behringensis* which were less abundant than at Cap F (covering just 0.6 % cover or 7.0 % of total vegetation cover; Figure 2.3). The low vegetation cover relative to Cap E shows that while invading species did relatively well on Cap E, the seeded species were less success on Cap F during the first five years following cap installation.

Percent litter at Cap F was approximately the same as at Cap E (20.2% versus 20.0% cover) and the levels of bare mineral soils at the two sites are similar.

The sparse vegetation cover on Cap F is consistent with the slow vegetation recovery expected for the Crowberry Stripe Community. Vegetation in the Crowberry Stripe Zone is quite fragile and any attempt to increase vegetative cover on Cap F should avoid disturbing vegetation which has managed to become established despite the harsh growing conditions.

References Cited

Amundsen, C.C. 1972. Amchitka Bioenvironmental Program. Plant Ecology of Amchitka Island: USAEC Report BMI-171-139. Battelle Memorial Institute.

Vegetative Cover Log

Mud Pit Site: Drill Site F

Cap Section	% Vegetative Cover (check one)				Comments
	0-25	25-50	50-75	75-100	
F1-1 145 feet	3%				Moss.
F1-2 148 feet	6%				Moss.
F1-3 166 feet	0%				
F1-4 206 feet	0%				
F1-5 258 feet	3%				Moss.
F1-A1 8 feet	3%				*Festuca rubra*
F1-A2 26 feet	0%				
F1-A3 54 feet	0%				
F1-A4 138 feet	6%				Moss.
F1-A5 142 feet	0%				
F1-A6 211 feet	0%				
F1-A7 227 feet	0%				
F1-A8 252 feet	0%				
F1-A9 275 feet	6%				*Festuca rubra*; moss.
F1-A10 290 feet		42%			Moss.

Vegetative Cover Log

Mud Pit Site: Drill Site F

Cap Section	% Vegetative Cover (check one)				Comments
	0-25	25-50	50-75	75-100	
F2-1 6 feet	8%				Moss.
F2-2 20 feet	14%				*Lupinus nootkatensis.*
F2-3 27 feet	0%				
F2-4 34 feet	6%				Moss.
F2-5 59 feet	0%				
F2-A1 12 feet			50%		Moss, *Festuca rubra, Carex macrochaeta*
F2-A2 30 feet	8%				Moss.
F2-A3 44 feet	3%				*Festuca rubra*
F2-A4 47 feet	0%				
F2-A5 53 feet	3%				*Festuca rubra*
F3-1 10 feet	19%				Moss.
F3-2 36 feet	0%				
F3-3 40 feet	3%				Moss.
F3-4 44 feet	6%				*Deschampsia beringensis.*
F3-5 60 feet	17%				Moss.

Vegetative Cover Log

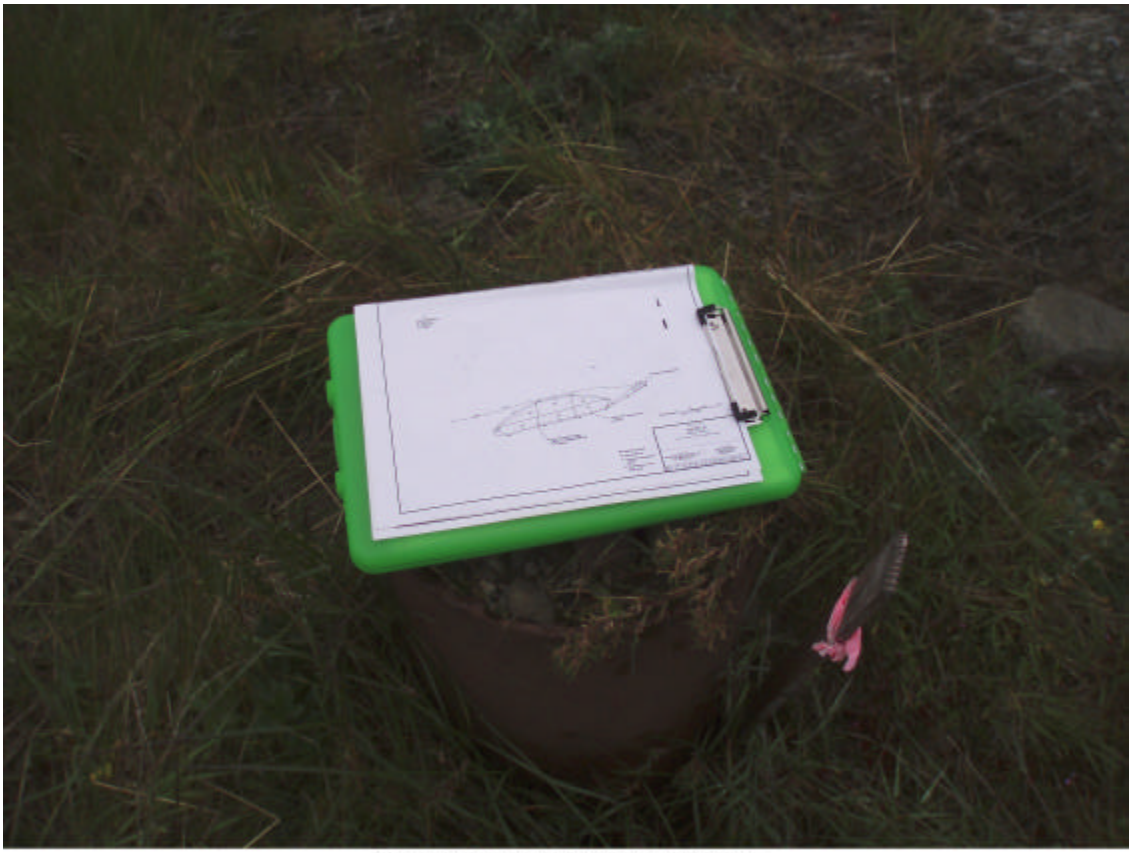
Mud Pit Site: Drill Site F

Cap Section	% Vegetative Cover (check one)				Comments
	0-25	25-50	50-75	75-100	
F3-A1 13 feet		25%			Moss.
F3-A2 29 feet	0%				
F3-A3 33 feet	6%				Moss.
F3-A4 57 feet		25%			*Lupinus nootkatensis*, *Carex macrochaeta.*
F3-A5 63 feet	17%				*Lupinus nootkatensis.*

Photograph Log

Mud Pit Site: Drill Site F

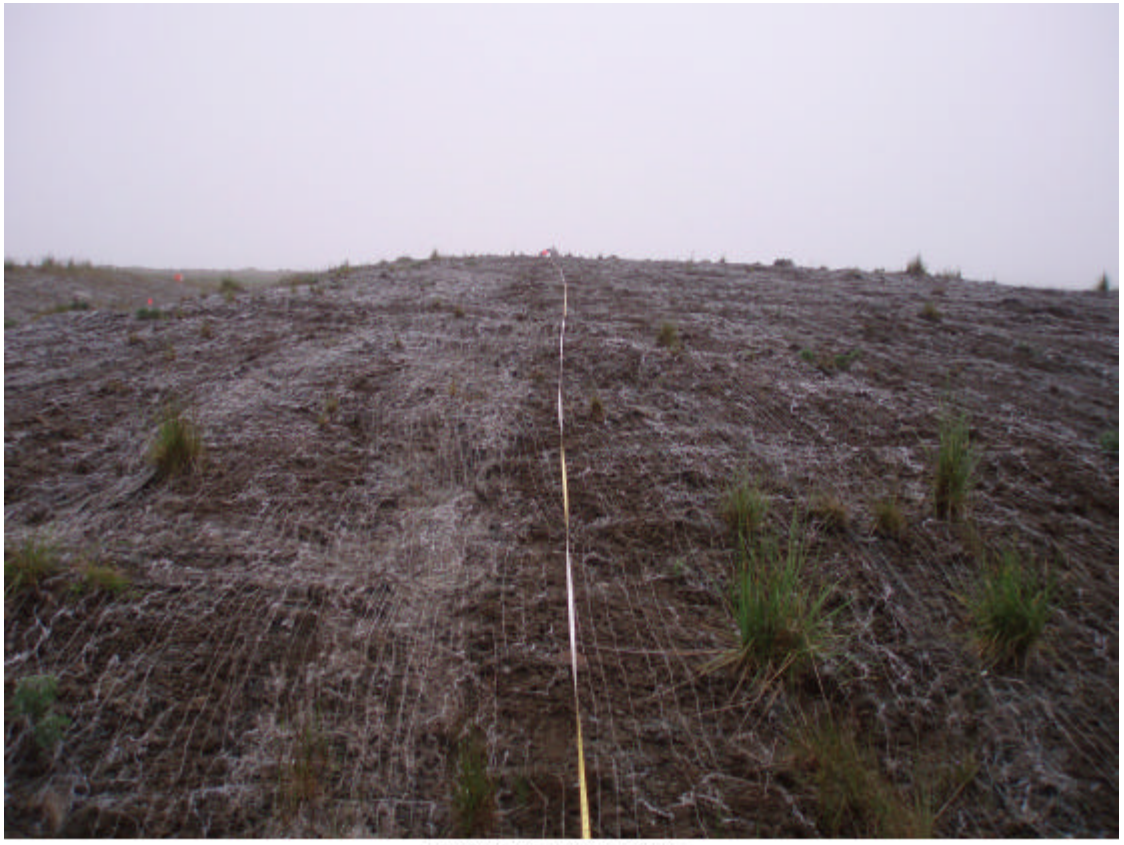
Date	Photo #	GPS Location	Direction of Photo	DESCRIPTION
8/2/06	P8020007	See Figure	N/A	USFWS Monument
8/2/06	P8020008	See Figure	West	Transect F-1 E
8/2/06	P8020009	See Figure	South	North Photopoint looking South
8/2/06	P8020010	See Figure	East	Transect F-1 W
8/2/06	P8020011	See Figure	North	South Photopoint Looking North
8/2/06	P8020012	See Figure	North	Minor subsidence in Grid Area 5



P8020007 Drill Site F USFWS Monument

P8020008 F-1 E Looking W

P8020009 N Looking S



P8020010 F-1 W Looking E

P8020011 S Looking N

P8020012 Minor Subsidence Transect Area 5

7.0 Drill Site E

E-1 NW
E=2134545.4900
N=243985.8781

N 244,080

N 244,000

E 2,134,500

E 2,134,500

ENERGY DISSIPATOR

APPROXIMATE LIMITS OF DISTURBED AREA

E-2 NE
E=2134605.5910
N=243915.4771

APPROXIMATE LIMITS OF ORIGINAL MUD PIT

℄ ANCHOR TRENCH

(E-1)

(E-2)

E-2 SW
E=2134513.4270
N=243902.2551

E-1 SE
E=2134558.4770
N=243835.9061

1 2 3 4

Explanation

- (1) Vegetative Cover Grid Area
- • Transect/Photopoint
- ⊗ Starting Point
- → Visual Inspection Route

Coordinates:
Alaska State Plane, Zone 10 NAD27

0 50 100 150 200
SCALE IN FEET

AS-BUILT OF

Site E

AMCHITKA MUDPITS

MUDPIT CLOSURE FINAL TOPOGRAPHY SURVEY

PREPARED BY
McCLINTOCK LAND ASSOCIATES, INC.
11940 BUSINESS BOULEVARD, SUITE 205
EAGLE RIVER, ALASKA 99577
(907) 694-4499

PREPARED FOR
BRICE INCORPORATED
3200 SHELL STREET
FAIRBANKS, ALASKA 99707
(907) 452-2512

PLOT: 1"=50'	CHK: GDK	JOB: 01-117	DWG: AS-BUILT	FB NO: JOB
SITE: E	DWN: KQ	DATE: 10-25-01	DISK: DELL-E	SHEET: 1 OF 1

AMCHITKA MUD PIT SITES POST-CLOSURE MONITORING CHECKLIST

Mud Pit Site: Drill Site E	Date of Inspection: August 2, 2006
Responsible Agency: National Nuclear Security Adm.	Project Manager: John Jones
Inspector (name, title, organization): Patrick Matthews, Task Manager, Stoller Navarro Joint Venture	

A. General Instructions

1. All checklist items must be completed and detailed comments made to document the results of the site inspection.
2. The completed checklist is part of the field record of the inspection. Additional pages should be used as necessary to ensure that a complete record is made. Number and attach the additional pages upon completion of the inspection.
3. Any checklist line item marked by an inspector in a SHADED BOX must be fully explained or an appropriate reference to previous reports provided. The explanation should include the inspector's rationale for conclusions and recommendations, if appropriate. Explanations are to be placed on additional attachments and cross-referenced appropriately, and may take the form of sketches, measurements, and/or annotated site maps.
4. The site inspection is a walking inspection of the entire site, including the perimeter and sufficient transects to be able to inspect the entire surface and all features specifically described in this checklist. Attach a drawing indicating the starting and ending points and the direction and pattern of the inspection.
5. A standard set of color 35 mm photographs (or equivalent) is required. In addition, all anomalous features or new features (such as changes in adjacent area land use) are to be photographed. A photo log entry will be made for each photograph taken.

B. Preparation (to be completed prior to site visit)	YES	NO	EXPLANATION
1. Site as-built plans and site base map reviewed	X		Amchitka Mud Pit Closure -As Built
2. Previous inspection reports reviewed		X	No previous inspections were performed
a. Were anomalies or trends detected on previous inspections?			Not Applicable
b. Was maintenance performed on areas with anomalies?			Not Applicable
3. Site maintenance and repair records reviewed		X	No previous maintenance activities were performed
a. Has site repair resulted in a change from as-built conditions?		X	No detectable changes from the as-builts were observed.
b. Are revised as-builts available that reflect repair changes?			Not Applicable: No repairs have occurred.

C. Site Inspection (to be completed during inspection)	YES	NO	EXPLANATION
1. Adjacent offsite features within mud pit site area			
a. Changes in use of adjacent area?		X	Wildlife refuge
b. Any new roads or trails?		X	Per previous photos and As-built Drawings
c. Change in the position of nearby washes?		X	None Detected
d. Erosion/deposition of nearby washes?		X	None Detected
e. New drainage channels?		X	None Detected
f. Change in surrounding vegetation?		X	None Detected
2. Security markers; signs			
a. Displacement of site markers, boundary markers, or monuments?		X	USFWS Monument was present / Good Condition
b. Signs damaged or removed?		X	No signs were present or noted in the As-builts
3. Cap			
a. Evidence of subsidence?		X	
b. Evidence of cracking?		X	
c. Evidence of erosion (wind or water)?	X		Minor areas as noted below.
d. Evidence of animal burrowing?		X	
e. Are site markers disturbed? By man?____ By natural processes?____		X	
f. Do natural processes threaten the integrity of cap or site marker?		X	

AMCHITKA MUD PIT SITES POST-CLOSURE MONITORING CHECKLIST (continued)

Mud Pit Site: Drill Site E	Date of Inspection: August 2, 2006

C. Site inspection (continued)	YES	NO	EXPLANATION
4. Vegetative cover			
a. Is plant cover adequate to prevent erosion?	X		See Discussion on Continuation Sheet
b. Are weedy annual plants present? Do they require removal?		X	See Discussion on Continuation Sheet
c. Evidence of animals on cap?		X	See Discussion on Continuation Sheet
d. Evidence of excessive plant mortality?		X	See Discussion on Continuation Sheet
e. Has a vegetative cover log been completed?	X		See attached log
5. Photo Documentation			
a. Has a photo log been prepared?	X		See attached log
b. How many photos were taken?			5 Photopoints as noted in the photographic log

D. Field Conclusions			
1. Imminent hazard to integrity of cap? (If yes, immediate report required. Note the person or agency the report will be made to.)		X	
2. Are more frequent inspections required?		X	
3. Are existing maintenance actions satisfactory?			N/A No maintenance was performed or required
4. Are existing repair actions satisfactory?			N/A No repairs were performed or required
5. Is other maintenance/repair necessary?		X	

6. Rationale for field conclusions: Conclusions were based on walkover visual inspections and plant counts.

Water erosion was minimal (i.e. no more than two inches of top soil) and did not expose the geomembrane liner. The overlain vegetation netting was present on the cap and may aid in minimizing wind erosion and a deterrent to birds nesting or accumulating on the cap.

Transect lines were established in the field and associated GPS Coordinates are provided on the attached figure. No permanent stakes were set.

7. Factors contributing to or impacting inspection: None noted

E. Certification

I certify that I have conducted an inspection of the Drill Site E Mud Pit Site cap in accordance with the Monitoring and Inspection Plan for the Amchitka Mud Pit Release Sites, Rev. 0, dated November 2005, as recorded on this checklist, attached sheets, field notes, vegetative cover log, photo logs, and photographs.

Inspector Printed Name:	Inspector Signature:
Patrick Matthews	
Title:	Date:
Task Manager	9/12/06

AMCHITKA MUD PIT SITES POST-CLOSURE MONITORING CHECKLIST
Continuation Sheet
Drill Site E

Cap E is located approximately twenty seven miles northwest of Constantine Harbor at an elevation between approximately 472 and 475 feet and falls within the Crowberry Stripe community of Amundsen (1972). This cap had slightly more vegetation cover than Cap F (8.0 % versus 7.9 %), but the vegetative cover is consistent with the high elevation of the cap (Figure 2.1). The cap had the lowest species diversity (with only four separate taxa: moss, *Deschampsia behringensis, Festuca rubra,* and *Lupinus nootkatensis* observed). This low diversity also is in line with the observed trend of lesser diversity with increased elevation (Figure 2.2). The low percentages of *Festuca rubra* and *Deschampsia behringensis* cover (2.2 % cover or 27.9% of the total vegetation cover) also is line with observed elevation trends (Figure 2.3). The scarcity of *F. rubra* and *D. berhringensis* at Cap E may have been exacerbated by late completion of this cap relative to other caps (P. Sanders, personal communication, 2006). Late completion would have limited the initial growing season for plants and may have set back their establishment on the caps.

Amundsen (1977) attribute the lack of vegetative cover on mineral soil stripes in the Crowberry Stripe community to frost heaving which disturbs the roots of seedlings. Seeds were emplaced in a vegetative mat which provided a thin layer of organic material, but this layer was largely removed from the site at the time of the follow-up survey (litter which includes left over seed mat and other forms of dead plant material was only found at 20 % of locations as thin deposits) leaving bare mineral soil behind.

Both seeded species and invading species had difficulty in becoming established during the first five years following cap installation. The sparse vegetation cover on Cap E illustrates the slow vegetation recovery found in the Crowberry Stripe zone. Any attempt to intervene on Cap E to increase vegetative cover should avoid disturbing the sparse vegetation which has managed to become established at the site.

References Cited

Amundsen, C.C. 1972. Amchitka Bioenvironmental Program. Plant Ecology of Amchitka Island: USAEC Report BMI-171-139. Battelle Memorial Institute.

Amundsen, C.C. 1977. Terrestrial plant ecology, pp. 203-226 in *The Environment of Amchitka Island, Alaska.* (Merritt, M.L and Fuller, R.G., eds). Technical Information Center, Energy Research and Development Admin, Washington, DC.

Vegetative Cover Log

Mud Pit Site: Drill Site E

Cap Section	% Vegetative Cover (check one)				Comments
	0-25	25-50	50-75	75-100	
E1-1 21 feet	14%				Moss.
E1-2 41 feet	8%				Moss.
E1-3 48 feet	17%				Moss.
E1-4 51 feet	3%				Moss.
E1-5 84 feet	0%				
E2-1 21 feet	14%				Moss.
E2-2 25 feet	0%				
E2-3 36 feet	8%				Lupinus nootkatensis; moss.
E2-4 47 feet	3%				Moss.
E2-5 87 feet	8%				Moss.
E1-A1 3 feet		25%			*Festuca rubra*; moss
E1-A2 9 feet	14%				Moss.
E1-A3 15 feet	0%				
E1-A4 30 feet	0%				
E1-A5 37 feet	6%				Moss.

Vegetative Cover Log

Mud Pit Site: Drill Site E

Cap Section	% Vegetative Cover (check one)				Comments
	0-25	25-50	50-75	75-100	
E1-A6 40 feet	6%				Moss.
E1-A7 43 feet	0%				
E1-A8 47 feet	6%				Moss.
E1-A9 50 feet	0%				
E1-A10 56 feet	0%				
E2-A1 2 feet				83%	*Deschampsia beringensis*; moss; *Festuca rubra*; *Lupinus nootkatensis.*
E2-A2 28 feet	3%				Moss.
E2-A3 45 feet	0%				
E2-A4 54 feet	0%				
E2-A5 60 feet	0%				
E2-A6 64 feet	3%				Moss.
E2-A7 67 feet	14%				Moss.
E2-A8 70 feet	0%				
E2-A9 74 feet	0%				
E2-A10 80 feet	6%				Moss.

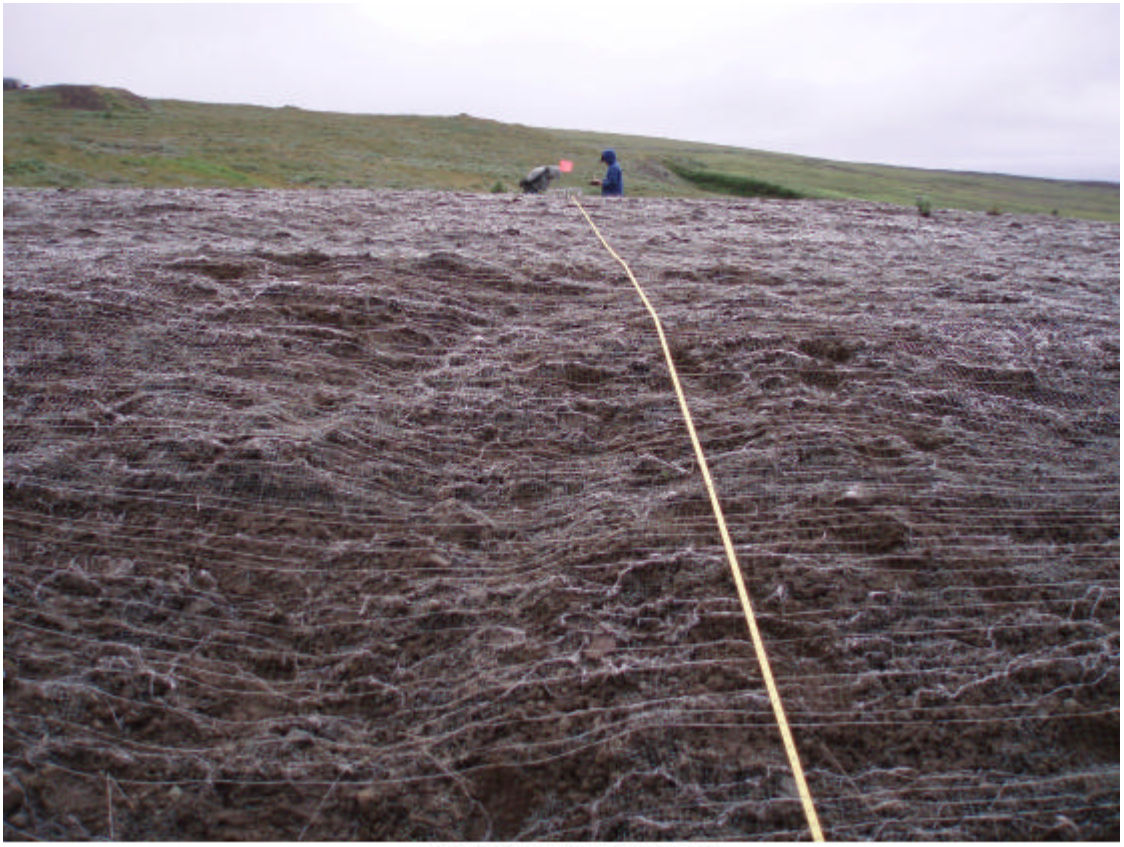
Photograph Log

Mud Pit Site: Drill Site E

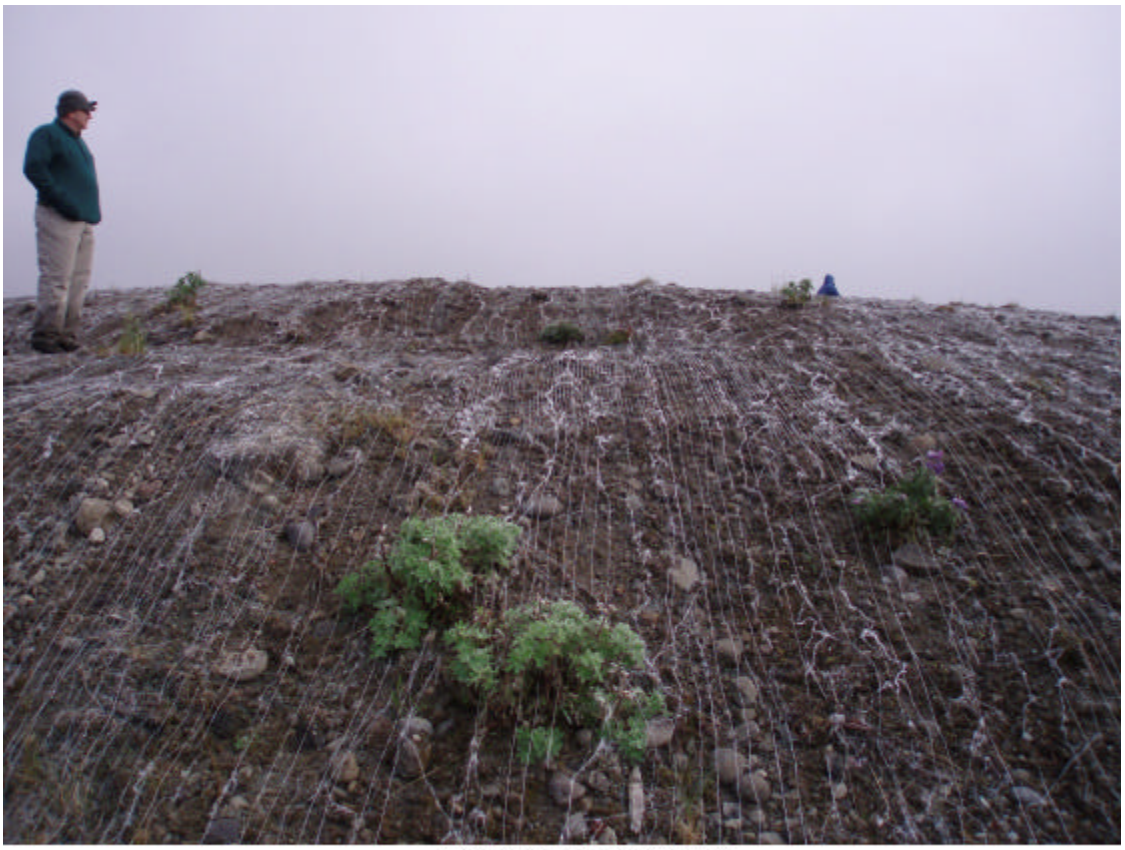
Date	Photo #	GPS Location	Direction of Photo	DESCRIPTION
8/2/06	P8020001	See Figure	N/A	USFWS Monument
8/2/06	P8020002	See Figure	Southeast	Transect E-1 NW
8/2/06	P8020003	See Figure	Northeast	Transect E-2 SW
8/2/06	P8020004	See Figure	Northwest	Transect E-1 SE
8/2/06	P8020005	See Figure	Southwest	Transect E-2 NE

P8020001 Drill Site E USFWS Monument

P8020002 E-1 NW Looking SE



P8020003 E-2 SW Looking NE



P8020004 E-1 SE Looking NW

P8020005 E-2 NE Looking SW