MINUTES
RESTORATION ADVISORY BOARD
NAVY AREA-WIDE

A Restoration Advisory Board (RAB) meeting for the Navy Area-Wide Installation Restoration (IR) sites was held on Wednesday, February 9, 2000 at the Hyatt Regency Hotel, Guam at 7:00 pm. Enclosure (1) is a list of attendees for the meeting and the preceding public tour. Copies of the minutes from the October 6, 1999 RAB meeting were made available for distribution to all interested persons.

Lieutenant Craig Prather introduced himself as Regional Environmental Programs Officer for US Naval Forces Marianas (COMNAVMARIANAS) and as RAB co-chairman. In opening remarks, LT Prather introduced Mr. Mike Gawel of Guam Environmental Protection Agency (GEPA) as co-chairman and Roy Tsutsui as facilitator for the meeting. Mr. Gawel extended his welcome and requested that attendees review handout materials that were available for each of the meeting's presentations. Mr. Gawel introduced the evening's speakers, Helen Lam and Cowan Azuma, both from the Navy's Pacific Division, Naval Facilities Engineering Command (PACDIV) in Hawaii.

1. Ms. Helen Lam presented an overview on the progress of clean-ups at various IR sites on Guam. Ms. Lam explained that presentations would be made for the three sites for which there was a substantive change in project status. Ms. Lam went on to describe the major milestones and status of each of the nine active IR project sites. The handout in enclosure (2) summarized the progress and was made available to the public at the meeting. The following questions and answers were addressed:

> **Q1: What is the significance of the "area behind the COMNAVMARIANAS fence"? What was there previously?**
> A: This was previously part of the Ship Repair Facility (SRF) and the area contains underground storage tanks as well as sand blast grit that was disposed of in the area. The tank locations have been identified and the tanks are still in place. The sand blast grit may contain paint chips with heavy metals and needs further testing.

2. Ms. Helen Lam presented an update on the progress of the seawall construction and the final landfill cover design at the Orote Landfill, as provided in enclosure (3). Seawall construction is about 90% complete, with the exception of the installation of rock anchors at the toe wall. The landfill cap design was finalized in January 2000. Construction of the landfill cap started in February 2000. Work on the seawall construction and the pilot test of revegetation are continuing.

> **Q1: How does the water behave when a large 70-foot wave hits the seawall? Will it go up in laminar flow and then into the valley and drain back or is it broken up?**

A: Because the wall is made up of individual concrete cubes and placed so that it has a lot of jagged surfaces, when the water hits the surface, a lot of the energy of the water will be dissipated.

Q2: It appears from photos that there is so much flat surface that water would just shove up the hill.
A: There are openings between the cubes for the water to drain down into.

Q3: On your risk assessment, what were the specific compounds and chemicals of interest that were found, their populations and impact?
A: The risk assessment was conducted during the Remedial Investigation phase in 1996. The discussion of which was found in the RI report. The landfill contained a lot of metals and PAHs (poly-aromatic hydrocarbons). Risk assessments were conducted for both humans and animals found in the area. There are no carcinogenic (cancer) risks at the site. There is some non-carcinogenic risk associated with touching the contaminated soils.

The facilitator noted that the RAB had been meeting for several years as projects progressed through various stages of progress. The earlier stages of planning included public discussions of alternatives for remediation, risks, the chemicals involved, and the pathways by which chemicals might travel or impact humans. Decisions were made to place priority on the sea wall before capping. Historic and background information is available in fact sheets which are available.

Q4: Is there a way to verify the existence of unexploded ordnance on-site?
A: Some ordnance was discovered during construction and was taken into account. The stabilizing of ordnance and metallic debris in-place was considered to be an adequate mitigation in design discussions between EPA and Navy. Stabilizing of the area will include land use restrictions to prohibit future digging.

Q5: The Orote Peninsula had been the site of extensive bombing. During removal of the upper layers of debris and materials, how much ordnance was found?
A: Five pieces.

3. Mr. Cowan Azuma presented an update on the Lower Sasa Fuel Burning Pond. The presentation provided information that covered changes in site conditions and the recent sampling event, as provided in enclosure (4). Wetland enhancements by GovGuam created new habitat for the endangered Moorhen adjacent to the site. Moorhen have been sighted at the Lower Sasa Fuel Burning Pond wetland area. The Navy held discussions with representatives from Guam Department of Aquatic and Wildlife Resources (DAWR), Guam EPA, and the U.S. Fish and Wildlife Service (USFWS) to develop a sampling and analysis plan. Accordingly, sampling for

contaminants of interest was expanded to include surface water, sediment, and a variety of available, potential Moorhen food sources. Results will be incorporated into the revised ecological risk assessment and considered in the development of the final removal action design. There were no questions from the audience.

4. Mr. Cowan Azuma presented an update on the Remedial Investigation (RI) for the Carpentry Shop Dip Tank, including the results of the wet season soil and groundwater sampling conducted in July 1999. The additional sampling and testing are being conducted at the request of Guam EPA. Slides from the presentation are provided in enclosure (5).

Q1: A series of questions were asked as to the location of water and soil sampling sites relative to the dip tank?
A: The samples of groundwater were taken from the 19 monitoring wells and 6 soil samples were taken around the former dip tank, the locations are referenced in enclosure (5).

Q2: Were samples taken outside, at the periphery of the tank also?
A: The diagrams show the locations of additional soil sampling and groundwater monitoring only. However, a total of 92 soil samples were taken during the remedial investigation and are not shown on the diagrams.

Q3: Were samples also taken directly under the site of the dip tank? What materials was the tank made from? If there was a crack or leak in the tank, was contamination found under the tank?
A: The tank was a metal tank, lined with concrete. At the time of the tank's removal, confirmation samples were taken directly below the dip tank and results were below threshold limits (PRGs) for industrial use.

Q4: Where did that contamination come from?
A: There was no sign of tank leakage, however, there were indications that with heavy rains, the tank would overflow. This was a possible source of contamination next to the tank.

Q5: The chemicals used to kill termites will also kill people. Could the chemicals have leaked down? What assurance is there that the extent of contamination was adequately characterized?
A: None of these chemicals were found in groundwater samples. Soil sampling found chemicals at levels allowed by EPA for industrial use. The site is in an industrial setting within the PWC maintenance yard and is not a residential area.

In the earlier characterization phase, before it was determined what type of remediation might be needed, 92 soil samples were taken to adequately cover the entire area, the results showed no areas of high chemical concentration, and subsequent risk assessment concluded that there was no problem. At the request of Guam EPA, additional confirmation samples were taken, the wet season groundwater sampling was conducted in July 1999 and the dry season sampling event is occurring this week. The results from both sampling events will be evaluated and incorporated into the final remedial investigation report.

Q6: At the beginning, we seem to know what the source is and what specific chemicals such as wood preservative are involved. However, when you have taken your samples of soil or ground water, you detect volatiles, semi-volatiles or metals. In this case you are detecting dioxin and furans. That doesn't relate to the source; or does it? Are the compounds that are detected background contamination or related to the source?

A: We are currently looking into possible sources of the dioxins and furans. We did not sample for dioxins and furans in groundwater during the original remedial investigation sampling event. That was added during this additional sampling plan. We are currently looking at the data and trying to determine where the source is or if it is background.

Mr. Lance Richman of GEPA explained that dioxin could come from a lot of things. Most people are familiar with it as a by-product of incineration. With the way that pentachlorophenols are made, a lot of times impurities are in them. Some of the potential impurities are some of the dioxins and furans, and would be considered quite common. Companies that produce chlorinated compounds and compounds that affect plants or reduce the growth of plants or fungus never made these chemicals perfectly and have unwanted percentage of contamination, especially the larger chlorinated solvents. A lot of these are made to last; they don't break down or go away easily.

To summarize; yes, there could be a logical correlation and association between these compounds and the source contaminant. As to the adequacy of characterization, we did not do it on the first phase, but we're now testing for it and that will be put into the risk assessment.

Q7: From 1953 to 1972, many variations of chemical insecticides and pesticides were used for treatment. Did you make a study of what was used?

A: Yes. During the remedial investigation, in addition to pentachlorophenol, we tested for metals, polyaromatic hydrocarbons, PCB, methylene chloride, the semi-volatiles. We did a full scan analysis. An historic record search of usage for the area indicated that pentachlorophenol was the primary chemical used. The testing was not limited to this chemical alone. Site screening was done to

find unknown compounds to be sure to detect any other contaminants from the EPA lists of toxic compounds. The full scan analysis confirmed the presence of the primary chemical contaminant, but included a broad array of other tests also. Care was also taken in developing the sampling plan to be sure to catch everything.

5. The following are general questions that were asked regarding the RAB:

Q1: The public notice was not advertised until today. I would have liked to have come to the tour this afternoon. Could you provide more advanced notices?
A: There should have been two notices in the paper this week, Monday and Wednesday. Also, there is an open door policy for these meetings. With your attendance at these meetings, we intend to continue to keep you on our distribution list for further meetings by telephone, mail, and email. A public tour is always done the same day as the RAB meeting. Although we prefer that you attend the public tour, special arrangements can be made through our Public Affairs Officer if you are unable to attend.

Q2: Assuming that all remedial actions are completed satisfactorily, what else will be the function of the RAB?
A: The RAB's function is to allow for public involvement in our decisions to clean up or restore sites. Once we have completed all of those sites, say in 2009, we can celebrate, but we can also look to retaining this open public dialogue.

Q3: Is this information sent over to territorial planners so that some contractor, twenty years from now doesn't go into some site and start digging a foundation.
A: Because land use is looked at in terms of remediation, such as whether a site is industrial, this is important for planners to know if land is encumbered by some sort of mitigation constraint; for example digging at the Orote landfill cap. To answer your question directly, these are all Navy sites and do not go through the Territorial Planner. For federal lands, we still perform the same kinds of planning functions and are required to keep appropriate records for 50 years.

Q4: With the well-publicized A-76, what will be the impact to the RAB?
A: None of the IR work goes over to Raytheon Technical Services. The Navy, NAVFAC, and PACDIV will all stay involved in this forever and ever. The Navy retains ownership.

6. Lt. Prather thanked the audience for their participation. He also expressed his thanks for the cooperative relationship with regulators and contractors, and the

professionalism of the parties involved. The success of this RAB is due in large part to the continuing open dialog with them and with the public.

Approved by:

MIKE GAWEL
Community Co-Chairperson

CRAIG S. PRATHER, LCDR,CEC,USN, P.E.
Navy Co-Chairperson

NAVY AREA-WIDE
RESTORATION ADVISORY BOARD

Hyatt Regency Ballroom C
Wednesday, February 9, 2000 (7:00 P.M. – 9:00 P.M.)

NAME	AGENCY/ ADDRESS	CONTACT NO./ FAX	E-MAIL
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A. Loerzel	PDN		
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Jean Roberts	Raytheon	[redacted]	
Dr. Gonzales	NAS RAB		[redacted]
Mike Gawel	Guam EPA	[redacted]	
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Alice Hadley	Public	[redacted]	
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Lawrence Lansdale	Ogden Env	[redacted]	
Eric Wetzstein	Ogden Env		

Enclosure (1)

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Trini Torres	RAB Member	[redacted]	
Clint Huntington	Leo Palace Resort	[redacted]	
Cowan Azuma	PACDIV	808-474-5389	Azumach@efdpac.navfac.navy.mil
Helen Lam	PACDIV	808-474-8911	Lamhs@efdpac.navfac.navy.mil

PUBLIC TOUR
NAVY AREA-WIDE
RESTORATION ADVISORY BOARD
Wednesday, February 09, 2000 at 2:00 PM

Mike Gawel	Guam EPA	[redacted]	
Lt Craig Prather	CNM (N45)	339-4365/7051	N45@guam.navy.mil
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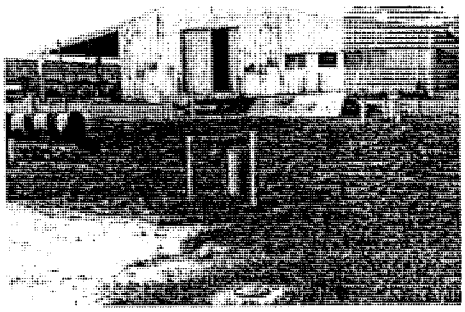
Cowan Azuma	PACDIV	808-474-5389	Azumach@efdpac.navfac.navy.mil
Terry Traxell	PDN	477-9711 x 421	
Adriene Loerzel	PDN	477-9711 x 421	Aloerzel@pdnguam.com

Updates on Progress of Installation Restoration (IR) Sites in Guam

Restoration Advisory Board Meeting
February 9, 2000
Helen Lam

Carpentry Shop Dip Tank (PWC)

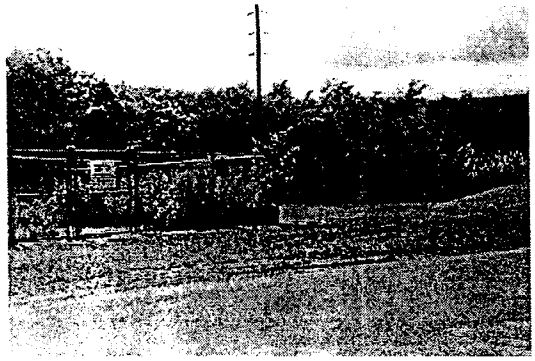
- **Dip Tank, drain lines, and sump were removed in Feb 1998**
- **Final Field Sampling Plan and Quality Assurance Project Plan Addendum completed in May 1999**
- **Wet season groundwater sampling conducted in July 1999**
- **Dry season groundwater sampling will be conducted in Feb 2000**



Enclosure (2)

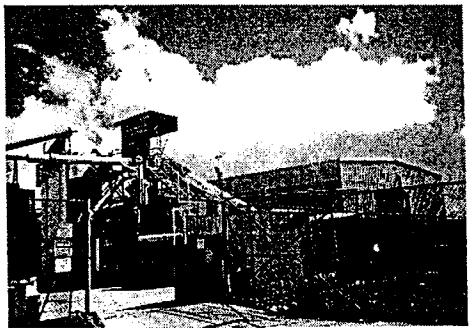
Dry Cleaning Shop (COMNAVMARIANAS)

- **Remedial Investigation (RI) Report finalized in Feb 1996**
- **Additional groundwater sampling planned for 2000**



Building 3009 (PWC)

- **Removal Action to treat PCB contaminated soil completed in Mar 1997**
- **Additional soil sampling was completed in Nov 1998**
- **Remedial Verification Report completed in Dec 1998**
- **RI to characterize the site planned for 2001**

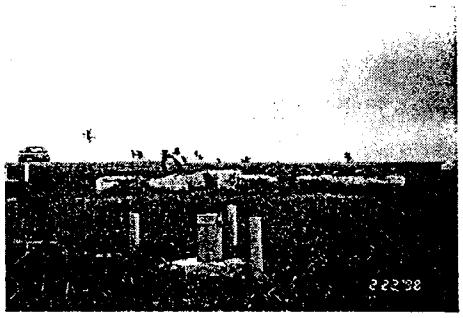


Area Behind the Fence (COMNAVMARIANAS)

- **Remedial Investigation finalized in 1995**
- **Additional sampling planned for 2008**

NEX Garage Septic Tank Site (COMNAVMARIANAS)

- **EE/CA finalized in March 1998**
- **Alternative revised in final EE/CA**
- **Draft Action Memo completed in March 1998**
- **Draft Field Sampling Plan completed in June 1998**
- **Cleanup planned for 2000**



South Finegayan Construction Battalion Landfill (PWC)

- **Completed construction in June 1998**
- **Final Site Work Plan for GW completed in April 1999**
- **Dye Trace Study conducted in July 1999**
- **Continue GW monitoring and maintenance**

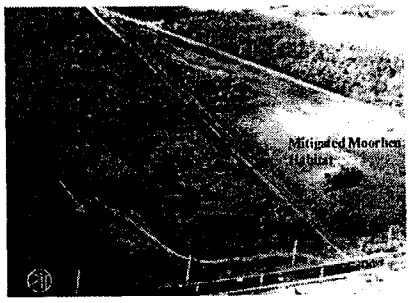
Orote Landfill (COMNAVMARIANAS)

- **Field work to construct the seawall started in March 1999**
- **Final design for the landfill cap available in Jan 2000**
- **Construction of landfill cap started in Feb 2000**

USS Proteus Fire Fighting Training Area (COMNAVMARIANAS)

- **2 USTs and burn pit soil removed in Oct 1997**
- **Soil treated by bioremediation in Feb 1998**
- **Final Decision Document for Site Closeout completed in Sep 1999**
- **Site was closed out in Oct 1999**

Lower Sasa Fuel Burning Pond, COMNAVMARIANAS



- **Engineering Evaluation/ Cost Analysis (EE/CA) finalized in Dec 1997**
- **Draft Removal Action Design completed in Aug 1998**
- **Revised ecological risk assessment completed in late Jan 1999**
- **Additional sampling conducted in Jan 2000**

Seawall Construction and Landfill Cover Design

Orote Landfill Site COMNAVMARIANAS, Guam

Fact Sheet No. 7

February 2000

This Fact Sheet describes the ongoing cleanup of contamination at U.S. Naval Forces Marianas (COMNAVMARIANAS) Guam under the Installation Restoration (IR) Program. This is one in a series of informational flyers that will be issued periodically throughout the cleanup process.

INTRODUCTION

This fact sheet provides updated information regarding the construction activities at the Orote Landfill Site, COMNAVMARIANAS Guam. Construction of the seawall began in March 1999 and will continue until June 2000. The previous fact sheet dated October 1999 discussed the seawall construction and the draft landfill cover design. The final design for the landfill cover has been completed.

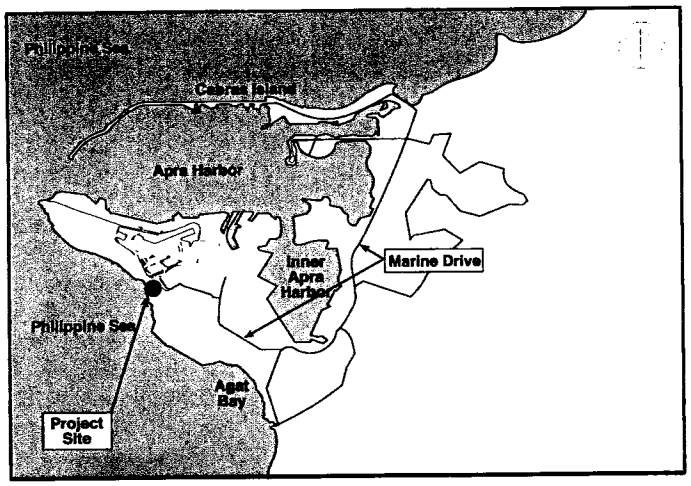


Figure 1. Location Map

BACKGROUND

The Orote Landfill Site occupies approximately 9.4 acres of land within COMNAVMARIANAS on the southern portion of the Orote Peninsula (Figures 1 and 2). The Orote Landfill was used for disposal of residential, industrial, and construction wastes from approximately 1944 to 1969. The face of the cliff that surrounds the landfill was reportedly the most active disposal area. Flammable material was burned, and the ashes were buried on the cliff above the nearby cove. Nonflammable material was either buried behind the cliff or bulldozed over the cliff onto the beach. The beach contained a large amount of rusted metal and other debris. Erosion of the landfill cliff had been observed as a source of the debris on the beach.

SEAWALL AND LANDFILL COVER

The unprotected cliff at the Orote Landfill site was eroding into the sea. It was recognized that as the cliff has eroded, landfill material that was exposed may be transported to the Philippine Sea. Additionally, the cliff needed to be stabilized before a landfill cap could be applied over the site. A seawall was therefore needed to stabilize the existing cliff.

The purpose of the seawall is to protect the site from further erosion, enable a landfill cap to be placed on the landfill, and to cap the landfill material currently exposed on the cliff. Further erosion will be prevented since waves will impact the seawall rather than the cliff. A liner was included as part of the design to prevent the waves from coming into contact with the landfill materials. The landfill cover has a liner that overlaps the liner beneath the seawall forming a continous low permeability cap over the landfill materials.

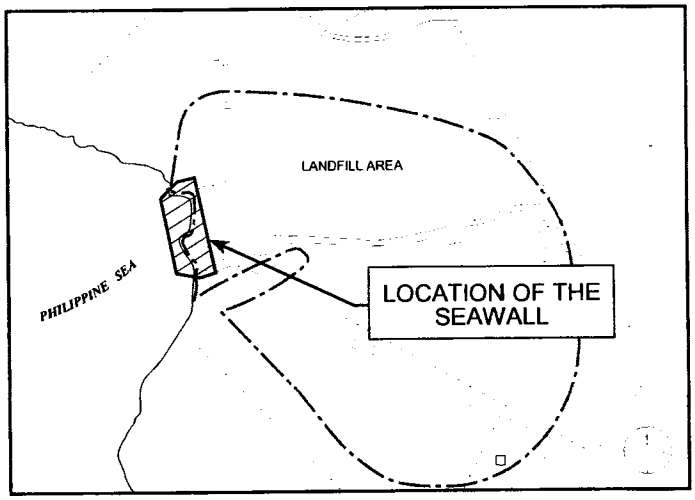


Figure 2. Map of site showing the approximate boundary of the landfill and location of seawall that is under construction

CONSTRUCTION ACTIVITIES

Construction activities on the seawall began in March 1999. Currently the seawall is approximately 90% completed. Activities completed to date include casting the 24-ton and 9-ton concrete cubes, placement of the cubes on the slope, casting the toe wall itself and installation of the liner and gravel layers on the slope (Figures 3 and 4). The installation of rock anchors and restoring the site is expected to be completed in June 2000.

LANDFILL COVER DESIGN

The 100% landfill cover design was reviewed and approved by the regulatory agencies. The cap includes a low permeability liner and a vegetative layer designed to accomodate native plants and trees (Figure 5). A pilot test concerning the vegetative layer is currently underway in cooperation with the University of Guam. The pilot test will assess if root damage will occur to the liner from trees. Construction on the landfill cover began in February 2000, and is expected to be completed by December 2000.

Enclosure (3)

COMMUNITY INVOLVEMENT

This fact sheet is part of the Community Relations Program for the RI, RSE, and clean-up activities at Orote Landfill Site. This effort is intended to keep you informed of planned or ongoing activities at each site.

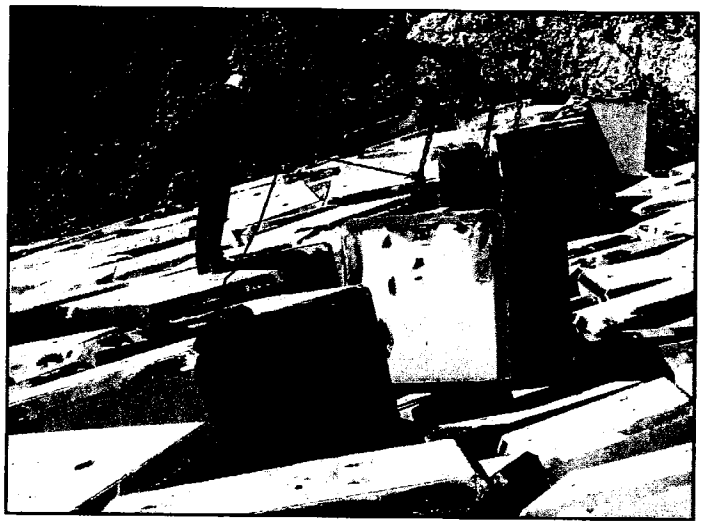


Figure 3. A worker guides a 9-ton concrete cube into place

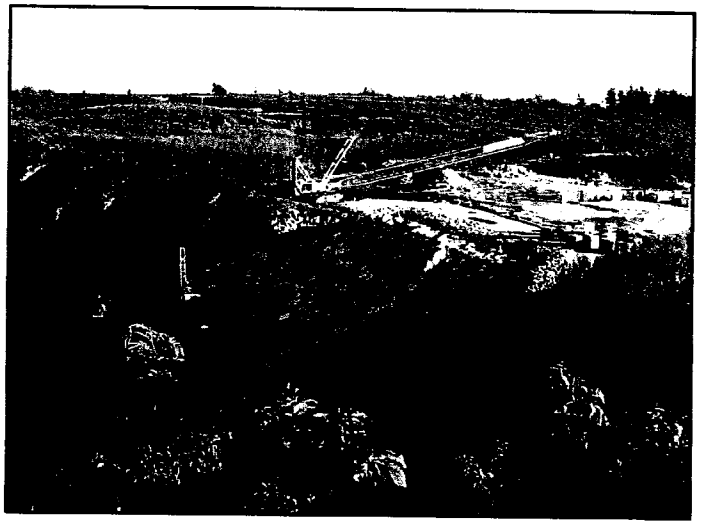


Figure 4. Placement of 9-ton concrete blocks nearing completion

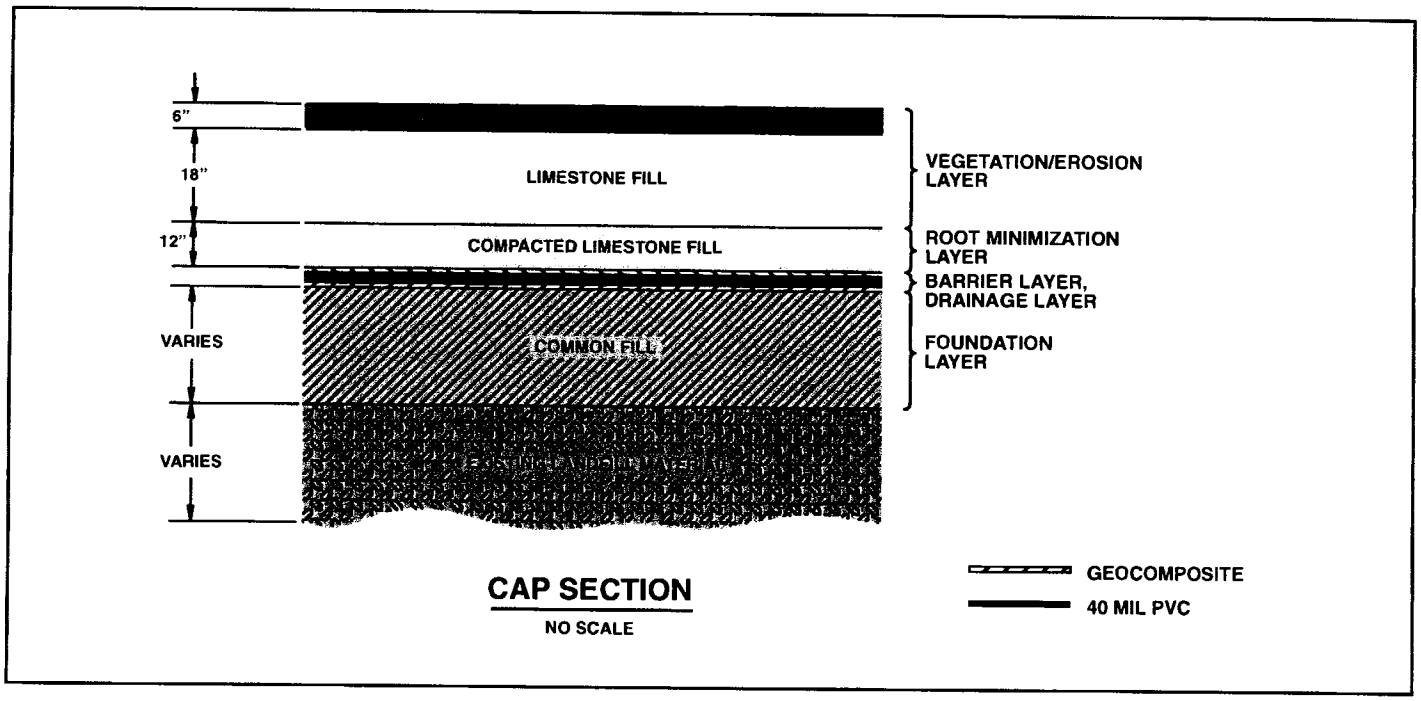


Figure 5. Cross-section of landfill cover

FOR MORE INFORMATION

For any questions, please contact the U.S. Naval Forces Marianas (COMNAVMARIANAS) at (671) 339-5027. The complete 100% Seawall Design, 100% Landfill Cover Design and Pilot Study Work Plan are currently available at the information repository located at Nieves M. Flores Memorial Library at Hagatna.

REMOVAL ACTION AT THE LOWER SASA FUEL BURNING POND SITE U.S. NAVAL FORCES MARIANAS (COMNAVMARIANAS)

Fact Sheet No. 7 **February 2000**

This Fact Sheet describes the ongoing Investigation of potential contamination at U.S Naval Forces Mairanas (COMNAVMARIANAS) Guam under the Installation Restoration (IR) Program. This is one in a series of informational flyers that will he issued periodically throughout the investigation process

Background

The Lower Sasa Fuel Burning Pond is located near the Apra Harbor shoreline on the southwest coast of Guam as shown in Figure 1. The site was used from early 1950's until 1970 as a collection pond and burn pit for waste petroleum, oil and lubricants generated from various Navy activities. The pond received waste from an oil/water separator located at the COMNAVMARIANAS Supply Department Fuel Division Fuel Tank Farm across Marine Drive. The separator reportedly had mechanical problems that allowed oily wastewater to drain into the holding pond. Water at the bottom of the pond was drained into the adjacent wetlands via a drainage channel. The remaining petroleum residue was then burned. This continued until 1970 when the Clean Air Act was enacted. At that time, the oil/water separator was repaired and the unlined pond was lined with concrete for use as an evaporation pond.

Previous Environmental Investigations

A Remedial Investigation (RI) was conducted in 1993 to assess the nature and extent of soil and groundwater contamination in the vicinity of the Sasa pond and to determine whether there are any risks to human health or the environment. The RI concluded that chemicals found in sediment from the drainage channel and channel mouth area may be a primary contributor to the identified ecological risk. The investigation also concluded that the site did not pose a risk to humans. Based on the findings of the RI, a non-time-critical Removal Action (RA) was recommended to reduce the ecological risk.

Additional investigative activities were performed in 1996, which focused on the drainage channel and adjacent wetlands to determine which chemicals cause risk in the wetland sediments. An Engineering Evaluation/Cost Analysis (EE/CA) was prepared to evaluate cleanup alternatives and to select the most appropriate cleanup remedy. The EE/CA was finalized in December 1997 and recommended excavating sediment from four areas in the wetlands with the highest risk (maximum concentrations of chemicals) (see Figure 2), treating the sediments and disposal at the Public Works Center (PWC) Landfill.

A re-evaluation of thermal desorption technologies was performed to consider repairing and upgrading the PWC Guam thermal desorption unit (TDU) damaged by Typhoon Paka and to considered other available thermal desorption technologies. The repair and upgrade of the PWC Guam TDU was not possible since it was being

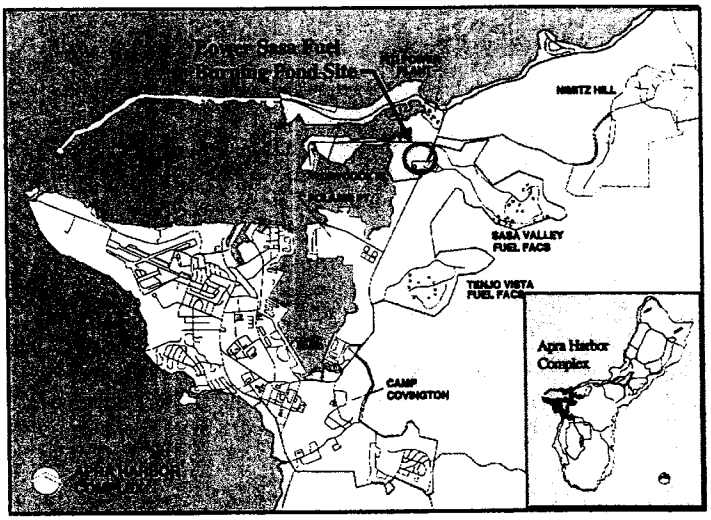


Figure 1. Site Location

demolished and the use of another thermal desorption process such as Terra Therm was not feasible due to the significant cost (approx. $1,056K). The re-evaluation determined that off-island disposal of excavated sediments was the most feasible (approx. $749K) based on the significant cost difference between shipping a portable TDU to Guam and off island disposal. The Navy presented this information at the July 1998 Restoration Advisory Board meeting. The Navy also provided documents reflecting the change in alternatives from sediment treatment to sediment disposal off-island to the Information Repository at the Nieves M. Flores Memorial Library, Hagatna, Guam to solicit feedback from the public. The public did not submit any comments objecting to the change in recommended alternatives.

A draft RA Design Package was developed in August 1998 specifying sediment excavation from four hot spot areas and disposing of the sediment off-island.

Site Condition Changes

In November 1998, the United Stated Fish and Wildlife Service (USFWS) informed the Navy that site conditions had changed since the completion of the Southern High School mitigation wetland north of the site. Representatives from both the USFWS and the Guam Department of Aquatic and Wildlife Resources (DAWR) sited moorhen in the Lower Sasa Fuel Burning Pond wetland area. Since

Enclosure (4)

the RI and EE/CA did not consider the Mariana common moorhen as an ecological receptor, the Navy conducted a re-evaluation of the site to determine if it posed a risk to the moorhen.

The Navy developed a revised Screening Ecological Risk Assessment (SERA) in January 1999 which re-evaluated existing data. The revised SERA evaluated the potential risk of the site to the moorhen and determined that the site was not a threat to the moorhen. However, the USFWS expressed concerns with the revised SERA indicating that there was insufficient existing data from the wetland area of the site. The USFWS recommended that additional sediment and biological (moorhen food items) samples be taken to determine potential risk to the moorhen.

Additional Sampling Effort

A draft Sampling and Analysis Plan (SAP) and a Heatlh and Safety Plan (HSP) addenda were developed in November 1999 to confirm the conclusions of the revised SERA and address the concern of USFWS. The proposed sampling effort involves taking a minimum of 10 sediment, three water samples and three samples each of three different moorhen food groups from the proposed sampling area identified in Figure 3. The samples will be analyzed for lead, methyl mercury and polynuclear aromatic hydrocarbons (PAHs). The draft SAP/HSP Addenda were developed with input from the USFWS.

The final SAP incorporated comments from the USFWS and U.S. EPA which expanded the scope to include analysis for dioxin and metals. Both Guam EPA and DAWR did not have any comments to the draft SAP. The fieldwork to collect the additional samples was conducted at the end of January 2000.

Current Status

The additional information obtained from this effort will be used to determine whether the revised SERA properly determined the potential risk to the moorhen. Data from the additional sampling will be analyzed and used to amend the revised SERA. If the results of this investigation detects contamination that poses a significant risk, the removal action design will be changed to ensure contamination and risk to the moorhen are removed or minimized.

Future Activities

- Incorporate the sampling results into the amended SERA
- Finalize the removal action design incorporating the results of the additional sampling and receipt of the review comments from GEPA, U.S. EPA, PWC Guam, USFWS and other federal and local agencies.

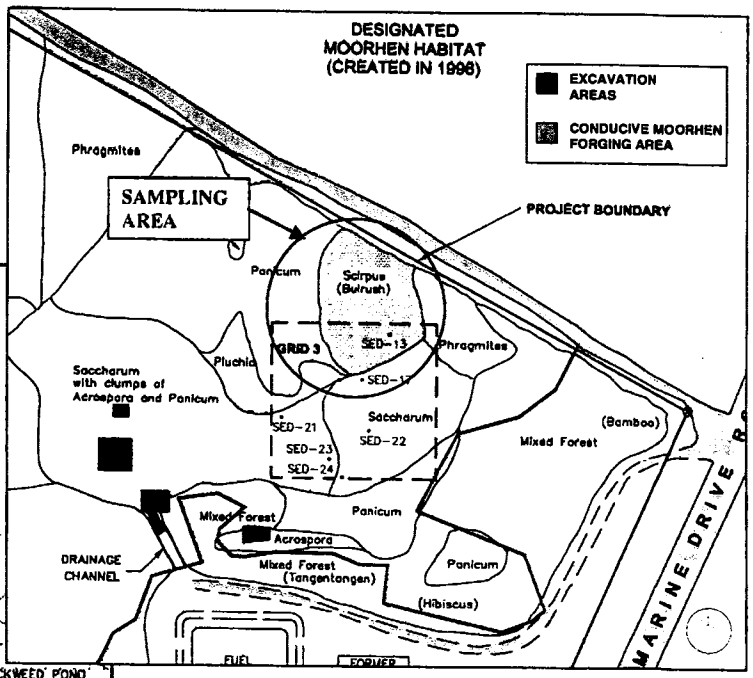


Figure 3. Proposed Sampling Area

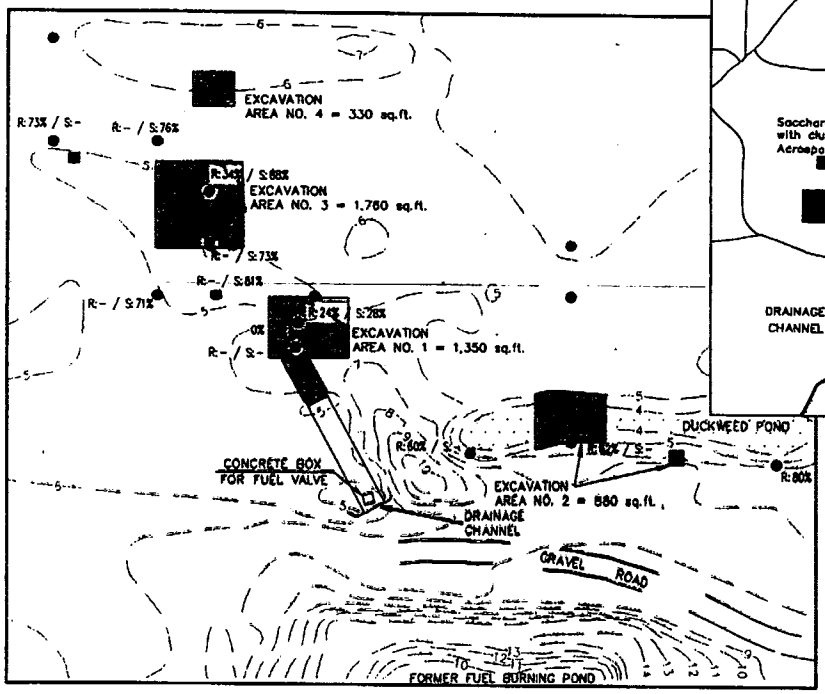


Figure 2. Areas of Excavation

FOR MORE INFORMATION

If you have any questions, please contact U.S. Naval Forces Marianas (COMNAVMARIANAS) at (671) 339-5207. The Final RI Report, Final EE/CA, Draft Design, and Final SAP/HSP Addenda are available for review at the Nieves M. Flores Memorial Library in Hagatna, Guam.

REMEDIAL INVESTIGATION AT THE CARPENTRY SHOP DIP TANK SITE U.S. NAVY PUBLIC WORKS CENTER, GUAM

Fact Sheet No. 4 **February 2000**

This Fact Sheet describes the ongoing Investigation of potential contamination at U.S Public Works Center (PWC) Guam under the Installation Restoration (IR) Program. This is one in a series of informational flyers that will he issued periodically throughout the investigation process

Background

The Carpentry Shop Dip Tank (Dip Tank) Site is located within the maintenance compound of the Public Works Center (PWC) Guam, Apra Harbor Naval Complex (Figure 1). The abandoned dip tank and associated features are located approximately 60 feet east of the PWC Carpentry Shop, Building 1771 (Figure 2). The Dip Tank Site is relatively flat and partially covered with asphalt, crushed coralline limestone, and grass.

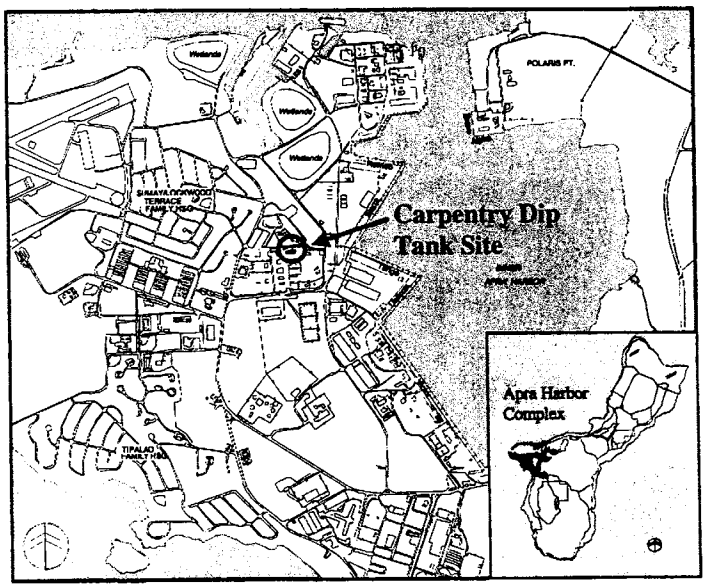


Figure 1. Site Location

From 1953 to 1972, the dip tank was used continuously to treat wood with pentachlorophenol (PCP) and other wood preservatives including metal salt solutions (containing arsenic, chromium, copper, and zinc); aromatic-based oil and methylene chloride may have been used as a carrier for PCP. From 1972 to 1979, the dip tank was used sporadically. Wood previously coated with creosote was soaked in a bath of PCP and allowed to drip dry on the drying rack. Drippage flowed back to the dip tank. Waste fluids were discharged to the sump.

In 1979, the dip tank vault was left in place and backfilled with crushed coralline rock level with the ground surface. The drying rack and aboveground storage tank were also removed in 1979.

Figure 2. Dip Tank Site

Previous Environmental Investigations

In 1982, the Navy conducted an Initial Assessment Study (IAS) of the Guam Naval Complex and identified the Dip Tank Site as potentially contaminated. A Site Investigation (SI) was conducted in 1990. SI findings included the following: locating dip tank boundaries and a drain pipe emptying into the surface water drainage channel; PCP, phenols, total fuel hydrocarbons (TFH), toluene, and ethylbenzene in soil samples collected adjacent to the dip tank; elevated metals concentrations in drainage sediment; and PCP, phenols, TFH, and polynuclear aromatic hydrocarbons (PAHs) in site ground water.

A Remedial Investigation (RI) followed in 1993. The RI found that surface sediment samples volatile organic contained compounds (VOCs), PCP, PAHs, dioxins, fuel hydrocarbons, and elevated concentrations of arsenic, chromium, copper, and zinc. Subsurface soil samples contained elevated arsenic and zinc concentrations, PCP, PAHs, and fuel hydrocarbons. Surface and subsurface soil impacts were localized around the dip tank and the sump. Groundwater samples collected adjacent to the dip tank contained phenols and PAHs; however organic compounds in ground water were greatest near the sump. Downgradient wells contained very low levels of only a few organic compounds. Metal concentrations in groundwater were below those naturally occurring.

Groundwater beneath the site lies within shallow fill and lagoonal sediments and limestone gravel overlying limestone bedrock. Flow in

Enclosure (5)

the aquifer is generally eastward. The predominant ground-water flow direction is toward Inner Apra Harbor. Because the site aquifer contains brackish water, it is unusable as a drinking water supply.

Although chemical concentrations in a few soil samples exceeded federal guidelines, results show that direct contact with soil from 0 to 3 feet below ground surface is safe to human health. Based on the current land use and future parade field land use, human contact with subsurface soil is highly unlikely. The results also show that chemicals in groundwater are safe for marine life. Based on recommendation of the risk assessment and RI data, removal of the concrete dip tank vault, drain lines, and sump were completed in 1998 as part of the Underground Storage Tank (UST) program.

However, the Guam Environmental Protection Agency (GEPA) expressed concerns of data gaps with the RI and recommended that additional surface soil and groundwater samples be taken to better characterize the site.

Objective of the Additional Soil and Groundwater Sampling

A Field Sampling Plan (FSP) and Quality Assurance Project Plan (QAPP) Addenda was developed in May 1999 to confirm the conclusions of the RI and address the concern of GEPA. The additional information obtained from this effort will be used to determine whether the RI properly characterized the site. Data from the additional sampling will be analyzed and used to finalize the RI report. If the results of this investigation detect contamination that poses a significant risk, a remedial action will be initiated to clean up or neutralize the contamination.

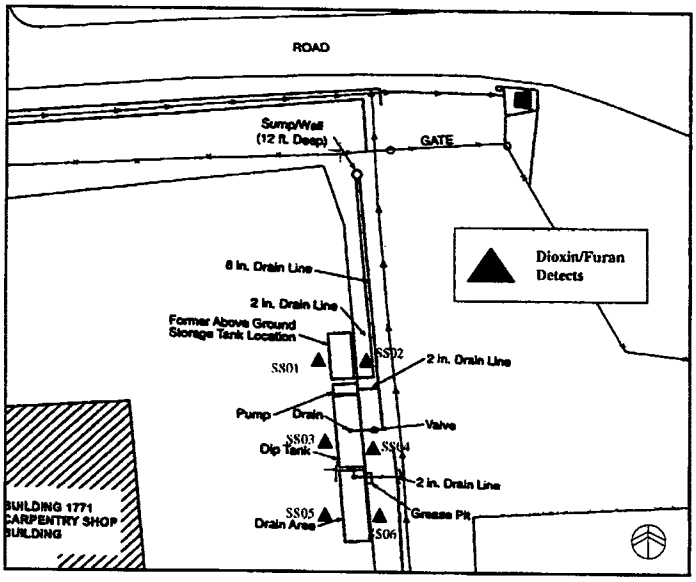


Figure 3. Soil Samples with Dioxin/Furan Detects

Current Status

The first round of sampling conducted in July 1999 comprised of additional soil sampling from areas immediately surrounding the dip tank and groundwater sampling of the entire monitoring well (MW) network at the site. The following are results from the first round of sampling:

Soil samples around dip tank (Figure 3)

- No detects of any phenols
- A few detects of dioxin/furans, approximately the same magnitude found during the RI

Groundwater samples from MWs (Figure 4)

- No detects of Light Non-Aqueous Phased Liquids or Dense Non-Aqueous Phased Liquids.
- No detects of phenols above the National Oceanic and Atmospheric Administration (NOAA) Surface Water Criteria.
- Several detects of semi-volatiles slightly above the NOAA standard.
- A few detects of dioxins/furans around the dip tank and sump area.

Future Activities

- Conduct second round of groundwater sampling as specified in the final the FSP/QAPP in February 2000.
- Analyze the data from the additional sampling, assess risk associated with the additional data and incorporate the results into the final RI report.

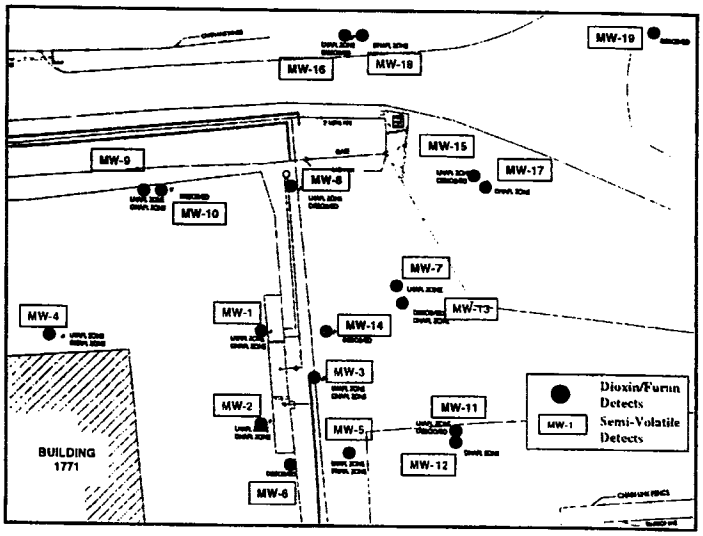


Figure 4. Monitoring Wells with Semi-Volatiles and Dioxin/Furan Detects

FOR MORE INFORMATION

If you have any questions, please contact U.S. Naval Forces Marianas (COMNAVMARIANAS) at (671) 339-7051. The Draft RI Report and Final FSP/QAPP are available for review at the Nieves M. Flores Memorial Library in Hagatna, Guam.