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NAS KEY WEST  
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PROJECT PLAN REVISION FOR IMPLEMENTATION OF REMEDIATION AT SOLID WASTE  
MANAGEMENT UNITS 1 AND 2 WITH TRANSMITTAL LETTER AND SAMPLING RESULTS  
NAS KEY WEST FL  
12/9/1996  
BECHTEL ENVIRONMENTAL INC

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# Bechtel

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Susan Collins

DEC 9 1996

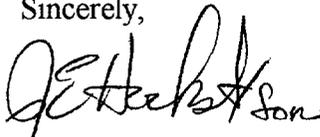
Scott Flickinger  
Brown and Root Environmental  
900 Trail Ridge Road  
Aiken, SC 29803-5297

SUBJECT: Bechtel Job No. 22567  
Department of the Navy Contract No. N62467-93-D-0936  
**DO 0004, NAS KEY WEST, SWMU-1 AND 2**  
Subject Code: 5320

Dear Mr. Flickinger:

Per your request, please find enclosed copies of the PPRs that were written to implement the remediation at SWMU-1 and 2. Also enclosed are the figures and table that are being included into the completion report.

If you have any questions or need additional information, please feel free to give me a call at (423) 220-2745 or Roy Hoekstra at (423) 220-2271.

Sincerely,  
  
O. N. McNeil, Jr.  
Project Manager

REH:dcm:LR1020  
Enclosure: As stated

cc: D. Patrick w/o enc.  
Phillip Williams w/o enc.  
Bob Milazzo w/enc.

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Bechtel Environmental, Inc.

**Table \_\_.1  
Summary of Quantities Excavated, Treated, and Restored**

Waste Stream or Material Handled	Budget Estimated Quantity of Material to be Excav./Removed	Actual Quantity of Material Excavated and Disposed of Offsite	Disposal Manifest Numbers	Transporter	Disposal Facility or Material Source	Quantity of Soil Treated	Restoration Material Quantity
<b>SWMU-1 - Boca Chica Open Disposal Area</b>							
Contaminated Soil (Lead) Hazardous Waste	2500 Cubic Yards (3150 Tons)	71 Tons	96034, 96035 and 96083	Robbie D. Woods Trucking EPA ID# ALD067138891 Dolomite, AL 35061	Michigan Disposal EPA ID# MID000724831 Belleville, MI 48111 (Treatment Facility)  Wayne Disposal, Inc. EPA ID# MID048090633 Belleville, MI ( Landfill)	71 Tons	
Contaminated Soil (Lead) Non-Hazardous Waste	NA	7383 Tons	96036 through 96082 and 96084 through 96362	Soil Tech Distributor, Inc. Hiialeah, FL 33011	Chamber Okeechobee Landfill Okeechobee, FL 32972	NA	
Backfill Placement					Sunshine Rock, Inc. Miami, FL  Rinker Materials Miami, FL 33012		5797 Tons
<b>SWMU-2 - Boca Chica DDT Mixing Area</b>							
Contaminated Soil (Pesticides) Hazardous Waste	2400 Cubic Yards (3024 Tons)	2471 Tons	96363 through 96468	Robbie D. Woods Trucking EPA ID# ALD067138891 Dolomite, AL 35061	Michigan Disposal EPA ID# MID000724831 Belleville, MI 48111 (Treatment Facility)  Wayne Disposal, Inc. EPA ID# MID048090633 Belleville, MI ( Landfill)	2471 Tons	
Backfill Placement					Sunshine Rock, Inc. Miami, FL  Rinker Materials Miami, FL 33012		1495 Tons

## **4.8 SWMU NO. 1 - BOCA CHICA OPEN DISPOSAL AREA**

### **4.8.1 Interim Remedial Action**

SWMU-1 was used as an open disposal and burn area from 1942 to the mid-1960's. The IRA objectives at the Boca Chica Open Disposal Area are:

- contaminant source removal of the lead contaminated soils and sediments to prevent further migration of waste into other media and
- to comply with regulatory requirements.

To accomplish this objective, the scope of work for the Boca Chica Open Disposal Area will consist of the following elements:

- excavation of contaminated soils and sediments;
- offsite disposal of the excavated material;
- backfill with clean fill; and
- revegetation of wetland areas.

### **4.8.2 Regulatory Requirements**

#### **Interim Remediation Goals**

The Interim Remediation Goal is to remove and dispose of the contaminated soil and sediments.

#### **UPLANDS**

The cleanup guideline for the soils contaminated with lead in the upland areas is 400 ppm. This cleanup goal for lead in soils is based on the revised CERCLA Guidance Document dated July, 1994.

#### **WETLANDS**

The cleanup guideline for the sediments contaminated with lead in the wetland areas is 30.2 ppm. This cleanup goal is based on the TEL values from Table 4 of FDEP's "Approach to the Assessment of Sediment Quality in Florida Coastal Waters", dated November, 1994.

The proposed limits of excavations at this site were coordinated with EPA and FDEP during October 24-30, 1995. The areas that have lead levels above the sediment criteria and are outside the excavation limits will be addressed by the risk assessment.

#### **RCRA Waste Analysis**

The sampling results reported by IT in the RFI/RI report and the additional delineation sampling performed by BEI showed elevated detections of lead at this site. IT performed TCLP analysis on one sample and it failed for lead. BEI performed TCLP analysis on the three samples with the highest total lead and all three of these samples passed the TCLP testing. Based on this lab data, the soil excavated in the vicinity of the sample that failed TCLP will be

classified as a hazardous waste with a RCRA waste code of D008. This excavated soil will be managed, transported, treated and disposed of in accordance with Federal and FDEP requirements. The area that will be treated as a hazardous waste is Grid J20 as designated on the attached figure.

The remaining soil to be removed has total lead concentrations above the EPA cleanup guideline for lead of 30.2 ppm for sediments or 400 ppm for soils, but because the TCLP analysis performed passed, soil from these areas can be excavated and disposed of as a non-hazardous waste

### **Protection of Natural Resources**

BEI has determined that the boundaries of excavation of contamination will impact regulated wetland areas, mangrove habitat and potentially endangered species (Lower Key Marsh Rabbit) habitat. Permits from both the State of Florida and the U.S. Army Corps of Engineers have been issued. All work will be conducted following the permit requirements.

SWMU-1 is adjacent to known Marsh Rabbit Habitat and parts of the SWMU-1 may serve as a corridor for rabbits. BEI will comply with the U.S. Fish and Wildlife Service and Florida Fish and Game Commission requirements with respect to this area of habitat and before work starts in this area, the NAS Key West Natural Resources Manager will be contacted for any special instructions or requirements.

### **Waste Management Requirements**

Best management practices will be used to prevent stormwater and sediment runoff from becoming a pathway for migration of contamination. These practices will include the use of a straw bale barrier backed with impermeable plastic liner. This barrier will be installed along the edge of the excavation to prevent any water from escaping during excavation into the surrounding wetlands. This barrier can be removed during backfill operations at the site. If a storm event occurs the storm water can be pumped out of the excavation across the barrier.

Some equipment on the site will come in contact with hazardous waste and will be decontaminated. Decontamination water may be used for dust suppression, and if any remains at the conclusion of the work, it will be collected, sampled, and if contaminated, properly disposed of.

#### **4.8.3 Excavation of Contaminated Soils**

Primary excavation limits have been determined from the RFI/RI Report and the field delineation sampling and are shown in the attached figure.

- The soils and sediments will be excavated, stockpiled if necessary, and then loaded into dump trucks or suitable containers for transportation.
- The site will be excavated to the caprock underlying the site or the excavation will be dug to a depth of two feet, whichever is less.

- The soil excavated from Grid J20 will be a hazardous waste once it is excavated. This soil will be excavated and handled separately from the general excavation for the rest of the site. It will be containerized and transported to a licensed TSDF for treatment and disposal. Because of the relatively small quantities, no onsite treatment of hazardous waste will be performed.
- The soil that is excavated from outside of the identified hazardous area will be disposed of in a licensed municipal landfill.
- The existing monitoring wells on the site are to remain in place. Any damage to these wells caused by the excavation at SWMU-1 will be repaired.
- Before excavation begins at SWMU-1, a location survey for underground utilities will be performed with standard field utility detection equipment.

Confirmatory samples will be collected from the excavated area to verify removal of impacted soil. Samples will be collected from the edge of the excavation and analyzed for total lead. Sample locations and quantities are indicated on the attached figure and can be adjusted based on field conditions, the actual excavation limits and presence of the lead. No confirmation samples will be taken from the floor of the excavation, unless caprock is not reached. If floor samples are needed they will be taken on a 100 foot grid. DQO levels are described in Section 5.2 of the Remediation Work Plan. A two day turnaround for laboratory analysis will be used for these confirmation samples.

When the confirmatory sampling is completed and approval of the Navy is obtained, the excavation will be backfilled as detailed in Section 4.9.4 and 4.16.

#### **4.9.4 Backfill**

The site will be backfilled with crushed stone or graded sand to a elevation of 6" below final grade. The final grade will be the original elevations as measured during the preconstruction survey. The only exception is where the existing soil depths are less than 6 inches, the final grade will be 6 inches from the top of the caprock. A 6 inch layer of topsoil will be placed over the backfill and graded. The layer of topsoil will be at least 6 inches even in areas where the existing depth of soil was less than 6 inches. Care will be taken to ensure that the final grade elevations are maintained to allow revegetation by natural colonization. A completion survey will be performed after backfilling is complete.

#### **4.8.5 Wetlands Restoration**

##### **Background Information**

Wetlands impacted by remedial activities will be restored by backfilling with clean backfill and allowed to revegetate by natural colonization. The long term objective of the mitigation is to establish a persistent wetland with a native wetland species plant density of at least 50% aerial canopy cover in three years.

## **Revegetation**

The restoration sites are immediately adjacent to mature "seed" (propagule) producing mangroves and tidal or wave action is not expected to impact seedling establishment and natural recolonization will be used to revegetate the mitigation sites.

## **Reporting**

Documentation of mitigation performance will consist of a submittal of an initial grading and revegetation plan marking the end of the construction period and the beginning of the monitoring period. This report will be prepared by BEI. Three annual reports during the monitoring period will document revegetation progress, habitat use and water depth at a reference point. These annual reports will be prepared by the Natural Resource Manager at NAS - KW, and will include panoramic photographs of the existing condition of the reference point, as well as demonstrations of progress.

### **4.8.6 Transportation of Contaminated Soil**

To the extent practical, contaminated soil will be loaded directly into dump trucks or suitable containers. Stockpiling may also be used for material handling. Handling of hazardous waste and non-hazardous contaminated material will follow the Waste Management Plan detailed in Section 6.0. Transportation of contaminated materials will be accomplished as detailed in Sections 4.17 and 6.7 as appropriate.

## **4.9 SWMU NO. 2 - BOCA CHICA DDT MIXING AREA**

### **4.9.1 Interim Remedial Action**

The IRA objectives at the Boca Chica DDT Mixing Area are:

- contaminant source removal to prevent further migration of waste into other media and
- to comply with regulatory requirements.

To accomplish this objective, the scope of work for the Boca Chica DDT Mixing Area will consist of the following elements:

- excavation and dredging of pesticide contaminated sediments from the adjacent man-made ditch;
- on-site treatment of pesticide contaminated surface water;
- excavation of pesticide contaminated soils;
- offsite treatment/disposal of the excavated soils;
- backfill with clean fill;
- natural colonization of the wetland areas; and
- natural revegetation of the upland areas with native upland species.

### **4.9.2 Regulatory Requirements**

#### **RCRA Waste Analysis**

Process knowledge indicates that this SWMU was a DDT mixing area, and sampling data indicates that DDD, DDE and DDT are present in soil. DDD, DDE and DDT are listed RCRA wastes when these commercial chemical products have been spilled and contaminated soil or debris (see 40 CFR 261.33). Therefore, these soils contaminated with DDD, DDE and DDT are hazardous waste (with RCRA waste codes U060 and U061) and will be managed, transported, and disposed in accordance with Federal and FDEP RCRA requirements.

#### **Interim Remediation Goals**

The Interim Remediation Goal for this site is to remove the source area of the pesticide contamination. Two different sets of cleanup goals for soils are applicable to this site. One set for the upland areas and one set for sediment in the drainage ditch. Also surface water cleanup goals are included.

### UPLANDS

The cleanup guidelines for the soils contaminated with pesticides in the upland areas are:

- DDD - 17 ppm
- DDE - 9.9 ppm
- DDT - 12 ppm

These cleanup goals are based on the industrial guidelines from FDEP's "Soil Cleanup Goals for Military Sites" dated April 5, 1995.

### WETLANDS

The cleanup guidelines for the sediments contaminated with pesticides in the ditch are:

- DDD - 0.00122 ppm
- DDE - 0.00207 ppm
- DDT - 0.00119 ppm

These cleanup goals are based on the TEL values from Table 4 of FDEP's "Approach to the Assessment of Sediment Quality in Florida Coastal Waters", dated November 1994.

It is expected that the cleanup goals for the uplands will be reached within the limits of the proposed excavation. However, it appears that the background levels of pesticides surrounding SWMU-2, as determined by the delineation sampling, are far above the proposed sediment cleanup goals. Upland soil containing these background levels of pesticides will continue to wash into the ditch after completion of this IRA. It is therefore unlikely that the ditch can be permanently restored within the scope of this IRA. For this reason only the portion of the ditch that is adjacent to the source area will be included in the excavated area as indicated on the attached figure. The remaining portion of this ditch will be addressed by the risk assessment.

### SURFACE WATER

The cleanup guidelines for the surface water in the ditch contaminated with pesticides are:

- DDD - 1.0 ppb
- DDE - 1.0 ppb
- DDT - 1.0 ppb

These cleanup goals are from the wetlands permit.

### **Protection of Natural Resources**

BEI has determined that the boundaries of excavation will impact regulated wetland areas, mangrove habitat and endangered species (Lower Key Marsh Rabbit) habitat. Permits from both the State of Florida and the U.S. Army Corps of Engineers have been issued. All work will be conducted following the permit requirements.

The area south of the ditch has been identified as an area of known Marsh Rabbit habitat. BEI will comply with the U.S. Fish and Wildlife Service and Florida Fish and Game Commission requirements with respect to this area of habitat. The following steps will be followed for work in this area:

- Before work starts in this area the NAS Key West Natural Resources Manager will be contacted.
- The area will be surveyed under the direction of the NAS Key West Natural Resources Manager to ensure that no rabbits are in the work area.
- Once this survey is completed and the area is clear of any rabbits, the vegetation will be mowed or scraped away. This will prevent the rabbits from returning until the remediation activities at the site are complete.
- During the remediation, the construction crew will totally avoid driving equipment or vehicles into the areas that have not been mowed or scraped.
- Once all the contaminated soils have been removed backfill shall be carefully placed to allow the natural grasses, sedges and other upland vegetation to recolonize the area.
- Erosion control devices and methods will be used to retain the topsoil. This will include covering the backfill next to the ditch with erosion control mats.

### **Waste Management Requirements**

Best management practices will be used to prevent stormwater runoff from becoming a pathway for migration of contamination. Some equipment on the site will come in contact with hazardous waste and will be decontaminated if required. Decontamination water may be used for dust suppression and if any remains at the conclusion of the work, it will be collected, sampled, and if contaminated, treated and properly disposed of.

### **4.9.3 Excavation of Contaminated Soils and Sediments**

Primary excavation limits have been determined from the RFI/RI Report and the field delineation sampling and are shown on Figure 1.

- Before excavation begins at SWMU-2, a location survey for underground utilities will be performed with standard field utility detection equipment.
- Existing elevations of the site will be surveyed prior to the start of excavation. This information will be used to place backfill.
- The existing monitoring wells on site are to remain in place. Any damage to these wells caused by the excavation at SWMU-2 will be repaired.

## **Sequence of Work Activities**

The following details the required sequence of work activities for the successful completion of the remedial activities at SWMU-2.

### **CLEARING**

The SWMU-2 site will be cleared. The upland grass areas will be mowed or scraped to remove any vegetation that might attract the endangered Lower Key Marsh Rabbits. The Mangroves and other trees and bushes along the ditch will be removed. The soil along the ditch will be excavated back 5 to 10 feet to expose the caprock along the ditch and the areas where the rubber cofferdams are to be installed will be prepared.

### **COFFERDAM INSTALLATION**

Waterfilled coffer dams will be placed at each end of the excavation area in the ditch as shown on Figure 2. These barriers shall be monitored during construction to ensure that they are performing properly. These cofferdams will be filled until the top of the cofferdam is 3 inches above the water level in the ditch. This will allow stormwater to overtop the cofferdams in the event of a major storm. The cofferdams will be installed per the vendor's instructions. Vendor's literature for the cofferdams is included in Attachment 1.

Once the cofferdams are in place and until they are removed, a storm water pump system will be on site to lower the water levels in case of a storm event. A 3" diameter gasoline powered trash pump will be rented and will be on standby at the site the entire time that the cofferdams are in the ditch. The trash pump has a capacity to move water at a rate of 425 gallons per minute. Vendor's literature for the trash pump is included attachment 1.

### **SEDIMENT BARRIERS**

Temporary straw bale sediment barriers will be placed along each edge of the ditch before any excavation begins. The straw bales will be wrapped or draped with GTF 180 Silt Fence as they are installed. These barriers will be inspected during the duration of the work at the site and repaired as necessary. Vendor's literature for the silt fence is included in Attachment 1.

### **SEDIMENT EXCAVATION**

An excavator with a toothless bucket will be used to scoop out the majority of the sediments from the ditch. This material will be stockpiled on the upland area adjacent to the ditch to dry and drain. This stockpile will be within the limits of excavation. The straw bale barriers will be used to prevent any sediment from migrating back to the ditch.

### **SEDIMENT DREDGING**

After the excavator has removed as much of the sediments as practicable, the ditch will be dredged with a dredge pump attached to the excavator arm. The dredge pump is a self contained unit that uses a generator to provide its power. The sediments will be dredged down to the rock in the bottom of the ditch. The sediments will be pumped to the drying bed (see Figure 3 for details). The drying bed will filter out the sediment and allow the water to return to the ditch. The Mirafa filter fabric will be used to filter the water from the drying bed. Vendor's literature for the dredge pump and the filter fabric are included in Attachment 1.

### TREATMENT OF THE CONTAMINATED WATER IN THE DITCH

The water that remains in the ditch after all the sediments are removed could be contaminated with pesticides. Samples of the water will be collected prior to starting of water treatment and tested for pesticides. The samples will be submitted with a 2-day turnaround. The water in the ditch will be allowed to settle for 48 hours before the treatment begins. If this water is contaminated it will be treated onsite before the cofferdams are removed. Prior to starting the pumping the field will measure the depth of water in the ditch and the width of the ditch in three locations. These measurements will be used to determine the actual required treatment time.

A 50 gpm carbon treatment unit will be used to treat this water. Carbon is an excellent treatment system for the treatment of pesticide contaminated water with an absorptive capacity of 346 mg/g. In this case with a 50 gpm unit and an inlet concentration of pesticides of 80 ppb in the water, the carbon will be used up at a rate of 0.129 pound per day. The 80 ppb is a worst case estimate of surface water pesticide concentrations after removal of the sediments. The discharge concentrations will be non-detect. Vendor's literature of the carbon unit is included in Attachment 1. A small 50 gpm gasoline powered pump will be rented locally by the field for the water treatment system. The suction line will be placed in one end of the ditch and the discharge line will be routed to the opposite end of the ditch. The system will be operated until the total volume of water treated equals twice the volume of the water in the ditch. It is estimated that it will take 48 hours to treat the water in the ditch. Records will be kept during the operation of the system to record flow rates and any downtime. The flow rate will be monitored every two hours by timing the time that it takes to fill a 5 gallon bucket. After the required volume is circulated through the treatment system, the water in the ditch will once again be tested for pesticides. Once the cleanup goals of 1 ppb for pesticides are met, the cofferdams will be removed.

### CONTAMINATED SOILS

Contaminated soils will be excavated from the upland areas on both sides of the ditch. This excavation will also remove the sediment that was excavated and dredged from the ditch. The limits of the excavation are shown on Figure 1. Confirmation sampling will be used to finalize the exact limits of the excavation. Upland excavation can be ongoing with the sediment removal and water treatment.

- The soils will be excavated, stockpiled if necessary within the limits of excavation, and then loaded into dump trucks or suitable containers for transportation to a RCRA-permitted treatment/disposal facility.
- The depth of excavation of soils in the upland areas at SWMU-2 will be to caprock or to the water table, whichever is reached first.

#### **4.9.4 Confirmatory Sampling**

Confirmatory samples will be collected from the excavated area to verify removal of impacted soil. Samples will be collected from the excavation sidewalls and analyzed for pesticides using IMU field test kits. The analysis using these test kits will be performed in a controlled environment. Sample locations and quantities are indicated on the attached figure and can be adjusted based on field conditions, the actual excavation limits, and presence of the sample matrix. No samples will be taken from the bottom of the excavation or from the ditch. If the field screening analysis confirms that the cleanup levels have been achieved, final confirmatory samples will be collected and sent for off-site analysis. The sample analysis results will be required to be submitted to BEI within 2-days. DQO levels are described in Section 5.2 of the Remediation Work Plan.

When the confirmatory sampling is completed and the approval of the Navy is obtained, the excavation will be backfilled.

#### **4.9.5 Backfill**

The site will be backfilled with crushed stone or graded sand to an elevation of 6 inches below final grade. The final grade will be the original elevations as measured during the preconstruction survey. The only exception is where the existing soil depths are less than 6 inches, the final grade will be 6 inches from the top of the caprock. A 6 inch layer of topsoil will be placed over the backfill and graded. The layer of topsoil will be at least 6 inches even in areas where the existing depth of soil was less than 6 inches. Care will be taken to ensure that the final grade elevations are maintained to allow revegetation by natural colonization. A completion survey will be performed after backfilling is complete.

Erosion control devices and methods will be used to retain the topsoil. These will include:

- Installing a sediment barrier along both sides of the ditch. This barrier will be constructed by laying the GTF 200 filter fabric on the ground, stacking sandbags twelve inches high and wrapping the filter fabric around the bags. The ends of the filter fabric will be placed away from the ditch and beneath the backfill. The sand bags will be filled with the backfill material. The filter fabric material vendor's literature is included in Attachment 1.
- Covering the backfill on each side of the ditch with a 25 foot strip of erosion control mats these mats will be Curlex II erosion control blankets. Vendor literature is included in the Attachment 1.

The sediment barrier will not be removed until upland vegetation has been established as specified in the wetlands permit. The Navy will be responsible for inspection, maintenance, and removal of these sediment barriers.

## **4.9.6 Wetlands Restoration**

### **Background Information**

Wetlands impacted by remedial activities will be restored by allowing them to revegetate by natural colonization. The long term objective of the mitigation is to establish a persistent wetland with a native wetland species plant density of at least 50% aerial canopy cover in three years.

### **Revegetation**

The wetland restoration site is immediately adjacent to mature "seed" (propagule) producing mangroves and tidal or wave action is not expected to impact seedling establishment. Therefore, natural recolonization will be used to revegetate the site.

### **Reporting**

Documentation of mitigation performance will consist of a submittal of an initial grading and revegetation plan marking the end of the construction period and the beginning of the monitoring period. This report will be prepared by BEI. Three annual reports during the monitoring period will document revegetation progress, habitat use and water depth at a reference point. These annual reports will be prepared by the Natural Resource Manager at NAS - KW, and will include panoramic photographs of the existing condition of the reference point, as well as demonstrations of progress

## **4.9.7 Transportation of Contaminated Soil**

To the extent practical, contaminated soil will be loaded directly into dump trucks or suitable containers. Stockpiling in upland areas within the limits of excavation may also be used for material handling. Handling of the contaminated material will follow the Waste Management Plan detailed in Section 6.0. Transportation of contaminated materials will be accomplished as detailed in Section 4.17 and 6.7 as appropriate.

## **4.9.8 Precautions for Operations Around the Airfield**

Special care will be exercised during work at the SWMU-2 site. Each truck and piece of equipment will be inspected prior to crossing the runway to ensure that all loose and foreign material is removed. If any foreign material does fall from trucks and equipment crossing the taxiway, it shall be immediately removed. All drivers will be instructed in the proper crossing procedures. Additionally, a responsible individual will be assigned to police the taxiway for foreign material in the crossing area and to coordinate traffic movement with the air operations.



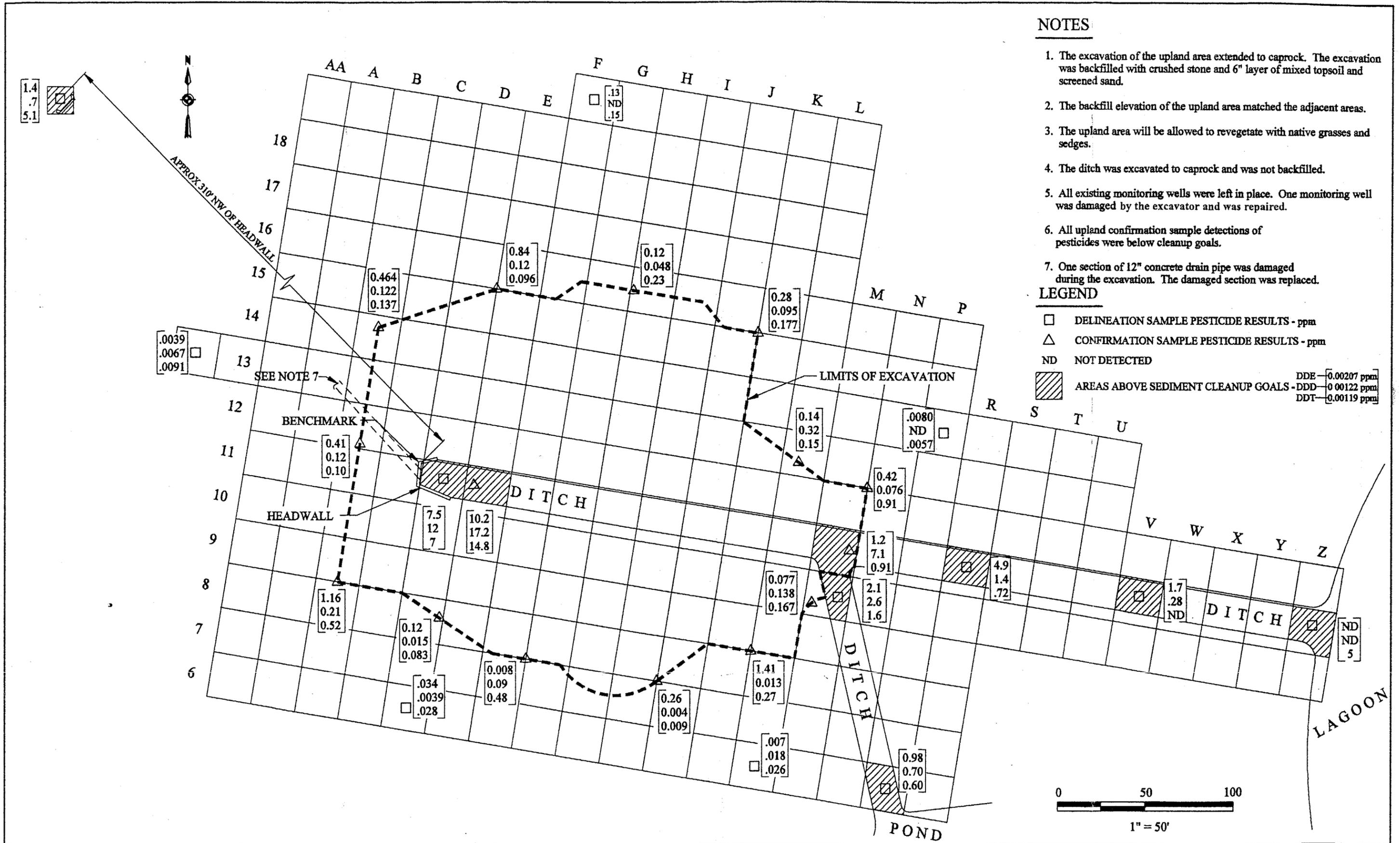


Figure 9-1  
SWMU-2 BOCA CHICA DDT MIXING AREA  
AS PLUMTS