FINAL

WORK PLAN
AMENDMENT 2

Contains
FIELD SAMPLING PLAN
QUALITY ASSURANCE PROJECT PLAN
SITE SAFETY AND HEALTH PLAN

LONG-TERM MONITORING
LANDFILL NOs. 3 (SWMU 105), 4 (SWMU 104), AND 25 (SWMU 97)

CANNON AIR FORCE BASE
CLOVIS, NEW MEXICO

Contract Number DACW45-94-D-0031
Project Number 98-325

Prepared for

U.S. Army Corps of Engineers
Omaha District

Prepared by

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May 1999

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1.0 PROJECT DESCRIPTION

Foothill Engineering Consultants, Inc. (FEC) has prepared this Work Plan to serve as a guidance document for the long-term monitoring program at Cannon Air Force Base (CAFB) near Clovis, New Mexico (Figure 1-1). This Work Plan consists of the Field Sampling Plan (FSP), the Quality Assurance Project Plan (QAPP), and the Site Safety and Health Plan (SSHP).

PURPOSE

FEC will perform the activities described in this Work Plan under U.S. Army Corps of Engineers (USACE) General Contract Number DACW 45-94-D-0031, Delivery Orders 0029 and 0033. The scope of services includes semi-annual of monitoring well R located downgradient of Landfill 25 and annual monitoring for wells O and N located downgradient of Landfills 3 and 4, respectively. Landfills 3, 4 and 25 are located on CAFB property (Figure 1-2).

The long-term monitoring program meets the New Mexico Environmental Department's (NMED) Assessment Monitoring requirements for solid waste management units (SWMU) located in the state of New Mexico. Groundwater quality monitoring for SWMUs 3, 4, and 25 is being conducted to collect groundwater data for eventual use during post-closure monitoring. All sampling events described in the SOS serve as follow-on monitoring of the three SWMUs.

The purpose of the long-term monitoring program is to assess whether the associated SWMUs have leaked hazardous waste constituents into the adjacent groundwater. The long-term monitoring program meets requirements under 40 Code of Federal Regulations (CFR) 264.97, and meets the NMED Solid Waste Management Regulations 20 New Mexico Administrative Code (NMAC) 9.1, Subpart VIII, and the New Mexico Hazardous Waste Management Regulations 20 NMAC 4.1.

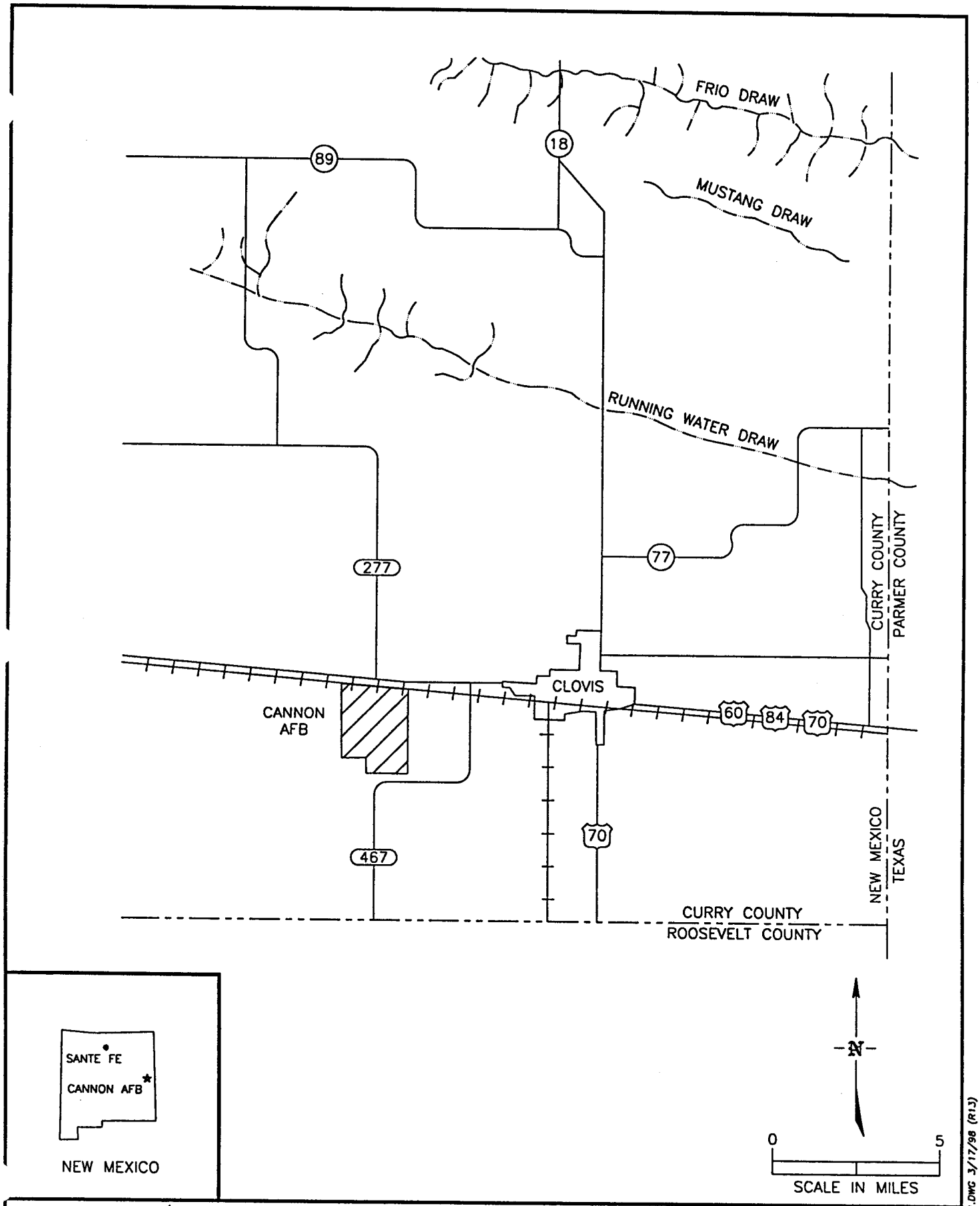
1.2 SITE BACKGROUND: LANDFILL NO. 3 (SWMU NO. 105), LANDFILL NO. 4 (SWMU NO. 104), LANDFILL NO 25 (SWMU 97)

1.2.1 SWMU 105 (Landfill No. 3)

Landfill No. 3 is located in the east-central portion of CAFB. It is approximately 1,960 feet by 300 feet (13.5 acres) and rectangular in shape. Currently, the site is an open field covered with native vegetation. The landfill was in operation between 1959 and 1967. During this time, domestic solid wastes, waste oils, solvents, paints, paint thinners, pesticide containers, and empty drums were burned in trenches. As trenches filled, new trenches were excavated in adjacent areas and subsequently filled. In the past, borings have been drilled at the site. Soil samples from the borings were analyzed for volatile organic compounds (VOCs), metals, oils, and grease. In January 1995, one monitoring well, MW-O, located downgradient of Landfill 3, was sampled and found to contain detectable concentrations of carbon tetrachloride, 1.6 micrograms per liter (µg/L), and toluene, 6.8 µg/L. Gasoline-range organic (GRO) compounds were detected at a concentration of 16 µg/L. Metal analytes detected include arsenic, 0.022 milligrams per liter (mg/L); barium, 0.064 mg/L; selenium, 0.0025 mg/L; and vanadium, 0.018 mg/L.

1.2.2 SWMU 104 (Landfill No. 4)

Landfill 4 is located near Landfill 3 in the east-central portion of the base. It is rectangular in shape and has the approximate dimensions of 573 feet by 479 feet (6.3 acres). Landfill 4 was active between 1967 and 1968. During this time, domestic solid wastes, waste oils, solvents, paints, paint thinners, pesticide containers, and empty drums were burned in trenches. As trenches filled, new trenches were excavated in adjacent areas and subsequently filled. Soil samples have been collected from previous investigation of the landfill. Laboratory analysis was performed for VOCs, metals, oil, and grease. One monitoring well, MW-N, was installed and developed downgradient of the site. The well was initially sampled in January 1995. Results of the sample analyses indicated that toluene was present at a concentration of 5.7 µg/L. A duplicate sample taken from the well contained toluene at 6.4 µg/L. GRO compounds were also detected in the sample and duplicate sample collected from the well. GRO concentrations of 17 µg/L and 14 µg/L were

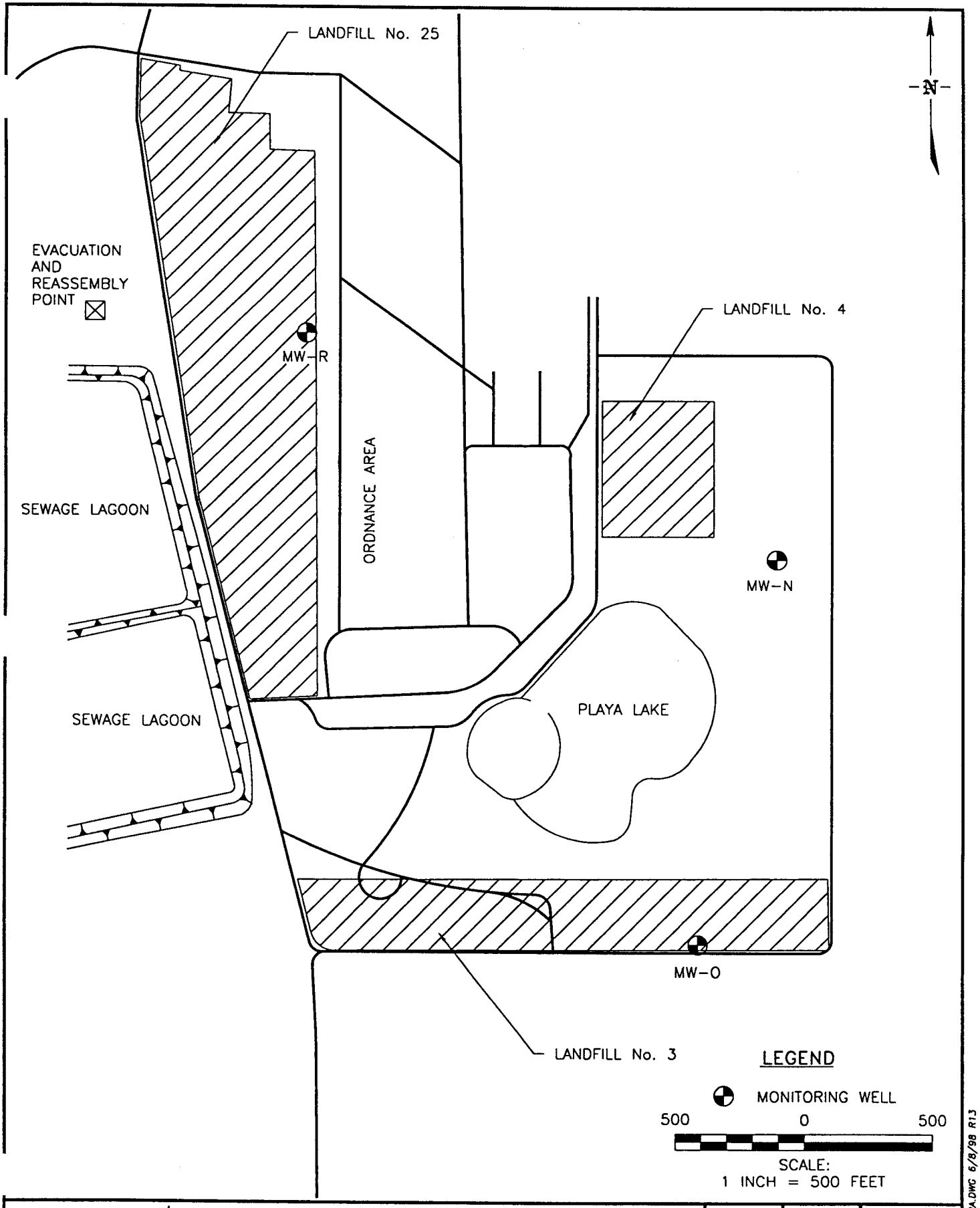


FOOTHILL ENGINEERING CONSULTANTS, INC.

FIGURE 1-1
SITE LOCATION MAP
CANNON AIR FORCE BASE

DATE:	SCALE:	DRAWN BY:
4/98	SHOWN	SHN

96-333\FIGURE1.DWG 3/17/98 (RIJ)



FOOTHILL ENGINEERING CONSULTANTS, INC.	FIGURE 1-2 MONITORING WELL LOCATION MAP CANNON AIR FORCE BASE	DATE: 6/98	SCALE: 1"=500'	DRAWN BY: SHN

97-336\FIG1-2A.DWG 6/8/98 R13

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1.0 PROJECT DESCRIPTION

Foothill Engineering Consultants, Inc. (FEC) has prepared this Field Sampling Plan (FSP) to address field activities, reporting, and scheduling associated with semi-annual sampling for Landfill 25 (Well R) and annual sampling for Landfill 3 (Well O) and Landfill 4 (Well N) at Cannon Air Force Base (CAFB), Clovis, New Mexico.

1.1 PURPOSE AND SCOPE

This FSP is designed to describe the tasks to be conducted to satisfy the requested scope of services. The FSP describes task activities for sampling and associated standard operating procedures (SOPs), investigative derived material management, and reporting for monthly progress reports, daily quality control reports, and monitoring reports (semi-annual and annual).

This FSP is supplemented by the Quality Assurance Project Plan (QAPP) for the acquisition of data of known and sufficient quality including field quality and laboratory quality procedures.

2.0 TASK ACTIVITIES

This section presents FEC's plan for field activities, reporting, and project scheduling. Field activities include semi-annual groundwater sampling of MW R at Landfill 25 and annual groundwater sampling of MWs O and N at Landfills 3 and 4, respectively. Field activities will be performed in accordance with the SOPs presented in Appendix A. Tables 2-1 and 2-2 present the planned activities for each sampling event.

2.1 GROUNDWATER SAMPLING

MWs O, N, and R will be sampled for the constituents listed in Table 2-2. The required sample containers, sample preservation, and holding times are presented in Table 2-3. The semi-annual sampling events for MW R will occur in June and December 1998 and 1999. The annual sampling event for MWs O and N will occur in December 1998 and 1999.

Prior to sampling, the depth to groundwater will be measured in each monitoring well. Water level measurement procedures are presented in Appendix A (SOP 1, Water Level Survey). The water levels will be recorded on groundwater level measurement sheets (SOP 1, Appendix A).

Each monitoring well will be purged and sampled using a dedicated Bennett piston pump previously installed in each of the monitoring wells. At least three casing volumes of groundwater will be purged prior to sampling. Temperature, pH, conductivity, dissolved oxygen, salinity, and turbidity will be measured using procedures presented in Appendix A (SOP 2, Field Measurement of Water Quality Parameters). The field equipment will be calibrated following manufacturer procedures prior to use. The purge parameters will be recorded on well purge data sheets presented in Appendix A (Figure 4-1, SOP 4, Groundwater Sampling). Turbidity will be no greater than 5.0 nephelometric turbidity units (NTU) at the completion of purging. These parameters will be measured at the beginning of purging and twice per casing volume removed. Purging will continue beyond three casing volumes, if needed, until the parameters have stabilized.

Table 2-1. Monitoring Wells N, O, and R at Landfills 3, 4, and 25 Groundwater Samples Per Semi-Annual Event

Parameter/Method	Quality Control (A-E) Samples					Quality Assurance (MRL) Samples			
	# of Field Samples	# of Dups/ Splits	# of Sampler Rinsates	# of Trip Blanks	Total AE Samples	QA Dups/ Splits	QA Sampler Rinsates	QA Trip Blanks	Total QA Samples
Appendix IX VOCs/8260B	3	1	0	1	5	1	0	1	2
Appendix IX SVOCs 8270C (including Petroleum Aromatic Hydrocarbons)	3	1	0	0	4	1	0	0	1
TAL Metals 6010B. Series	3	1	0	0	4	1	0	0	1
PCBs / 8082	3	1	0	0	4	1	0	0	1
Pesticides Organochlorinated/ /8081A	3	1	0	0	4	1	0	0	1
Pesticides Organophosphates/ 8140	3	1	0	0	4	1	0	0	1
Chlorinated Herbicides / 8151	3	1	0	0	2	1	0	0	1
Chloride / 300.1	3	1	0	0	4	1	0	0	1
Sulfate / 300.1	3	1	0	0	4	1	0	0	1
Nitrate / 300.1	3	1	0	0	4	1	0	0	1
Phenol / 420.2	3	1	0	0	4	1	0	0	1

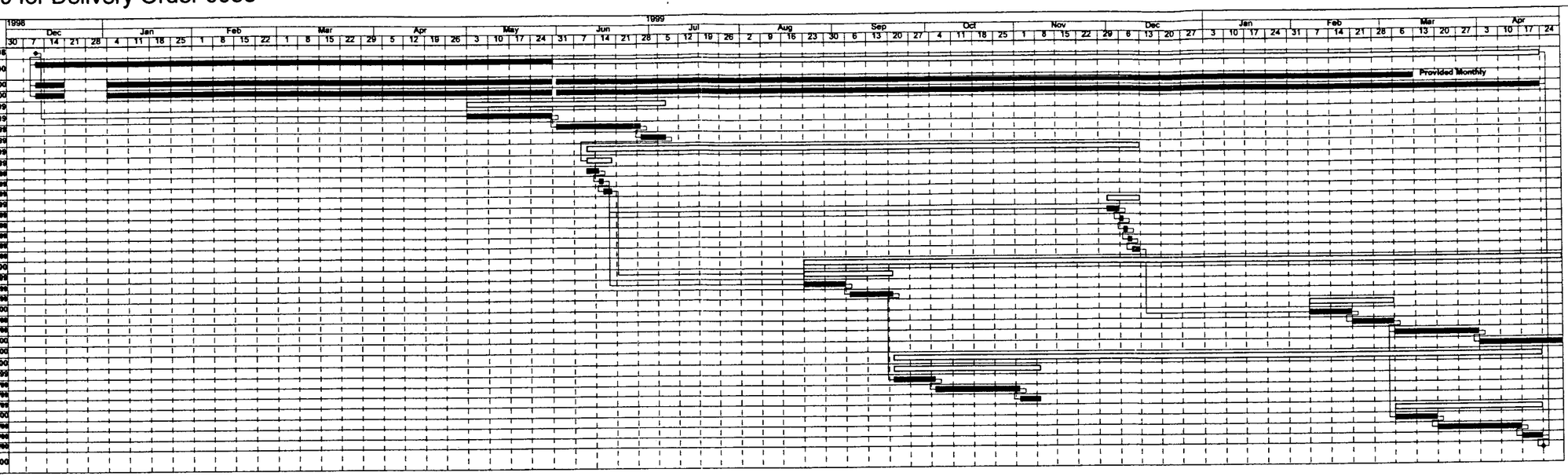
= number
A-E = Architect-Engineer
Dups = duplicates
MRL = Missouri River Laboratory
QA = quality assurance
PCB = polychlorinated biphenyl
SVOC = semivolatile organic compound
TAL = target analyte list
VOC = volatile organic compound

ATTACHMENT 1

Cannon Air Force Base Long-Term Monitoring Program

Project Schedule as of May 1999 for Delivery Order 0033

WBS Code	Task	Dur	Start	Finish
	NOTICE TO PROCEED	0d	12/10/98	12/10/98
	PROJECT MANAGEMENT	329d	12/10/98	04/21/00
	Submit Monthly Progress Reports / Schedule	299d	12/10/98	03/10/00
	Project Scheduling / Organization / Coordinat	329d	12/10/98	04/21/00
	WORK PLAN	45d	05/03/99	07/06/99
	Prepare Draft FSP/QAPP/SSHP Addendum	20d	05/03/99	06/28/99
	Agency Review / Comment	20d	06/01/99	06/28/99
	Prepare Final FSP/QAPP/SSHP	5d	06/29/99	07/06/99
	LTM GROUNDWATER SAMPLING	125d	06/10/99	12/10/99
	Collect Semi-Annual GW Samples	6d	06/10/99	06/17/99
	Prepare for Field Investigation	3d	06/10/99	06/14/99
	Perform Landfill No. 25 Sampling	1d	06/15/99	06/15/99
	Mobilize / Demobilize	2d	06/16/99	06/17/99
	Collect Annual GW Samples	8d	12/01/99	12/10/99
	Prepare for Field Investigations	3d	12/01/99	12/03/99
	Perform Landfill No. 25 Sampling	1d	12/06/99	12/06/99
	Perform Landfill No. 4 Sampling	1d	12/07/99	12/07/99
	Perform Landfill No. 3 Sampling	1d	12/08/99	12/08/99
	Mobilize / Demobilize	2d	12/09/99	12/10/99
	CHEMICAL ANALYSIS / QUALITY CONTROL	164d	08/23/99	04/28/00
	Semi-Annual GW Sampling QC	20d	08/23/99	09/20/99
	Prepare Semi-Annual Analytical Data Package	10d	08/23/99	09/03/99
	Validate Semi-Annual Analytical Data	10d	09/07/99	09/20/99
	Annual GW Sampling QC	20d	02/07/00	03/03/00
	Prepare Annual Analytical Data Package	10d	02/07/00	02/18/00
	Validate Annual Analytical Data	10d	02/21/00	03/03/00
	Prepare QCSR	20d	03/06/00	03/31/00
	ERPIMS Data Entry / Management	20d	04/03/00	04/28/00
	REPORTING	139d	09/21/99	04/21/00
	Semi-Annual Reporting	35d	09/21/99	11/08/99
	Prepare Draft State of N. Mexico Semi-Annual Re	10d	09/21/99	10/04/99
	Agency Review and Comment	25d	10/05/99	11/08/99
	Prepare Final State of N. Mexico Semi-Annual Re	5d	11/02/99	11/08/99
	Annual Reporting	35d	03/06/00	04/21/00
	Prepare Draft State of N. Mexico Annual Report	10d	03/06/00	03/17/00
	Agency Review / Comment	25d	03/20/00	04/14/00
	Prepare Final State of N. Mexico Annual Report	5d	04/17/00	04/21/00
	PROJECT COMPLETION	0d	04/21/00	04/21/00



Default

Complete | Complete Milestone | Remaining | Remaining Milestone | Free Float | Total Float (+) | Total Float (-) | Delay | Non-Resource | Required Date | % Labor Complete

Critical

Remaining | Remaining Milestone

Parent

Remaining | Remaining Milestone

schedule tentative

p:/ps7/projects/98-