

N83447.AR.000403
NAS FORT WORTH
5090.3a

MEETING MINUTES FROM BASE REALIGNMENT AND CLOSURE MEETING HELD 6
NOVEMBER 1998 WITH ATTACHMENTS NAS FORT WORTH TX
11/6/1998
BRAC TEAM



**NAVAL AIR STATION
FORT WORTH JRB
CARSWELL FIELD
TEXAS**

**ADMINISTRATIVE RECORD
COVER SHEET**

AR File Number 441

**Minutes for the
BCT Meeting, 6 November 1998
At the Former Carswell Air Force Base (AFB), Texas**

The meeting was conducted on 6 November 1998 to discuss the status of active Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs), including recent investigation findings and plans for future work. These meeting minutes document the topics of discussion and the results of the meeting.

Meeting Attendees

<u>NAME</u>	<u>ORGANIZATION</u>	<u>PHONE</u>	<u>E-MAIL</u>
Mark Weegar	TNRCC	(512) 235-2360	mweegar@tnrcc.state.tx.us
Tim Sewell	TNRCC	(817) 496-6750	Tsewell@state.tx.us
Gary Miller	EPA	(214) 665-8306	Miller.gary@epa.gov
Joe Dunkle	HQ AFCEE/ERD	(210) 536-5390	Joe.dunkle@hqafcee.brooks.af.mil
Michael Dodyk	HQ AFCEE/ERD	(817) 732-9734	Michael.Dodyk@hqafcee.brooks.af.mil
Alvin Brown	AFBCA/OL-DC	(512) 386-5425	Abrown@afbda1.hq.af.mil
Rafael Vazquez	AFBCA/OL-DC	(512) 386-5425	Rvazquez@afbda1.hq.af.mil
Thomas Doriski	Fannie, Phillips & Molnar	(210) 524-7737	Tdoriski@aisi.net
Atul Salhotra	Fannie, Phillips & Molnar	(713) 784-5151	Smatul@aol.com
Mark Maki	IT Corporation	(423) 690-3211	Mmaki@itcrp.com
Todd Harrah	Universe Technologies	(210) 536-5840	Tharrah@unitec-tx.com
Amy Hardberger	Universe Technologies	(210) 333-4466	Ahardberger@unitec-tx.com
Bob Duffner	The Environmental Company	(425) 557-7899	Rmduffner@tecinc.com
Jim Costello	HydroGeoLogic	(703) 736-4507	Jpc@hgl.com

Meeting Began 0810 hours

General Announcements

Mr. Weegar announced that Ray Reisner is the new Texas Natural Resource Conservation Commission (TNRCC) Carswell Project Manager, however, while he transitions in, he will only be working with Joe Dunkle on the Defense Environmental Restoration Account (DERA) projects. During that time, Mr. Weegar will remain in charge of Base Realignment and Closure (BRAC).

Offsite Weapons Storage Area (WSA) Status Briefing

Mr. Duffner discussed the status of the WSA. Sampling took place in October 1998 to delineate contamination identified during the Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) and validate questionable results. Mr. Duffner stated that some of the sites that showed contamination in the RFI proved to be anomalous because no contamination was detected during the recent October sampling. Mr. Weegar asked if site analyses were non-detect (ND), or below cleanup levels. Mr. Duffner responded that the samples were ND. A few locations require additional sampling to delineate contamination. Polynuclear Aromatic Hydrocarbons (PAHs) seem to be a result of the roadway and not a point source.

Mr. Duffner requested a meeting with the TNRCC, Environmental Protection Agency (EPA) and Air Force Base Conversion Agency (AFBCA) to review remediation plans. The meeting was set for 17 December 1998 in Austin, Texas. The RFI will be finalized to include new data. A limited removal will be performed; and closure documents will be issued. Mr. Duffner raised a concern about the closure procedure. The WSA only has one SWMU but the broad investigation exposed contaminated areas not covered by a SWMU or an AOC. Mr. Vazquez suggested that a Decision Document be issued to allow for property transfer after the RFI is completed. Mr. Weegar said regardless of the presence of a SWMU, any release must be closed under Risk Reduction Standards (RRS). The RRS requires submittal of a Final Report explaining attainment of Standards 1, 2 or 3. Mr. Weegar approved the use of one closure document for the SWMU and other sites. Mr. Brown suggested attempting to close it as Standard 1 to avoid a deed restriction or notice. Mr. Duffner was also concerned that, because the area chosen to determine the background was an agricultural area, the results seen at the WSA could just be a result of human inhabitants and not a release. Therefore, these sites should not be included in the Final RFI. Mr. Weegar remarked that if the samples do not have a distribution indicative of a release, or if the constituents are not consistent with the waste managed at the site, the Final Report needs to state that contamination was found but does not suggest a release. The results can be attributed to a variation in background. Mr. Sewell asked if there was evidence of fill importation. Mr. Duffner replied that examination of aerial photos showed no evidence of fill.

Mr. Duffner stated that Underground Storage Tank (UST) areas will also be excavated. Mr. Weegar instructed that these sites be reviewed by the TNRCC Petroleum Storage Tank (PST) division. Mr. Duffner requested that they remain in the report and sent to both TNRCC divisions. Mr. Weegar agreed. Because the Work Plan is still valid, Mr. Duffner is planning to submit a letter summarizing the December meeting, and excavation will begin in January 1999. Mr. Duffner asked if the regulatory agencies require copies of the voluminous analytical data. Mr. Brown stated that the AFBCA would need either the originals or copies. Mr. Weegar and Mr. Miller agreed that they did not need a copy of the raw analytical data.

Mr. Duffner stated that there were no unusual results in the FamCamp samples. He asked if a letter stating that the original report was valid would be sufficient. Mr. Weegar said that he would have to check because the agency initiative is to not accept any reports with ITS data. A final decision will be made at the December meeting.

Sanitary Sewer System (SSS) Status Briefing

Mark Maki discussed the status of the SSS. Mr. Maki reviewed the background of site and the RFI findings. Mr. Maki explained that the RFI was performed under the Texas Risk Reduction Rules that were never promulgated. Mr. Maki reviewed the major TNRCC comments to the Draft RFI. The major concern was that the RFI did not fully characterize the nature and extent of any hazardous constituents. Another comment included, that the RRS require a full definition of the aerial and vertical extent of contamination, which was not done. In addition, the Baseline Risk Assessment (BRA) should be separate from the RFI report. Mr. Maki stated that, similar to the WSA, some areas that had contamination that were not SWMUs, and in other areas, nearby SWMUs were responsible for contamination. Mr. Maki asked how to separate impacts from the

SSS and those caused by industrial activity. A rough estimate to determine the lateral extent of the inorganics to background and organics to Practical Quantitation Limit (PQLs) was approximately \$500K.

Mr. Maki proposed working with regulators to find an approach that avoided a full Phase II RFI due to financial constraints. He proposed a statistical sample selection of 10% of the previous sampling locations randomly chosen for SPLP testing. It was also proposed that instead of defining each point that has an exceedence of background or PQL, the boundary of the industrial area will be defined as a Corrective Action Management Unit (CAMU). Mr. Miller stated that a CAMU is difficult to attain. Past CAMU permits have cost at least \$150K because it is considered a permit modification which requires paperwork and special circumstances. Mr. Weegar explained that his comments did not instruct immediate further sampling because the purpose of the investigation was to take a systematic approach to defining releases which he did not feel occurred in the RFI. He also remarked that a risk assessment regulation that has not been promulgated cannot be referenced in a work plan. He explained that the sample results from the RFI are not erroneous but they need to be considered in terms of the accepted RRS 1 or 2. Mr. Weegar also stated that it was not clear why certain decisions in the RFI were made.

Mr. Weegar asked for an explanation of decisions made in the RFI as to why some findings do not represent a release. An explanation is necessary to allow the regulators to agree that no further action is required. Mr. Miller stated that if contamination is a result of another SWMU, the project that is treating it should be stated. Mr. Weegar explained that first, it must be determined if a release occurred. If a release did occur, the contamination needs to be delineated and remediated to the standard chosen. If the contamination is caused by a different source, it needs to be explained in the RFI. Mr. Maki expressed concern in the length of time that would be required to delineate all potential releases associated with the SSS. Mr. Weegar said that in his experience, SSS releases were all fairly localized. Mr. Maki asked how many phases past SSS projects required. Mr. Weegar replied that it typically took two phases; an identification phase and a delineation phase. Mr. Weegar also explained that the purpose of SPLP testing is to determine if soils of concern are likely to leach into the ground water.

Mr. Weegar recommends that the existing data be reexamined to comply with the current Risk Reduction Standards. First, decide if the results indicate a release, or can a case be made that the data does not indicate one. If it appears that the result is associated with another SWMU, it needs to be clarified in the RFI report. In areas that a SSS release is suspected, further sampling may be necessary to define the nature and extent. Mr. Brown added that he feels that most of the areas can be eliminated because of their association with other SWMUs.

Closure Reports Status Briefing

Mr. Doriski discussed the status of the Grounds Maintenance Yard, Golf Course Maintenance Yard, the Unnamed Stream, and the Aerospace Museum. Work Plan Addenda for all of the above named sites will be submitted to the regulatory agencies by 13 November 1998. Mr. Dunkle stated that the French Underdrain is a DERA site. Mr. Doriski explained that there is a 20-30 foot portion of the underdrain extending outside the fence. Mr. Vazquez questioned removing the remainder of the underdrain and the soil if the property could not be transferred

due to ground water contamination. Mr. Miller explained that it must be done eventually and due to the minimal cost it should be done now. Mr. Vazquez agreed, but mentioned to Mr. Doriski that the closure document must clarify that the SWMU is not closed, although a portion of the remedial effort will be complete.

Mr. Weegar explained a new TNRCC directive mandating that no work plans will be reviewed by the agency. Therefore, if approval is desired, it should take place in a scoping meeting. These issues will also be discussed at the 17 December meeting. Mr. Salhotra asked if the submittal of work plans is still necessary. Mr. Miller, Mr. Sewell, and the AFBCA said they need a copy. Mr. Weegar added that the TRNCC directive does not include the EPA. Mr. Doriski stated that he planned for all proposed work to begin January 1999. Mr. Miller and Mr. Sewell asked to be contacted prior to commencement. Mr. Doriski agreed. Mr. Doriski also mentioned that the Treatment, Storage, and Disposal Facility (TSDF) closure report has been submitted to TNRCC.

Mr. Vazquez raised a concern regarding the Grounds Maintenance Yard. There is evidence that the Navy has continued to use the area to mix pesticides, and therefore, the area is still being impacted. Mr. Weegar recommended the production of a baseline report at which point it will be turned over to the Navy. Closure is not required.

Finding of Suitability for Transfer (FOST) Status Briefing

Mr. Vazquez discussed the status of the FOST for the Horse Stable and Prison Hospital. The Horse Stable area has been auctioned off and a FOST should be delivered for review by December 1998. A FOST for the Prison Hospital should be submitted in January 1999.

Other Topics

Mr. Costello stated that additional sampling at Landfills 1 and 9 would occur in December 1998. Ground water sampling at Landfills 2, 3, 6, and 7 will also occur in December 1998. The first quarter 1999 Long Term Monitoring (LTM) event will occur in January. Implementation of the Waste Accumulation Area RFI will begin in February. He also mentioned that three monitoring wells were drilled near the Unnamed Stream, one was dry and two were ND.

Mr. Vazquez asked Mr. Dunkle if he had anything to add. Mr. Dunkle said that he did not.

Action Items

- a. Additional samples will be taken at WSA to complete contamination delineation. A proposal for excavation will be submitted and work should commence in January 1999.
- b. A scoping meeting to discuss the remediation plans at the WSA will take place on 17 December 1998, at 1030 hours, at the AFBCA offices, Austin, Texas.
- c. IT Corporation will determine what further action is necessary at the SSS to adhere to RRS 1 or 2.
- d. Work Plan Addenda will be submitted for Grounds Maintenance Yard, Golf Course Maintenance Yard, the Unnamed Stream and the Aerospace Museum. Work is scheduled to commence in January 1999.
- e. The FOST for the Horse Stable and the Prison Hospital should be complete in January or February 1999.
- f. The next BCT meeting will take place 11 February 1999 in the same location.

Meeting Adjourned 1030 hours

CARSWELL BCT MEETING
November 6, 1998

441 6

BCT Agenda Item #3 – Closure Reports

The permitted Treatment, Storage, and Disposal Facility (TSDF) closure report has been submitted to TNRCC.

FPM has prepared Work Plan Addenda for the Golf Course Maintenance Yard (AOC 9), the Aerospace Museum Site (AOC 8) and the Unnamed Stream Area (IRP site SD-13), which includes the Unnamed Stream (AOC 14), the French Underdrain System/Unnamed Stream (SWMU 64), and the former B 1340 Oil/Water Separator (SWMU 67). These addenda will be distributed for review comments on November 10, 1998. Following the field work detailed in these addenda, closure reports for these three areas will be prepared. The following is a summary of the work that will be performed at each area:

- Golf Course Maintenance Yard (GCMY)

Soil sampling will be performed at the locations shown on the attached GCMY figure. The purpose of this sampling is to document levels of herbicides at the 10 locations and pesticides at two of the 10 locations (previous ITS analytical data), and SPLP nickel at one of the 10 locations (protection of groundwater determination). At each of the locations, additional soil samples in the vertical and horizontal directions around the sampling location will be retained for analysis, dependent upon analytical results from initial samples. The results will be evaluated to determine if the site meets RRS 2 criteria for closure and if any incidental soil removal/interim removal actions are necessary to achieve closure.

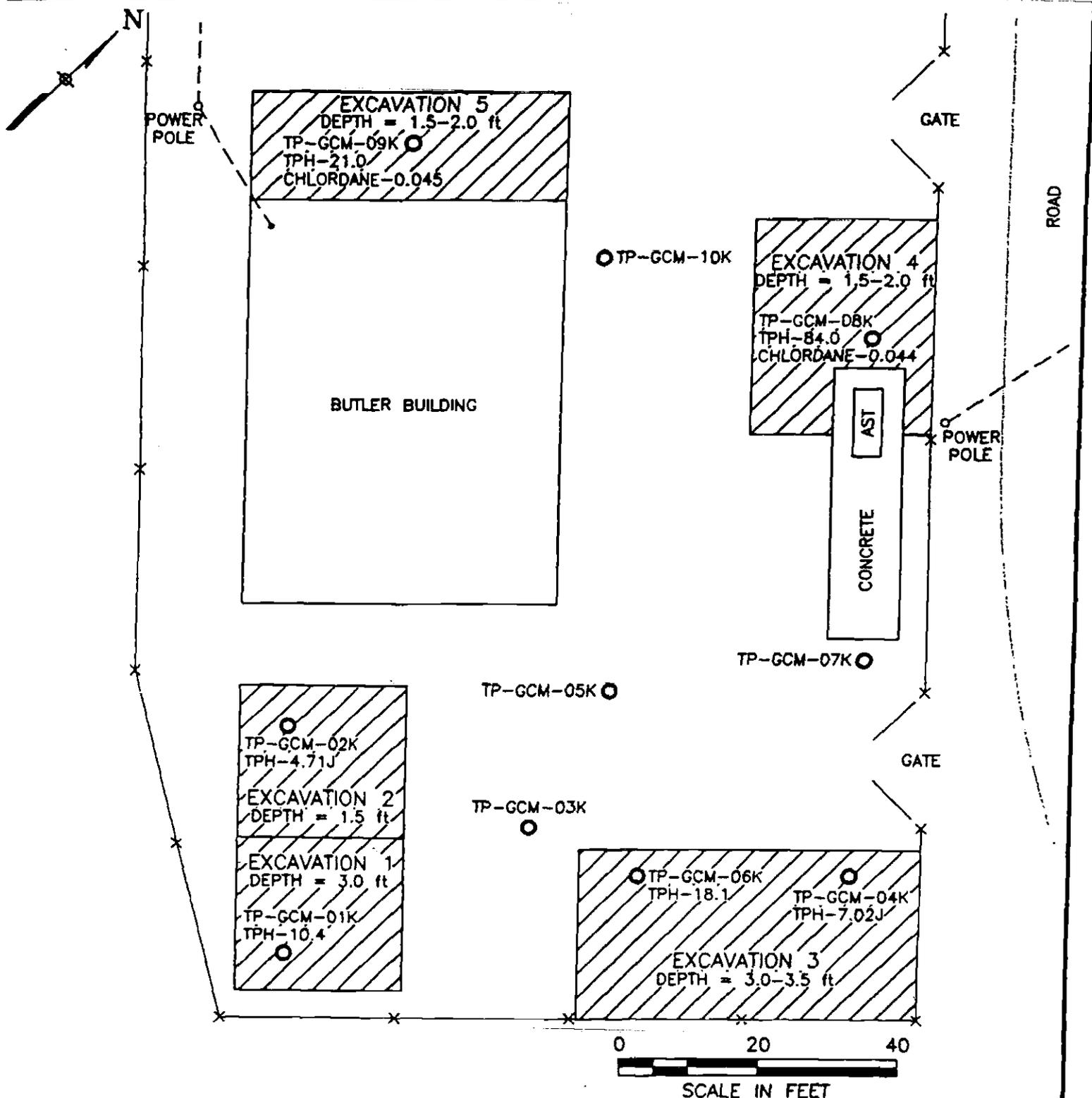
- Aerospace Museum Site (AMS)

Soil sampling will be performed at the locations shown on the attached AMS figure. The purpose of this sampling is to fill data requirements for RRS 2 closure at five locations where data is currently deficient. At the five locations, SVOCs will be analyzed. At one of the five locations, lead will be analyzed. At each of the locations, additional soil samples in the vertical and horizontal directions around the sampling location will be retained for analysis, dependent upon analytical results from initial samples. The results will be evaluated to determine if the site meets RRS 2 criteria for closure and if any incidental soil removal/interim removal actions are necessary to achieve closure.

- Unnamed Stream Area (SD-13)

Soil sampling will be performed at the locations shown on the attached SD-13 figure. The purpose of this sampling is to fill data requirements for RRS 2 closure at 14

locations where data is currently deficient. At three of the locations along the Unnamed Stream, SVOCs, arsenic, and barium will be analyzed. At four of the locations near the former OWS and the Unnamed Stream, arsenic and cadmium will be analyzed. At two locations at the former OWS, arsenic will be analyzed. At one location near the former OWS, arsenic and barium will be analyzed. At four locations along the French Drain, metals, VOCs, and SVOCs will be analyzed. At each of the locations, additional soil samples in the vertical and horizontal directions around the sampling location will be retained for analysis, dependent upon analytical results from initial samples. The results will be evaluated to determine if the site meets RRS 2 criteria for closure and if any incidental soil removal/interim removal actions are necessary to achieve closure. In addition, the limited amount of French Drain System remaining at the site (20 to 30 feet) will be removed by excavation, if feasible.



LEGEND:

TP-GCM-01K



SAMPLE LOCATION

TPH - TOTAL PETROLEUM HYDROCARBONS

CHLORDANE - CHLORDANE CONCENTRATIONS

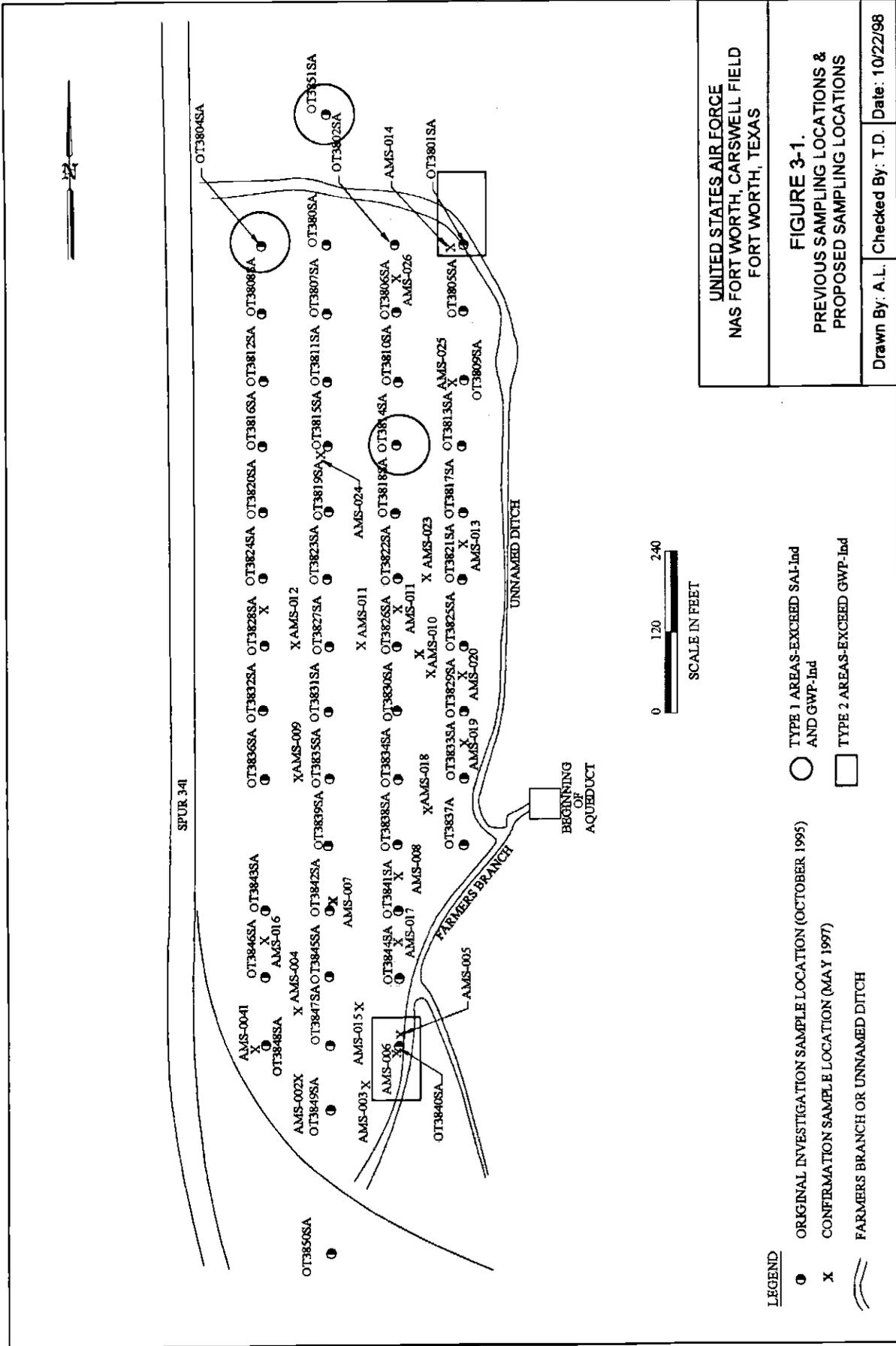
NOTES:

1. ALL CONCENTRATIONS ARE IN mg/kg. EXCEPT AS NOTED.
2. NON-DETECTED COMPOUNDS ARE NOT SHOWN.

UNITED STATES AIR FORCE
 NAS FORT WORTH, CARSWELL FIELD
 FORT WORTH, TEXAS

FIGURE 3-1
 PROPOSED SAMPLING LOCATIONS
 AT THE GCMY

Drawn By: L.G. Checked By: T.D. Date: 10/22/98



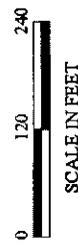
UNITED STATES AIR FORCE
 NAS FORT WORTH, CARSWELL FIELD
 FORT WORTH, TEXAS

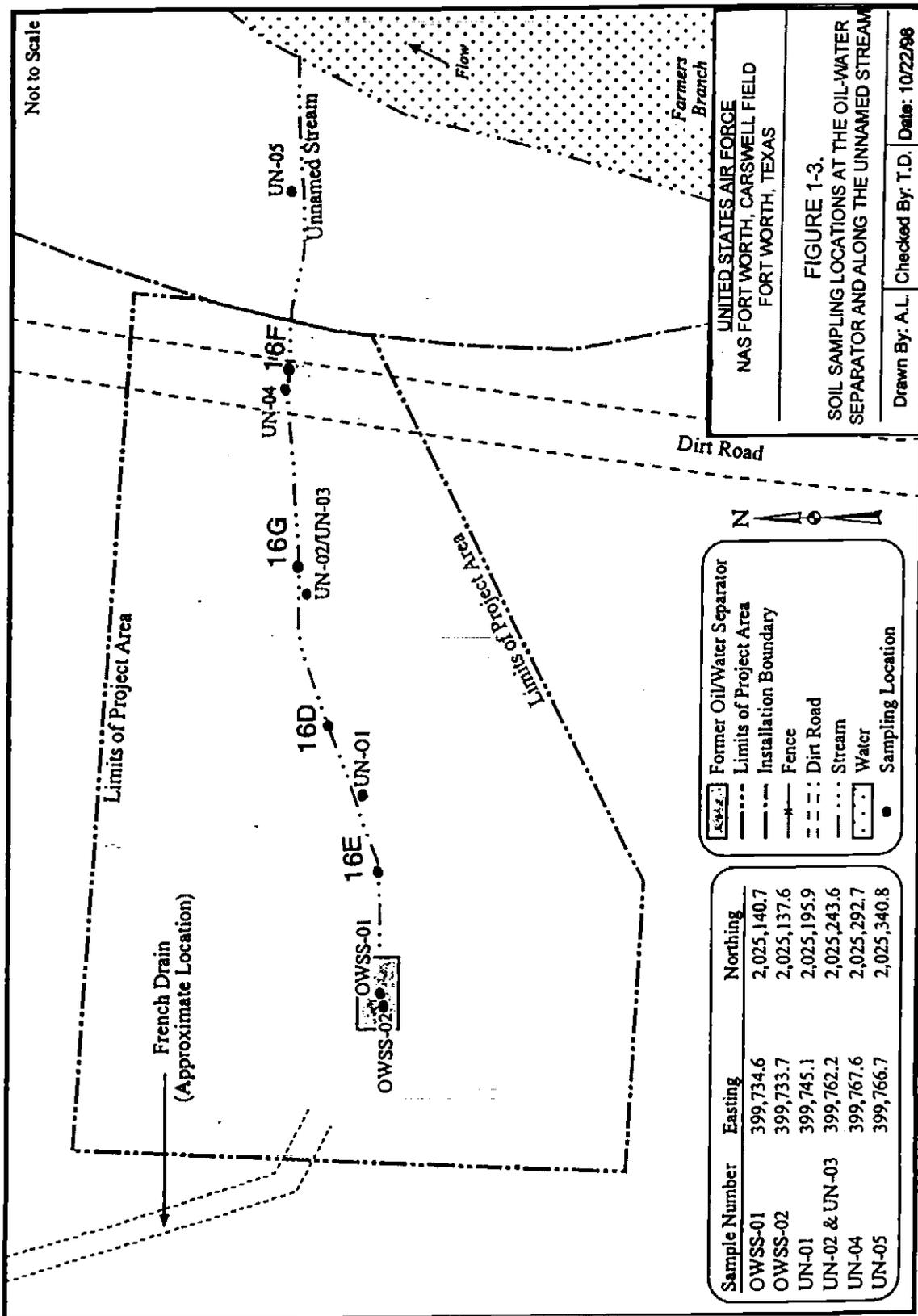
FIGURE 3-1.
 PREVIOUS SAMPLING LOCATIONS &
 PROPOSED SAMPLING LOCATIONS

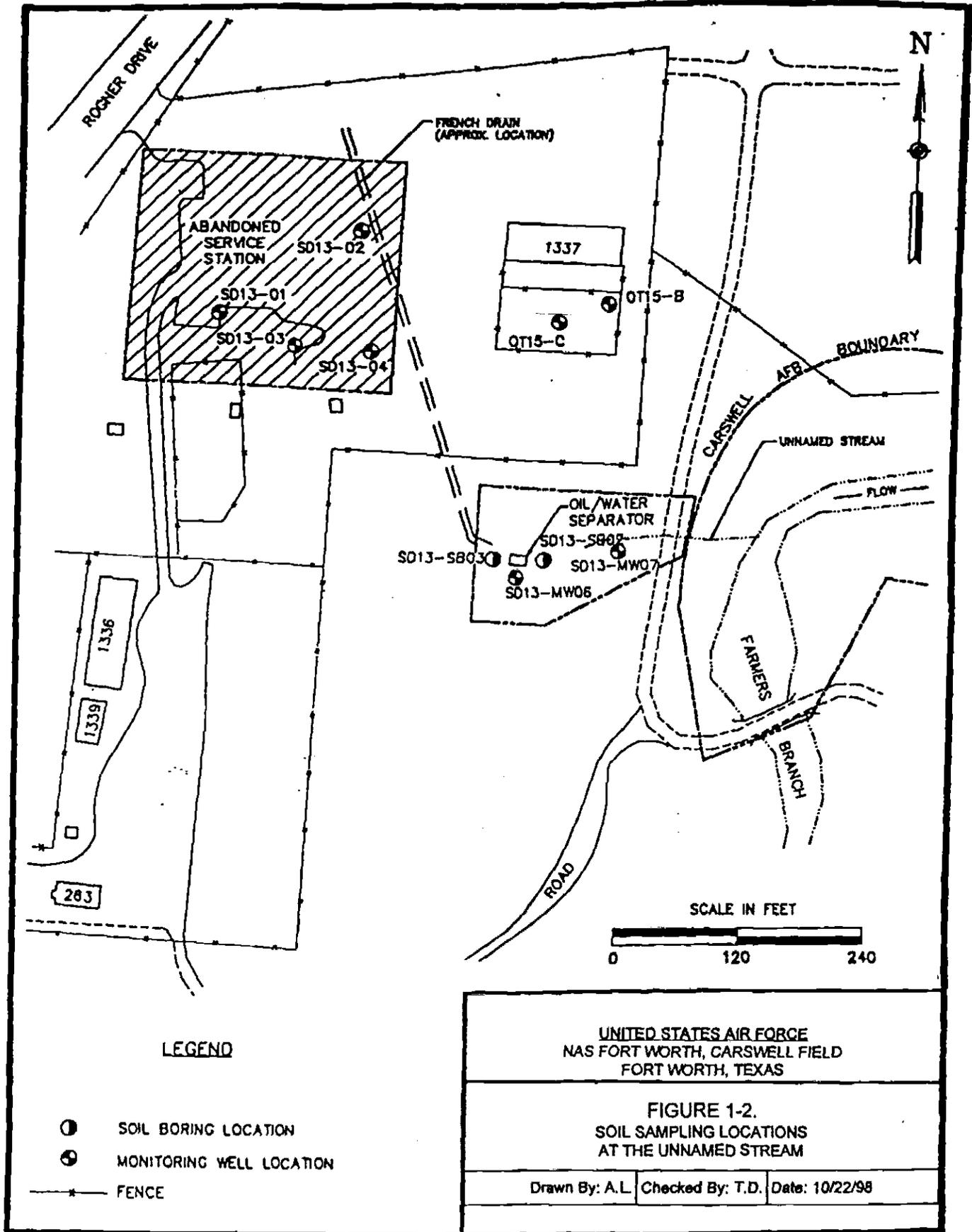
Drawn By: A.L. Checked By: T.D. Date: 10/22/98

LEGEND

- ORIGINAL INVESTIGATION SAMPLE LOCATION (OCTOBER 1995)
AND GWP-Ind
- X CONFIRMATION SAMPLE LOCATION (MAY 1997)
- ▭ FARMERS BRANCH OR UNNAMED DITCH
- TYPE 1 AREAS-EXCEED SAL-Ind
AND GWP-Ind
- ▭ TYPE 2 AREAS-EXCEED GWP-Ind









**INTERNATIONAL
TECHNOLOGY
CORPORATION**

441 12

**Sanitary Sewer Supplemental Soils
Investigation**

**NAS Fort Worth JRB
Fort Worth, Texas**

Presented to:

Carswell Base Closure Team

November 6, 1998

Summary of Sanitary Sewer Supplemental Soils Investigation

Overview

- Review of IT Draft Sanitary Sewer System RFI Report Findings
- Review of TNRCC Comments to Draft Sanitary Sewer System RFI Report
- Basis of IT Comment Responses To TNRCC Comments
- Proposed Supplemental SPLP Soil Testing Strategy for Sanitary Sewer System Closure.

Review of IT Draft Sanitary Sewer System RFI Report Findings

- **Final Work Plan for RFI approved January 1997**
 - Investigation conducted at pre-negotiated sampling locations at Sanitary Sewer System components
 - Investigation included 341 subsurface, 109 surface, and 41 groundwater samples analyzed for VOCs, SVOCs, and metals.
 - Concentrations of organic compounds and inorganics detected in both soil and groundwater samples indicated no unacceptable health risks in the Baseline Risk Assessment.
 - No specific patterns of contaminant concentrations are apparent to indicate a point specific release point from the Sanitary Sewer System.
 - Monitoring wells installed for evaluation of groundwater conditions at Sanitary Sewer System components indicate TCE from Air Force Plant 4 plume extends farther east than previously mapped.
 - TCE/DCE from the AFP 4 plume were not considered as contaminants released from the Sanitary Sewer System in evaluation of risk to human health and the environment.
 - Ecological risk assessment indicates no overall risk to no risk to the indicator wildlife receptor species and insignificant risk to the least shrew and deer mouse to aroclor-1254 based on its occurrence at one location.

Summary of TNRCC Comments to Draft Sanitary Sewer System RFI Report

- **TNRCC concerned that the Sanitary Sewer System RFI has not fully characterized the nature and extent of releases of hazardous constituents**
 - 30 TAC 335 Subchapter S requires that the full nature and extent of a release of hazardous constituents be delineated to the PQL for organics and to background for inorganics.
 - If releases of hazardous constituents were not fully defined to background and/or PQLs, additional investigation activities will be required.
 - Where joint TNRCC/EPA concerns cannot be adequately addressed through revisions to the RFI report, additional field work may be required.
 - Baseline risk assessment cannot be used until the RFI has characterized the nature and extent.
 - The baseline risk assessment should be separate from the RFI report and completed in conjunction with the corrective measures study.
 - The Texas Risk Reduction Program has been withdrawn indefinitely and the baseline risk assessment must comply strictly with the RRS.

Basis of IT Comment Responses To TNRCC Comments

- Sanitary Sewer System RFI was conducted at specified major system components (manholes, junctions, OWS).
- Work Plan specified proposed TNRCC Risk Reduction Program, not the currently used Risk Reduction Standards to assess risk from releases.
- Detections of contaminants did not indicate significant releases from the system. Separation of Sanitary Sewer System releases and releases from industrial operations at Carswell AFB is impracticable.
- To fully define lateral extent of contamination to UTLs/PQLs would at a minimum two additional sample locations for each sample exceeding these requirements.
- Order of magnitude of costs for definition of lateral extent - \$500,000.

Rough Order of Magnitude Estimate for Phase II Delineation of Lateral Extent of Contamination Required Under TNRCC RRS

- Funds required to delineate the Sanitary Sewer System to RRS would be difficult to commit. A rough order of magnitude estimate of costs to collect samples to define the lateral limits of contamination for TNRCC RRS program include the following:
 - 267 industrial subsurface soil sample locations x 45% of locations exceeding UTLs/PQLs x (\$500 analytical/sample + \$350/sample collection costs) x 2.5 off set samples/location = \$255,000.
 - 90 industrial surface soil sample locations x 45% of locations exceeding UTLs/PQLs x (\$500 analytical/sample + \$350/sample collections costs) x 4 off-set samples/location = \$137,000.
 - 1 monitoring well (WITCTA024) requiring lateral extent defined for naphthalene and trimethylbenzene detections below published and calculated MSCs – geoprobe investigation with field screening (\$10,000) and 4 monitoring wells installed with VOC and SVOC analysis (\$20,000) for a total of \$30,000. Monitoring well WITCTA031 not included because it detected arsenic in groundwater at OWS.
 - Rough estimate for investigative costs for second phase of sampling (not guaranteeing full lateral definition of extent of contamination) and **not including** data management, report, risk assessment, or project management are about \$422,000.

Proposed Supplemental SPLP Soil Testing Strategy for Sanitary Sewer System Closure

- Would require consideration of entire Sanitary Sewer System industrial area as a single corrective action management unit (CAMU).
- Consideration of statistical selection of sampling points along Sanitary Sewer System for SPLP testing (not including the OWS connected to the system).
- Proposed that 10% of surface and subsurface soil sample locations be selected for SPLP testing.
 - 10 surface soil samples randomly collected along defined segments of the Sanitary Sewer System
 - 30 subsurface soil samples collected along defined segments of the Sanitary Sewer System
- Segments of Sanitary Sewer System passing SPLP testing for groundwater protective MSCs could be closed under TNRCC RRS Standard II.
- Monitoring well WITCTA024 could be included in the LTM program.
- Costs proposed for SPLP testing of Sanitary Sewer System CAMU soils would be about \$170,000.

Table 1
Metals Concentrations
Soil and Groundwater Background Upper Tolerance Limits
NAS Fort Worth, Texas

Analyte	Surface Soils UTL (mg/kg)	Subsurface Soils UTL (mg/kg)	Groundwater UTL (mg/L)
ALUMINUM	22035	17180	1.332
ANTIMONY	0.56	0.712	ND at 0.002
ARSENIC	5.855	5.533	ND at 0.0049
BARIUM	233	128.1	0.587
BERYLLIUM	1.02	0.957	0.0003
CALCIUM	167788	272000	266.3
CADMIUM	0.5562	0.5891	ND at 0.0005
CHROMIUM	21.056	16.31	0.006
COBALT	11.05	6.191	ND at 0.0089
COPPER	17.373	13.72	0.0028
IRON	17717	15224	0.2239
LEAD	30.97	12.66	ND at 0.0016
MAGNESIUM	3003	2420	37.8
MANGANESE	849.1	351.7	0.175
MERCURY	0.14	ND at 0.035	ND at 0.0001
MOLYBDENUM	1.46	1.93	ND at 0.0144
NICKEL	14.6	19.76	0.0204
POTASSIUM	2895	1717	15.03
SELENIUM	0.9072	0.3130	0.0077
SILVER	0.213	0.1277	0.0002
SODIUM	25800	53200	167.2
THALLIUM	63.9	65.4	ND at 0.0632
VANADIUM	46.26	37.39	0.0123
ZINC	38.8	31.27	0.118

Source:

Surface soil upper tolerance limit (statistical value determined from background levels) Jacobs Engineering Group, Inc., 1997, *NAS Fort Worth JRB, Texas (Formerly Carswell AFB, Texas), Basewide Background Study, Volume I, January*.

**TNRCC Risk Reduction Standard 2,
Media Specific Concentrations
NAS Fort Worth, Texas**

Naval Air Station Fort Worth

July 1998

Page 1 of 4)

Parameter	Surface Soil MSC (mg/kg)	Subsurface Soil MSC (mg/kg)	Groundwater MSC (mg/L)
Metals			
ALUMINUM	10220	10220	36500
ANTIMONY	0.6	0.6	0.006
ARSENIC	3.27	5	0.05
BARIUM	200	200	2
BERYLLIUM	0.4	0.4	0.004
CADMIUM	0.5	0.5	0.005
CALCIUM	Essential Nutrient	Essential Nutrient	Essential Nutrient
CHROMIUM	10	10	0.1
COBALT *	613	613	6.13
COPPER *	35770	35770	358
IRON	Essential Nutrient	Essential Nutrient	Essential Nutrient
LEAD	1.5	1.5	0.015
MAGNESIUM	Essential Nutrient	Essential Nutrient	Essential Nutrient
MANGANESE *	235	235	2.35
MERCURY	0.2	0.2	0.002
MOLYBDENUM *	51	51	0.511
NICKEL	10	10	0.1
POTASSIUM	Essential Nutrient	Essential Nutrient	Essential Nutrient
SELENIUM	5	5	0.05
SILVER	51	51	0.183
SODIUM	Essential Nutrient	Essential Nutrient	Essential Nutrient
THALLIUM	0.2	0.2	0.002
VANADIUM	30.7	30.7	0.11
ZINC *	3066	3066	30.7
Semivolatile Organics			
1,2,4-TRICHLOROBENZENE	7	7	0.07
1,2-DICHLOROBENZENE	60	60	0.6
1,3-DICHLOROBENZENE	60	60	0.6
1,4-DICHLOROBENZENE	7.5	7.5	0.075
2,4,5-TRICHLOROPHENOL	1020	1020	3.65
2,4,6-TRICHLOROPHENOL	2.6	2.6	0.00774
2,4-DICHLOROPHENOL	30.7	30.7	0.11
2,4-DIMETHYLPHENOL	204	204	0.73
2,4-DINITROPHENOL	20.4	20.4	0.073
2,4-DINITROTOLUENE	20.4	20.4	0.204

**TNRCC Risk Reduction Standard 2,
Media Specific Concentrations
NAS Fort Worth, Texas**

Naval Air Station Fort Worth
July 1998
Page 2 of 4)

Parameter	Surface Soil MSC (mg/kg)	Subsurface Soil MSC (mg/kg)	Groundwater MSC (mg/L)
2,6-DINITROTOLUENE	102	102	0.102
2-CHLORONAPHTHALENE	818	818	2.92
2-CHLOROPHENOL	51.1	51.1	0.183
2-METHYLPHENOL	511	511	5.11
4-CHLOROANILINE	40.9	40.9	0.146
4-METHYLPHENOL	511	511	5.11
ACENAPHTHENE	613	613	2.19
ANTHRACENE	3070	3070	11
BENZO(A)ANTHRACENE	0.01	0.01	0.0001
BENZO(A)PYRENE	0.01	0.01	0.0002
BENZO(B,K)FLUORANTHENE	0.01	0.01	0.0002
BENZOIC ACID	40880	40880	408.8
BIS(2-CHLOROETHYL)ETHER	0.026	0.026	0.0000774
BIS(2-CHLOROISOPROPYL)ETHER	4.09	4.09	0.0122
BIS(2-ETHYLHEXYL)PHTHALATE	2.04	2.04	0.00608
CHRYSENE	0.02	0.02	0.0002
DI-N-BUTYL PHTHALATE	1020	1020	3.65
DI-N-OCTYL PHTHALATE	204	204	0.73
DIBENZO(A,H)ANTHRACENE	0.03	0.03	0.0003
DIETHYL PHTHALATE	8180	8180	29.2
FLUORANTHENE	409	409	1.46
FLUORENE	409	409	1.46
HEXACHLOROBENZENE	0.1	0.1	0.001
HEXACHLOROBUTADIENE	3.67	3.67	0.0109
HEXACHLOROETHANE	20.4	20.4	0.0608
INDENO(1,2,3-CD)PYRENE	0.04	0.04	0.0004
N-NITROSO-DI-N-PROPYLAMINE	0.00409	0.00409	0.0000122
N-NITROSODIPHENYLAMINE	--	--	0.000000568
NAPHTHALENE	409	409	1.46
NITROBENZENE	5.11	5.11	0.0183
PENTACHLOROPHENOL	0.1	0.1	0.001
PHENOL	6130	6130	21.9
PYRENE	307	307	1.1
Volatile Organics			
1,1,1,2-TETRACHLOROETHANE	11	11	0.0328
1,1,1-TRICHLOROETHANE	20	20	0.2
1,1,2,2-TETRACHLOROETHANE	1.43	1.43	0.00426
1,1,2-TRICHLOROETHANE	0.5	0.5	0.005
1,1-DICHLOROETHANE	1020	1020	3.65
1,1-DICHLOROETHENE	0.7	0.7	0.007
1,2,3-TRICHLOROPROPANE	61.3	61.3	0.219

**TNRCC Risk Reduction Standard 2,
Media Specific Concentrations
NAS Fort Worth, Texas**

Parameter	Surface Soil MSC (mg/kg)	Subsurface Soil MSC (mg/kg)	Groundwater MSC (mg/L)
1,2,4-TRICHLOROBENZENE	7	7	0.07
1,2-DIBROMO-3-CHLOROPROPANE	0.02	0.02	0.0002
1,2-DICHLOROBENZENE	60	60	0.6
1,2-DICHLOROETHANE	0.5	0.5	0.005
1,2-DICHLOROPROPANE	0.5	0.5	0.005
1,3,5-TRIMETHYLBENZENE *	511	511	5.11
1,3-DICHLOROBENZENE	60	60	0.6
1,4-DICHLOROBENZENE	--	--	0.075
ACETONE	1020	1020	3.65
BENZENE	0.5	0.5	0.005
BROMODICHLOROMETHANE	0.946	10	0.1
BROMOFORM	10	10	0.1
BROMOMETHANE	14.3	14.3	0.0511
CARBON TETRACHLORIDE	0.5	0.5	0.005
CHLOROBENZENE	10	10	0.1
CHLOROETHANE	204	204	0.73
CHLOROFORM	0.504	10	0.1
CIS-1,2-DICHLOROETHENE	7	7	0.07
DIBROMOCHLOROMETHANE	10	10	0.1
DICHLORODIFLUOROMETHANE	47.9	2040	7.3
ETHYL BENZENE	70	70	0.7
HEXACHLOROBUTADIENE	3.67	3.67	0.0109
ISOPROPYLBENZENE *	1020	1020	10.2
M+P-XYLENE	1000	1000	10
METHYLENE CHLORIDE	0.5	0.5	0.005
NAPHTHALENE	409	409	1.46
N-BUTYLBENZENE *	102	102	1.02
N-PROPYLBENZENE *	102	102	1.02
O-XYLENE	1000	1000	10
STYRENE	10	10	0.1
TETRACHLOROETHENE	0.5	0.5	0.005
TOLUENE	100	100	1
TRANS-1,2-DICHLOROETHENE	10	10	0.1
TRICHLOROETHENE	0.5	0.5	0.005
TRICHLOROFLUOROMETHANE	8.36	3070	11
VINYL CHLORIDE	0.0241	0.2	0.002
Organochlorine Pesticides and PCBs			
4,4'-DDD	0.0355	0.0355	3.55E-04
4,4'-DDE	0.025	0.025	2.50E-04
4,4'-DDT	0.025	0.025	2.50E-04
ALDRIN	0.000501	0.000501	5.01E-06

**TNRCC Risk Reduction Standard 2,
Media Specific Concentrations
NAS Fort Worth, Texas**

Naval Air Station Fort Worth

July 1998

Page 4 of 4)

Parameter	Surface Soil MSC (mg/kg)	Subsurface Soil MSC (mg/kg)	Groundwater MSC (mg/L)
ALPHA-BHC	0.00135	0.00135	1.35E-05
ALPHA-CHLORDANE	0.2	0.2	2.00E-03
AROCLOR-1016	0.05	0.05	5.00E-04
AROCLOR-1221	0.05	0.05	5.00E-04
AROCLOR-1232	0.05	0.05	5.00E-04
AROCLOR-1242	0.05	0.05	5.00E-04
AROCLOR-1248	0.05	0.05	5.00E-04
AROCLOR-1254	0.05	0.05	5.00E-04
AROCLOR-1260	0.05	0.05	5.00E-04
BETA-BHC	0.0473	0.0473	4.73E-04
DELTA-BHC	0.02	0.02	2.00E-04
DIELDRIN	0.000532	0.000532	5.32E-06
ENDOSULFAN I	0.183	0.183	1.83E-03
ENDOSULFAN II	0.183	0.183	1.83E-03
ENDOSULFAN SULFATE	0.183	0.183	1.83E-03
ENDRIN	0.2	0.2	2.00E-03
ENDRIN ALDEHYDE	0.2	0.2	2.00E-03
GAMMA-BHC (LINDANE)	0.02	0.02	2.00E-04
GAMMA-CHLORDANE	0.2	0.2	2.00E-03
HEPTACHLOR	0.04	0.04	4.00E-04
HEPTACHLOR EPOXIDE	0.02	0.02	2.00E-04
METHOXYCHLOR	4	4	4.00E-02
TOXAPHENE	5	5	5.00E-02

Notes:

Reference: TNRCC Risk Reduction Standards, TNRCC, 1993, "Final Standards:

Chapter 335, Subchapter S. Risk Reduction Standards," *Texas Register*

18: 3842-3872.

* Calculated MSC per reference as shown in Chapter 4 of the text.

**Summary Table of Analysis of Environmental Media
 Sanitray Sewer RFI
 NAS Fort Worth, Texas**

Analyses	Analytical Method	Industrial Samples	Industrial Hits	Residential Samples	Residential Hits	City of Fort Worth Sanitary Sewer Samples	City of Fort Worth Sanitary Sewer Hits
Near-Surface Soil - Volatiles	SW 8260	90	82	7	7	3	3
Near-Surface Soil - Semivolatiles	SW 8270	109	42	7	0	3	0
Near-Surface Soil - Pest/PCBs	SW 8080	108	19	7	1	3	0
Near-Surface Soil - Inorganic	SW 6010/7000	90	41	7	1	3	0
Total All Near-Surface Soil Sample Locations by Area = 119		109		7		3	
Subsurface Soil - Volatiles	SW 8260	267	211	10	7	11	9
Subsurface Soil - Semivolatiles	SW 8270	286	98	10	0	11	0
Subsurface Soil - Pest/PCBs	SW 8080	98	8	10	0	11	0
Subsurface Soil - Inorganic	SW 6010/7000	267	117	10	1	11	1
Soil - Geotechnical/Biotechnical	See Table 3-2	12		0		0	
Total All Subsurface Soil Sample Locations by Area = 307		286		10		11	
Groundwater - Volatiles	SW 8260	41	36	0	NA	0	NA
Groundwater - Semivolatiles	SW 8270	41	10	0	NA	0	NA
Groundwater - Pest/PCBs	SW 8080	1	0	0	NA	0	NA
Groundwater - Inorganic	SW 6010/7000	41	13	0	NA	0	NA
Groundwater - Biotechnical	See Table 3-2	12		0		0	
Total All Groundwater Sample Locations by Area = 41		41		0		0	
Surface Water - Volatiles	SW 8260	3	0	1	0	0	NA
Surface Water - Semivolatiles	SW 8270	3	0	1	1	0	NA
Surface Water - Inorganic	SW 6010/7000	3	3	1	1	0	NA
Surface Water - Biotechnical	See Table 3-2	3		1		0	
Total All Surface Water Sample Locations by Area = 4		3		1		0	

FINAL PAGE

ADMINISTRATIVE RECORD

FINAL PAGE