Fill materials (gravel, and boulder sized material) as well as pallets of 25 L pails (contents unknown) have used to level the base below the garage floor slab. Photos 53 and 54 present views of the Garage interior.

Southeast of the garage is a pile of 120 lubricating oil barrels that are currently leaking lubrication oil. Fluid sample US-BS-01 was taken from the leaking barrels indicating that the lubricating oil did not contain PCBs as noted in Tables 22.1, 22.2 and 22.3 of Appendix D.

Northwest of the Garage is the remains of a paint shed that contains cans of paint and various solvents. South of the garage is the southern face of the mountain. The southern face contains scattered barrels and heavy soil staining. West of the garage there are 2 mobile fuel tanks on pallets. The associated fuel gauges indicate there is still approximately 7000 liters of fuel remaining. All materials are listed in detail on Table 5 of Appendix F.

The upper station POL storage area is similar to the one located at the Beach Area. The outside of the tanks and the associated pump house contain PCB levels that exceed criteria.

The station antenna and the associated concrete foundations still remain. A small barrel dump containing approximately 40 barrels is just north of the Antenna.

The remains of the Inuit house is locate at the southeast corner of the Upper Site and has an associated dump area just north of it. There are approximately 200 barrels scattered to the south of the house. The house itself has wood painted with PCB containing paint. There are also creosote treated timbers noted at the Inuit House area.

6 REGULATORY CRITERIA

The following presents a summary of the criteria that had been selected to be used for comparison purposes. This included the following criteria for the each media type.

- Soil - The results of the laboratory analyses for metals and PCBs were compared to the criteria that were developed for the Department of National Defence to support their DEW Line clean up projects (DCC Tier I and Tier II criteria). For metals that were not included in the DCC criteria, the most recent edition of the *CCME Canadian Environmental Quality Guidelines* – Residential/Parkland criteria was used for comparison. Hydrocarbon analysis was compared to the CCME Canadian Wide Standards for Hydrocarbons.
- Water – *CCME Canadian Environmental Quality Guidelines* Freshwater Aquatic Life Criteria.
- Sediments – *CCME Canadian Environmental Quality Guidelines* Freshwater
- Tissues - *CCME Canadian Environmental Quality Guidelines*

7 NCS SITE CLASSIFICATION SUMMARY

The national Classification System for Contaminated Sites (NCS) was developed by the CCME for the review and classification of contaminated sites in Canada. The NCS is a standardized method that uses site characteristics, site location and contaminant information to prioritize and classify the potential for adverse impacts. All relevant site information is stored in a national database in an effort to ensure funding for contaminated site clean up is allocated to sites with respectively higher potentials for adverse effects and impacts.

A previous assessment had calculated a NCS value of 76.7 for the FOX – C DEW Line Site. This value ranks the site as a Class 1 site.

As requested in the Terms of Reference for this project, an updated NCS Classification was determined based on the findings of the investigation. In summary the NCS score determined by Earth Tech is 73.7 , indicating a Class 1 site. A copy of the NSC score is included as Appendix H.

8 SUMMARY OF INVESTIGATION ACTIVITIES

8.1 Phase III Site Investigation

During the time period of August 24 to September 1, 2004, Earth Tech completed a detailed Phase III ESA of the FOX-C DEW Line Site. The purpose of this assessment was to help determine the extent and volumes of contaminated materials in order to support the development of a remedial plan for the site.

Based on the findings of the Phase III Assessment, the following table presents a summary of the areas with soil or groundwater contamination in excess of the governing DCC or CCME criteria.

Table 8.1 Summary of Areas Requiring Remedial Action

Location	Contaminant Exceeding Governing Criteria (Max Concentration ppm)	Media	Volume m^3	Comments
Beach Area POL Tanks	Hydrocarbons (F2 2890 ppm)	Soil	340	Close proximity to Fiord
Helipad Surface Stains	Hydrocarbons (F3 18000 ppm)	Soil	75	Maximum depth not achieved in hand augered testpits
Drainage Ditch Stain	Hydrocarbons (F3 13700 ppm, F4 8210 ppm)	Soil	6	
Mid Station Barrel Storage Area	Hydrocarbons, (F3 26,300 ppm and F4 15,600 ppm) PAHs (phenanthrene, 6.54 ppm)	Soil	75	Contaminant migration into rock material below gravel pad
Mid Station Barrel Dump #2	Hydrocarbons (F3 9,330 ppm, F4 21,000 ppm)	Soil	50	Complete delineation of hydrocarbons not achieved towards the south
Mid Station Barrel Dump #6	Hydrocarbons (F3 17800, F4 13800) Metals (Cu, 381 ppm, Pb 946 ppm, Zn 931 ppm)	Soil	60	Complete delineation of hydrocarbons not achieved towards the south. Metals concentrations exceed DCC Tier 2 criteria.
South of Module Train	PCB (5.6 ppm)	Soil	7	PCB concentrations exceed DCC Tier 2 criteria. Located near staircase.
West of Module Train	Hydrocarbons F2 8,050 ppm, F3 1,940 ppm)	Soil	14	Complete delineation of hydrocarbons not achieved
Sewer Outfall Area	PCBs (2.8 ppm), Hydrocarbons (F3 1,050 ppm)	Soil	30	Difficult area to delineate due to site conditions
Sewer Outfall Area	Metals (Cu 109, Pb 690)	Soil	5	Difficult area to delineate due to site conditions
Stain west of Garage	PCBs (3.8)	Soil	1	PCB levels less than DCC Tier 2 criteria
Stain below D8 Cat	Hydrocarbons F2 6540 ppm , F4 15600 ppm)	Soil	4	Leaking from Cat

Location	Contaminant Exceeding CCME Criteria (Max Concentration ppm)	Media	Volume m^3	Comments
Stain on pad west of Garage	Hydrocarbons (F3 1210 ppm)	Soil	140	Vertical delineation for hydrocarbons not achieved, potential dump site
Stain area east of Garage	PCBs (3.6 ppm), hydrocarbons (F3 16500 ppm), Metals (Cu 278 ppm, Zn 1060 ppm, Zn 1400 ppm)	Soil	8	Metal concentrations exceed DCC Level 2 criteria. PCB and metals delineation to the north was not completed
Garage Dump Area	PCB (3.3 ppm)	Soil	35	Four isolated pockets, less than DCC Tier 2 criteria
Garage Dump Area	Hydrocarbons (F2 8000 ppm, F3 31900 ppm, F4 8180 ppm)	Soil	330	Extensive amount of surface staining, barrels onsite continue to be source for additional contamination
POL Storage Facility	Hydrocarbons (F2 2630 ppm, F3 1990 ppm)	Soil	200	Complete delineation of hydrocarbons not achieved
Warehouse ASTs	Hydrocarbons (F2 2770 ppm)	Soil	15	Complete delineation of hydrocarbons not achieved to the east
Inuit House Stain	Metals (Zn 204, Cr 67)	Soil	14	Metals delineated
Inuit House Dump	PCB, dissolved metals	Water	-	Elevated PCBs and dissolved cadmium exceedance above FWAL criteria in one water sample
Surface Stain – Antenna Base Area	Hydrocarbons (F3 29200, F 4 10100)	Soil	25	
Surface Stain – Antenna Base Area	PCBs, dissolved metals	Water	-	Elevated PCBs and dissolved cadmium exceedance above FWAL criteria in one water sample
Surface Stains – NW of Module Train	PCB (2), Hydrocarbons (F3 14100, F8300)	Soil	10	
All Barrel Dumps	Hydrocarbons	Soil	-	Confirm site conditions at each barrel dump site after barrels are removed
Total Estimated Volume			1444	

8.2 Waste Audit

A detailed Waste Audit was completed to in order to determine the volumes of non-hazardous and hazardous materials. The following table briefly summarizes the quantities of the major categories for each waste type.

It should be noted that the volume of materials containing PCB paint should be considered as a rough estimate as this volume is dependant on the amount of volume reduction completed by a contractor. In some locations the paint had substantially peeled away. It is envisioned that some amount of abatement will be required in the field prior to the removal of the substrate materials.

Approximately 6400 m^3 of non hazardous material is located on the site. Based on the location and nature of these materials, all of the materials could be removed from the site. It should be indicated that a number of waste items including a partially visible crane and barrels were located either in Water Lake or in the steams flowing into and out of Water Lake. The removal of these items will need to be completed in a manner that will satisfy DFO requirements.

Table 8.2 Summary of Waste Volumes

Waste Type	Items	Estimated Volume m^3	Estimated Volume L
Non Hazardous			
	Wood, steel, domestic waste, vehicles, equipment parts building materials and contents, scattered debris	1824	
	Contents of Mid Station Dump	3300	
	8380 Empty Barrels	1257	
	Total	**6381**	
Hazardous			
	Miscellaneous materials, batteries, asbestos materials, oil filters, blasting caps	25	
	36 Full to partially full barrels		7400 L
	120 split open lube oil barrels at Mid station Barrel Dump #3		9000 L
	200 leaking 45 L barrels at Garage dump		2500 L
	PCB painted building materials (2000 m^2)	115	
	Miscellaneous fuel in day tanks and skid mounted tank		9000 L
	Total	**170 m^3**	**27,900 L**

9.0 CONCLUSIONS

Based on the scope of work of the Phase III Environmental Assessment and Waste Audit that was completed at the FOX – C DEW Line site the following conclusions are made.

Phase III ESA

- The Phase III investigation included the assessment of 15 areas of the site in order to delineate previously identified contaminated areas and to confirm the presence of contaminants in areas that had not been previously identified.

- The total volume of hydrocarbon, metal and PCB contaminated material found to be contaminated was estimated at 1,444 m^3. Due to site conditions, full delineation was not achieved in some locations.

- Hydrocarbon impacted soils and groundwater were identified between the Beach Area POL tanks and Ekalugad Fiord. Due to the proximity of the material to the fiord, removal of this contaminated material is recommended.

- Study areas located at the Mid-Station and Upper Station areas typically had very small amounts of soil media. Fine to coarse grained, weathered material was encountered on the ground surface in some areas, however the site is dominated with large boulder sized (>300 mm) rocks. In some areas, contaminants are located on and below the large diameter rock, remediation of contaminants located in these areas may be impractical.

- Runoff surface water was occasionally encountered, in some locations, this water was visible, however it was commonly located within a gully filled with coarse/fine grained material or with boulder sized material.

- Total metal concentrations in collected perched groundwater samples typically indicated exceedances for a number of metal concentrations. Comparison of dissolved metal concentrations to CCME criteria indicated no exceedances above CCME criteria except for cadmium in some locations.

Waste Audit

- Approximately 6400 m^3 of non-hazardous materials are located on the site. The vast majority of this material is located in accessible areas and this material should be removed from the site. Minor amounts of debris were located at the bottom of a cliff area below the Modular Train outfall and Mid-Station Dump. This material would be removable provided an access to this lower area on the north side of the mountain was available.

- A number of non-hazardous waste items including a partially buried crane and barrels were located either in Water Lake or in the steams flowing into and out of

Water Lake. The removal of these items will need to be completed in a manner that will satisfy DFO requirements.

- A total of 8380 empty barrels were identified at the site, it is recommended that subsurface soil conditions below the barrels be determined following their removal.

- A total of 36 full to partially full barrels were identified on the site. In addition, 120 lube oil barrels were split open and left at a dumpsite. Minor amounts of fuel were also identified in some of the day tanks located on the site. The remedial program will need to include a program to recover all liquids from these barrels and tanks.

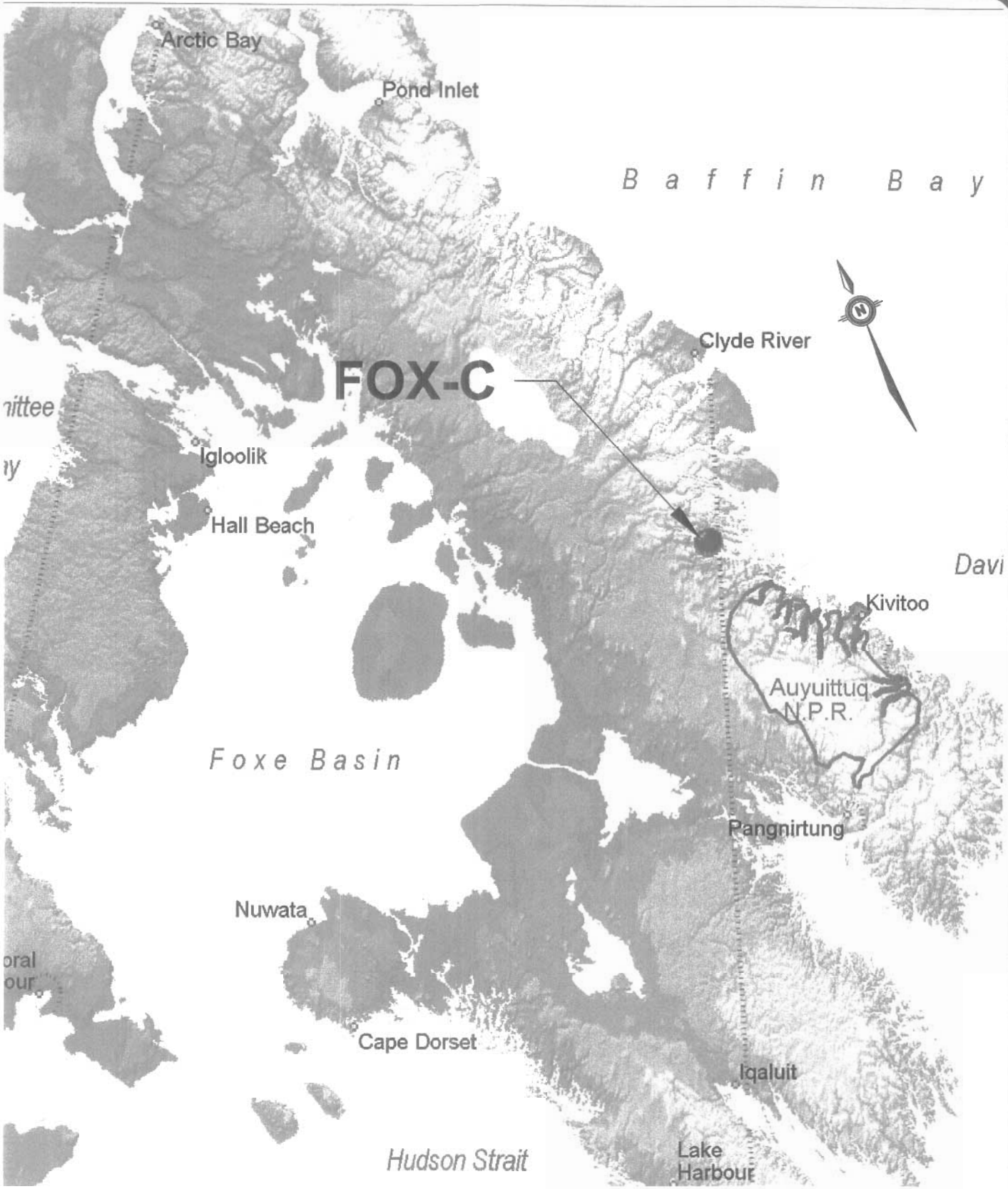
- Approximately 2000 m^2 of material was observed to be painted with PCB containing paint. The majority of the paint products on a metal substrate was in poor condition (peeling) and may require some form of abatement prior to removal of the painted components. Wood materials painted with PCB containing paint was typically weathered and non peeling. It is recommended that the painted materials be removed by a contractor following a waste reduction process.

10.0 CLOSURE

The usage of this report is limited by the standard Earth Tech Special Provisions – Environmental Site Services, which are included in Appendix I of this report.

APPENDIX A

FIGURES



PWGSC-Environmental Services

FOX-C Phase III

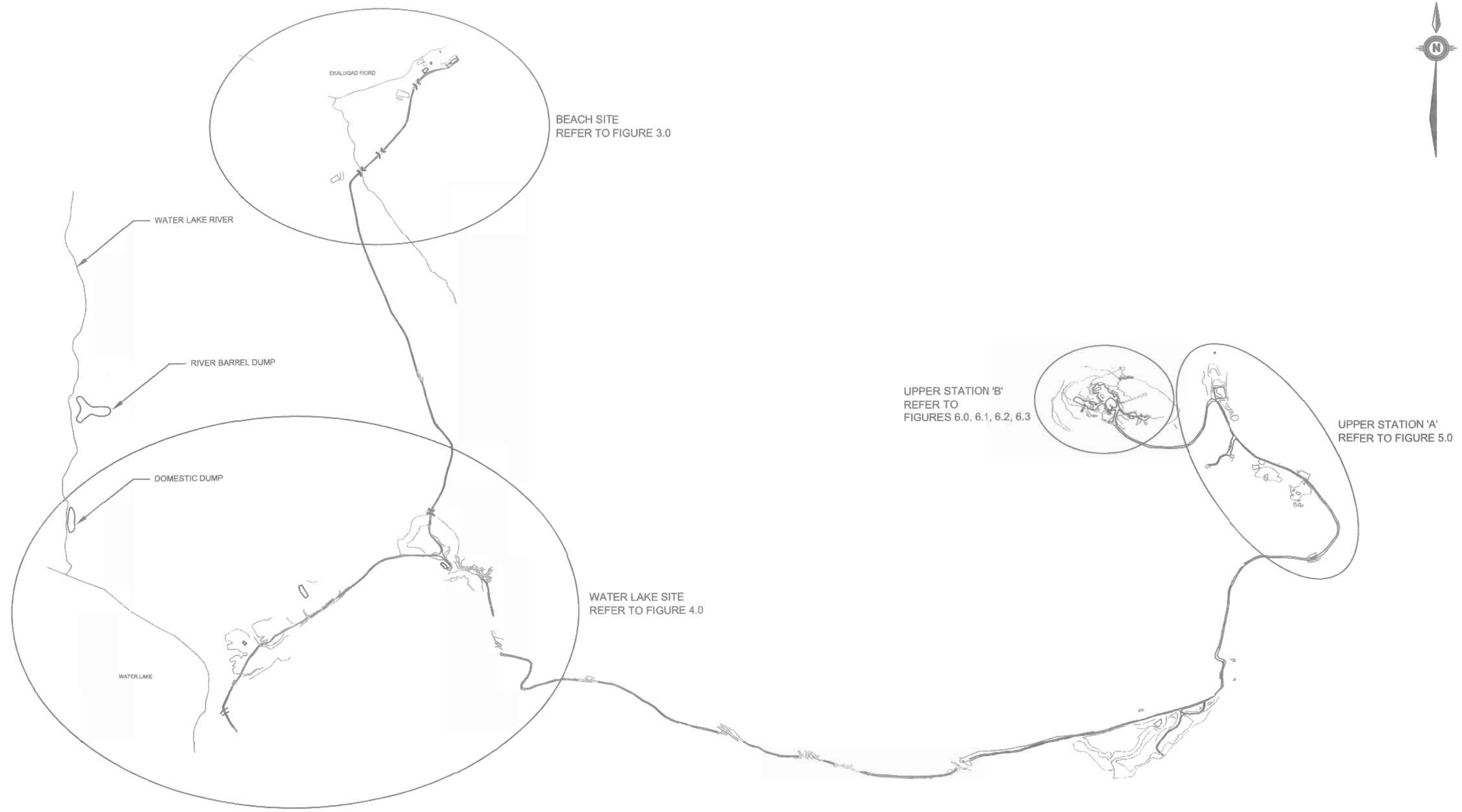
FOX-C Location

EarthTech

A Tyco International Ltd. Company

October, 2004

Figure 1.0



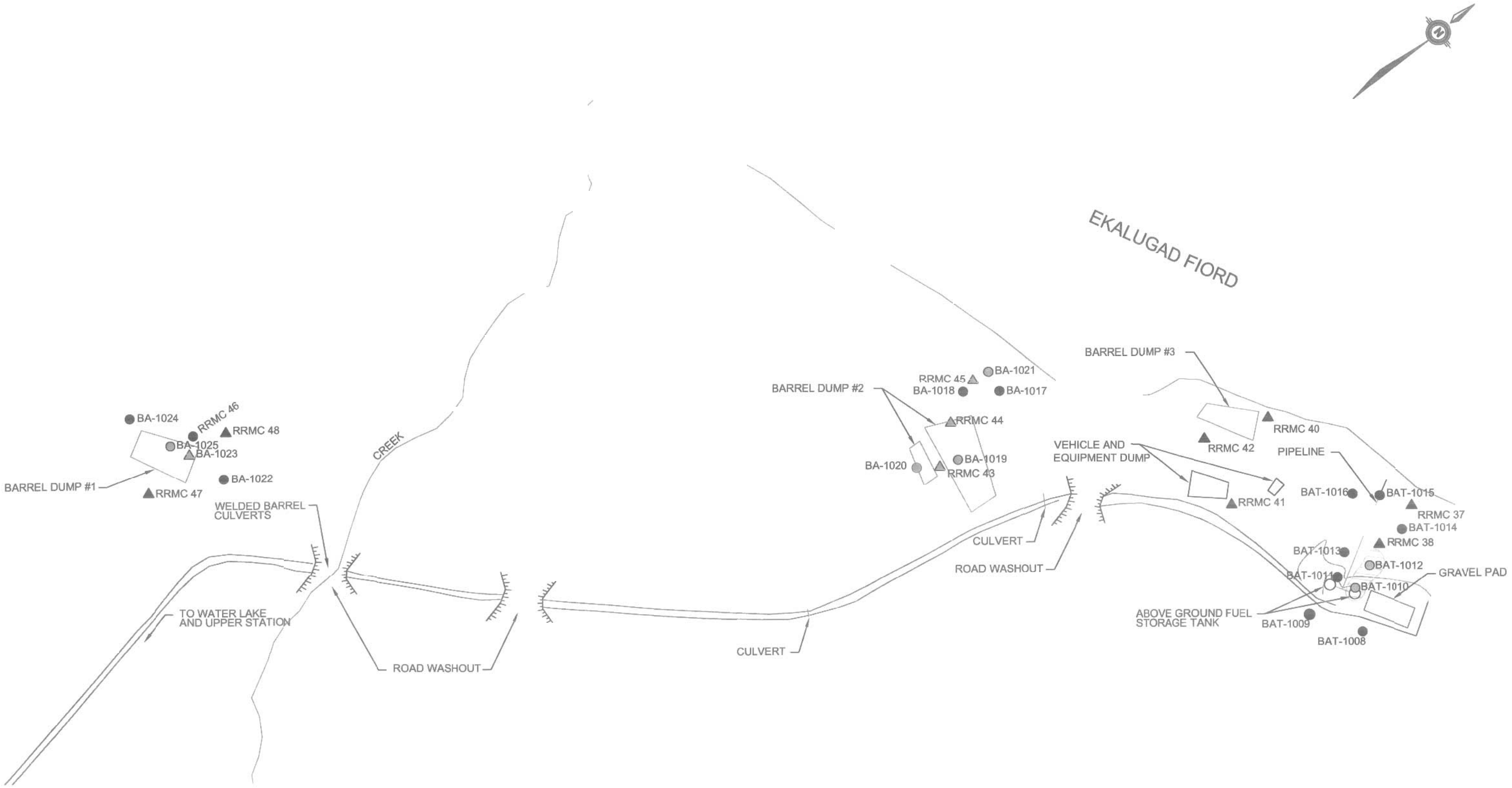
Date: OCTOBER 05, 2004

0 200 400 600 800

Scale 1:15000

EarthTech
A Tyco International Ltd. Company

PWGSC
FOX-C DEW LINE
SITE PLAN
Figure 2.0



Date: JANUARY 03, 2005

0 20 40 60 80 100

Scale 1:2000

EarthTech
A Tyco International Ltd. Company

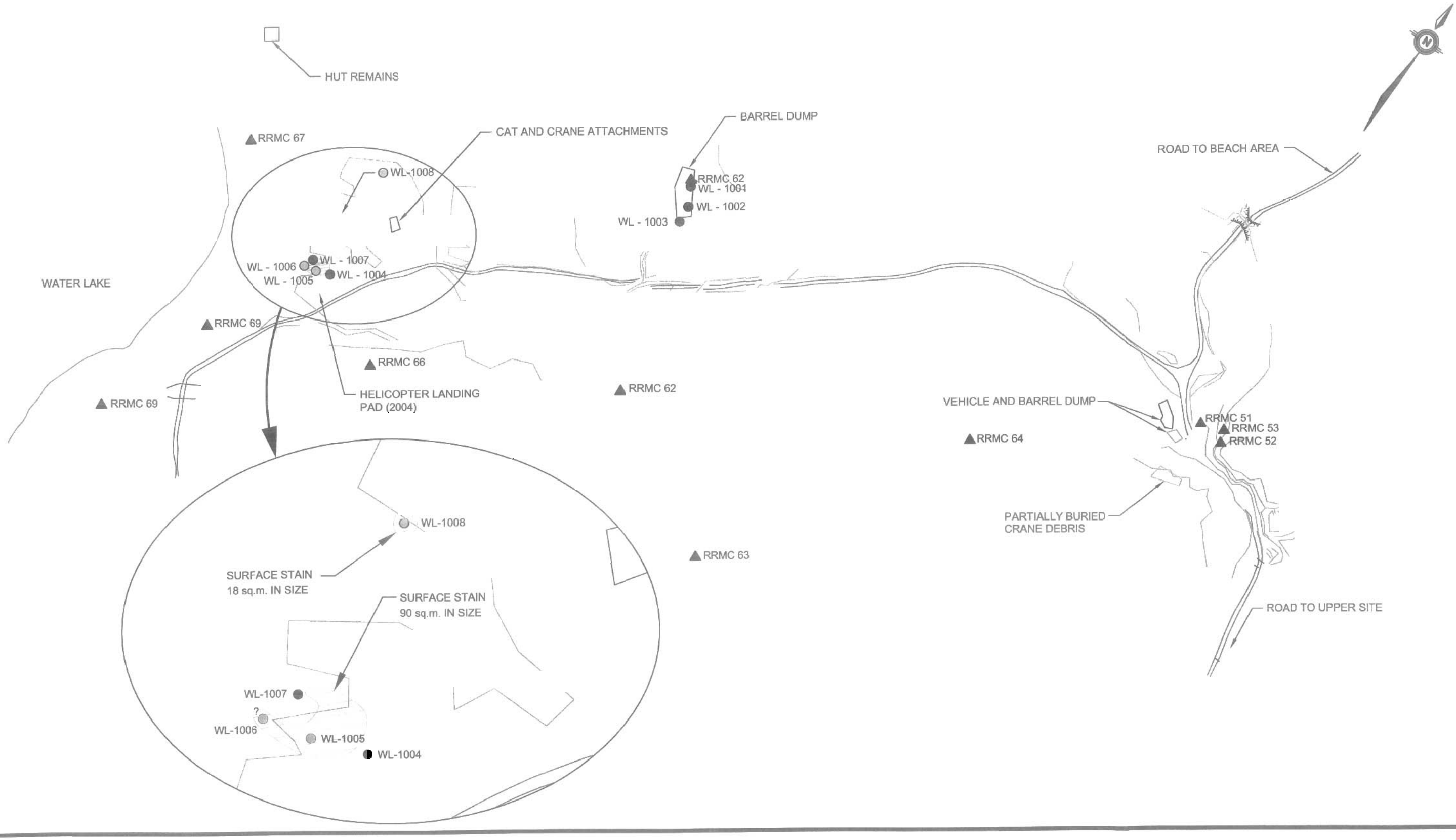
Legend

- ○ SOIL SAMPLE
- △ RRMC SAMPLE

- PCBs EXCEEDANCE
- METALs EXCEEDANCE
- PHCs EXCEEDANCE
- PAHs EXCEEDANCE
- NONE

- PCBs CONTAMINATION PLUME
- METALs CONTAMINATION PLUME
- PHCs CONTAMINATION PLUME
- PAHs CONTAMINATION PLUME

PWGSC
FOX-C DEW LINE SITE - BEACH AREA
BOREHOLE LOCATION PLAN
Figure 3.0



t:\WORK\78000\78850\02a-CAD\GFI\current\Cadd File. 78850_Fox-C Dew Line.dwg Last Edit: 2004-10-05 (12:00) Plot Scale: 1:1 (A3)

Date: OCTOBER 05, 2004

0 20 40 60 80 120 160 200

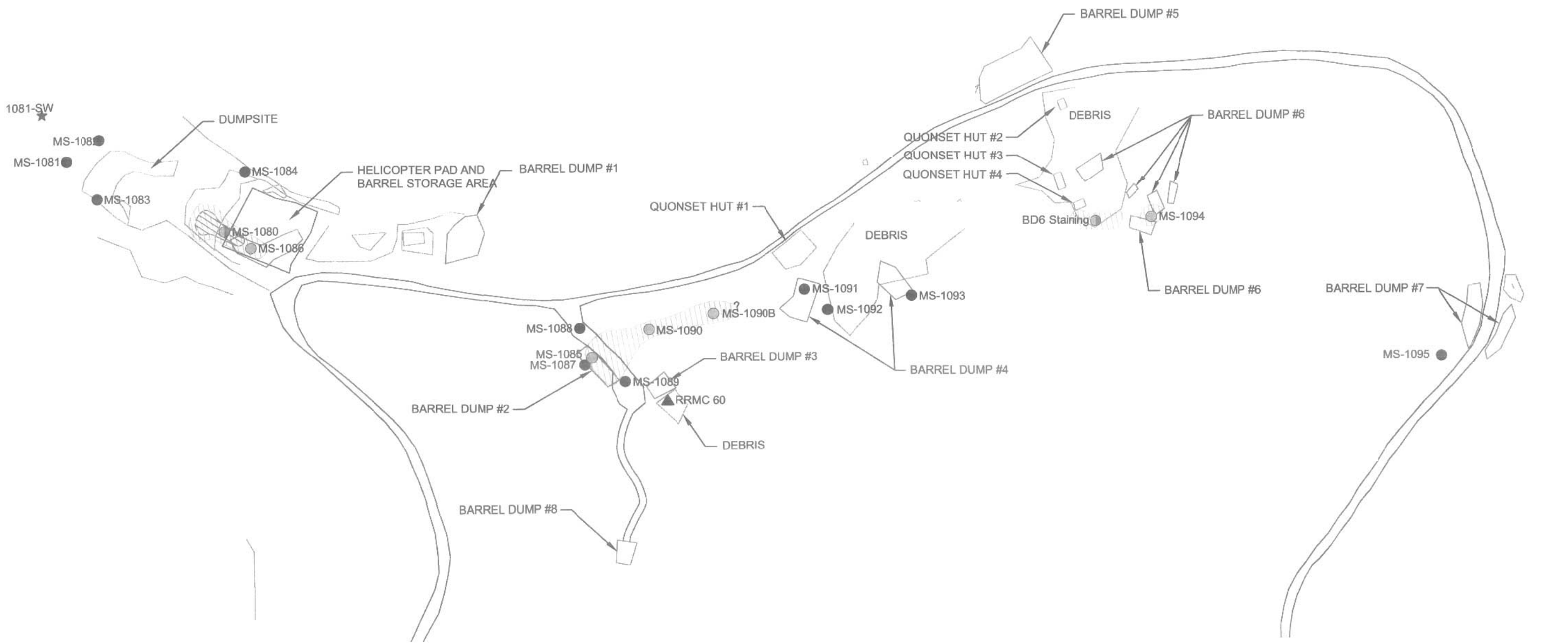
Scale 1:4000

EarthTech
A Tyco International Ltd. Company

Legend

- ○ SOIL SAMPLE
- △ RRMC SAMPLE
- PCBs EXCEEDANCE
- METALs EXCEEDANCE
- PHCs EXCEEDANCE
- PAHs EXCEEDANCE
- NONE
- PCBs CONTAMINATION PLUME
- METALs CONTAMINATION PLUME
- PHCs CONTAMINATION PLUME
- PAHs CONTAMINATION PLUME

PWGSC
FOX-C DEW LINE SITE - WATER LAKE
BOREHOLE LOCATION PLAN
Figure 4.0



*NOTE: METAL EXCEEDANCES AT BD6 INCLUDES; Cu 381ppm, Pb 946ppm, Zn 931ppm

Date: JANUARY 03, 2005

0 25 50 75 100

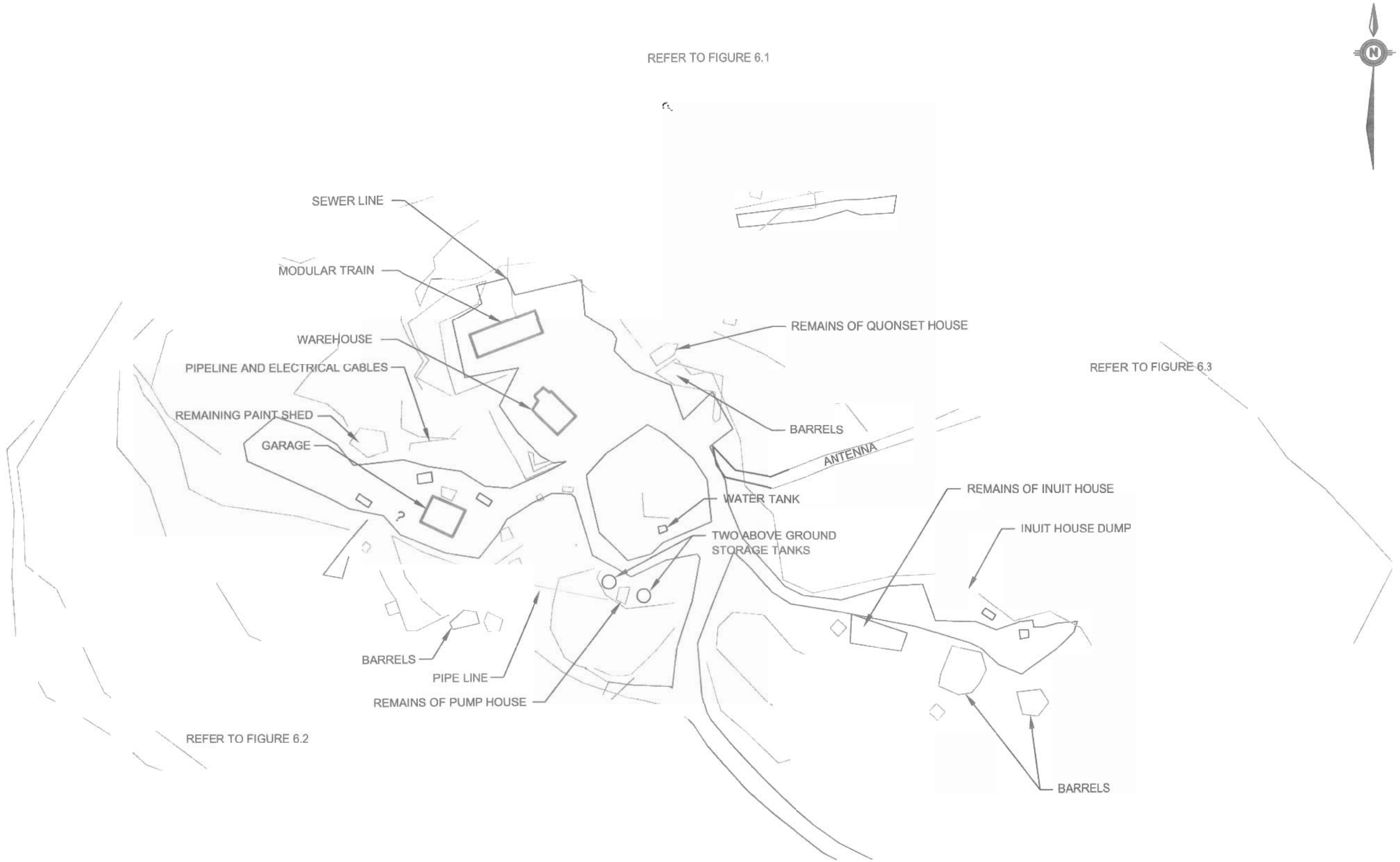
Scale 1:2500

EarthTech
A Tyco International Ltd. Company

Legend

- ○ SOIL SAMPLE
- △ RRMC SAMPLE
- ☆ WATER SAMPLE
- PCBs EXCEEDANCE
- METALs EXCEEDANCE
- PHCs EXCEEDANCE
- PAHs EXCEEDANCE
- NONE
- PCBs CONTAMINATION PLUME
- METALs CONTAMINATION PLUME
- PHCs CONTAMINATION PLUME
- PAHs CONTAMINATION PLUME

PWGSC
FOX-C DEW LINE SITE - MID STATION
BOREHOLE LOCATION PLAN
Figure 5.0



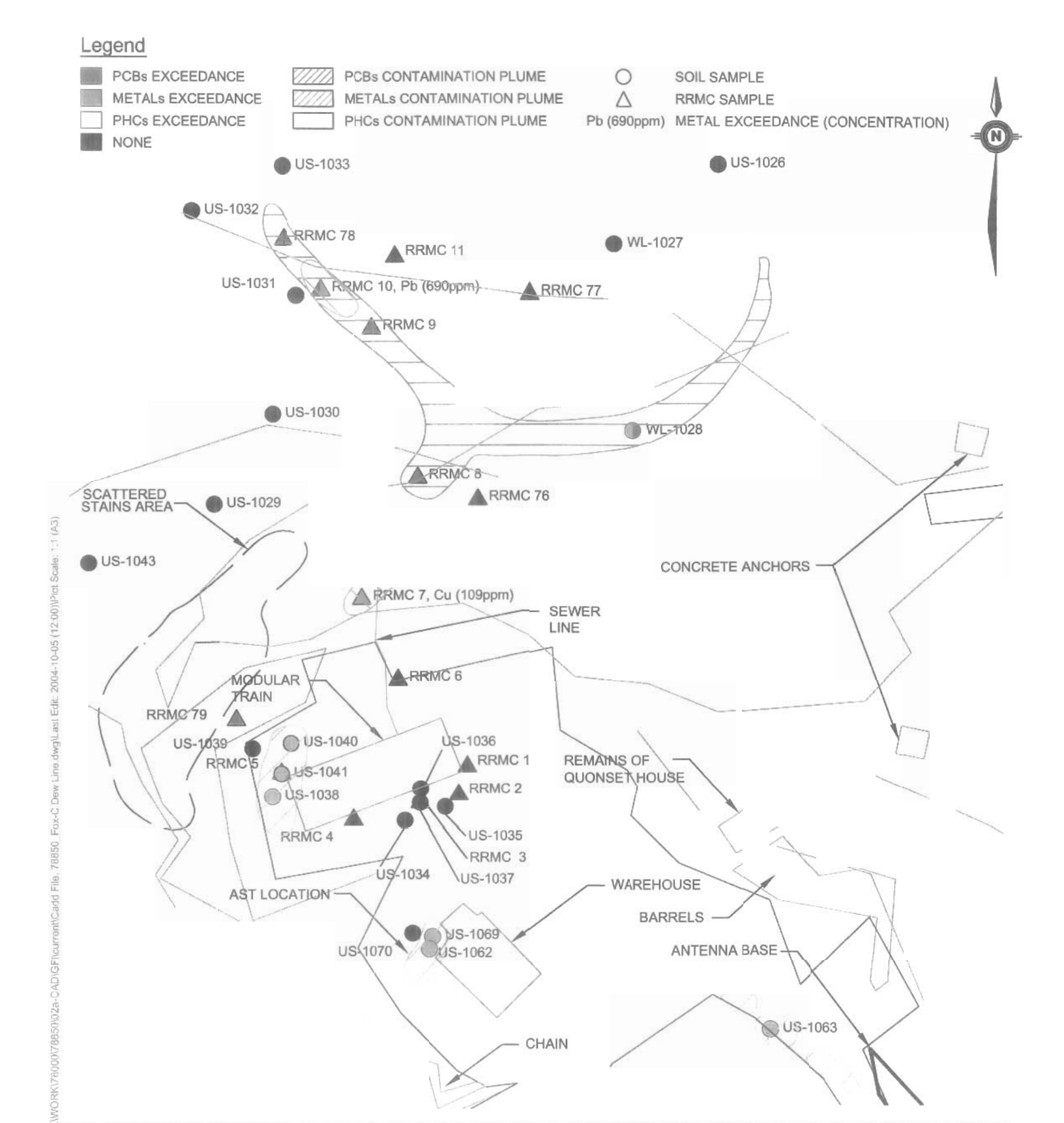
Date: OCTOBER 05, 2004

0 20 40 60 80 100

Scale 1:1500

EarthTech
A Tyco International Ltd. Company

PWGSC
FOX-C DEW LINE SITE - UPPER STATION 'B'
UPPER STATION 'B' PLAN
Figure 6.0



..\WORK\76\00\78850\02a-CAD\GF\current\Cadd File: 78850_Fox-C Dew Line.dwg\Last Edit: 2004-10-05 (12:00)\Plot Scale: 1:1 (A3)

Date: JANUARY 03, 2005

0 10 20 30 40 50

Scale 1:750

PWGSC

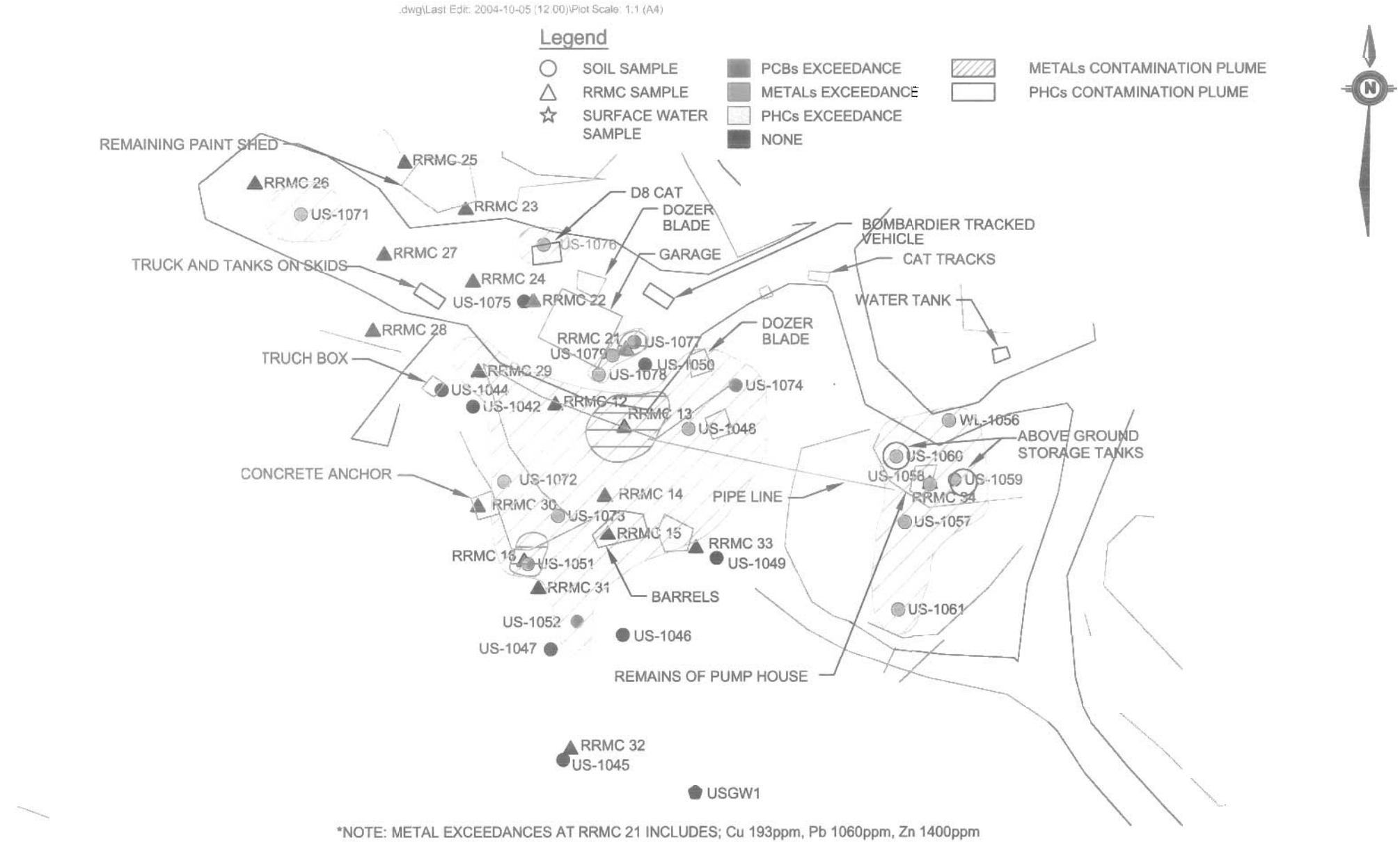
FOX-C DEW LINE SITE - UPPER STATION 'B'

UPPER STATION 'B' PLAN

Figure 6.1

EarthTech

A Tyco International Ltd. Company



*NOTE: METAL EXCEEDANCES AT RRMC 21 INCLUDES; Cu 193ppm, Pb 1060ppm, Zn 1400ppm

Date: JANUARY 03, 2005

0 10 20 30 40 50

Scale 1:1000

EarthTech

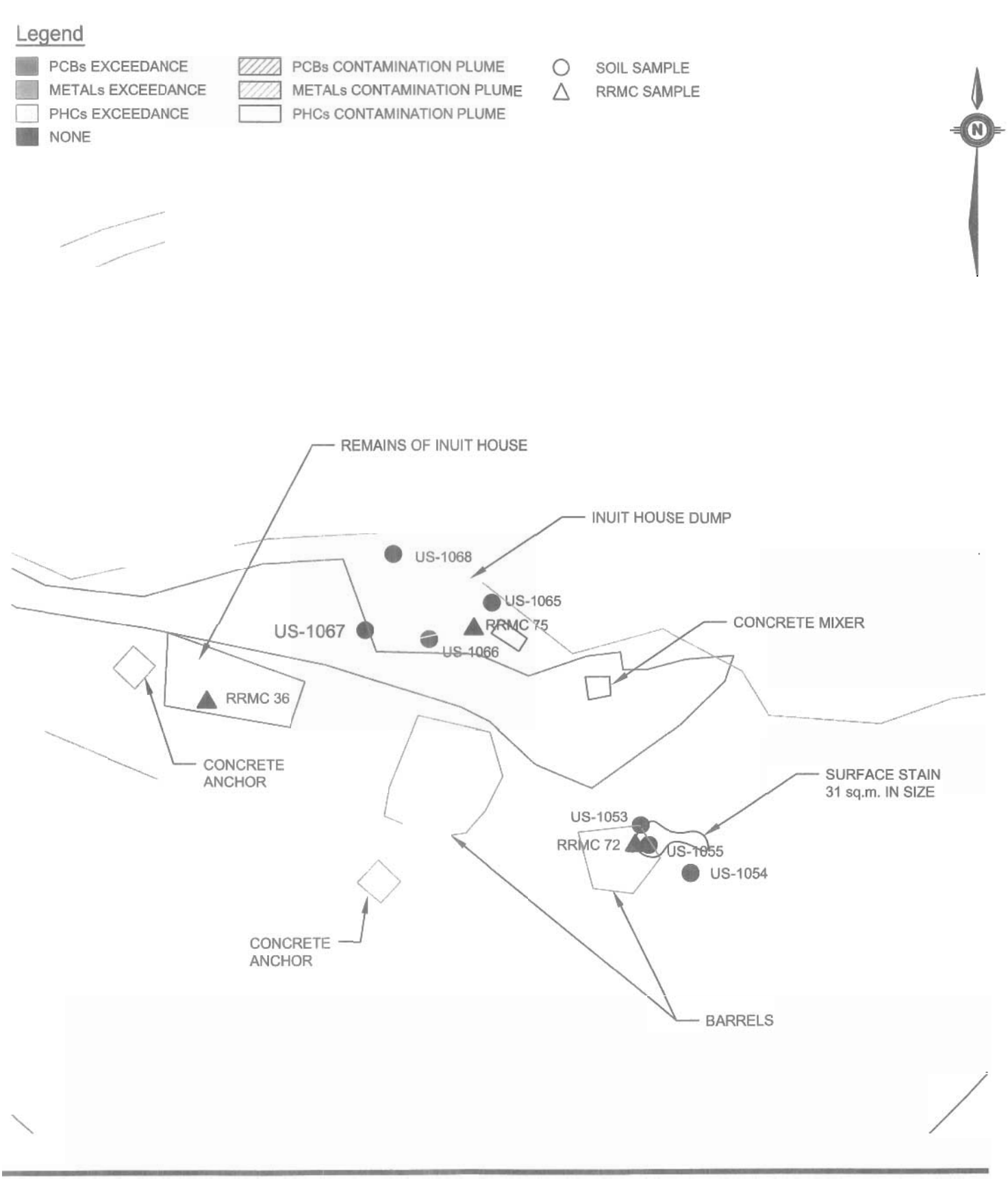
A Tyco International Ltd. Company

PWGSC

FOX-C DEW LINE SITE - UPPER STATION 'B'

UPPER STATION 'B' PLAN

Figure 6.2



\\WORK\17800\17885\02a-CAD\GF current\Cadd File: 78850_Fox-C Dew Line.dwg\Last Edit: 2004-10-05 (12:00)\Plot Scale: 1:1 (A3

Date: OCTOBER 05, 2004

0 10 20 30 40 50

Scale 1:1500

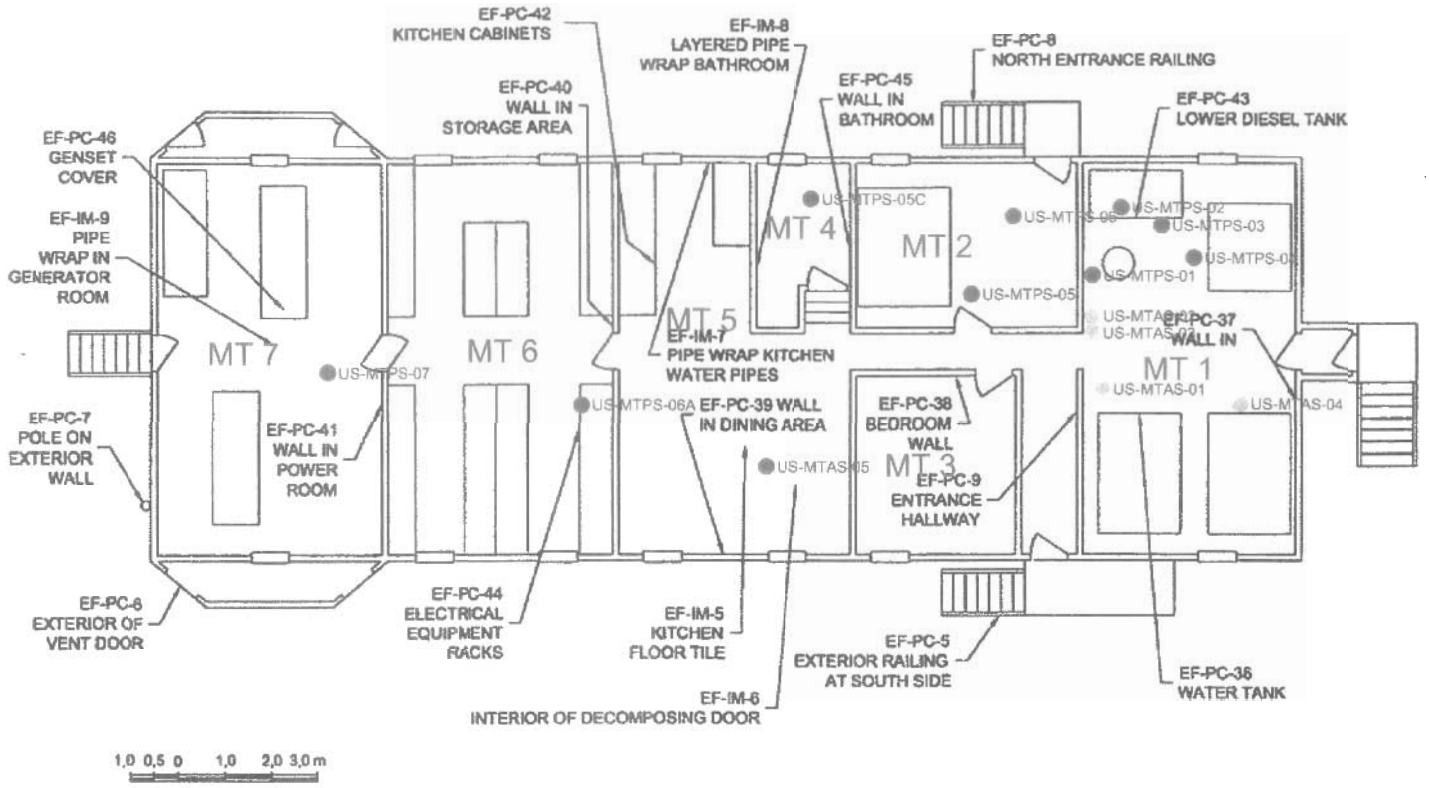
EarthTech
A Tyco International Ltd Company

PWGSC

FOX-C DEW LINE SITE - UPPER STATION 'B'

UPPER STATION 'B' PLAN

Figure 6.3



Date: OCTOBER 05, 2004

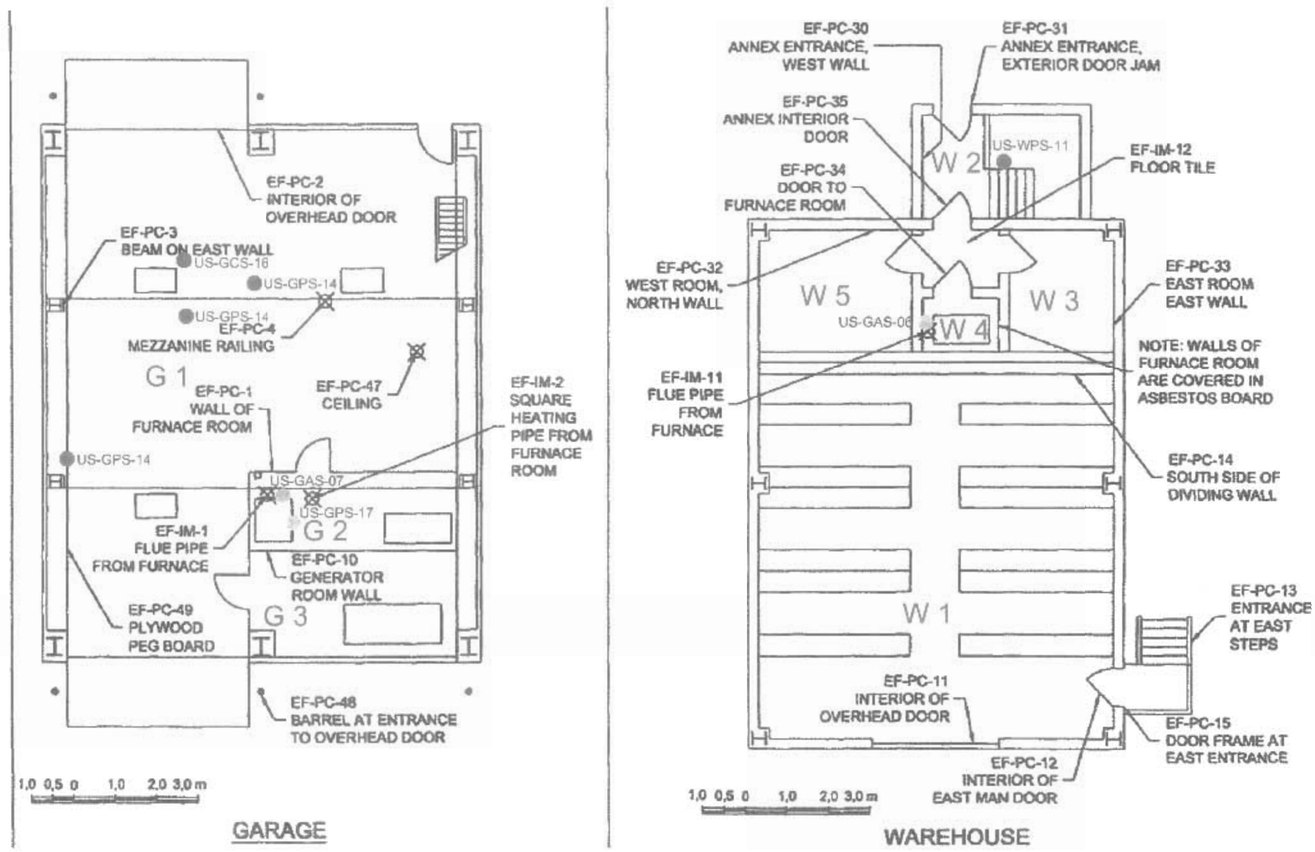
EarthTech
A Tyco International Ltd. Company

PWGSC

FOX-C DEW LINE SITE - UPPER STATION 'B'

Material Samlping Locations Module Train

Figure 7.1



Date: OCTOBER 05, 2004

EarthTech
A Tyco International Ltd. Company

PWGSC

FOX-C DEW LINE SITE - UPPER STATION 'B'

Material Samlping Locations Garage/Warehouse

Figure 7.2