

10/16/03-02667

Final

## Phase I

# Remedial Investigation Interim Report

## For Operable Unit 14, Site 90

Marine Corps Air Station  
Cherry Point, North Carolina



Prepared for

## Department of the Navy

Atlantic Division

Naval Facilities Engineering Command  
Norfolk, Virginia

Contract No. N62470-95-D-6007  
CTO-0209

**October 2003**

Prepared by

**CH2MHILL**

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## SIGNATURE PAGE

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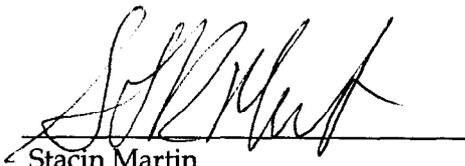
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# Introduction

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This technical memorandum (memo) describes the results of preliminary (Phase I) Remedial Investigation (RI) data collection activities at OU14, Site 90, and presents proposed follow on sampling activities to close identified data gaps. The preliminary investigation activities were performed for the purpose of delineating the concentrations and extent of chlorinated volatile organic compounds (CVOCs) in the lower and upper portions of the surficial aquifer. The activities described were completed in October 2002 in accordance with the RI work plan (CH2M HILL, 2002) for OU14, Site 90 at Marine Corps Air Station (MCAS) Cherry Point, North Carolina. Initially two phases of work were proposed to investigate the presence of CVOCs in groundwater at OU14, Site 90. Upon completion of the Phase I field investigation, data from ongoing groundwater monitoring as part of the UST program (in the vicinity of Tank Farm A, north and west of Site 90) was made available to the Site 90 RI team. These data, and the results of the Phase I sampling, indicated that CVOCs are present in groundwater to the north and west, beyond the extent of the Phase I investigation area. Consequently, it may be necessary to conduct an additional phase of data gap sampling (Phase III) following the proposed Phase II investigation presented in this memo. The proposed approach for the Phase III investigation, if necessary, will be presented following an evaluation of the Phase II investigation results.

The objective of the Phase I investigation was to determine the preliminary extent of CVOC contamination in the groundwater at Site 90 in advance of a Phase II investigation originally intended to close data gaps and include a more comprehensive suite of chemical analyses. As discussed above, the Phase II investigation will now be used to delineate the extent of CVOC contamination in groundwater within the expanded study area. If necessary, a Phase III investigation will be conducted to fill any data gaps evident from the first two investigation phases.

The overall objectives of the RI at Site 90 are to:

- Determine the nature and extent of CVOC groundwater contamination that may be associated with former non-petroleum sources in the OU14 area.
- Obtain sufficient data to support a human health risk assessment (HHRA). An ecological risk assessment (ERA) does not appear to be warranted due to a lack of receptors. The site is entirely paved over with concrete; however, exposed ground surface and surface water is present to the northwest of the site beyond the current extent of the investigation area. For the sake of completeness, the RI Report for OU14 will include a section entitled "Ecological Risk Assessment."

The results of the Phase I investigation activities and recommendations for the Phase II investigation are presented in this memo.

# Site Description and History

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## 2.1 Site Description

Marine Corps Air Station (MCAS) Cherry Point is a 13,164-acre military reservation located adjacent to the City of Havelock in southeastern Craven County, North Carolina.

Commissioned in 1942, MCAS Cherry Point provides support facilities and services for the Second Marine Aircraft Wing, the Naval Aviation Depot (NADEP), Service Support Detachment 21 of the Second Force Service Support Group (2<sup>nd</sup> FSSG), the Naval Air Maintenance Training Group Detachment, and the Defense Reutilization and Marketing Office (DRMO). MCAS Cherry Point maintains facilities for training and support of the Atlantic Fleet Marine Force (FMF) aviation units, and is designated as a primary aviation supply point.

The boundaries of MCAS Cherry Point include the Neuse River to the north, Hancock Creek to the east, North Carolina Highway 101 to the south, and a boundary approximately  $\frac{3}{4}$ -mile west of Slocum Creek to the west. **Figure 1** shows the general layout of MCAS Cherry Point.

OU14, Site 90 consists of the area including and surrounding Building 130, which is located in the west-central portion of the MCAS Cherry Point base flight-line complex, adjacent to Sixth Avenue (**Figure 2**). Building 130 is a large aircraft hangar that is approximately 450 ft long and 250 ft wide. The hangar consists of two large aircraft bays, storage rooms, and administrative offices. A broad expanse of concrete tarmac generally surrounds the building and extends northward and eastward to aircraft taxiways and runway 14L. A concrete airplane wash rack and small outbuildings are located adjacent to the southeast side of the building. Portions of an abandoned underground aviation pipeline generally surround Building 130. This pipeline network was previously used to refuel aircraft at multiple fueling stations. The only surface features that indicate the location of the abandoned pipeline network are two manhole covers, which provide access to pipeline junction vaults; the manholes are located in the two parking lots on the northwest and southeast sides of Building 130 near Sixth Avenue.

The airplane wash rack, located near the southeast side of Building 130, has apparently been used to wash aircraft and related equipment since the construction of Building 130 in the early 1940s. The wash rack is currently used to flush aircraft fuel drop tanks with water. The wash rack drains to a diversionary catch basin (located near Sixth Avenue) that is connected to the industrial sewer system. Portions of the sewer system are reportedly constructed of clay pipe, which may crack and break with age. Also, Building 3745 is located adjacent to the wash rack, and is used as a hazardous waste accumulation area. Building 1700, an aircraft maintenance hangar, is located to the southeast (and potentially upgradient) of the OU14 area.

Numerous underground utility lines and features are located within the project area, including sanitary sewer, stormwater, water, steam, communication lines, fuel lines, electrical lines, and USTs.

## 2.2 Site History

MCAS Cherry Point was commissioned in 1942. A massive aircraft assembly and repair facility, which later became the Naval Aviation Depot (NADEP), was added in 1943. Hazardous wastes have historically been generated through aircraft assembly and maintenance operations. These wastes have included plating wastes, organic solvents, paint removers and cleaners, oils and lubricants, waste petroleum, and polychlorinated biphenyls (PCBs). The Air Station was placed on the federal National Priorities List (NPL) in December 1994. Currently, the investigation and remediation process is ongoing at several operable units.

According to building construction drawings, Building 130, located within OU14, was reportedly constructed in the early 1940s to house and maintain seaplanes. The underground aviation pipeline network that surrounds the hangar was also apparently constructed at this time and was expanded several times before its abandonment. Records concerning when and how the pipeline system was abandoned are not available (Law, 1995).

The underground pipeline system includes two 12-inch and one 4-inch diameter pipelines that run adjacent to Sixth Avenue. The main pipelines branched off to multiple fueling stations, primarily located near the northeast, southeast, and northwest sides of Building 130. Another run of abandoned pipeline is located northwest of Building 130 and branches off to individual refueling stations in this area. The overall pipeline system consisted of several miles of pipeline, which was connected to Tank Farm A, located approximately 600 ft northwest of Building 130.

An addition to the southwest side of Building 130 was constructed in the 1950s (estimated) over a portion of the abandoned pipeline adjacent to Sixth Avenue and over a suspected lubrication oil/waste oil UST of unknown size that is assumed to have been abandoned in place. An addition to the northeast side of the building was also apparently constructed at this time over another suspected UST that is assumed to have been abandoned in place (a 1944 base construction drawing shows these USTs).

The aircraft wash rack was reportedly constructed at the same time as Building 130. History related to Building 4438 (hazardous material accumulation area) is not clear. Building 4438 is located between the aircraft wash rack and Building 3745.

Both petroleum-related compounds and CVOCs have been detected in groundwater beneath OU14, Site 90. The petroleum-related contamination consists primarily of benzene, toluene, ethylbenzene and xylenes (BTEX), as well as semi-volatile organic compounds (SVOCs), including naphthalene. This petroleum-related contamination is currently being addressed under the MCAS Cherry Point UST Program. Because of the presence of CVOCs in groundwater, Site 90 was identified as a new site in 1999 for inclusion in the Installation Restoration (IR) Program for MCAS Cherry Point. The source of the CVOCs is not definitively known at this time.

# Field Investigation of Groundwater Contamination

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To determine the nature and extent of potential groundwater contamination at OU14, 19 initial locations were investigated in October 2002, in the vicinity of Building 130. Based on the analytical sample results at the initial 19 locations, an additional 8 locations were investigated. Grab groundwater samples were collected at each of the 27 locations (Figure 3) utilizing direct push technology (DPT). With the exception of one location (9005), a groundwater sample was collected at the top of the surficial aquifer (shallow sample) and at the base of the surficial aquifer (deep sample). No deep groundwater sample was collected at location 9005 due to the DPT rig hitting refusal at approximately 18 feet bgs. All of the groundwater samples were submitted to an off-site laboratory for the analysis of Target Compound List (TCL) VOCs.

Soil core samples for lithological characterization were collected at each of the 27 locations from the ground surface to the depth of the water table surface utilizing DPT. Samples were screened with a photoionization detector (PID), inspected visually for any indications of contamination such as staining, and were logged for lithology. Elevated PID readings and/or visual inspection indicated possible soil contamination at 9 locations. As a result, soil samples were collected from these locations and submitted to an off-site laboratory for the analysis of TCL VOCs. The 9 soil samples were collected at locations 9006 through 9009, 9021, and 9024 through 9027. The samples were collected from a 1-foot subsurface interval that varied in depth between locations based on the PID readings. The shallowest sample (9006SB0203) was collected from the 2 to 3-foot bgs interval, and the deepest sample (9025SB1011) was collected from the 10 to 11-foot bgs interval.

The 19 initial groundwater sample locations are identified as 9001 through 9019, and were pre-selected based on historical data. These initial locations are presented in the Final OU14, Site 90 Work Plan (CH2M HILL, 2002). The 8 additional groundwater sample locations (9020 through 9027) were selected to further delineate the CVOC plume based on the results of VOC analysis of the samples collected from the initial 19 locations.

Each location was investigated by advancing into the soil a 2-inch diameter, 4-foot long DPT soil sampling tool with an acetate-lined inner sleeve. The resulting 4-foot soil core was retrieved and opened to enable the soil core to be first screened with a PID and then to have the lithology logged. Multiple 4-foot soil cores were collected at each location until the depth of the water table was encountered (approximately 8-12 feet bgs). At the 9 locations where elevated PID readings and/or visual evidence of possible contamination was present, soil samples were collected from the soil cores with an Encore<sup>®</sup> sampling device, and submitted for off-site laboratory analysis of TCL VOCs.

Following the collection of soil core samples at each location, a 4-foot stainless steel groundwater sampling device was advanced an additional 4 feet beneath the water table for the collection of the upper surficial aquifer groundwater sample. A peristaltic pump and

polyethylene tubing were used to purge groundwater from the DPT groundwater sampling tool until turbidity was sufficiently reduced and a representative groundwater sample could be collected. The groundwater samples were collected from within the DPT groundwater sampling tool and drill rods using the "straw method". The disposable polyethylene tubing containing the representative groundwater sample was withdrawn from the sampling tool and was then allowed to drain to the sample vials. After the collection of the shallow groundwater sample, a decontaminated sampling device was advanced to the lower portion of the surficial aquifer, ranging from 40 to 50 feet bgs, and the deep sample was collected. Boring logs from previous well installation activities at Site 90 were used to determine the depth of the confining unit across the site. The depth of each deep sample was determined based on the likely depth of the confining unit at that location after examining boring logs generated in the vicinity of each sample location. The deep aquifer samples were collected in the same manner as the shallow samples. All samples were submitted to an off-site laboratory for the analysis of TCL VOCs, with the results from the initial sample locations being returned within 24-hours of laboratory receipt.

Groundwater elevations were collected from 4 nearby permanent monitoring wells screened in the upper 25 feet of the surficial aquifer and from 5 monitoring wells screened in the lower portion of the surficial aquifer. The results of the water level survey are presented in Table 1 and are shown on Figures 4 and 5.

## Summary of Results

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Chlorinated VOCs as well as non-chlorinated VOCs, including petroleum related compounds such as BTEX, were detected in soils and groundwater at Site 90. The discussion in the following sections will focus on the CVOCs, as they are target contaminants in this investigation. Petroleum-related contamination will be discussed only briefly, as it is being addressed under the UST program at MCAS Cherry Point.

### 4.1 Groundwater

Groundwater sample results were screened against the following regulatory criteria:

- Federal Maximum Contaminant Levels (MCLs) and secondary guidelines (SMCLs);
- North Carolina 2L Groundwater Standards; and
- USEPA Region IX PRGs for tap water.

Groundwater VOC detections and exceedances are presented in [Table 2](#) and are shown on [Figure 6](#).

#### 4.1.1 Upper Surficial Aquifer Groundwater

Chlorinated VOCs were found to be present in the upper portion of the surficial aquifer (8 to 16 feet bgs) predominantly in the southern portion of the investigation area adjacent to Building 130. Ten CVOCs were detected in the upper portion of the surficial aquifer: 1,1-dichloroethane (1,1-DCA), 1,1-dichloroethene (1,1-DCE), 1,2-DCA, cis-1,2-DCE, trans-1,2-DCE, trichloroethene (TCE), chloroethane, chloromethane, methylene chloride, and vinyl chloride.

The highest concentrations of 1,1-DCA, 1,1-DCE, and vinyl chloride in the upper portion of the surficial aquifer were found at location 9003, located adjacent to the southeast wall of Building 130. Although higher concentrations of cis-1,2-DCE were found in deep samples, location 9003 had the highest concentration found in the shallow samples. 1,1-DCA and 1,1-DCE exceeded one or more screening criteria at location 9003. Vinyl chloride and cis-1,2-DCE exceeded all three screening criteria at location 9003.

The vinyl chloride concentration (850 µg/L) in the upper surficial aquifer sample at location 9003 was elevated significantly above other detected concentrations in both deep and shallow samples. The 850 µg/L result is more than two orders of magnitude greater than other detected concentrations and exceeds all screening criteria. Vinyl chloride also exceeded one or more screening criteria in shallow groundwater samples from six other locations adjacent to and downgradient of location 9003 and Building 130.

TCE was detected in two shallow samples, at locations 9002 and 9006. Both TCE detections in the upper surficial aquifer exceeded the USEPA Region IX tap water PRG.

Chloroethane, chloromethane, and methylene chloride exceeded one or more screening criteria in upper surficial aquifer groundwater samples. Chloroethane was detected in the vicinity of Building 130, specifically at locations 9001, 9003, and 9005. The greatest concentration of chloromethane in the upper surficial aquifer was detected in the sample from location 9002, which is located inside of Building 130. Methylene chloride was detected at one location, 9009, approximately 700 feet downgradient (northwest) of Building 130.

Non-chlorinated VOCs detected in the upper surficial aquifer that exceeded screening criteria included benzene, ethylbenzene, and total xylenes. Toluene was detected in upper surficial aquifer groundwater, but did not exceed any screening criteria.

#### 4.1.1.1 Summary of Upper Surficial Aquifer Groundwater Investigation Results

The CVOCs detected in the upper surficial aquifer groundwater during the Phase I investigation are predominantly degradation products of TCE. Compounds indicative of progressively greater degradation, such as chloroethane, methylene chloride, and vinyl chloride, were detected in the upper surficial aquifer samples. The concentrations of compounds resulting from TCE degradation show a downgradient trend (higher concentrations of parent compounds upgradient to higher concentrations of daughter compounds downgradient) from the aircraft wash rack area to the north and northwest. The spatial distribution of CVOCs in the upper surficial aquifer groundwater found during the Phase I investigation are consistent with previous investigations that show elevated concentrations of CVOCs exceeding screening criteria in the vicinity of Building 130.

#### 4.1.2 Lower Surficial Aquifer Groundwater

Eight of the ten CVOCs detected in the upper surficial aquifer were also detected in the lower surficial aquifer (36 to 50 feet bgs). 1,2-DCA and chloroethane were not detected in the samples from the lower surficial aquifer and no CVOCs were found that were not also detected in the upper portion of the aquifer.

TCE, cis-1,2-DCE, and 1,1-DCA were the most frequently detected CVOCs in the lower surficial aquifer. One or more groundwater screening criteria for TCE were exceeded in samples from 11 of the 27 sample locations. Cis-1,2-DCE exceeded one or more screening criteria at 4 locations. The highest concentrations of TCE (location 9017) and cis-1,2-DCE (location 9018) were found in the middle of the investigation area downgradient (north) of Building 130. The concentrations of these two compounds decrease moving downgradient to the north and northwest. The highest detected concentration of 1,1-DCA in lower surficial aquifer groundwater samples was found at location 9023 (at the downgradient extent of the Phase I study area), and concentrations decrease moving upgradient to the southeast.

1,1-DCE was detected in lower surficial aquifer groundwater samples at six locations, but did not exceed any screening criteria at these locations. 1,1-DCE was found from Building 130 extending north and west to the vicinity of sample location 9019.

Vinyl chloride was detected in lower surficial aquifer samples at 2 locations, 9017 and 9018. The concentrations in both samples exceeded all three groundwater screening criteria. Trans-1,2-DCE was detected in the lower surficial aquifer at six locations, but did not exceed any groundwater screening criteria.

Chloromethane and methylene chloride were detected in the lower surficial aquifer sample from location 9009. Only methylene chloride exceeded any groundwater screening criteria.

Benzene and ethylbenzene were detected above screening criteria in a number of lower surficial aquifer groundwater samples across the investigation area. Total xylenes were also detected in a number of samples, but did not exceed any screening criteria. Toluene was detected at one location, 9026, but did not exceed any screening criteria.

#### 4.1.2.1 Summary of Lower Surficial Aquifer Groundwater Investigation Results

The CVOCs most frequently exceeding screening criteria in lower surficial aquifer groundwater samples were TCE and cis-1,2-DCE. The highest concentrations of CVOCs in the lower surficial aquifer were found north of Building 130. Concentrations of CVOCs exceeding screening criteria extend downgradient (northwest) from the washrack area to the approximate middle of the Phase I investigation area, where concentrations then begin to decrease. A number of CVOCs were not detected as far to the northwest as sample location 9009, but concentrations of these compounds increased significantly to levels exceeding screening criteria downgradient at the northwest extent of the Phase I investigation area. Cis-1,2-DCE exceeded all screening criteria and TCE exceeded the USEPA Region IX Tap Water PRG in the most downgradient Phase I samples. The distribution of CVOCs in the lower surficial aquifer indicates that the wash rack area may not be the only source area for CVOC contamination. The Phase I investigation results indicate that CVOC contamination is likely present downgradient of the Phase I investigation area. The downgradient concentrations and probable contamination beyond the Phase I investigation area may be due to other, localized sources rather than the wash rack area adjacent to Building 130.

#### 4.1.3 Soil

Subsurface soil sample results were collected at 9 locations where PID readings were elevated during soil headspace screening. These data were screened against the following regulatory criteria:

- USEPA Region IX PRGs for industrial soils
- North Carolina Soil Revised Draft SSLs.

Subsurface soil analyte detections and exceedances are presented in [Table 3](#) and are shown on [Figure 7](#).

Six CVOCs were detected in soils at Site 90, predominately to the north and northwest of Building 1701. 1,1,2,2-tetrachloroethane (1,1,2,2-PCA), 1,1,2-trichloroethane (1,1,2-TCA), 1,2-dibromo-3-chloropropane, and bromodichloromethane were detected at one location (9009), where concentrations of the four compounds exceeded both soil screening criteria. However, none of these CVOCs were detected in either the upper or lower surficial aquifer groundwater samples collected at this same location. Cis-1,2-DCE was detected in soil at one location (9025), and chloromethane was detected at four locations. Neither cis-1,2-DCE or chloromethane exceeded any screening criteria.

Thirteen non-chlorinated VOCs were detected in subsurface soils. Of these, 2-hexanone, 4-methyl-2-pentanone, methyl acetate, and styrene were detected at one location (9009), but

did not exceed screening criteria. In addition, cumene and methylcyclohexane were detected at more than one location, but did not exceed screening criteria. The maximum concentrations of the VOCs 2-butanone, acetone, benzene, cyclohexane, ethylbenzene, and total xylenes were also found at location 9009, and exceeded one or more screening criteria. The maximum concentration of toluene was detected at location 9026, but did not exceed any screening criteria.

#### **4.1.3.1 Summary of Soil Sample Results**

The compounds detected in the soil samples collected as part of the Phase I investigation do not appear to be related to the source of the CVOC contamination found in the underlying groundwater. The VOCs predominant in the soil samples were non-chlorinated VOCs commonly associated with petroleum products.

## SECTION 5

# UST Program CVOC Groundwater Data

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Upon completion of the Phase I investigation, CVOC data recently collected as part of MCAS Cherry Point UST program groundwater monitoring efforts were made available to the IR Program. The groundwater data were collected in the vicinity of Buildings 1700, 130, 1701, 250, 4075, and approximately 500 feet to the northwest of Building 4075. The UST Program CVOC data are presented in Tables 4 and 5, which were provided by Catlin Engineers and Scientists. The UST Program sample locations and results are shown on Figure 8.

The data collected as part of the UST monitoring program indicate that CVOC contamination in the surficial aquifer extends northwest from Building 1700 to beyond Building 4075. The data points are infrequent over the approximately 3,000 foot long and 1,000 foot wide area, revealing a number of data gaps, but indicates that the CVOC contamination in the surficial aquifer extends considerably further downgradient to the northwest than the limits of the Phase I study area.

## Recommendations for Phase II RI Activities

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After a review of the Phase I groundwater data presented in this report in conjunction with the CVOC groundwater data collected as part of the UST monitoring program, it is recommended that a comprehensive round of groundwater sampling be conducted utilizing existing monitoring wells located within Site 90 and extending downgradient along the flightline beyond Building 4075. The objective of the Phase II sampling round is to determine the extent of the CVOC plume in the surficial aquifer, which appears to extend considerably further downgradient than anticipated. Following the Phase II groundwater sampling, the complete data set from all investigations to date will be evaluated to determine if any data gaps remain. If necessary, a focused Phase III investigation will be conducted to clear up any remaining data gaps.

The proposed Phase II study area and sampling locations are shown in Figure 9. The proposed existing monitoring wells to be sampled (57 monitoring wells) consist of wells screened in the upper and lower portions of the surficial aquifer. Samples will be analyzed for TCL VOCs, RCRA-8 metals, nitrate, and sulfate, and will be collected in accordance with the Final Remedial Investigation Work Plan for OU14, Site 90 (CH2M HILL, August 2002).

SECTION 7

## References

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CH2M HILL, Inc. (August 2002), *Final Remedial Investigation Work Plan for Operable Unit 14, Site 90, Marine Corps Air Station, Cherry Point, North Carolina*, Contract No. N62470-95-D-6007, Contract Task Order 0209.

Law Engineering (June 1995), *Leaking Underground Pipeline Site Assessment Report, Building 130, Marine Corps Air Station, Cherry Point, North Carolina*, Contract No. N62470-93-D-4020.

**Table 1**  
**Groundwater Elevation Measurements, October 2002**  
**Phase I Remedial Investigation**  
**OU14, Site 90**  
**MCAS Cherry Point**

<b>Monitoring Well Identification</b>	<b>TOP OF PVC CASING ELEVATION (FEET AMSL)</b>	<b>DEPTH TO WATER (FEET)</b>	<b>GROUNDWATER ELEVATION (FEET AMSL)</b>
<b>SHALLOW (Upper Surficial Aquifer)</b>			
72GW03	27.63	10.00	17.63
OU1-MW70	22.52	8.93	13.59
OU1-MW68	24.33	10.30	14.03
OU1-MW61	26.85	7.10	19.75
<b>DEEP (Lower Surficial Aquifer)</b>			
72GW16	27.53	11.49	16.04
OU1-MW72	22.66	10.01	12.65
OU1-MW71	22.50	8.74	13.76
OU1-MW69	24.43	10.30	14.13
OU1-MW62	26.83	11.90	14.93

Table 2  
Groundwater VOC Detects and Exceedances

Station ID	MCL- Groundwater (1)	NC-GW- Screening (2)	Region IX PRGs - Tap Water (3)	Phase I Remedial Investigation OU14, Site 90 MCAS Cherry Point																			
				9001GW		9002GW		9003GW		9004GW		9005GW		9006GW		9007GW		9008GW		9009GW		9010GW	
Sample ID				9001GW1216	9001GW3640	9002GW1216	9002GW3640	9003GW1216	9003GW3640	9004GW1216	9004GW4044	9005GW1216	9006GW1216	9006GW4044	9007GW1216	9007GW4044	9008GW0812	9008GW4448	9009GW0812	9009GW4448	9010GW1216	9010GW4448	
<b>Chemical Name</b>																							
<b>Volatile Organic Compounds (ug/L)</b>																							
1,1-Dichloroethane	700	700	810	51	10	3.9	8	720 (2)	5.2	10	1 U	7.6	1 U	9	1 U	15	1 U	1.2	25 U	25 U	1 U	30	
1,1-Dichloroethene	7	7	340	0.87 J	5 U	1 U	2.2	38 (1,2)	5 U	1 U	1 U	1 U	1 U	0.7 J	1 U	1 U	1 U	1 U	25 U	25 U	1 U	1 U	
1,2-Dichloroethane	5	0.38	0.12	1 U	5 U	1 U	1 U	4 (2,3)	5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	25 U	25 U	1 U	1 U	
2-Hexanone	280	280	5 U	5 U	25 U	5 U	5 U	4.8 J	25 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	130 U	130 U	5 U	5 U	
Acetone	700	700	810	5 U	25 U	5 U	12	5 U	25 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	4.1 J	5 U	130 U	130 U	5 U	5 U	
Benzene	5	1	0.34	3.1 (2,3)	150 (1,2,3)	1.4 (2,3)	1 U	9.4 (1,2,3)	9.2 (1,2,3)	0.76 J (3)	1 U	600 (1,2,3)	1 U	11 (1,2,3)	1 U	250 (1,2,3)	16 (1,2,3)	16 (1,2,3)	210 (1,2,3)	25 J (1,2,3)	1 U	2.5 (2,3)	
Carbon disulfide	700	700	1,000	1 U	5 U	3.1 U	1 U	1.3	5 U	1.1	0.96 J	1 U	1 U	1 U	1.5 U	1 U	2.6 U	1.3 U	20 J	88	1 U	1 U	
Chloroethane	2,800	2,800	4.6	6.9 (3)	5 U	1 U	1 U	47 (3)	5 U	1 U	1 U	9.1 (3)	1 U	1 U	1 U	1 U	1 U	1 U	25 U	25 U	1 U	1 U	
Chloromethane	2.6	1.5	1 U	5 U	2.6 (2,3)	1 U	1 U	1 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	25 U	21 J (2,3)	1 U	1 U	
cis-1,2-Dichloroethene	70	70	61	5.9	5 U	6.4	1 U	150 (1,2,3)	5 U	1.8	7.2	1 U	0.54 J	3.9	1 U	1.3	1 U	35	25 U	57	1 U	8.8	
Ethylbenzene	700	29	2.9	1 U	140 (2,3)	1 U	1 U	2.3	130 (2,3)	1 U	1 U	66 (2,3)	1 U	1 U	1 U	1.9	12 (3)	1	160 (2,3)	30 (2,3)	1 U	1 U	
Methylene chloride	5	5	4.3	1.5 U	14 U	1.3 U	1.5 U	2 U	14 U	1.2 U	1.3 U	2 U	1 U	2.5 U	1 U	1 U	1 U	1 U	36 (1,2,3)	37 (1,2,3)	2.1 U	2.3 U	
Styrene	100	100	1,600	1 U	5 U	1 U	1 U	1 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	25 U	25 U	1 U	1 U	
Toluene	1,000	1,000	720	1 U	5 U	1 U	1 U	5.3	5 U	1 U	1 U	7.7	1 U	1 U	1 U	1 U	1 U	1 U	25 U	25 U	1 U	1 U	
trans-1,2-Dichloroethene	100	70	120	1 U	5 U	1 U	1 U	3.2	5 U	1 U	0.7 J	1 U	1 U	1 U	1 U	1 U	1 U	7.5	25 U	25 U	1 U	1 U	
Trichloroethane	5	2.8	0.028	1 U	5 U	0.55 J (3)	0.67 J (3)	1 U	5 U	1 U	24 (1,2,3)	1 U	0.64 J (3)	1.2 (3)	1 U	1 U	1 U	1 U	25 U	25 U	1 U	1 U	
Vinyl chloride	2	0.015	0.02	25 (1,2,3)	5 U	1 U	1 U	850 (1,2,3)	5 U	1.9 (2,3)	1 U	1.6 (2,3)	1 U	1 U	1 U	1 U	0.56 J (2,3)	1 U	25 U	25 U	1 U	1 U	
Xylene, total	10,000	530	210	1 U	5 U	1 U	1 U	17	5 U	1 U	1 U	980 (2,3)	1 U	1 U	1 U	2.4	12	2	250 (3)	77	1 U	1 U	

Station ID	MCL- Groundwater (1)	NC-GW- Screening (2)	Region IX PRGs - Tap Water (3)	Phase I Remedial Investigation OU14, Site 90 MCAS Cherry Point																		
				9011GW		9012GW		9013GW		9014GW		9015GW		9016GW		9017GW		9018GW		9019GW		
Sample ID				9011GW1216	9011GW4448	9012GW1216	9012GW4650	9013GW1216	9013GW4650	9014GW1216	9014GW4050	9015GW1216	9015GW4650	9016GW1216	9016GW4448	9017GW1216	9017GW4448	9018GW1216	9018GW4650	9019GW1216	9019GW4650	
<b>Chemical Name</b>																						
<b>Volatile Organic Compounds (ug/L)</b>																						
1,1-Dichloroethane	700	700	810	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	3.1	1 U	18	6.4	52	
1,1-Dichloroethene	7	7	340	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1.3	1 U	2.2	1 U	2.2	
1,2-Dichloroethane	5	0.38	0.12	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	
2-Hexanone	280	280	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	
Acetone	700	700	810	5 U	5 U	5 U	5 U	5 U	5 U	5 U	3.1 J	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	
Benzene	5	1	0.34	1 U	1 U	1 U	1 U	1 U	1 U	1 U	9 (1,2,3)	1 U	3.7 (2,3)	1 U	0.56 J (3)	4 (2,3)	1 U	2.3 (2,3)	1 U	2.5 (2,3)	1.4	
Carbon disulfide	700	700	1,000	3.8	2.3 U	1 U	2	1 U	1.3 U	1 U	1.6 U	2.9 U	0.7 J	3.1	1.5	5.1	1 U	3.3	1 U	1.4		
Chloroethane	2,800	2,800	4.6	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U		
Chloromethane	2.6	1.5	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1.4	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U		
cis-1,2-Dichloroethene	70	70	61	1 U	1.8	1 U	1 U	1 U	1 U	1 U	42	1 U	8.3	1 U	43	130 (1,2,3)	1 U	300 (1,2,3)	2.7	54		
Ethylbenzene	700	29	2.9	0.51 J	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	4.6 (3)	1 U	1 U	1 U	1 U	1 U	1 U	1 U		
Methylene chloride	5	5	4.3	1 U	1 U	1.2 U	1.1 U	1 U	1 U	1 U	1 U	1 U	1.6 U	1.6 U	2.5 U	1.3 U	1.5 U	1.2 U	1.2 U	1.2 U		
Styrene	100	100	1,600	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U		
Toluene	1,000	1,000	720	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U		
trans-1,2-Dichloroethene	100	70	120	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1.8	1 U	1 U	1 U	1 U	3.3	16	1 U	33	1 U		
Trichloroethane	5	2.8	0.028	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	69 (1,2,3)	1 U	16 (1,2,3)	1 U		
Vinyl chloride	2	0.015	0.02	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.7 J (2,3)	1 U	1.8 (2,3)	2.7 (1,2,3)	1 U	2.4 (1,2,3)	1 U		
Xylene, total	10,000	530	210	0.64 J	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U		

Station ID	MCL- Groundwater (1)	NC-GW- Screening (2)	Region IX PRGs - Tap Water (3)	Phase I Remedial Investigation OU14, Site 90 MCAS Cherry Point																	
				9020GW		9021GW		9022GW		9023GW		9024GW		9025GW		9026GW		9027GW			
Sample ID				9020GW1216	9020GW3640	9021GW1216	9021GW4044	9022GW1216	9022GW4650	9023GW1216	9023GW4448	9024GW1216	9024GW4650	9025GW1216	9025GW4044	9026GW1216	9026GW4448	9027GW1216	9027GW4448		
<b>Chemical Name</b>																					
<b>Volatile Organic Compounds (ug/L)</b>																					
1,1-Dichloroethane	700	700	810	28	11	1 U	0.99 J	1 U	1 U	1 U	75	1 U	1 U	1 U	1 U	1 U	1.9	1 U	1 U	1 U	
1,1-Dichloroethene	7	7	340	1 U	5.5	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	
1,2-Dichloroethane	5	0.38	0.12	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	28 (1,2,3)	1 U	1 U	1 U	1 U	
2-Hexanone	280	280	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	
Acetone	700	700	810	5 U	5 U	5 U	5 U	5 U	5 U	5 U	6.8	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	
Benzene	5	1	0.34	1,000 (1,2,3)	1,500 (1,2,3)	140 (1,2,3)	58 (1,2,3)	1 U	1.9 (2,3)	73 (1,2,3)	27 (1,2,3)	440 (1,2,3)	19 (1,2,3)	210 (1,2,3)	290 (1,2,3)	1,100 (1,2,3)	19 (1,2,3)	150 (1,2,3)	170 (1,2,3)	170 (1,2,3)	
Carbon disulfide	700	700	1,000	0.88 J	2.7	1 U	1.9	16	6.7	1 U	1.2 U	1 U	1 U	1 U	1 U	1.1	1 U	1 U	1 U	1 U	
Chloroethane	2,800	2,800	4.6	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	
Chloromethane	2.6	1.5	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	
cis-1,2-Dichloroethene	70	70	61	1 U	1 U	1 U	1 U	0.77 J	32	0.66 J	170 (1,2,3)	1 U	90 (1,2,3)	1.5	7.1	1.2	6.8	1 U	12		
Ethylbenzene	700	29	2.9	160 (2,3)	97 (2,3)	1 U	0.73 J	1 U	1 U	43 (2,3)	1 U	25 (3)	8.8 (3)	11 (3)	4 (3)	120 (2,3)	69 (2,3)	170 (2,3)	32 (2,3)		
Methylene chloride	5	5	4.3	1.9 U	1.2 U	1 U	1.2 U	1.3 U	1.3 U	3.3 U	2.7 U	2.8 U	3 U	3.1 U	3.7 U	2.3 U	1.3	2 U	2.7 U		
Styrene	100	100	1,600	1 U	1 U	1 U	1 U	1 U	1 U	0.87 J	1 U	1 U	1 U	1 U	1 U	2.5	1.3	1 U	1 U		
Toluene																					

**Table 3**  
**Soil VOC Detects and Exceedances**  
**Phase I Remedial Investigation**  
**OU14, Site 90**  
**MCAS Cherry Point**

Station ID	NC-Revised Draft SSLs (1)	Region IX PRGs - Industrial Soil (2)	9006SB0203	9007SB0607	9008SB0203	9009SB0708	9021SB0506*	9024SB0203	9025SB1011	9026SB0607	9027SB0607
<b>Chemical Name</b>											
<b>Volatile Organic Compounds (ug/Kg)</b>											
1,1,2,2-Tetrachloroethane	0.953	930	4.6 U	4.7 U	4.9 U	3,200 J (1,2)	5 U	4.9 U	7.3 U	5.5 UJ	6.1 U
1,1,2-Trichloroethane	3.34	1,600	4.6 U	4.7 U	4.9 U	2,500 J (1,2)	5 U	4.9 U	7.3 U	5.5 UJ	6.1 U
1,2-Dibromo-3-chloropropane	0.15	2,000	4.6 U	4.7 U	4.9 U	3,900 J (1,2)	5 U	4.9 U	7.3 U	5.5 UJ	6.1 U
2-Butanone	692	27,000,000	8.5 J	9.5 U	10	5,800 J (1)	10 U	9.8 U	15 U	11 UJ	12 U
2-Hexanone	--	--	9.2 U	9.5 U	9.8 U	19,000	10 U	9.8 U	15 U	11 UJ	12 U
4-Methyl-2-pentanone	--	2,800,000	9.2 U	9.5 U	9.8 U	53,000	10 U	9.8 U	15 U	11 UJ	12 U
Acetone	2,810	6,000,000	48	9.5 U	51	25,000 (1)	12 U	49	15 U	72 J	34 J
Benzene	5.62	1,300	4.6 U	4.7 U	4.9 U	8,000 (1,2)	5 U	5.1	210 (1)	43 J (1)	6.1 U
Bromodichloromethane	3.13	1,800	4.6 U	4.7 U	4.9 U	3,200 J (1,2)	5 U	4.9 U	7.3 U	5.5 UJ	6.1 U
Chloromethane	--	2,600	9.2 U	9.5 U	9.8 U	12,000 U	3.6 J	4.7 J	7.7 J	8.5 J	12 U
Cumene	--	2,000,000	4.6 U	4.7 U	4.9 U	8,400	5 U	190	32	560 J	200 J
Cyclohexane	--	140,000	4.6 U	4.7 U	11	520,000 (2)	83 J	260 J	7.3 U	520 J	6.1 U
Ethylbenzene	241	20,000	4.6 U	4.7 U	1.9 J	56,000 (1,2)	5 U	520 J (1)	300 J (1)	1,800 J (1)	1,600 J (1)
Methyl acetate	--	92,000,000	4.6 U	4.7 U	4.9 U	800,000	5 U	4.9 U	7.3 U	5.5 UJ	6.1 U
Methylcyclohexane	--	8,700,000	4.6 U	4.7 U	21	46,000	58 J	1,700 J	900 J	2,000 J	6.1 U
Styrene	2,240	1,700,000	4.6 U	4.7 U	4.9 U	6,200 U	5 U	4.9 U	7.3 U	36 J	6.1 U
Toluene	7,270	520,000	4.6 U	4.7 U	4.9 U	6,200 U	5 U	4.9 U	8.1	560 J	4.5 J
Xylene, total	4,960	420,000	2 J	4.6 J	6.1	160,000 (1)	3.9 J	610 J	160	1,900 J	1,400 J
cis-1,2-Dichloroethene	350	150,000	4.6 U	4.7 U	4.9 U	6,200 U	5 U	4.9 U	7.2 J	5.5 UJ	6.1 U

Notes:

\* - Duplicate sample collected at this location

Sample ID scheme example:

9006 - Site 90, location 06

SB - subsurface soil sample

0203 - sample collected from the 2-3 foot bgs interval

Detections of a chemical are indicated by bold font.

Detections that exceed one or more screening criteria are indicated by bold red font.

Screening criteria exceeded at least once are also indicated by bold red font.

Each screening criteria has been assigned a reference number listed in parentheses in the column header.

The reference number is used to identify specific criteria exceeded in a particular sample.

Data entries consist of the concentration followed by the data qualifier (if any) followed by the reference number(s).

U - compound not detected

J - reported value is estimated

"--" - no screening criteria available

**TABLE 4**  
**SITE 130**  
**GROUND WATER LABORATORY ANALYTICAL RESULTS**  
**EPA 601**

Date Sampled: 2/11/02

PARAMETER	2L	GCL	UNITS	72GW10	72GW23	72GW27	72GW28	72GW28DUP	72GW29	74GW15
"1,1,1-Trichloroethane"	200.0000	0.0000	ug/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1,1,2,2-Tetrachloroethane"	0.1700	170.0000	ug/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00
"1,1,2-Trichloroethane"	0.0000	0.0000	ug/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00
"1,1-Dichloroethane"	700.0000	700,000.0000	ug/L	0.00	0.00	45.00	3.40	3.90	4.80	0.00
"1,1-Dichloroethene"	7.0000	7,000.0000	ug/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00
"1,2-Dichlorobenzene"	620.0000	72,500.0000	ug/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00
"1,2-Dichloroethane"	0.3800	380.0000	ug/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00
"1,2-Dichloropropane"	0.5600	560.0000	ug/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00
"1,3-Dichlorobenzene"	620.0000	61,500.0000	ug/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00
"1,4-Dichlorobenzene"	75.0000	39,500.0000	ug/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00
"cis-1,2-Dichloroethene"	70.0000	70,000.0000	ug/L	17.00	5.50	2.50	1.30	1.50	5.10	0.00
"cis-1,3-Dichloropropene"	0.2000	200.0000	ug/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00
"trans-1,2-Dichloroethene"	70.0000	70,000.0000	ug/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00
trans-1,3-Dichloropropene"	0.2000	200.0000	ug/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bromodichloromethane	0.6000	0.0000	ug/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bromoform	0.1900	0.0000	ug/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bromomethane	0.0000	0.0000	ug/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Carbon tetrachloride	0.3000	0.0000	ug/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Chlorobenzene	50.0000	0.0000	ug/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Chloroethane	2,800.0000	0.0000	ug/L	0.00	3.60	0.00	0.00	0.00	0.00	0.00
Chloroform	0.1900	0.0000	ug/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Chloromethane	2.6000	2,600.0000	ug/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dibromochloromethane	0.4100	0.0000	ug/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EDB	0.0004	50.0000	ug/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Methylene Chloride	5.0000	5,000.0000	ug/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tetrachloroethene	0.7000	700.0000	ug/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Trichloroethene	2.8000	0.0000	ug/L	0.00	3.90	0.00	0.00	0.00	0.00	0.00
Trichlorofluoromethane	2,100.0000	0.0000	ug/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Vinyl Chloride	0.0100	0.0000	ug/L	0.00	0.00	0.00	1.50	1.80	0.00	0.00
<b>Totals:</b>				<b>17.00</b>	<b>13.00</b>	<b>47.50</b>	<b>6.20</b>	<b>7.20</b>	<b>9.90</b>	<b>0.00</b>

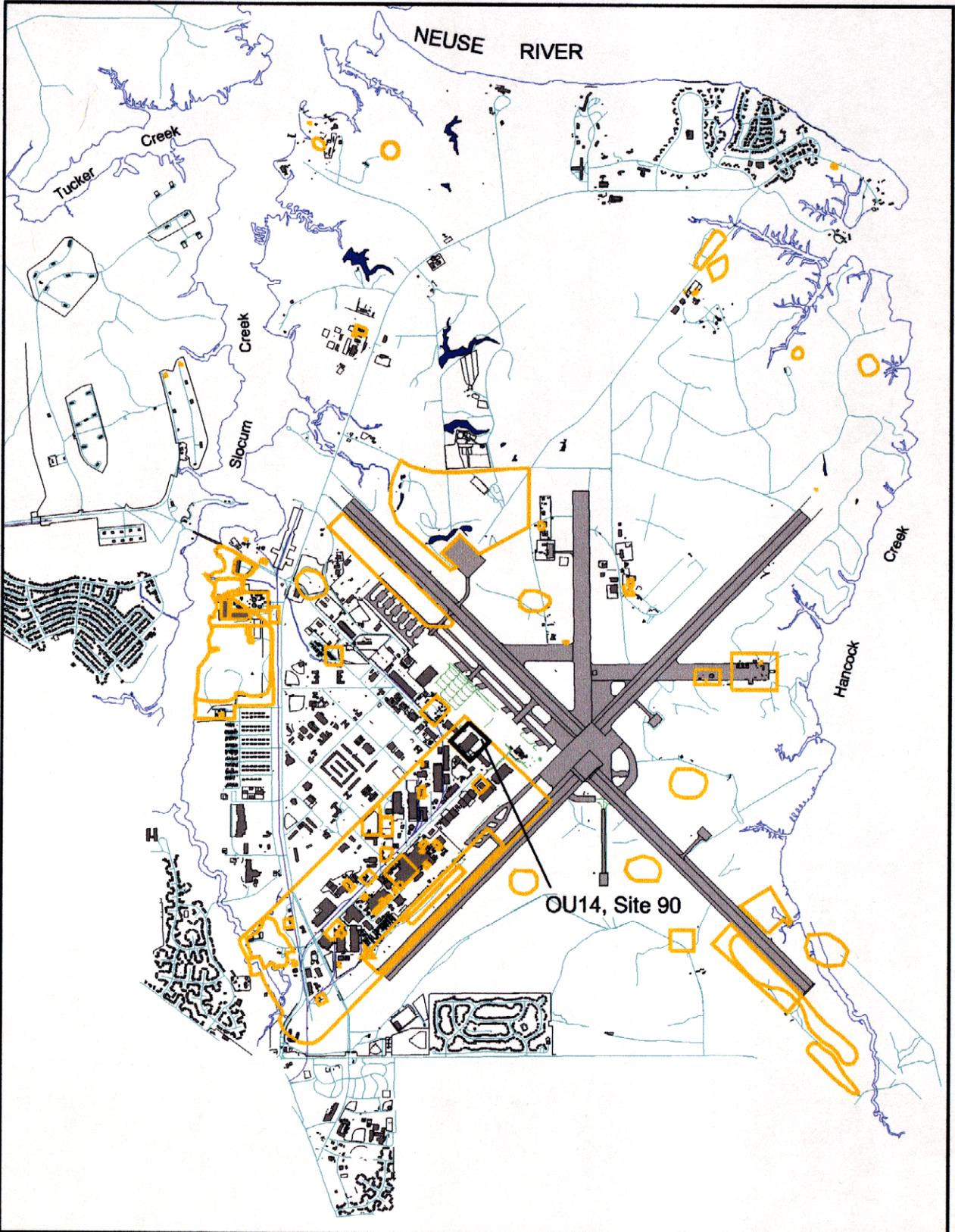
- Notes: 1. 2L = North Carolina groundwater quality standard 15A NCAC 2L .0202  
2. GCL = Gross Contamination Levels for ground water as defined in "Groundwater Section Guidelines for the Investigation and Remediation of Soil and Groundwater" Volume II January, 1998  
3. ug/L = Micrograms per Liter  
4. A zero ("0.00") in the results column indicates concentration is either below detection limit or below quantitation  
5. A zero ("0.0000") in the 2L column indicates the 2L standard is equal to the laboratory detection limit  
6. A zero ("0.0000") in the GCL column indicates a GCL has not been established

**TABLE '5**  
**SITE 4075**  
**GROUND WATER LABORATORY ANALYTICAL RESULTS**  
**EPA 601**

Date Sampled: 2/6/02

PARAMETER	2L	GCL	UNITS	13GW11	13GW12	13GW142	13GW142DUP	13GW17	13GW29	66GW02	66GW08	66GW09	66GW04	66GW20	66GW36
"1,1,1-Trichloroethane"	200.0000	0.0000	ug/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1,1,2,2-Tetrachloroethane"	0.1700	170.0000	ug/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
"1,1,2-Trichloroethane"	0.0000	0.0000	ug/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
"1,1-Dichloroethane"	700.0000	700,000.0000	ug/L	21.00	12.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
"1,1-Dichloroethene"	7.0000	7,000.0000	ug/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00
"1,2-Dichlorobenzene"	620.0000	72,500.0000	ug/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
"1,2-Dichloroethane"	0.3800	380.0000	ug/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
"1,2-Dichloropropane"	0.5600	560.0000	ug/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
"1,3-Dichlorobenzene"	620.0000	61,500.0000	ug/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
"1,4-Dichlorobenzene"	75.0000	39,500.0000	ug/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
"cis-1,2-Dichloroethene"	70.0000	70,000.0000	ug/L	200.00	6.00	450.00	420.00	2.00	33.00	5.00	25.00	8.00	11.00	0.00	4.00
"cis-1,3-Dichloropropene"	0.2000	200.0000	ug/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
"trans-1,2-Dichloroethene"	70.0000	70,000.0000	ug/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
trans-1,3-Dichloropropene"	0.2000	200.0000	ug/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bromodichloromethane	0.6000	0.0000	ug/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bromoform	0.1900	0.0000	ug/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bromomethane	0.0000	0.0000	ug/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Carbon tetrachloride	0.3000	0.0000	ug/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Chlorobenzene	50.0000	0.0000	ug/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Chloroethane	2,800.0000	0.0000	ug/L	0.00	3.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Chloroform	0.1900	0.0000	ug/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Chloromethane	2.6000	2,500.0000	ug/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dibromochloromethane	0.4100	0.0000	ug/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EDB	0.0004	50.0000	ug/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Methylene Chloride	5.0000	5,000.0000	ug/L	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tetrachloroethene	0.7000	700.0000	ug/L	0.00	0.00	230.00	210.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Trichloroethene	2.8000	0.0000	ug/L	0.00	0.00	140.00	130.00	0.00	0.00	4.00	0.00	0.00	0.00	0.00	0.00
Trichlorofluoromethane	2,100.0000	0.0000	ug/L	0.00	0.00	0.00	0.00	0.00	0.00	110.00	1.00	140.00	0.00	0.00	2.00
Vinyl Chloride	0.0100	0.0000	ug/L	0.00	0.00	100.00	94.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>Totals:</b>				<b>221.00</b>	<b>21.00</b>	<b>920.00</b>	<b>854.00</b>	<b>2.00</b>	<b>33.00</b>	<b>115.00</b>	<b>30.00</b>	<b>148.00</b>	<b>13.00</b>	<b>6.00</b>	<b>6.00</b>

- Notes: 1. 2L = North Carolina groundwater quality standard 15A NCAC 2L .0202  
2. GCL = Gross Contamination Levels for ground water as defined in "Groundwater Section Guidelines for the Investigation and Remediation of Soil and Groundwater" Volume II January, 1993  
3. ug/L = Micrograms per Liter  
4. A zero ("0.00") in the results column indicates concentration is either below detection limit or below quantitation  
5. A zero ("0.0000") in the 2L column indicates the 2L standard is equal to the laboratory detection limit  
6. A zero ("0.0000") in the GCL column indicates a GCL has not been established



**LEGEND**  
Site Boundary  
Runway  
Buildings

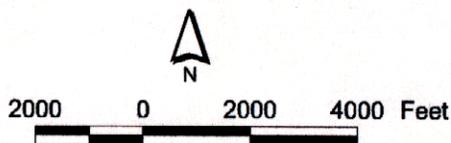
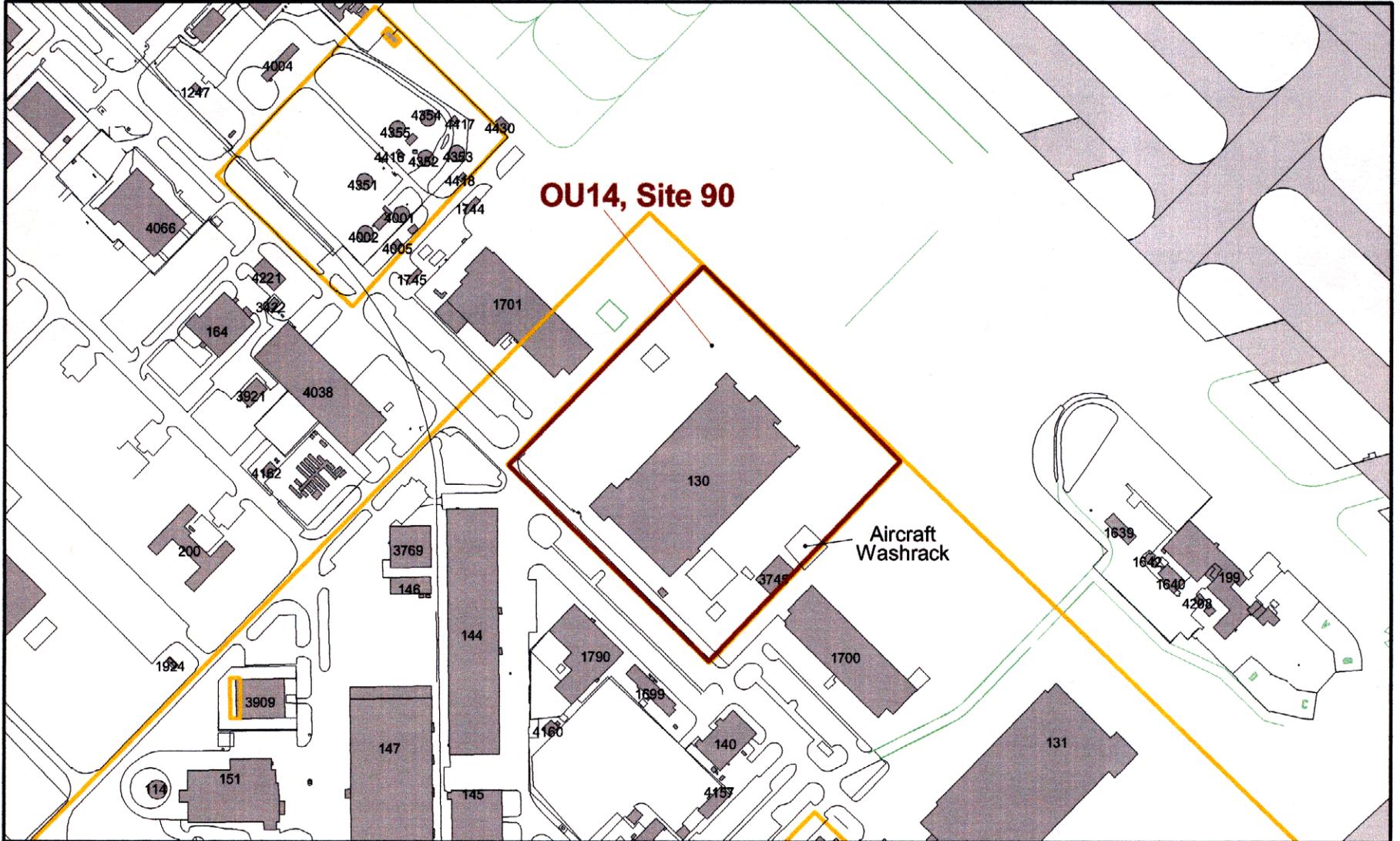


Figure 1  
Vicinity Map  
OU14, Site 90  
MCAS Cherry Point



- LEGEND**
- Site Boundary
  - MCAS Sites
  - Buildings & Structures
  - Airfield Pavement

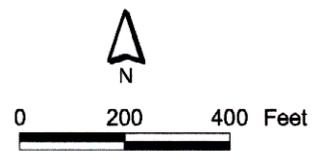
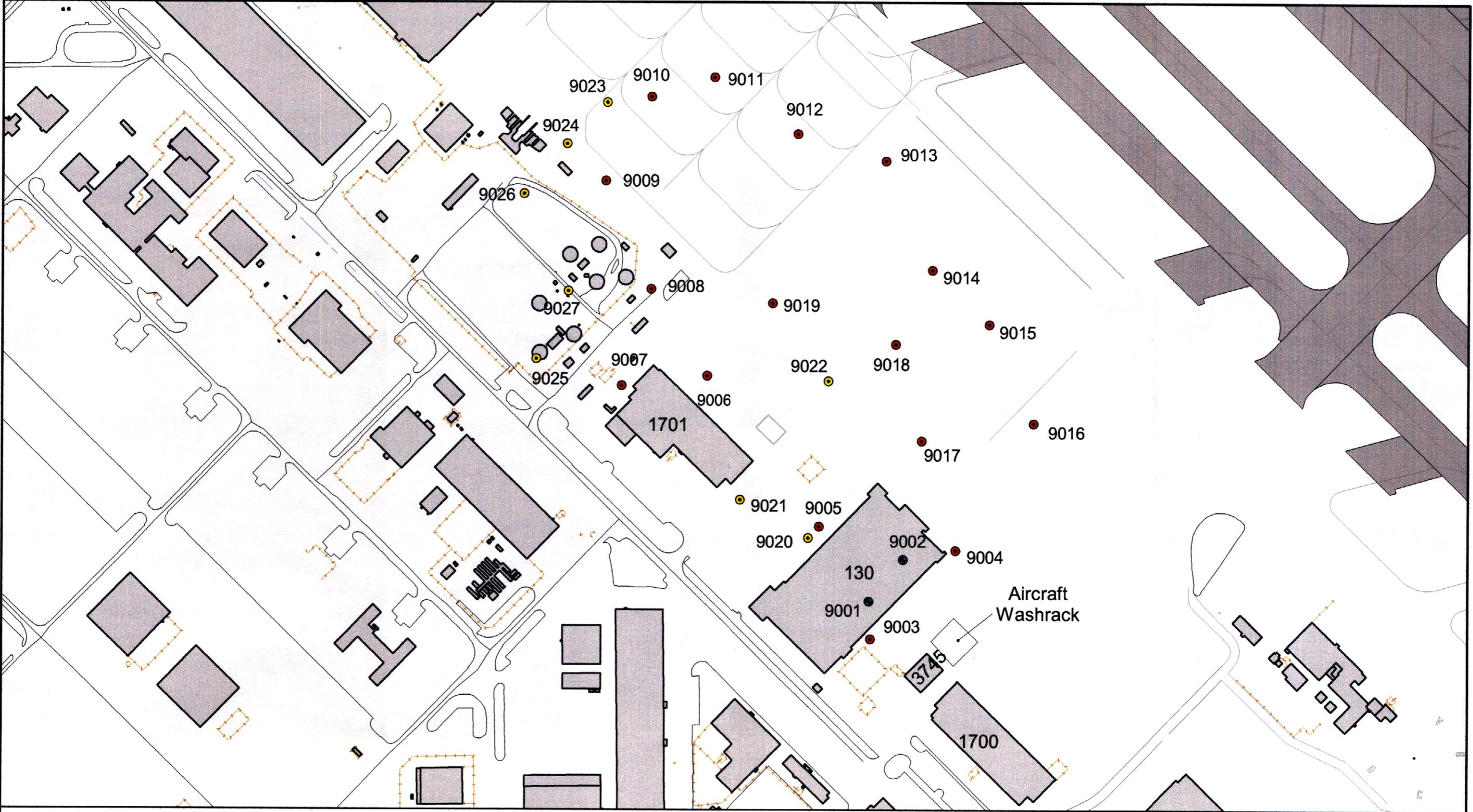


Figure 2  
Site Map  
OU14, Site 90  
MCAS Cherry Point



**LEGEND**

- Initial Phase I Investigation Locations
- Additional Phase I Investigation Locations

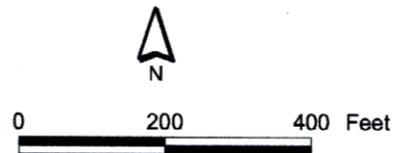
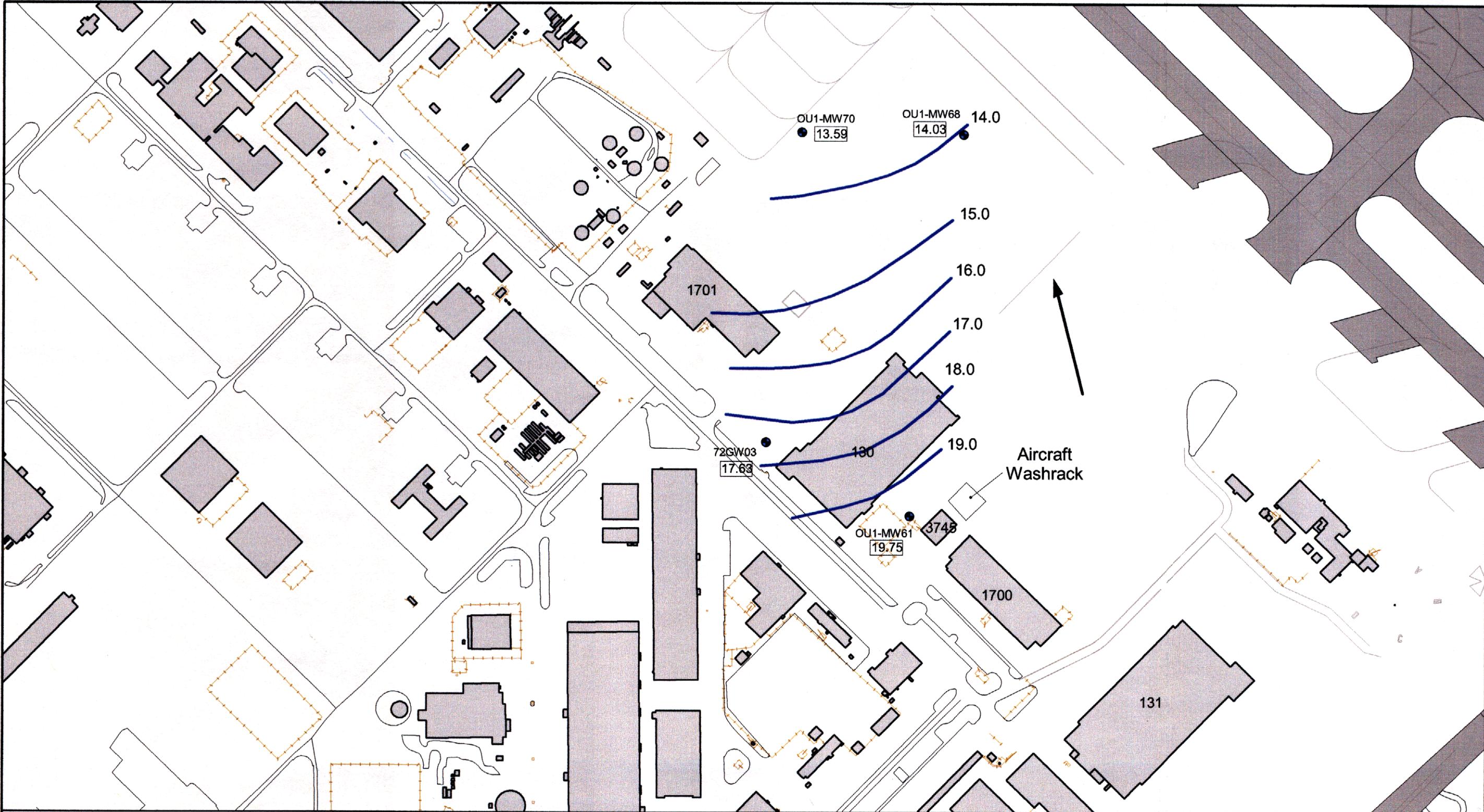


Figure 3  
Phase I Investigation Locations  
OU14, Site 90  
MCAS Cherry Point



**LEGEND**

- Monitoring Well
- 13.59 Monitoring Well Location With Potentiometric Surface Elevation
- Potentiometric Surface Elevation Contour
- Groundwater Flow Direction
- 14.0 - Groundwater Elevations in Feet Above Mean Sea Level

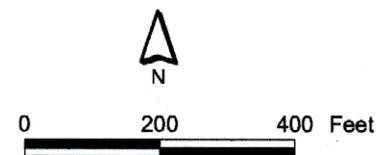
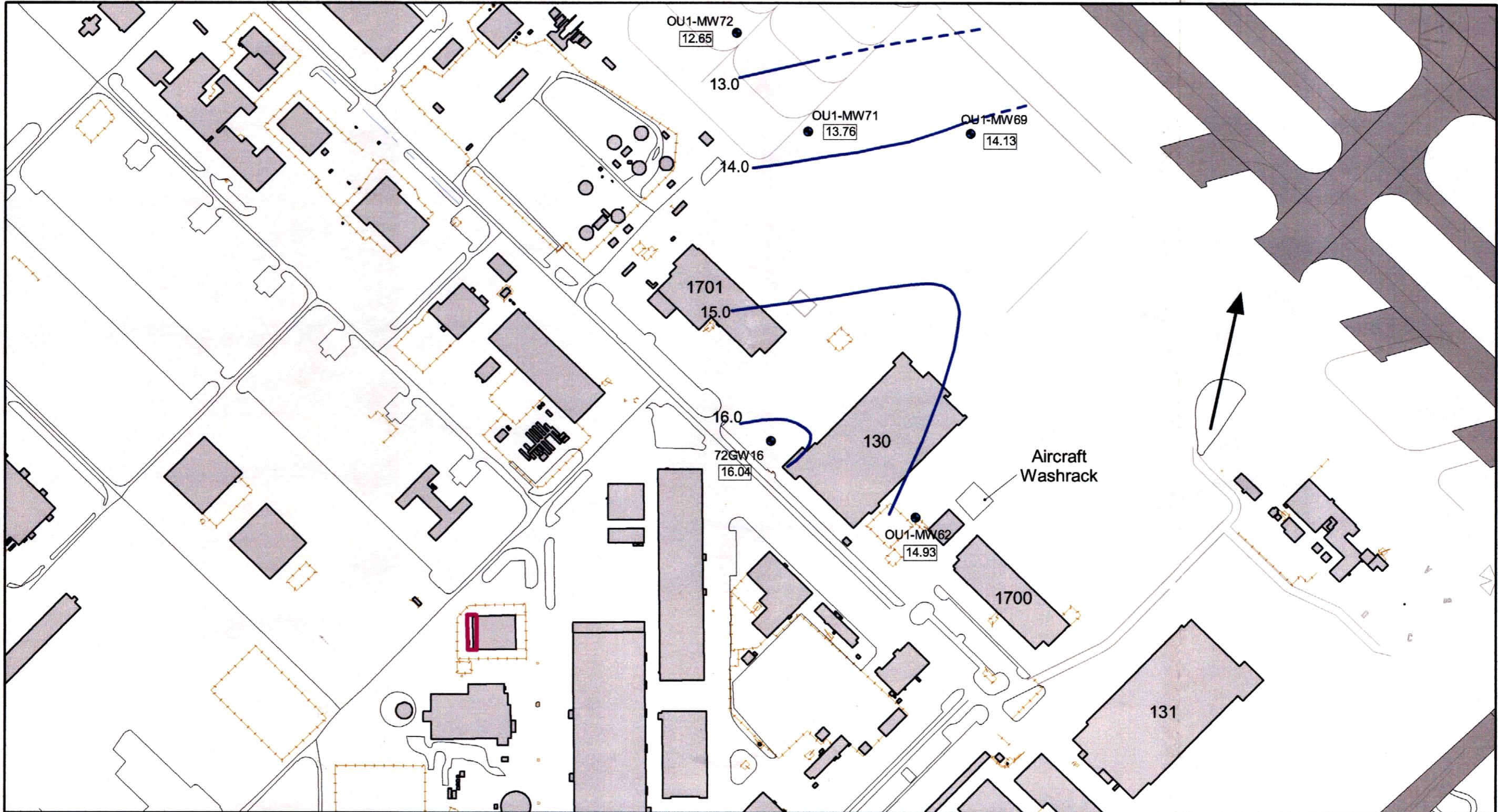


Figure 4  
Potentiometric Surface Map -  
Upper Surficial Aquifer, October 2002  
OU14, Site 90  
MCAS Cherry Point



**LEGEND**

- Monitoring Well
- 12.65 Monitoring Well Location With Potentiometric Surface Elevation
- Potentiometric Surface Elevation Contour
- Groundwater Flow Direction
- 13.0 - Groundwater Elevations in Feet Above Mean Sea Level

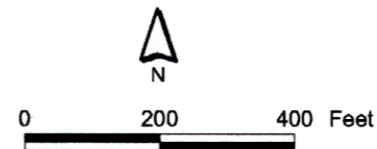
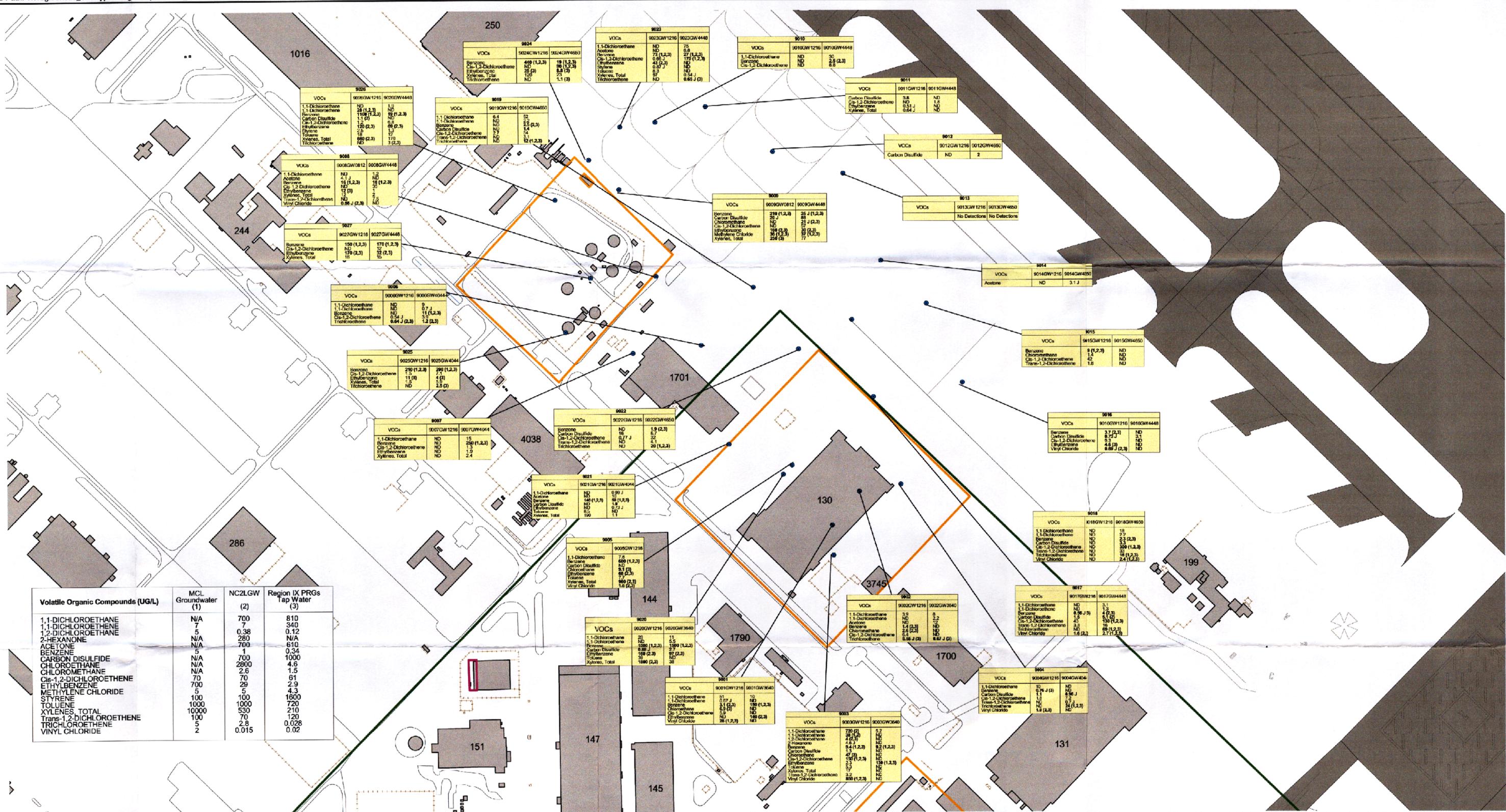


Figure 5  
Potentiometric Surface Map -  
Lower Surficial Aquifer, October 2002  
OU14, Site 90  
MCAS Cherry Point



Volatile Organic Compounds (UG/L)	MCL Groundwater (1)	NC2LGW (2)	Region IX PRGs Tap Water (3)
1,1-DICHLOROETHANE	N/A	700	810
1,1-DICHLOROETHENE	7	7	340
1,2-DICHLOROETHANE	5	0.38	0.12
2-HEXANONE	N/A	280	N/A
ACETONE	N/A	700	610
BENZENE	5	1	0.34
CARBON DISULFIDE	N/A	700	1000
CHLOROETHANE	N/A	2800	4.6
CHLOROMETHANE	N/A	2.6	1.5
Cis-1,2-DICHLOROETHENE	70	70	61
ETHYLBENZENE	700	29	2.9
METHYLENE CHLORIDE	5	5	4.3
STYRENE	100	100	1600
TOLUENE	1000	1000	720
XYLENES TOTAL	10000	530	210
Trans-1,2-DICHLOROETHENE	100	70	120
TRICHLOROETHENE	5	2.8	0.028
VINYL CHLORIDE	2	0.015	0.02

**LEGEND**

- DPT Groundwater Sample Locations
- Buildings
- ∩ Roads
- ∩ Water Bodies
- J - Reported value is estimated
- ND - Not Detected

Number in Parentheses Indicates Screening Criteria Exceeded  
 Results Shown in **bold** text indicate an exceedance of one or more screening criteria  
 All results are in micrograms per liter (ug/L).  
 9001GW1216:  
 9001 - Location ID  
 GW - Indicates Groundwater sample  
 1216 - Sample collected from 12 - 16 feet bgs

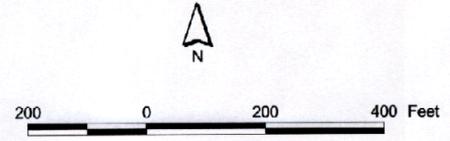
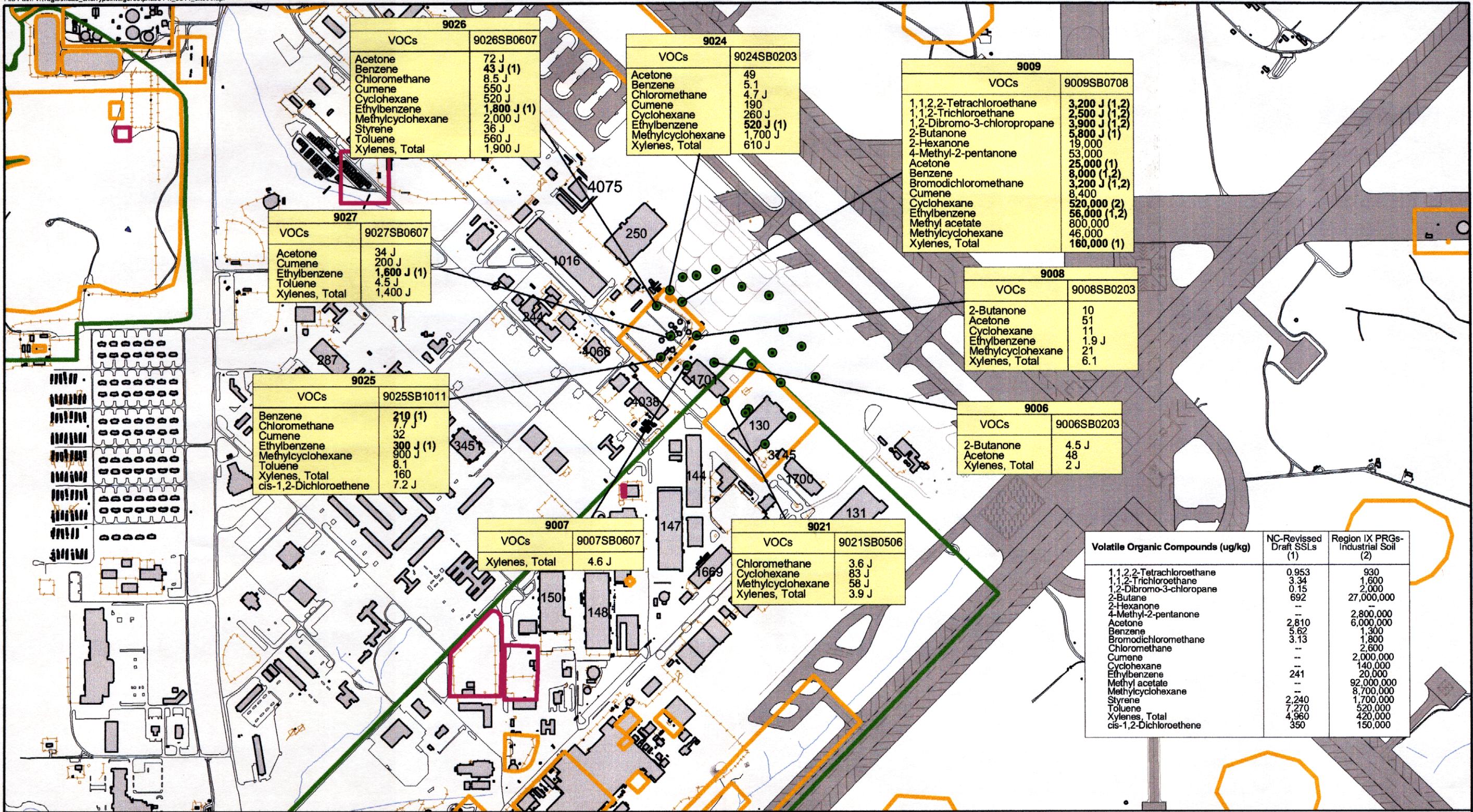


Figure 6  
 Phase I RI Groundwater VOC Detects and Exceedances  
 OU14, Site90  
 MCAS Cherry Point



**LEGEND**

- Soil Sample Locations
- Buildings
- ∧ Roads
- ∕ Water Bodies
- J - Reported value is estimated
- All results are in micrograms per kilogram (ug/kg).

Number in parentheses indicates screening criteria exceeded  
 Results shown in **bold** text indicate an exceedance of one or more screening criteria  
 9006SB0607:  
 9006 - Location ID  
 SB - Indicates Subsurface Soil Sample  
 0607 - Sample collected from 6-7 feet bgs

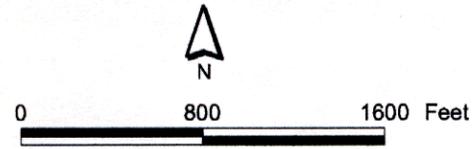
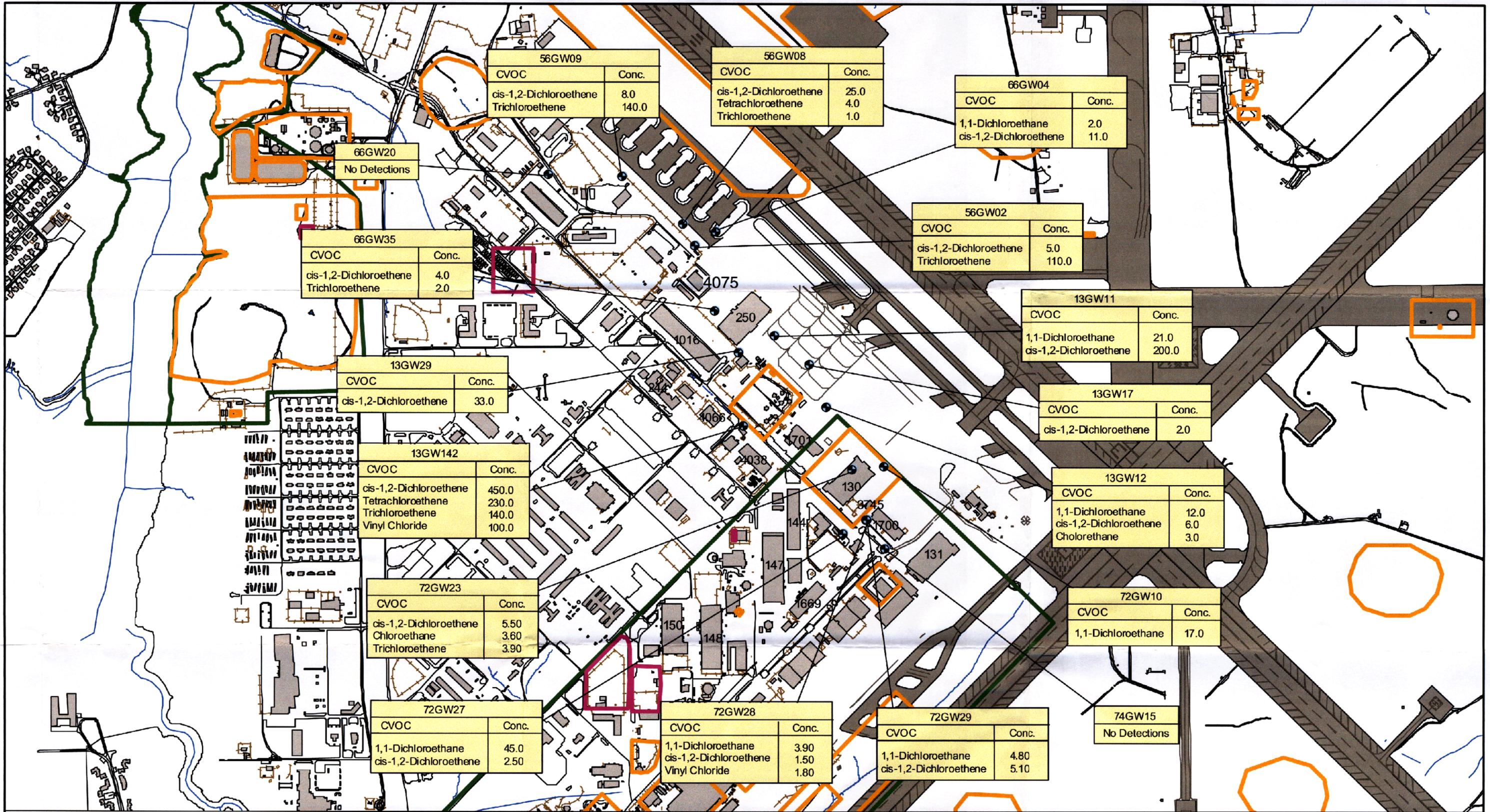


Figure 7  
 Phase I RI Subsurface Soil VOC Detects and Exceedances  
 OU14, Site90  
 MCAS Cherry Point



**LEGEND**

- Monitoring Well
- Buildings
- ▬ Roads
- ▬ Water Bodies

All results are in micrograms per liter (ug/L)

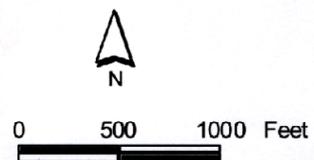
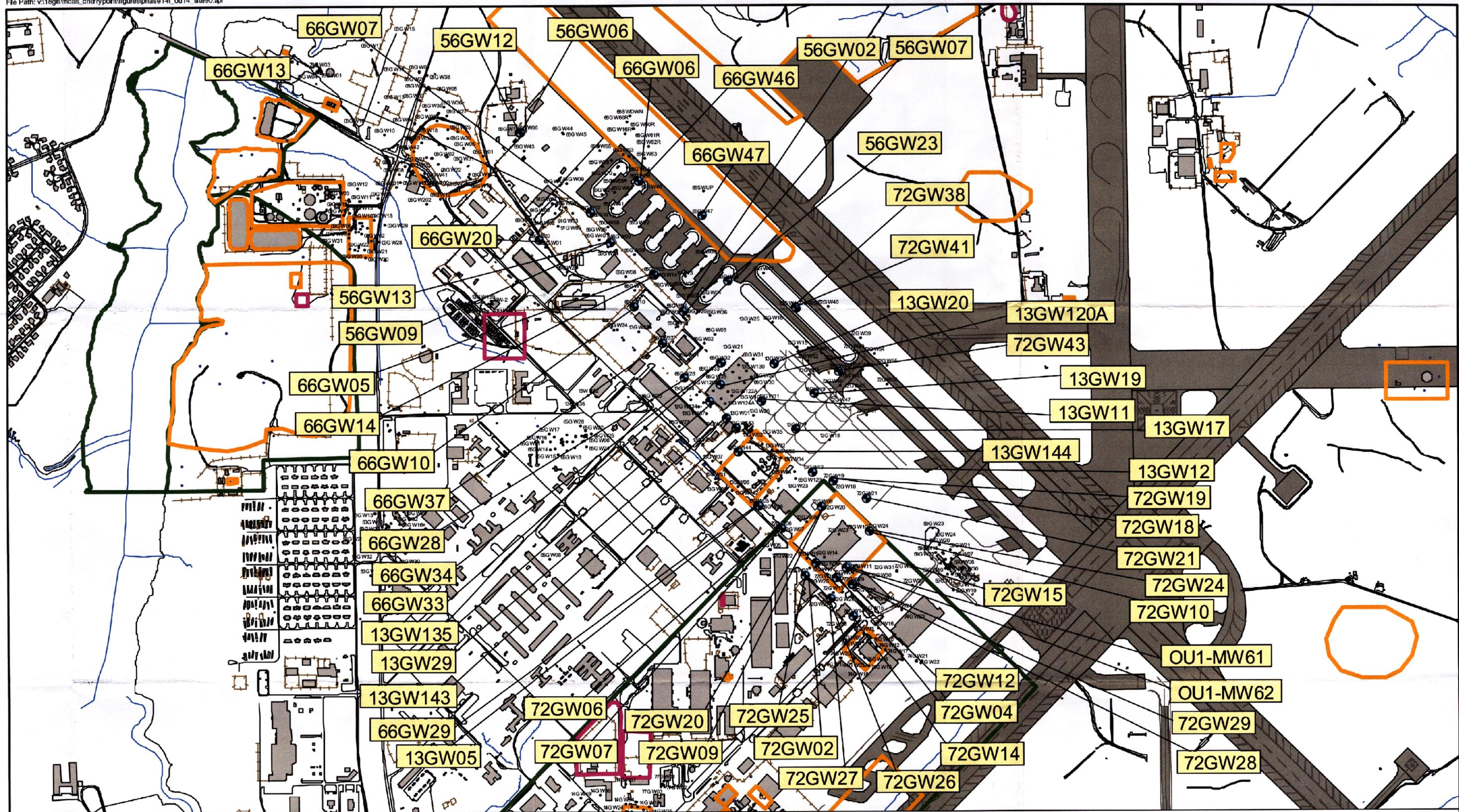


Figure 8  
 UST Program Groundwater Sample CVOC Concentrations - February 2002  
 OU14, Site 90  
 MCAS Cherry Point



**LEGEND**

- Monitoring Well
- Buildings
- ∨ Roads
- ∕ Water Bodies

Note:  
Well IDs in call out boxes are proposed  
Phase II sampling locations.



Figure 9  
Proposed Phase II Sample Locations  
OU14, Site 90  
MCAS Cherry Point