

**APRIL 2002 MONTHLY REPORT  
SITE IR-1/21 INDUSTRIAL LANDFILL  
GROUNDWATER EXTRACTION SYSTEM  
HUNTERS POINT NAVAL SHIPYARD**

**Environmental Remedial Action  
Contract Number N62474-98-D-2076  
Contract Task Order 0082**

**Document Control Number 3847  
Revision 0**

**May 1, 2002**

Submitted to:

U. S. Department of the Navy  
Southwest Division  
Naval Facilities Engineering Command  
Environmental Division  
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*A Member of The IT Group*

**IT TRANSMITTAL/DELIVERABLE RECEIPT**

**CONTRACT : N62474-98-D-2076**

**DOCUMENT CONTROL NUMBER : 3847.0**

**TO:** Administrative Contract Officer  
 Southwest Division  
 Naval Facilities Engineering Command  
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**Date :** May 02, 2002

**CTO :** 0082

**Location:** Hunters Point Shipyard

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**DESCRIPTION** *April 2002 Monthly Report, Site IR-1/21 Industrial Landfill Groundwater Extraction System, Hunters Point Naval Shipyard, Dated May 1, 2002.*

**ENCLOSURE :**

**TYPE :** CTO Deliverable

**VERSION :** Final

**REVISION No :** 0

**ADMIN RECORD :**

**SCHEDULED DELIVERY DATE** May 03, 2002

**ACTUAL DELIVERY DATE** May 02, 2002

**NUMBER OF COPIES SUBMITTED TO THE NAVY:** 1/O, 5/C, 6/E  
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## 1.0 Introduction

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This monthly report was prepared by IT Corporation (IT) on behalf of the U.S. Department of the Navy (Navy) under Environmental Remedial Action Contract Number N62474-98-D-2076, Contract Task Order 0082 to document activities associated with the operation and maintenance (O&M) of the groundwater extraction system (GES) at Hunters Point Shipyard, Site IR-1/21 Industrial Landfill. This report includes a summary of activities from March 19, 2002 through April 16, 2002.

The objective of the GES is to prevent mounding of the groundwater behind a containment wall along a portion of the landfill to reduce the migration of groundwater and landfill constituents into the San Francisco Bay. The GES collects groundwater from seven extraction wells and one extraction trench, and discharges the groundwater into the City and County of San Francisco sanitary sewer. The installation of the containment barrier was completed in December 1997 and the GES began operations in February 1999 (IT, 1999). A cathodic protection system installed in June 1999 minimizes corrosion of the sheet pile barrier.

Operation of the GES and scheduled monitoring events are performed according to the Operation and Maintenance Manual (IT, 2000) and with the City and County of San Francisco Industrial Wastewater Discharger Class I Permit No. 01-1202. This permit was issued on December 1, 2001 and expires on June 17, 2004.

## **2.0 Summary of Field Activities**

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Field activities performed during this reporting period of March 19, 2002 through April 16, 2002 include various O&M activities and the collection of field data. The collected field data includes groundwater levels; pressure and flow readings throughout the GES and the voltage and amperage readings at the cathodic protection system rectifiers.

### **2.1 Operation and Maintenance**

The following O&M activities were performed at the GES during this reporting period:

- Throughout the system flow rates were taken on a daily basis to monitor flow at the extraction wells and collection and monitoring pad.
- On March 26, 2002, the basket strainer at the collection and monitoring pad was cleaned.
- On March 27, 2002, malfunctioning level control switches associated with the pump at well EW-122 were repaired. Prior to the repair, IT staff observed that the pump at EW-122 was pumping even though it was not submerged in the groundwater.
- On March 29, 2002, the rotometer and pad totalizer were cleaned and adjusted.
- On April 4, 2002, the basket strainer, pressure regulator screen and flow meter at the collection and monitoring pad were cleaned.
- On April 4, 2002, the totalizer at the collection and monitoring pad was cleaned and adjusted.
- On April 4, 2002, the totalizer rotor and shaft were replaced.
- On April 9, 2002, the flow meters and screens at wells EW-138 and EW-150 were cleaned.
- On April 10, 2002, the flow meters and screens at wells EW-142, EW-154, and the collection and monitoring pad were cleaned.
- On April 12, 2002, the basket strainer and flow meter were cleaned at the collection and monitoring pad.

## **2.2 Field Data**

Data collected during this period to support O&M of the GES and cathodic protection system include the following:

- Groundwater levels were measured at the extraction wells, monitoring wells, and piezometers.
- Pressure and flow readings were recorded at the extraction wells and at the collection and monitoring pad.
- Voltage and amperage readings were recorded at the cathodic protection system rectifiers.

These readings and results are included as Appendices A, B, and C. These data are used to monitor the performance of the system.

### **2.2.1 Groundwater Level Measurements**

On April 18, 2002, water levels were measured at the extraction wells, monitoring wells, and piezometers. Depth to groundwater was measured to the nearest 0.01 foot. These measurements are provided in Appendix A. Also included in Appendix A are the groundwater elevations associated with the groundwater level measurements and a map of the potentiometric surface.

### **2.2.2 Groundwater Extraction System Measurements**

Water well pressure and pipeline flow readings were taken at the extraction wells between March 19, 2002 and April 16, 2002. These readings are summarized in Appendix B. Water well pressures from the various groundwater extraction wells ranged from 18 to 28 pounds per square inch (psi). Water pressure at the monitoring pad was recorded as 18 psi.

Individual well pipeline flow and cumulative discharge pipe totalizer flow readings have been effected by mineral scaling and biofouling within the lines and flow meters. Under desirable conditions and according to permit operating conditions, the summation of flow meter readings from individual wells is to corroborate the flow meter reading with the discharge totalizer within 10 percent variability. During a period of about 2.5 months, the flow meter readings have not shown the desired corroboration. As a result, meter reading, inspection, and cleaning (if needed) have been performed on a daily basis beginning March 13, 2002. The daily practices described to mitigate the scaling and biofouling effects will continue until a solution to the biofouling problem is found. Appendix B also shows the daily flow readings and the corresponding percent error for that day.

Total flow for the 29-day system discharge period between March 19 and April 16, 2002 is 443,024 gallons based on the summation of flow meter readings from individual wells. This volume was throughput at an average flow rate of 10.61 gallons per minute (Appendix B).

### **2.2.3 Cathode Protection System Rectifier Inspection**

The cathode protection system rectifiers were inspected on April 16, 2002. A record of this inspection is provided in Appendix C. The output at Rectifier 1 was 10 volts direct current (VDC) and 40.0 amperes (amps). The output at Rectifier 2 was 16 VDC and 42.0 amps.

### **2.3 Sample Collection**

The City and County of San Francisco Industrial Wastewater Discharger Class I Permit No. 01-1202 requires a quarterly sample to be collected from the GES effluent. During this reporting period, no samples of the effluent were collected. The next sampling event will take place June 3, 2002 in compliance with the permit requirements and sent to Applied Physics & Chemistry Laboratory in Chino, California for analysis.

### 3.0 References

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IT Corporation, 2000, *Operation and Maintenance Manual, Groundwater Extraction System/Containment Barrier, Site IR-1/21 Industrial Landfill, Hunters Point Shipyard, San Francisco, California, Delivery Order #0083, Revision 0, Concord, California.*

IT Corporation, 1999, *Contractor Quality Control Plan, Environmental Protection Plan, Sampling and Analysis Plan, Health and Safety Plan, Long Term Groundwater Extraction and Monitoring, Site IR-1/21 Industrial Landfill, Hunters Point Shipyard, San Francisco, California, Delivery Order #0083, Revision 0, Martinez, California.*

San Francisco Public Utilities Commission, 2001, *Industrial Wastewater Discharger – Class I Permit No. 01-1202, Bureau of Environmental Regulation and Management, San Francisco, California.*

**APPENDIX A  
GROUNDWATER LEVEL MEASUREMENTS AND  
THE POTENTIOMETRIC SURFACE MAP**

**Monthly Monitoring Well, Extraction Well, and Piezometer Water Levels**  
**Contract No. N62474-98-D-2076**  
**Contract Task Order 0082**  
**Hunters Point Shipyard, Site IR-1/21 Industrial Landfill**  
**U. S. Navy Southwest Division**

IT Corporation  
 Project No. 831667

Date Recorded: 04/16/02  
 Operator: Bob Rust

Location	Time	Depth to Water (ft)	Determined Groundwater Elevation (ft)
EW-108	1051	4.61	2.24
EW-122	1058	4.84	3.44
EW-134	1045	10.32	-1.45
EW-138	1038	12.55	-3.10
EW-142	1030	7.23	2.82
EW-146	1022	8.12	1.72
EW-150	1015	11.73	-1.99
EW-154	1007	8.99	1.31
EW-158	1000	13.32	-2.82
IR01MW1-3	0946	11.87	1.91
IR01MW43A	0845	10.20	2.02
IR01MW44A	0715	7.04	2.08
IR01MW47B	0842	8.26	4.02
MW-60-1	0943	11.78	2.91
MW-60-2	0915	11.31	2.28
MW-60-3	0809	7.46	2.54
MW-60-4	0751	5.89	3.49
PZ-93D	0748	6.27	4.10
PZ-100B	0743	7.51	2.36
PZ-100E	0745	7.41	4.18
PZ-107C	0754	8.23	1.67
PZ-107D	0806	7.38	2.86
PZ-107E	0800	6.69	4.10
PZ-107F	0757	5.74	5.85
PZ-114D	0812	6.80	3.58

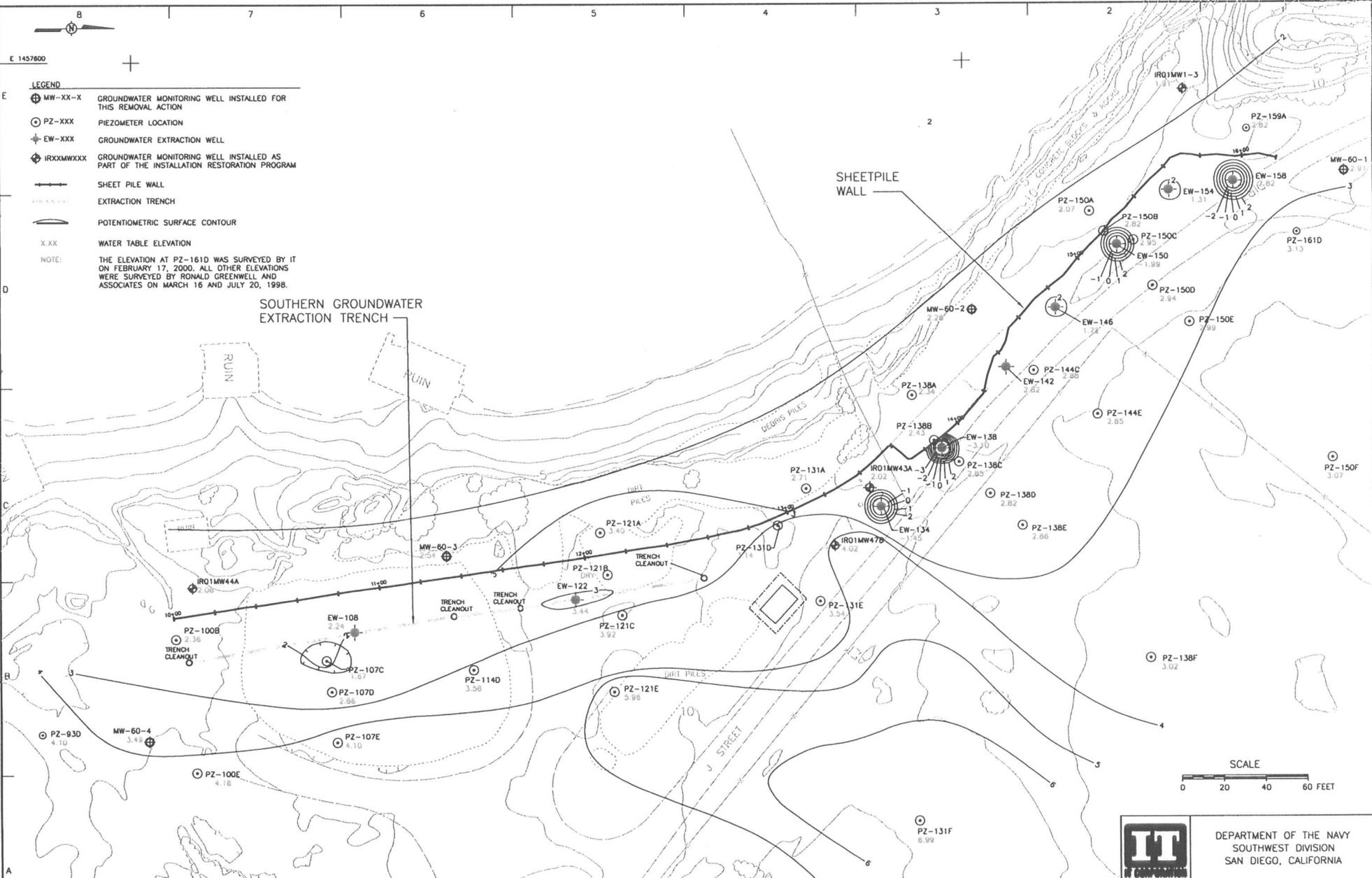
Location	Time	Depth to Water (ft)	Determined Groundwater Elevation (ft)
PZ-121A	0815	7.77	3.40
PZ-121B	0818	dry	Not Applicable
PZ-121C	0821	8.71	3.92
PZ-121E	0824	5.73	5.96
PZ-121F	0827	9.16	4.44
PZ-131A	0838	10.51	2.71
PZ-131D	0833	8.92	3.14
PZ-131E	0830	10.59	3.54
PZ-131F	0848	6.51	6.99
PZ-138A	0853	11.25	2.34
PZ-138B	0856	11.61	2.43
PZ-138C	0859	11.50	2.85
PZ-138D	0902	11.95	2.82
PZ-138E	856	11.53	2.86
PZ-138F	0859	16.86	3.02
PZ-144C	0902	11.87	2.88
PZ-144E	0909	12.23	2.85
PZ-150A	0918	13.44	2.07
PZ-150B	0921	11.85	2.82
PZ-150C	0924	11.89	2.94
PZ-150D	0927	12.21	2.94
PZ-150E	0930	12.31	2.99
PZ-150F	0933	19.46	3.07
PZ-159A	0940	11.27	2.82
PZ-161D	0936	12.13	3.13

NOTES:

ft denotes feet.

Determined Groundwater Elevation = Top of Casing Elevation - Depth to Water

IMAGE X-REF OFFICE CONCORD BUREAU OF NAVAL ENGINEERS AND ARCHITECTS DRAWN BY CONCORD BUREAU OF NAVAL ENGINEERS AND ARCHITECTS CHECKED BY CONCORD BUREAU OF NAVAL ENGINEERS AND ARCHITECTS APPROVED BY CONCORD BUREAU OF NAVAL ENGINEERS AND ARCHITECTS DRAWING NUMBER 771003-E66



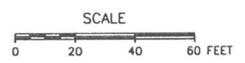
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- LEGEND**
- MW--XX-X GROUNDWATER MONITORING WELL INSTALLED FOR THIS REMOVAL ACTION
  - PZ-XXX PIEZOMETER LOCATION
  - EW-XXX GROUNDWATER EXTRACTION WELL
  - IRXXMWXXX GROUNDWATER MONITORING WELL INSTALLED AS PART OF THE INSTALLATION RESTORATION PROGRAM
  - SHEET PILE WALL
  - EXTRACTION TRENCH
  - POTENTIOMETRIC SURFACE CONTOUR
  - X.XX WATER TABLE ELEVATION

NOTE:  
THE ELEVATION AT PZ-161D WAS SURVEYED BY IT ON FEBRUARY 17, 2000. ALL OTHER ELEVATIONS WERE SURVEYED BY RONALD GREENWELL AND ASSOCIATES ON MARCH 16 AND JULY 20, 1998.

SOUTHERN GROUNDWATER EXTRACTION TRENCH

SHEETPILE WALL



DEPARTMENT OF THE NAVY  
SOUTHWEST DIVISION  
SAN DIEGO, CALIFORNIA

FIGURE  
SITE IR-1/21 INDUSTRIAL LANDFILL  
POTENTIOMETRIC SURFACE MAP  
MARCH 16, 2002  
HUNTERS POINT SHIPYARD

**APPENDIX B**  
**EXTRACTION WELL AND SYSTEM READINGS**

**Monthly Extraction Well and System Readings, 03/19/02-04/16/02**  
**Contract Task Order 0082**  
**Hunters Point Shipyard, Site IR-1/21 Industrial Landfill**  
**Contract No. N62474-98-D-2076**

IT Corporation  
 Project No. 831667

Date Recorded: 04/16/2002  
 Operator: Bob Rust

Location	Time	Pressure (psi)	Actual Flow Rate (gpm)	Average Flow Rate (gpm)	Total Flow (gal) (Since 02/20/99)	Change in Flow (gal) (03/19/02-04/16/02)
EW-108	1051	24	0	0.39	341,832	16,335
EW-122	1058	18	0	0.00	199,900	33
EW-134	1045	20	0	0.10	207,360	4,280
EW-138	1037	28	3	2.23	2,767,751	93,241
EW-142	1030	20	0	0.09	287,550	3,698
EW-146	1022	20	0	0.85	810,758	35,557
EW-150	1015	28	2	1.26	2,390,091	52,459
EW-154	1007	22	0	0.18	218,479	7,367
EW-158	1000	28	6	5.51	9,340,127	230,054
<b>Total Change in Flow at the Wells</b>						443,024
Collection and Monitoring Pad	1103	18	8.9	9.32	14,103,598	389,159

Conductivity at Monitoring Pad: 3.45 mS/CM  
 Number of days in reporting period 29

Average Monthly Flow Rate, Using Readings at the Wells (gpm)	10.61
Average Monthly Flow Rate, Using Readings at Monitoring Pad (gpm)	9.32
Error of Flow Meter at the Monitoring Pad (%)	12.16%

**Abbreviations:**

psi = pounds per square inch  
 gpm = gallons per minute  
 gal = gallon  
 EW = extraction well  
 mS/CM = millisiemens/centimeter

**Monthly Extraction Well and System Readings, 03/19/02-04/16/02**  
**Contract Task Order 0082**  
**Hunters Point Shipyard, Site IR-1/21 Industrial Landfill**  
**Contract No. N62474-98-D-2076**

**IT Corporation**  
**Project No. 831667**

**Date Recorded:**  
**Operator:**

**3/25/2002 through 4/16/2002**  
**Bob Rust**

<b>Date</b>	<b>Total Flow at wells (gallons)</b>	<b>Total Flow at Collection and Monitoring Pad (gallons)</b>	<b>Error in flow meters</b>
03/25/02	18,028	17,769	1.44%
03/26/02	14,997	14,896	0.67%
03/27/02	17,150	13,429	21.70%
03/28/02	15,220	12,496	17.90%
03/29/02	13,665	12,494	8.57%
04/01/02	40,055	38,113	4.85%
04/02/02	10,147	11,903	17.31%
04/03/02	17,696	15,053	14.94%
04/04/02	16,184	13,186	18.52%
04/05/02	18,894	15,316	18.94%
04/08/02	52,503	43,232	17.66%
04/09/02	13,429	12,448	7.31%
04/10/02	17,155	13,084	23.73%
04/11/02	17,886	13,299	25.65%
04/12/02	17,597	13,094	25.59%
04/15/02	48,310	39,701	17.82%
03/16/2002	16,832	14,009	16.77%

**Abbreviations:**

- psi = pounds per square inch**
- gpd = gallons per minute**
- gal = gallon**
- EW = extraction well**
- mS/CM = millisiemens/centimeter**

**APPENDIX C**  
**CATHODIC PROTECTION SYSTEM MONTHLY INSPECTION RECORD**

**Cathodic Protection System Monthly Inspection Record**  
**Contract No. N62474-98-D-2076**  
**Contract Task Order 0082**  
**Hunters Point Shipyard, Site IR-1/21 Industrial Landfill**  
**U. S. Navy Southwest Division**

IT Corporation

Project No. 831667

Date	Rectifier 1 Output		Rectifier 2 Output		Step Voltage Control Settings	
	VDC	Amperes	VDC	Amperes	C	F
06/01/1999	10.5	41.4	10.3	44.8	1	3
08/19/1999	10.8	44.0	10.2	48.2	1	3
09/09/1999	10.8	44.1	10.2	48.8	1	3
10/28/1999	10.6	47.4	10.0	≥ 50.0	1	3
11/18/1999	11.8	46.3	9.9	≥ 50.0	1	3
12/16/1999	11.5	46.1	8.7	48.6	1	3
01/13/2000	11.5	45.3	10.1	48.5	1	3
02/03/2000	11.4	46.5	10.0	48.2	1	3
03/09/2000	11.3	46.2	9.9	48.9	1	3
04/06/2000	10.8	45.3	10.1	48.9	1	3
05/10/2000	11.3	45.5	10.0	48.3	1	3
06/07/2000	10.7	44.5	10.0	48.0	1	3
07/06/2000	11.0	44.0	10.0	47.5	1	3
08/23/2000	12	44	10	48	1	3
09/12/2000	12	44	10	47.5	1	3
10/09/2000	11	45	10	48	1	3
11/02/2000	11	44	10	47.5	1	3
12/06/2000	10.5	46	10	49.5	1	3
06/07/2000	10.7	44.5	10.0	48.0	1	3
12/06/2000	10.5	46	10	49.5	1	3
01/09/2001	11	46.5	10	≥ 50.0	1	3

**Cathodic Protection System Monthly Inspection Record**  
**Contract No. N62474-98-D-2076**  
**Contract Task Order 0082**  
**Hunters Point Shipyard, Site IR-1/21 Industrial Landfill**  
**U. S. Navy Southwest Division**

IT Corporation

Project No. 831667

Date	Rectifier 1 Output		Rectifier 2 Output		Step Voltage Control Settings	
	VDC	Amperes	VDC	Amperes	C	F
02/06/2001	11	48	10	≥ 50.0	1	3
03/23/2001	11	45	10	48.5	1	3
04/06/2001	12	46.5	10	≥ 50.0	1	3
05/17/2001	11	47.0	10	≥ 50.0	1	3
06/18/2001	10	41.0	16	41.0	1	3
07/19/2001	10	41.0	16	41.0	1	3
08/15/2001	10	42.0	16	42.0	1	3
9/00/01	no readings	no readings	no readings	no readings	1	3
10/09/2001	10	42.0	16	42.0	1	3
11/14/2001	10	41.0	16	41.0	1	3
12/13/2001	10	42.0	16	42.0	1	3
01/15/2001	10	43	16	43	1	3
02/19/2002	10	44	14	44	1	3
03/19/2002	10	42	18	42	1	3
04/16/2002	10	40	16	42	1	3

Notes:

≥ = greater than or equal to (gauge was maxed out)

VDC denotes volts direct current.