Tetra Tech EM Inc.

135 Main Street, Suite 1800 ◆ San Francisco, CA 94105 ◆ (415) 543-4880 ◆ FAX (415) 543-5480

April 28, 2003

Mr. G. Patrick Brooks, R.G.
Remedial Project Manager
Naval Facilities Engineering Command
Southwest Division
1230 Columbia Street, Suite 1100
San Diego, CA 92101

Subject: **Quarterly Status Report – Field Measurements**
Parcel C Treatability Study Support
Hunters Point Shipyard, San Francisco, California
Contract Number N68711-00-D-0005, Delivery Order 0013

Dear Mr. Brooks:

This letter presents the status of activities conducted by Tetra Tech EM Inc. (Tetra Tech) for the Ferox^{sm} zero-valent iron injection technology demonstration at Parcel C, Remedial Unit C4, of Hunters Point Shipyard. This work is being conducted under the above-referenced delivery order from the U.S. Department of the Navy (Navy), Naval Facilities Engineering Command, Southwest Division, under the Indefinite Quantity Contract for Architectural-Engineering Services to Provide CERCLA/RCRA/UST Studies. The demonstration project is being conducted in association with and is partially funded by the Navy's Alternative Restoration Technology Team, Naval Facilities Engineering Service Center (NFESC).

During the first quarter of 2003, Tetra Tech completed three rounds of post-injection groundwater sampling. The three post-injection sampling events were completed during the weeks of January 6, February 3, and March 17, 2003. During the previous quarter, Tetra Tech completed one round of groundwater sampling to document baseline conditions before zero valent iron injection.

This status report specifically serves to transmit field measurements collected during all four rounds of sampling. Enclosure 1 presents the field measurements for all four rounds of sampling.

contains recycled fiber and is recyclable

If you have any questions or comments, please contact me at (215) 656-8720 or Doug Bielskis at (415) 222-8242.

Sincerely,

John McCall, P.E.
Project Manager

Enclosure

cc: Mr. Keith Forman, Southwest Division
Mr. Dave DeMars, Southwest Division
Ms. Diane Silva (Admin. Record), Southwest Division
Mr. Doug Bielskis, Tetra Tech
File

ENCLOSURE 1
GROUNDWATER SAMPLING FIELD MEASUREMENTS

Groundwater Sampling Field Measurements
FEROX Injection Technology Demonstration
Parcel C, Remedial Unit C4
Hunters Point Shipyard, San Francisco, California

Monitoring Well	Date	Sample ID	Temperature (oC)	Specific Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	pH	ORP (mv)	Turbidity (NTU)	Purge and Sample Method	Purge Rate (mL/min)
IR28MW211F	11/13/02	0246H009	17.31	0.682	1.01	6.9	166.3	0.67	Low-flow (peristaltic)	100
IR28MW211F	1/9/03	0302H022	16.48	0.61	0.13	8.52	-555.7	21.4	Low-flow (peristaltic)	160
IR28MW211F	2/7/03	0306H025	16.61	0.713	0.27	7.91	-447.2	3.38	Low-flow (peristaltic)	218
IR28MW211F	3/21/03	0312H024	16.53	0.708	0.18	8.11	-509.1	4.29	Low-flow (peristaltic)	240
IR28MW275F	11/13/02	0246H010	16.87	0.341	2.73	6.87	59.2	1.48	Modified low-flow (peristaltic)	120
IR28MW275F	1/8/03	0302H014	15.56	0.365	3.51	6.96	242.1	7.33	Modified low-flow (peristaltic)	120
IR28MW275F	2/5/03	0306H012	15.42	0.346	3.39	7.03	196.8	3.07	Modified low-flow (peristaltic)	160
IR28MW275F	3/19/03	0312H017	15.28	0.327	2.98	6.92	-41.5	1.98	Modified low-flow (peristaltic)	200
IR28MW311A	11/13/02	0246H011	19.2	39.9	0.23	6.71	124.8	0.31	Low-flow (peristaltic)	340
IR28MW311A	1/7/03	0302H003	17.85	38.94	0.07	6.83	61.3	1.07	Low-flow (peristaltic)	343
IR28MW311A	2/4/03	0306H002	17.28	34.82	0.01	6.88	137	2.09	Low-flow (peristaltic)	343
IR28MW311A	3/18/03	0312H002	17.7	33.93	0.2	6.81	149.6	0.8	Low-flow (peristaltic)	300
IR28MW341F	11/13/02	0246H008	17.02	0.823	0.17	6.92	170.7	0.71	Modified low-flow (peristaltic)	200
IR28MW341F	12/4/02	0249H012	17.03	0.83	0.26	6.86	86.9	1.76	Modified low-flow (peristaltic)	200
IR28MW341F	1/9/03	0302H023	17.05	0.417	0.06	7.87	-351.1	8.1	Modified low-flow (peristaltic)	240
IR28MW341F	2/6/03	0306H019	17.04	0.421	0.33	8.51	-471.3	4.9	Low-flow (peristaltic)	185
IR28MW341F	3/19/03	0312H012	16.95	0.407	0.13	8.38	-565.9	6.14	Modified low-flow (peristaltic)	300
IR28MW342F	11/12/02	0246H003	17.1	0.669	1.4	6.77	159.7	3.25	Modified low-flow (peristaltic)	700
IR28MW342F	1/9/03	0302H019	16.42	0.466	0.04	8.18	-323.9	7.7	Low-flow (peristaltic)	343
IR28MW342F	2/5/03	0306H010	16.3	0.534	0.11	8.61	-569	6.08	Low-flow (peristaltic)	240
IR28MW342F	3/18/03	0312H008	16.15	0.462	0.11	8.49	-426.5	4.38	Low-flow (peristaltic)	240
IR28MW351F	11/12/02	0246H002	17.8	5.689	0.19	7.08	82.3	1	Low-flow (submersible)	333
IR28MW351F	1/7/03	0302H002	17.26	6.883	0.26	7.18	0.4	5.5	Low-flow (submersible)	300
IR28MW351F	2/5/03	0306H011	17.52	7.369	0.35	7.02	61.5	4.63	Low-flow (submersible)	240
IR28MW351F	3/18/03	0312H004	17.35	5.841	0.59	7.02	50.1	2.07	Low-flow (submersible)	240
IR28MW355F	12/3/02	0249H003	17.18	0.56	4.6	7.15	98.1	4.64	Modified low-flow (peristaltic)	80
IR28MW355F	1/7/03	0302H005	16.69	0.655	3.56	7.6	45.5	1.6	Modified low-flow (peristaltic)	109
IR28MW355F	2/5/03	0306H008	16.31	0.649	6.3	7.82	154.4	1.26	Modified low-flow (peristaltic)	96
IR28MW355F	3/18/03	0312H005	16.51	0.626	6.11	7.86	249.3	1.03	Modified low-flow (peristaltic)	200
IR28MW356F	12/3/02	0249H002	17.02	0.83	3.59	6.57	115.8	2.61	Modified low-flow (peristaltic)	140
IR28MW356F	1/7/03	0302H007	16.98	0.96	6.2	7.25	182.2	0.45	Modified low-flow (peristaltic)	185
IR28MW356F	2/5/03	0306H009	16.7	0.988	5.85	7.34	149.7	0.42	Modified low-flow (peristaltic)	200
IR28MW356F	3/18/03	0312H006	16.67	0.896	6.11	7.52	282.1	0.58	Modified low-flow (peristaltic)	200

Groundwater Sampling Field Measurements
FEROX Injection Technology Demonstration
Parcel C, Remedial Unit C4
Hunters Point Shipyard, San Francisco, California

Monitoring Well	Date	Sample ID	Temperature (oC)	Specific Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	pH	ORP (mv)	Turbidity (NTU)	Purge and Sample Method	Purge Rate (mL/min)
IR28MW357F	12/3/02	0249H004	17.31	0.528	4.3	6.75	97.3	9.1	Modified low-flow (peristaltic)	160
IR28MW357F	1/7/03	0302H004	16.82	0.523	1.77	7.25	164.1	9.76	Modified low-flow (peristaltic)	250
IR28MW357F	2/5/03	0306H006	16.52	0.567	2.49	7.21	308.2	11.35	Modified low-flow (peristaltic)	300
IR28MW357F	3/18/03	0312H007	16.48	0.457	3.33	7.26	288.3	4.86	Modified low-flow (peristaltic)	300
IR28MW358F	12/4/02	0249H013	17.01	0.68	4.29	7.3	85.5	0.96	Purge dry (peristaltic)	NA
IR28MW358F	1/8/03	0302H009	14.93	0.79	2.58	7.22	210.4	7.91	Purge dry (peristaltic)	NA
IR28MW358F	2/6/03	0306H016	16.01	0.621	5.34	7.41	231.2	5.47	Purge dry (peristaltic)	NA
IR28MW358F	3/19/03	0312H011	16.47	0.579	6.6	7.33	86.1	5.65	Purge dry (peristaltic)	NA
IR28MW359F	12/4/02	0249H006	16.59	0.663	3.86	6.87	102.1	1.68	Modified low-flow (peristaltic)	80
IR28MW359F	1/8/03	0302H012	16.17	0.557	1.57	6.98	48.7	2.96	Modified low-flow (peristaltic)	133
IR28MW359F	2/6/03	0306H014	16.26	0.576	3.28	7.27	242.9	1.28	Modified low-flow (peristaltic)	171
IR28MW359F	3/19/03	0312H010	16.3	0.576	3.6	7.31	249.4	2.43	Modified low-flow (peristaltic)	160
IR28MW360F	12/4/02	0249H009	16.67	0.831	1.67	6.91	90.6	1.37	Low-flow (peristaltic)	160
IR28MW360F	1/8/03	0302H013	16.21	0.536	0.44	7.08	12.3	5.01	Low-flow (peristaltic)	240
IR28MW360F	2/7/03	0306H023	16.09	0.505	1.26	7.17	253.3	7.31	Low-flow (peristaltic)	185
IR28MW360F	3/21/03	0312H020	15.93	0.476	1.15	7.2	235.2	6.33	Low-flow (peristaltic)	120
IR28MW361F	12/4/02	0249H008	17.12	0.785	3.4	6.8	97.6	0.94	Modified low-flow (peristaltic)	160
IR28MW361F	1/8/03	0302H010	16.25	0.689	0.44	7.54	-378.3	214	Modified low-flow (peristaltic)	160
IR28MW361F	2/6/03	0306H018	16.51	0.66	0.49	7.99	-448.3	61.4	Modified low-flow (peristaltic)	200
IR28MW361F	3/19/03	0312H016	16.54	0.574	0.12	7.97	-230.9	18.14	Modified low-flow (peristaltic)	300
F2	12/4/02	0249H015	16.52	0.688	4.57	7.32	88.5	43.3	Grab (peristaltic)	NA
IR28MW362F	1/10/03	0302H026	16	0.466	0.17	8.24	-555.2	1.35	Low-flow (peristaltic)	150
IR28MW362F	2/6/03	0306H017	16.4	0.485	0.21	8.27	-436	1.61	Low-flow (peristaltic)	141
IR28MW362F	3/19/03	0312H013	16.46	0.433	0.11	8.39	-529.6	1.36	Low-flow (peristaltic)	240
IR28MW932F	11/12/02	0246H004	17	0.655	0.13	7.06	-87.6	2.61	Low-flow (peristaltic)	120
IR28MW932F	1/9/03	0302H020	16.19	0.504	0.13	8.23	-428	1.66	Low-flow (peristaltic)	120
IR28MW932F	2/7/03	0306H024	16.54	0.482	0.18	8.33	-313.4	2.22	Low-flow (peristaltic)	160
IR28MW932F	3/21/03	0312H021	16.65	0.516	0.19	8.1	-179.3	4.26	Low-flow (peristaltic)	150
IR28MW933F5	11/13/02	0246H013	17.12	1.191	0.56	6.74	101.2	0.23	Low-flow (peristaltic)*	160
IR28MW933F5	12/3/02	0249H011	17.05	1.221	0.63	6.72	89.1	0.77	Low-flow (peristaltic)*	150
IR28MW933F5	1/8/03	0302H016	17.12	0.619	0.13	7.01	-318.1	20.1	Low-flow (peristaltic)*	150
IR28MW933F5	2/6/03	0306H015	16.89	0.562	0.16	7.03	-261.7	31.1	Low-flow (peristaltic)*	141
IR28MW933F5	3/19/03	0312H010Z	17.21	0.544	0.12	7.11	-231.4	13.37	Low-flow (peristaltic)*	160

Groundwater Sampling Field Measurements
FEROX Injection Technology Demonstration
Parcel C, Remedial Unit C4
Hunters Point Shipyard, San Francisco, California

Monitoring Well	Date	Sample ID	Temperature (oC)	Specific Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	pH	ORP (mv)	Turbidity (NTU)	Purge and Sample Method	Purge Rate (mL/min)
IR28MW934F5	11/13/02	0246H012	16.99	1.154	0.26	6.81	79.4	0.24	Low-flow (peristaltic)*	150
IR28MW934F5	1/8/03	0302H015	16.75	0.99	0.2	6.72	-2	28.8	Low-flow (peristaltic)*	160
IR28MW934F5	2/6/03	0306H020	16.92	0.983	0.37	6.81	138.1	3.22	Low-flow (peristaltic)*	191
IR28MW934F5	3/21/03	0312H023	17.1	0.898	0.43	6.83	138.7	4.89	Low-flow (peristaltic)*	200
IR28IW938F	11/12/02	0246H006	17.23	0.761	0.09	6.63	58.9	1.55	Modified low-flow (peristaltic)	160
IR28IW938F	1/10/03	0302H027	16.65	0.542	0.01	8.38	-578.1	608	Low-flow (peristaltic)	133
IR28IW938F	2/5/03	0306H005	16.83	0.453	0.46	8.85	-689.7	254	Modified low-flow (peristaltic)	300
IR28IW938F	3/19/03	0312H014	16.55	0.402	0.09	8.97	-621.7	550	Low-flow (peristaltic)	160
IR28IW939F	11/12/02	0246H005	17.09	0.833	0.13	7.11	38.8	2.13	Low-flow (peristaltic)	120
IR28IW939F	1/9/03	0302H021	16.42	0.644	0.07	8.17	-392.1	28.9	Low-flow (peristaltic)	200
IR28IW939F	2/7/03	0306H026	16.45	0.591	0.18	8.52	-427.1	3.26	Low-flow (peristaltic)	185
IR28IW939F	3/21/03	0312H022	16.4	0.593	0.18	8.55	-196.1	3.19	Low-flow (peristaltic)	240

TETRA TECH EM INC.

TRANSMITTAL/DELIVERABLE RECEIPT

Contract No. N68711-00-D-0005 Document Control No. DS.A013.10834

TO: Mr. Ron Fuller, Code 02R1.RF
Contracting Officer
Naval Facilities Engineering Command
Southwest Division
1230 Columbia Street, Suite 1100
San Diego, CA 92101-8517

DATE: 4/29/03
DO: 013
LOCATION:
Hunters Point Shipyard, San Francisco
California

FROM: **Michael Wanta,** Contract Manager

DOCUMENT TITLE AND DATE:
Quarterly Status Report – Field Measurements, Parcel C Treatability Study Support, April 28, 2003

TYPE: ☐ Contractual Deliverable ☒ Technical Deliverable (DS) ☐ Other (TC)

VERSION: _____ (e.g., Draft, Draft Final, Final) REVISION #: Rev # or NA

ADMIN RECORD: Yes ☒ No ☐ CATEGORY: Confidential ☐

SCHEDULED DELIVERY DATE: 4/28/03 ACTUAL DELIVERY DATE: 4/29/03

NUMBER OF COPIES SUBMITTED TO NAVY: O/5C/4E

O = original transmittal form
C = copy of transmittal form
E = enclosure

COPIES TO: (Include Name, Navy Mail Code, and Number of Copies)

NAVY:	TtEMI:	OTHER:
K. Forman (06CH.KF)	File/Doc Control	
O/1E + CD	1C/1E (w/QC)	
D. DeMars (06CH.DD)	D. Bielskis (w/o Encl)	
1C/1E + CD	J. McCall 1C/1E + CD	
P. Brooks (06CH.PB)		
1C/1E + CD		
D. Silva *(05G.DS)		
1C/1E + CD		
T. Martin (5DEN.TM)		
1C + Letter Only		
L. Chapman (06CH.LC)		
1C + Letter Only		

Date/Time Received

*Admin Record Recipient
**Copies to Information Repositories

rev 07/22/02