



GRESSIVE

ENGINEERING & CONSTRUCTION, INC.

3912 W. Humphrey Street
Tampa, Florida 33614
Tel. (813) 930-0669
Fax. (813) 930-9809

May 8, 2002

Mr. Richard Boice
USEPA Region V
77 W. Jackson Blvd.
Mail Code SR-6J
Chicago, IL 60604-3590

Re: Project Progress Report for April 2002
Verona Well Field Superfund Site
Battle Creek, Michigan

Dear Mr. Boice:

The following narrative constitutes a monthly progress report with respect to actions and activities undertaken on RD/RA activities associated with the Verona Well Field (VWF), Annex, and Paint Shop. This report is submitted voluntarily to keep the United States Environmental Protection Agency (USEPA) informed of the progress on RD/RA activities and is subject to, and without waiver of, respondents' prior written objections to the scope and legality of portions of the February 18 and May 5, 1992 §106 Administrative Orders.

Description of Work Completed

- 1) CETC completed system equipment, outfall, and water quality monitoring in accordance with the NPDES permit.
- 2) The VWFMP parties participated in technical conference calls/meetings on 4/12/02 and 4/24/02. Minutes for the call and meeting were prepared and distributed by Bridget Morello. A conference call and a meeting are scheduled for 5/8/02 and 5/22/02, respectively.
- 3) Progressive submitted the Draft VWFMP Table of Contents, and Section 6 of that plan, the Draft Contingency Plan, for VWFMP party review (via U.S. Mail on 4/16/02).
- 4) Progressive arranged for a packing changeout of the VWF RA air stripper. The event commenced on 4/29/02 and was completed on 5/3/02. Documentation regarding the packing changeout and spent packing disposal will be provided in the next progress report.

- 5) Progressive issued a draft list of wells (email dated 4/19/02) for hydraulic and water quality monitoring during July 2002, for VWFMP party review.
- 6) Progressive issued a Summary Scope of Work (email dated 4/30/02) for miscellaneous activities at the source areas and VWF. The work began on 5/6/02 and will include aquifer testing at the Annex and Paint Shop and other tasks per VWFMP party agreements.
- 7) Progressive and the VWF Group submitted comments on the EPA's Draft ESD (dated 4/16/02) and Draft Five-Year Review (dated 4/23/02).

Summary of All Findings

None.

Sampling Results/Reports

- 1) On 4/17/02, CETC collected treatment system influent and effluent water samples in accordance with the NPDES permit. Analytical results and operating data, summarized on the appropriate reporting forms by Progressive, were submitted to the MDEQ SWQD on 5/6/02. A summary of the system influent and effluent water quality for 2002, including mass removal information, is presented in Attachment 1. No permit exceedances occurred in April 2002, and all of the effluent sample concentrations were reported as non-detectable.
- 2) City production well data for April 2002 are presented in Attachment 2. In April 2002, the City's average daily production rate was 9.4 mgd, and the maximum daily rate was 11.19 mgd. In addition, the City discharged approximately 5.25 million gallons of wastewater into the iron/manganese removal system lagoons during April 2002, based upon the City's assumption that for each of the 30 backwash events during the month, a total of 175,000 gallons of wastewater was discharged to the lagoons. The City's report also includes information regarding reservoirs, water chemistry, and its treatment system influent and effluent flow rates for April 2002.
- 3) Attachment 3 (Table 1 and Figure 1) provides a summary of VWF RA well and total system flow rates, average City production rate, and the performance evaluation results for April 2002. The O&M operator's logs for April are presented in Attachment 4.

Attachment 3, Table 1 highlights the key system performance evaluation data, Figure 1 illustrates the individual RA well performance in graphical format, and Tables 1A-1G summarize the system performance on a weekly basis. The operating data and performance evaluation indicate the following:

- The average totalized flow rate from all RA wells excluding downtime was 2653 gpm, based upon flow totalizer readings on 3/25/02 and 4/22/02 and

the total number of minutes between those dates less any well or treatment system downtime. This average flow rate is a key performance evaluation factor because it reflects how the system performed when it was operational, and individual well flow rates calculated in this manner can be compared to design flow rates to determine the performance of each well. The total uptime of the RA system was 84.3% during the period of 3/25/02 and 4/22/02.

- The average instantaneous flow rate from all RA wells was 2672 gpm (see Table 1A), based on the average of individual instantaneous well flow rates from 4/1, 4/8, 4/15 and 4/22/02. The instantaneous well flow rates are recorded by the O&M operator once per week, and are visually observed (not recorded) during each of the two additional O&M site visits each week. The instantaneous flow rates provide verification that the wells are operating at design rates, or as close to design rates as possible. The O&M operator notes any problems such as wells operating at less than design rates with flow control valves wide open or adjustments made to specific flow control valves during routine site visits, and maintenance or corrective actions are implemented by the O&M operator and/or Progressive accordingly.
- The average totalized flow rate (including downtime) from all RA wells was 2236 gpm, based upon flow totalizer readings on 3/25/02 and 4/22/02 and the total number of minutes between those dates. This value is reported at the request of USEPA, but does not reflect adjustments for well or treatment system downtime (if any) between the start and end dates and, therefore, is not a factor of performance evaluation.
- Operating data also are evaluated on a weekly basis, as summarized in Tables 1A through 1G, per USEPA's request. Downtime details are provided below under "Problems Encountered." A summary of weekly operating data is as follows:

Week of 3/25/02 – 4/1/02

- Average totalized flow rate from all RA wells excluding downtime – 2609 gpm
- RA system operated an average of 100% this period – no downtime.

Week of 4/1 – 4/8/02

- Average totalized flow rate from all RA wells excluding downtime – 2685 gpm
- RA system operated an average of 97.4% this period – individual blocking wells were offline from 4 to 7 hours during this period for valve and pipe maintenance (see "Problems Encountered" below).

Week of 4/8 – 4/15/02

- Average totalized flow rate from all RA wells excluding downtime - 2820 gpm
- RA system operated an average of 39.9% this period – entire system was offline for 101 hours this period due to blower failure (see “Problems Encountered” below).

Week of 4/15/17 – 4/22/02

- Average totalized flow rate from all RA wells excluding downtime - 2602 gpm.
- RA system operated an average of 100% this period – no downtime.

Contact Made With the Public

None.

Changes in Project Personnel

None.

Problems Encountered or Anticipated and Actions Taken to Address

- 1) CETC arrived onsite at 12:00 on 4/5/02 and found the Annex wells offline. The autodialer did not notify CETC of an alarm condition. CETC restarted the wells, and repaired the Annex autodialer. The total downtime of the Annex wells between 4/1/02 and 4/5/02 is unknown; CETC was not able to gain access to the Annex during its routine site visit on 4/3/02 due to railroad activities. As a result, the data presented in Attachment 3 for the Annex wells for the week of 4/1/02 lists downtime as “0” hours, but the actual number could be as much as 80 hours.
- 2) On 4/5/02, CETC shut down the northern blocking wells for 6 hours each while performing valve inspections/cleaning.
- 3) On 4/8/02, CETC shut down the southern blocking wells for 4 hours each while performing valve inspections/cleaning. Well V24 also was shutdown for 1 hour for a pipe fitting repair.
- 4) On 4/11/02, the telemetry system notified CETC of a blower failure. CETC arrived at the site and found the blower off and out of balance. CETC arranged for blower impeller/shaft repairs and motor inspection. The repairs were completed and the blower was reinstalled and started on 4/15/02. The entire system was offline for approximately 101 hours during this blower failure.

Additional Work Performed

None.

Work Anticipated in Following Month

CETC and Progressive will continue monitoring the system in accordance with the GWAMP and NPDES permit. Progressive and the VWFMP parties will finalize the list of wells for hydraulic and water quality monitoring during July 2002. Progressive will perform the activities outlined in the Summary Scope of Work (dated 4/30/02), including aquifer tests at the Annex and Paint Shop and other miscellaneous tasks associated with VWFMP party agreements.

Progressive and the VWF Group will participate in VWFMP activities, including resolution of technical issues and consent decree language. We also will support EPA's efforts in finalizing the ESD and Five-Year Review.

If you have questions or need additional information please do not hesitate to contact me.

Sincerely,
Progressive Engineering & Construction, Inc.



Bridget S. Morello, P.E.
Principal Engineer

Attachments

CC:

VWF Technical Committee
Matt Baltusis, MDEQ
David Rich, City of Battle Creek
Gary Kelterborn, Consumers Power

Beth Mead-O'Brien, MDEQ
Bill Davidson, Horizon
Ken Kohs, City of Battle Creek

ATTACHMENT 1

Summary of NPDES Water Quality Analytical Results and Calculated Mass Removal, Verona Well Field Superfund Site, Battle Creek, Michigan.

Parameter (ug/L)	Sample Date	1/9/02		2/20/02		3/13/02		4/17/02	
	Sample Location	Influent	Effluent	Influent	Effluent	Influent	Effluent	Influent	Effluent
NPDES Permit Discharge Criteria									
Volatile Organics									
Acetone	500	<50	<25	<25	<25	<25	<25	<25	<25
Benzene	report	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Carbon Tetrachloride	report	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Chloroform	report	42	2.9	2.2	<1.0	2.2	<1.0	2.2	<1.0
1,1-Dichloroethane	5	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,1-Dichloroethene	report	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2-Dichloroethane	10	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
cis-1,2-Dichloroethene	--	NA	NA	NA	NA	NA	NA	NA	NA
trans-1,2-Dichloroethene	--	NA	NA	NA	NA	NA	NA	NA	NA
Total 1,2-Dichloroethene	15	9.7	<1.0	10	<1.0	11	<1.0	13	<1.0
Ethylbenzene	report	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Methylene Chloride	10	<10	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Tetrachloroethene	3	<2.0	<1.0	1.4	<1.0	1.5	<1.0	1.2	<1.0
Toluene	report	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Trichloroethene	5	<2.0	<1.0	1.7	<1.0	1.6	<1.0	1.5	<1.0
1,1,1-Trichloroethane	report	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Vinyl Chloride	10	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Xylenes	report	<4.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Total VOCs		51.7	2.9	15.3	0	16.3	0	17.9	0
Monthly Average Flow (gpm)		2643		2702		2716		2653	
Mass Loading (lb/day)		1.64		0.50		0.53		0.57	
Mass Removed (lb/mth)		50.85		13.90		16.48		17.10	

Summary of NPDES Water Quality Analytical Results and Calculated Mass Removal, Verona Well Field Superfund Site, Battle Creek, Michigan.

Total Calculated Mass Removal since Startup of the VWF RA

Total Mass Removed 12/16/96-12/31/96	19.50	lbs
Total Mass Removed 1/1/97-12/31/97	295.55	lbs
Total Mass Removed 1/1/98-12/31/98	270.55	lbs
Total Mass Removed 1/1/99-12/31/99	255.83	lbs
Total Mass Removed 1/1/00-12/31/00	267.26	lbs
Total Mass Removed 1/1/01-12/31/01	203.21	lbs
Total Mass Removed 1/1/02-4/30/02	98.32	lbs
Cummulative Mass Removed 12/16/96-4/30/02	1410.22	lbs

Notes:

ug/L Micrograms per liter

< Denotes the detection limit.

J Indicates the compound was identified below the detection limit, and the value is an approximate concentration.

NA Indicates that the sample was not analyzed for the compound.

Analytical results obtained from monthly air stripper influent/effluent laboratory summary reports.

"--" Indicates discharge criterion not specified in NPDES permit.

"report" NPDES permit does not list discharge criteria for these compounds, but concentrations are required to be reported monthly (on DMRs).

* Value represents NPDES permit discharge criterion for total (cis and trans) 1,2-dichloroethene. NPDES permit does not require individual analyses of cis- and trans-1,2-DCE.

NPDES permit requires reporting of BTEX concentrations only once per year (in December).

Monthly average flow rates reflect calculated "Average Totalized Flow Rates Excluding Downtime" per table titled *Summary of VWF RA Well Flow Rates and City Production Rates* (submitted with monthly progress reports).

Mass loading (lb/day) calculated as follows: (total VOC conc.)*(flow rate)*(1.2E-05 conversion factor).

Mass removed (lb/mth) calculated as follows: (mass loading)*(#days in month).

Total mass removal (lbs) calculated as sum of monthly mass removals for the stated period. All effluent concentrations were non-detectable, therefore, system removed 100% of mass loading.

ATTACHMENT 2

APRIL 2002
City Flow Date

CITY OF BATTLE CREEK

MONTHLY REPORT OF WATER PLANT OPERATION

FOR A CLASS D-1 SYSTEM

FOR THE MONTH OF APRIL, 2002

VERONA SYSTEM

WSSN 0450

DAVID L. RICH
Certified Operator

D-1
Classification

David L. Rich
Signature

WATER SUPERINTENDENT
Title

Date: May 6, 2002

CITY OF BATTLE CREEK
Pg.2 Record of Pumpage

PUBLIC WORKS DEPARTMENT
Through Last Day of April 2002

WATER PRODUCTION DIVISION

MONTH	MONTHLY DEMAND			MAXIMUM DAILY DEMAND			MINIMUM DAILY	
	<i>Verona</i>	<i>Lakeview</i>	<i>Total</i>	<i>Verona</i>	<i>Lakeview</i>		<i>Verona</i>	<i>Lakeview</i>
JANUARY	323.33	0.00	323.33	11.20	0.00		8.55	0.00
FEBRUARY	280.46	0.00	280.46	10.67	0.00		8.38	0.00
MARCH	296.09	0.00	296.09	10.48	0.00		8.10	0.00
APRIL	282.03	0.00	282.03	11.19	0.00		7.83	0.00
Total	1181.91	0.00	1181.91	On Record: Verona 21.84 MG on 07/31/1997				
							<i>Verona</i>	<i>Lakeview</i>
YEARLY	2002	1181.91	MAXIMUM DAILY RATE	2002	17.40	0.00		
TOTALS	2001	4095.31		2001	27.70	0.00		
	2000	4141.57		2000	20.60	0.00		
				On Record: Verona 27.7 MGD on 04/26/2001 Lakeview 6.34 MGD on 07/07/1988				
							<i>Verona</i>	<i>Lakeview</i>
AVERAGE MONTHLY DEMAND	2002	295.48	MAXIMUM MONTHLY DEMAND	2002	323.33	0.00		
	2001	341.28		2001	457.24	0.00		
	2000	345.13		2000	406.72	0.00		
				On Record: Verona 539.43 MG for July 1997 Lakeview 136.13 MG for June 1988				

All Values Expressed in Million Gallons

CITY OF BATTLE CREEK**Water Treatment Plant Operation****April 2002**

<i>Pg 3</i>	<i>Influent</i>	<i>Effluent</i>	<i>Cl Applied</i>		<i>Cl</i>	<i>Phosphate</i>			<i>F Applied</i>		<i>F Analysis</i>	<i>pH</i>	<i>FE</i>	<i>Hydrograph</i>
<i>DATE</i>	<i>Mgd</i>	<i>Mgd</i>	<i>Gas</i>	<i>Mg/l</i>	<i>Plant</i>	<i>Lbs.</i>	<i>Mg/l</i>	<i>Mg/l-P</i>	<i>Lbs.</i>	<i>Mg/l</i>	<i>Plant</i>	<i>Plant</i>	<i>Plant</i>	<i>Level</i>
1	8.79	7.92	158	2.39	0.92	137	0.67	0.19	322	0.93	1.17	7.6	0.19	0.00
2	8.81	8.10	180	2.66	1.03	114	0.56	0.21	338	0.95	1.04	7.5	0.18	0.00
3	10.42	9.75	122	1.50	1.04	137	0.57	0.22	358	0.84	1.11	7.7	0.13	0.00
4	9.60	9.07	176	2.33	0.99	160	0.72	0.20	357	0.90	1.09	7.7	0.10	0.00
5	10.50	9.91	132	1.60	1.09	137	0.56	0.30	373	0.86	1.04	7.6	0.17	0.00
6	9.76	8.94	176	2.36	1.01	171	0.76	0.24	360	0.92	1.05	7.7	0.09	0.00
7	9.46	8.66	164	2.27	1.06	137	0.63	0.21	322	0.85	1.05	7.7	0.13	0.00
8	10.06	9.55	180	2.26	1.03	137	0.59	0.19	376	0.90	1.00	7.6	0.13	0.00
9	10.62	9.94	192	2.32	1.01	171	0.70	0.19	378	0.87	1.00	7.5	0.07	0.00
10	10.34	9.87	184	2.24	1.02	148	0.62	0.21	359	0.83	0.99	7.5	0.13	0.00
11	10.67	10.02	192	2.30	0.96	148	0.60	0.28	363	0.83	0.99	7.6	0.09	0.00
12	10.57	9.89	192	2.33	1.04	182	0.74	0.14	385	0.89	0.99	7.6	0.06	0.00
13	10.32	9.56	192	2.41	1.09	148	0.62	0.30	382	0.91	1.04	7.6	0.15	0.00
14	9.91	9.33	188	2.42	1.12	171	0.74	0.38	363	0.89	0.98	7.6	0.15	0.00
15	11.11	10.51	184	2.10	1.01	148	0.58	0.26	399	0.86	0.90	7.6	0.09	0.00
16	11.82	11.19	212	2.27	1.02	194	0.71	0.18	445	0.91	0.93	7.5	0.05	0.00
17	11.08	10.62	200	2.26	1.03	182	0.71	0.28	433	0.93	0.82	7.5	0.19	0.00
18	11.67	10.98	212	2.32	1.00	182	0.67	0.32	473	0.98	0.80	7.5	0.19	0.00
19	9.37	8.48	196	2.77	1.06	182	0.84	0.27	401	1.08	0.84	7.6	0.16	0.00
20	9.79	8.99	180	2.40	1.00	148	0.65	0.26	356	0.90	0.89	7.6	0.16	0.00
21	8.53	7.91	168	2.55	1.05	148	0.75	0.30	318	0.92	0.84	7.5	0.11	0.00
22	10.20	9.54	184	2.31	1.13	137	0.58	0.86	380	0.91	0.86	7.6	0.04	0.00
23	9.87	9.19	180	2.35	1.07	148	0.65	0.18	401	0.99	0.97	7.6	0.03	0.00
24	9.14	8.41	168	2.40	1.07	148	0.70	0.32	332	0.90	1.00	7.6	0.11	0.00
25	11.05	10.50	184	2.10	0.97	160	0.63	0.29	398	0.86	0.97	7.5	0.14	0.00
26	8.57	7.83	164	2.51	1.08	171	0.86	0.21	323	0.94	1.07	7.5	0.10	0.00
27	8.80	8.36	156	2.24	0.95	137	0.67	0.59	325	0.01	1.12	7.6	0.31	0.00
28	8.60	7.86	152	2.32	0.83	137	0.69	0.31	327	0.95	1.18	7.6	0.01	0.00
29	11.51	10.77	192	2.14	1.06	137	0.51	0.19	416	0.88	1.10	7.6	0.01	0.00
30	11.03	10.38	196	2.26	0.95	160	0.63	0.18	438	0.96	1.14	7.6	0.01	0.00
Total	302.00	282.03	5356			4617			10879					
Max.	11.82	11.19	212	2.77	1.13	194	0.86	0.86	473	1.08	1.18	7.7	0.31	0.00
Avg.	10.07	9.40	179	2.29	1.02	154	0.66	0.28	363	0.88	1.00	7.6	0.12	0.00
Min.	8.53	7.83	122	1.50	0.83	114	0.51	0.14	318	0.01	0.80	7.5	0.01	0.00

CITY OF BATTLE CREEK Pump Station Operation

April 2002

<i>Pg. 4</i>	<i>Pumpage M. G. D.</i>			<i>Verona Pumping</i>		<i>Verona Pressure</i>		<i>Ft. Custer Pressure</i>		<i>Beckley Sta. Pressure</i>	
<i>DATE</i>	<i>Brigden</i>	<i>Ft. Custer</i>	<i>Beckley (Est.)</i>	<i>Max.</i>	<i>Min.</i>	<i>Max.</i>	<i>Min.</i>	<i>Max.</i>	<i>Min.</i>	<i>Max.</i>	<i>Min.</i>
1	2.47	3.40	0.30	14.5	5.3	86.1	68.1	69.7	47.3	58.6	49.5
2	3.20	4.10	0.35	13.9	5.0	90.1	67.1	66.0	57.0	60.7	48.8
3	2.41	3.40	0.38	14.4	5.5	85.1	64.1	69.3	58.5	59.6	50.3
4	2.21	3.40	0.35	14.7	5.3	88.1	71.1	70.4	55.3	60.4	50.0
5	2.39	3.60	0.35	14.6	5.5	89.1	61.1	76.8	51.4	60.1	50.5
6	2.27	3.10	0.35	14.5	5.5	88.1	70.1	70.3	54.5	60.3	51.4
7	2.34	3.30	0.36	14.8	5.2	89.1	68.1	71.6	53.0	60.5	50.2
8	2.42	3.30	0.35	14.5	5.1	89.1	63.1	74.5	49.0	58.2	49.8
9	2.40	4.00	0.35	13.9	5.8	84.0	74.0	64.0	59.0	57.0	54.0
10	2.23	1.50	0.31	14.8	5.0	88.1	70.1	68.7	53.6	65.7	42.9
11	2.32	0.00	0.35	15.1	5.5	88.1	63.1	71.6	55.0	59.2	48.1
12	1.87	0.00	0.35	14.9	5.5	87.1	68.1	66.3	52.6	62.4	48.5
13	2.58	0.00	0.35	14.3	5.3	88.1	69.1	64.0	57.4	58.5	51.9
14	2.01	0.00	0.35	14.8	5.3	88.1	70.1	66.3	58.5	60.9	50.1
15	2.28	2.90	0.35	15.0	5.5	88.1	60.1	63.9	50.9	60.0	51.9
16	2.31	3.40	0.35	15.0	5.9	89.1	64.1	64.9	49.8	60.0	52.4
17	2.31	4.10	0.35	14.9	5.7	88.1	67.1	63.2	49.6	59.7	49.6
18	2.23	3.90	0.35	16.6	5.3	88.1	58.1	63.4	49.4	59.5	50.7
19	1.87	2.70	0.29	14.2	5.9	86.1	65.1	63.8	50.1	58.6	49.7
20	2.59	2.50	0.35	14.2	5.4	89.1	68.1	67.9	58.5	58.6	51.3
21	2.17	3.70	0.36	11.5	5.0	86.1	68.1	72.4	53.3	60.7	48.6
22	2.35	3.00	0.38	14.1	5.3	86.1	63.1	73.8	53.2	60.4	47.9
23	3.05	2.90	0.35	15.6	5.3	91.1	64.1	65.0	57.8	62.9	48.6
24	2.78	2.90	0.34	12.1	5.4	95.1	68.1	64.2	58.1	58.1	49.8
25	2.69	3.70	0.35	14.7	5.6	95.1	68.1	69.5	51.9	63.0	50.3
26	2.56	3.20	0.35	13.4	5.5	87.1	69.1	65.4	52.4	61.5	43.1
27	2.19	3.40	0.35	11.8	5.5	87.1	68.1	70.8	50.6	60.5	51.5
28	2.01	3.40	0.34	11.5	5.5	84.1	68.1	66.7	59.4	59.6	47.6
29	2.27	4.00	0.35	17.4	5.7	91.1	66.1	69.5	56.3	61.1	49.1
30	2.05	4.00	0.35	16.8	5.4	95.1	67.1	67.1	50.9	60.2	49.5
Total	70.83	86.80	10.40								
Max	3.20	4.10	0.38	17.4		95.1		76.8		65.7	
Min	1.87	0.00	0.29		5.0		58.1		47.3		42.9
Avg	2.36	2.89	0.35								

CITY OF BATTLE CREEK

**Monthly Water Storage
ELEVATED**

April 2002

GROUND

<i>Pg. 5</i>	<i>Brigden Reservoir</i>		<i>Urbandale Level</i>		<i>Ft. Custer Level</i>		<i>Gethings Tower</i>		<i>Beckley Rd. Reservoir</i>		<i>Verona Station Reservoir Level</i>	
<i>DAT</i>	<i>Max</i>	<i>Min</i>	<i>Max</i>	<i>Min</i>	<i>Max</i>	<i>Min</i>	<i>Max</i>	<i>Min</i>	<i>Max</i>	<i>Min</i>	<i>Max</i>	<i>Min</i>
1	62.9	53.0	29.0	15.6	40.0	29.8	37.9	29.1	39.1	29.9	10.5	8.5
2	62.6	57.5	27.5	13.4	40.0	24.8	38.0	26.1	40.0	29.9	10.3	8.7
3	59.9	53.0	21.8	14.1	40.0	30.2	38.1	29.7	39.1	29.9	10.3	8.5
4	62.7	53.0	26.5	14.8	40.0	30.0	38.0	29.9	39.2	29.9	10.3	8.7
5	62.1	52.9	25.1	14.1	40.0	30.2	38.0	29.6	39.1	29.9	10.5	8.7
6	62.6	53.0	26.8	14.9	40.0	27.6	38.0	28.1	39.5	29.9	10.5	8.7
7	62.0	52.9	25.3	13.9	40.0	30.1	38.0	29.9	39.1	29.9	10.5	8.7
8	62.0	53.0	24.9	14.2	40.0	30.3	38.0	30.0	39.1	29.9	10.5	8.7
9	62.0	53.0	24.0	15.0	40.0	30.0	38.0	30.0	40.0	30.0	10.4	8.7
10	62.0	53.0	24.7	15.5	40.0	29.5	38.0	29.8	39.1	29.9	10.5	8.6
11	62.0	52.6	25.7	10.1	40.0	29.9	38.0	30.0	39.2	29.9	10.5	8.7
12	62.0	53.0	24.7	14.9	40.0	29.8	38.0	30.0	39.1	29.9	10.7	8.7
13	62.0	52.7	26.7	13.6	40.0	30.6	38.0	30.0	39.1	29.9	10.5	8.6
14	62.0	53.0	25.4	15.4	40.0	30.3	38.0	30.0	39.1	29.9	10.5	8.7
15	62.0	51.7	24.9	12.1	40.0	29.6	38.0	30.0	39.1	29.9	10.5	8.6
16	61.9	52.0	23.4	12.6	40.0	29.9	38.0	30.0	39.1	29.9	10.4	8.7
17	61.0	53.0	23.2	15.9	40.0	29.5	38.0	29.9	39.1	29.9	10.5	8.6
18	62.0	54.3	24.7	15.5	40.0	29.5	38.0	30.0	39.1	29.9	10.5	8.6
19	60.6	52.6	23.7	13.5	40.0	29.7	39.2	30.0	39.1	29.9	10.4	7.7
20	62.0	53.0	26.3	14.8	40.0	30.4	38.0	30.0	39.1	29.6	10.5	8.7
21	62.4	53.4	26.1	15.3	40.0	30.1	38.0	30.0	40.0	29.8	10.8	8.9
22	62.0	53.0	24.7	15.3	39.1	30.1	36.6	29.6	39.1	29.9	10.7	8.7
23	62.0	53.0	26.7	17.8	40.0	28.3	38.0	27.8	40.0	30.8	10.5	8.6
24	62.3	51.5	27.1	12.9	40.0	29.3	38.0	29.8	39.1	29.9	10.5	8.8
25	60.1	52.8	30.0	15.9	40.0	29.3	38.0	29.0	39.1	29.9	10.4	8.7
26	62.0	54.2	26.2	16.8	40.0	31.1	38.0	30.0	39.1	29.9	10.5	8.9
27	62.0	55.0	24.8	17.5	40.0	33.1	38.0	31.4	39.1	29.9	10.5	8.9
28	62.0	55.0	25.3	17.5	40.0	32.2	38.0	30.2	39.1	29.9	10.6	8.9
29	60.3	53.6	22.8	15.7	40.0	32.1	38.0	30.2	39.1	29.9	10.4	8.5
30	62.0	52.6	25.5	14.1	40.0	33.6	38.0	33.9	40.0	31.9	10.5	8.5
<i>Max</i>	62.9		30.0		40.0		39.2		40.0		10.8	
<i>Min</i>		51.5		10.1		24.8		26.1		29.6		7.7

<i>CITY OF BATTLE CREEK</i>	<i>Monthly Pump Usage</i>							<i>WSSN 0450</i>					<i>April 2002</i>
<i>Pg. 6</i>	<i>#13</i>	<i>#14</i>	<i>#15</i>	<i>#17</i>	<i>#30</i>	<i>#36</i>	<i>#37</i>	<i>#38</i>	<i>#39</i>	<i>#40</i>	<i>#41</i>	<i>#42</i>	<i>Total</i>
<i>DATE</i>	<i>Hours</i>	<i>Hours</i>	<i>Hours</i>	<i>Hours</i>	<i>Hours</i>	<i>Hours</i>	<i>Hours</i>	<i>Hours</i>	<i>Hours</i>	<i>Hours</i>	<i>Hours</i>	<i>Hours</i>	<i>Hours</i>
1	0	0	0	0	0	0	0	0	3	0	0	0	3
2	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	4	0	0	0	4
4	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0	0	0	0
11	0	0	0	0	0	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0	0	0	0
16	0	0	0	0	0	0	0	0	0	0	0	0	0
17	0	0	0	0	0	0	0	0	0	0	0	0	0
18	0	0	0	0	0	0	0	0	0	0	0	0	0
19	0	1	1	1	0	0	0	0	1	0	0	0	4
20	0	0	0	0	0	0	0	0	1	0	0	0	1
21	0	0	0	0	0	0	0	0	0	0	0	0	0
22	0	0	0	0	0	0	0	0	0	0	0	0	0
23	0	0	0	0	0	0	0	0	0	0	0	0	0
24	0	0	0	0	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0	0	0	0	0
26	0	0	0	0	0	0	0	0	0	0	0	0	0
27	0	0	0	0	0	0	0	0	0	0	0	0	0
28	0	0	0	0	0	0	0	0	0	0	0	0	0
29	0	0	0	0	0	0	0	0	4	0	0	0	4
30	0	0	0	0	0	0	0	0	3	0	0	0	3
<i>Total</i>	0	1	1	1	0	0	0	0	16	0	0	0	19

CITY OF BATTLE CREEK**Monthly Pump Usage****WSSN 0450****April 2002**

Pg. 7	#43	#44	#45	#46	#47	#48	#49	#50	#51	#52	#53	#54	Total
DATE	Hours	Hours	Hours	Hours	Hours	Hours	Hours	Hours	Hours	Hours	Hours	Hours	Hours
1	0	3	12	12	9	9	13	13	17	17	0	16	121
2	0	0	7	8	10	10	12	12	24	24	0	24	131
3	0	4	6	7	13	13	18	18	24	24	0	24	151
4	0	0	6	7	9	9	17	17	24	24	10	24	147
5	0	0	7	7	12	12	17	17	21	21	24	24	162
6	0	0	7	8	10	10	11	11	21	21	24	24	147
7	0	0	8	8	8	8	10	10	21	21	24	24	142
8	0	0	4	4	13	13	15	15	21	21	24	24	154
9	0	0	8	8	13	13	17	17	21	21	24	24	166
10	0	0	6	6	10	10	17	17	22	22	24	24	158
11	0	0	6	6	14	14	17	17	21	21	24	24	164
12	0	0	8	8	13	13	15	15	21	21	24	24	162
13	0	0	9	9	11	11	13	13	21	21	24	24	156
14	0	0	6	7	8	8	15	15	21	21	24	24	149
15	0	0	8	8	15	15	18	18	21	21	24	24	172
16	0	0	8	8	16	16	20	20	24	24	24	24	184
17	0	0	9	9	13	13	18	18	22	22	24	24	172
18	0	0	12	12	14	14	20	20	22	22	24	24	184
19	0	1	1	1	17	17	20	20	24	24	24	24	173
20	0	1	4	4	11	11	12	12	21	21	24	24	145
21	0	0	0	1	6	6	12	12	20	20	24	24	125
22	0	0	6	6	10	10	17	17	21	21	24	24	156
23	0	0	8	9	10	10	11	11	21	21	24	24	149
24	0	0	1	1	10	10	11	11	21	21	24	24	134
25	0	0	4	5	16	16	17	17	24	24	24	24	171
26	0	0	1	1	6	6	10	10	21	21	24	24	124
27	0	0	0	0	4	5	15	15	22	22	24	24	131
28	0	0	0	1	7	9	11	11	22	22	24	24	131
29	0	4	4	5	13	13	18	18	24	24	24	24	171
30	0	3	7	7	11	11	17	17	21	21	24	24	163
Total	0	16	173	183	332	335	454	454	651	651	634	712	4595

CITY OF BATTLE CREEK**April 2002****Monthly High Service Usage****Monthly Low Service Usage**

Pg. 8	#1	#2	#3	#4	#5	#6	Total	#1	#2	#3	#4	Total
DATE	Hours	Hours	Hours	Hours	Hours	Hours	Hours	Hours	Hours	Hours	Hours	Hours
1	2	15	6	0	6	16	45	7	18	5	0	30
2	6	23	0	0	2	16	47	0	24	10	0	34
3	0	14	0	0	15	9	38	0	24	11	0	35
4	0	19	0	0	12	12	43	0	24	9	0	33
5	0	14	0	0	16	8	38	0	24	12	0	36
6	0	21	0	0	11	13	45	0	24	10	0	34
7	0	19	0	0	10	14	43	0	24	9	0	33
8	0	16	0	0	14	10	40	0	24	13	0	37
9	0	17	0	0	15	9	41	0	24	13	0	37
10	0	14	0	0	16	8	38	0	24	11	0	35
11	0	16	0	0	16	8	40	0	24	14	0	38
12	0	17	0	0	14	10	41	0	24	13	0	37
13	0	17	0	0	14	10	41	0	24	12	0	36
14	0	16	0	0	13	11	40	0	24	8	0	32
15	0	14	0	0	17	7	38	0	24	15	0	39
16	0	12	0	0	21	3	36	0	24	16	0	40
17	0	15	0	0	17	7	39	0	24	14	0	38
18	5	14	0	0	14	10	43	0	24	14	0	38
19	0	8	0	0	20	4	32	0	24	17	0	41
20	0	19	0	0	12	12	43	0	24	12	0	36
21	0	14	0	0	10	14	38	0	24	6	0	30
22	0	12	0	0	16	8	36	0	24	10	0	34
23	0	23	0	0	11	13	47	0	24	10	0	34
24	0	17	0	0	11	13	41	0	24	11	0	35
25	0	19	0	0	18	6	43	0	24	16	0	40
26	0	15	0	0	9	15	39	0	24	6	0	30
27	0	12	0	0	12	12	36	0	24	5	0	29
28	0	13	0	0	11	13	37	0	24	3	0	27
29	4	5	0	0	19	5	33	0	24	14	0	38
30	3	14	0	0	15	9	41	0	24	11	0	35
Total	20	464	6	0	407	305	1202	7	714	330	0	1051

CITY OF BATTLE CREEK DISTRIBUTION SYSTEM REPORT

Pg. 9

WSSN 0450

April 2002

Pg. 9

Location	04/02/2002			04/09/2002			04/16/2002			04/23/2002			04/30/2002		
	CL	F	P/A Result	CL	F	P/A Result	CL	F	P/A Result	CL	F	P/A Result	CL	F	P/A Result
#2 Fire Station	0.83	1.02	Positive	0.78	1.04	Negative	0.68	0.89	Negative	0.64	0.97	Negative			
Public Serv Bldg	0.81	0.96	Negative	0.81	1.02	Negative	0.75	0.93	Negative	0.69	1.01	Negative			
#5 Fire Station	0.63	1.00	Negative	0.70	1.01	Negative	0.63	0.99	Negative	0.57	0.99	Negative			
Lamon School			N/S	0.69	1.01	Negative	0.45	0.95	Negative	0.36	0.96	Negative			
W.W.T.P.	0.37	0.99	Negative	0.28	0.97	Negative	0.48	0.95	Negative	0.27	0.92	Negative			
V.A. Hospital	0.46	0.96	Negative	0.43	0.94	Negative	0.55	1.02	Negative	0.43	0.98	Negative	0.30	0.95	Negative
Brigden Sta	0.81	0.93	Negative	0.86	0.99	Negative	0.60	0.99	Negative	0.71	0.95	Negative	0.56	1.10	Negative
Ft. Custer Sta	0.68	0.96	Negative	0.49	0.97	Negative	0.78	0.99	Negative	0.41	0.96	Negative	0.77	1.02	Negative
# 4 Fire Station	0.85	0.92	Negative	0.77	0.98	Negative	0.66	0.99	Negative	0.66	0.99	Negative			
Lakeview Hi School	2.20	1.00	Negative	1.83	1.01	Negative	2.20	0.97	Negative	0.11	0.97	Negative			
240 E. Columbia			N/S	0.71	0.99	Negative	0.53	1.00	Negative	0.59	0.94	Negative			
# 3 Fire Station	0.85	0.90	Negative	0.59	1.02	Negative	0.80	0.97	Negative	0.61	0.91	Negative			
Mich State Police	0.57	0.95	Negative	0.76	0.98	Negative	0.58	0.97	Negative	0.62	0.94	Negative			
City Hall	0.89	0.89	Negative	0.89	0.93	Negative	0.59	0.97	Negative	0.65	1.01	Negative			
Beckley Rd. Sta.	0.40	0.95	Negative	0.42	0.97	Negative	0.57	0.96	Negative	0.33	0.95	Negative	0.45	1.00	Negative
Verona Pump Tap	0.96	1.04	Negative	0.86	1.07	Negative	0.93	0.98	Negative	1.01	1.14	Negative	0.87	1.26	Negative
# 1 Fire Station			N/S			N/S	0.68	0.95	Negative	0.66	1.00	Negative			
1051 N. Ave Bed	0.61	0.99	Negative	0.55	0.99	Negative	0.62	1.00	Negative	0.55	1.01	Negative			
CHECK SAMPLES															
#2 Fire Station			Negative			04/04/2002									
135 N Washington			Negative			04/04/2002									
160 N Washington			Negative			04/04/2002									

EMMETT TWP. WSSN 2125

Emmett Twp. Fire	0.55	0.82	Negative	0.56	0.95	Negative	N/S	N/S
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SPRINGFIELD WSSN 5240

Springfield Fire	0.37	0.97	Negative	0.44	0.99	Negative	0.51	0.97	Negative	0.53	0.98	Negative
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CITY OF BATTLE CREEK**Monthly Report Of Power Usage****April 2002****Pg 10**

DATE	VERONA	LAKEVIEW	BRIGDEN	FT CUSTER	BECKLEY	TOTAL
1	19.2		0.90	1.2	0.0	21.3
2	22.4		1.60	3.0	0.4	27.4
3	22.4		1.50	1.4	0.2	25.5
4	22.4		1.00	2.0	0.2	25.6
5	22.4					22.4
6	24.0					24.0
8	22.4		0.97	1.8	0.2	25.4
9	24.0		1.07	1.8	0.2	27.1
10	22.4		1.15	1.8	0.2	25.6
11	22.4		1.00	1.6	0.2	25.2
12	24.0					24.0
13	8.0					8.0
14	16.0		3.25	5.0	0.8	25.0
15	14.4		0.93	2.0	0.0	17.3
16	22.4		1.09	2.4	0.2	26.1
17	24.0		1.09	1.6	0.2	26.9
18	24.0		1.03	2.0	0.2	27.2
19	24.0					24.0
20	24.0					24.0
21	22.4		3.12	5.2	0.6	31.3
22	19.2					19.2
23	22.4		1.31	2.4	0.2	26.3
24	22.4		1.51	2.4	0.2	26.5
25	24.0		1.29	2.6	0.2	28.1
26	24.0					24.0
27	20.8					20.8
28	20.8		2.99	7.8	0.6	32.2
29	20.8		0.87	2.8	0.2	24.7
30	17.6		1.00	3.0	0.0	21.6
Total	619.2		28.68	53.8	5.0	706.7
Max	24.0		3.25	7.8	0.8	32.2
Min	8.0		0.87	1.2	0.0	8.0
Avg	21.4		1.43	2.7	0.3	24.4
GL/KWH	441		2388	1552	2008	

CITY OF BATTLE CREEK

VERONA WATER TREATMNT PLANT

PAGE 11

FILTER RUN TIMES APRIL, 2002

Date	Filter No.	Backwash Time	Run Time Hours	Date	Filter No.	Backwash Time	Run Time Hours
04/01/2002	F-7	7:55	192	04/16/2002	F-3	8:17	192
04/02/2002	F-4	9:08	193	04/17/2002	F-7	8:48	192
04/03/2002	F-8	8:54	192	04/18/2002	F-4	8:13	192
04/04/2002	F-1	8:43	192	04/19/2002	F-8	8:30	192
04/05/2002	F-5	8:23	192	04/20/2002	F-1	8:19	192
04/06/2002	F-2	8:15	192	04/21/2002	F-5	8:20	192
04/07/2002	F-6	8:36	192	04/22/2002	F-2	7:59	191
04/08/2002	F-3	8:33	192	04/23/2002	F-6	8:16	192
04/09/2002	F-7	8:27	193	04/24/2002	F-3	8:23	192
04/10/2002	F-4	8:25	191	04/25/2002	F-7	7:17	190
04/11/2002	F-8	8:25	192	04/26/2002	F-4	8:23	192
04/12/2002	F-1	8:39	192	04/27/2002	F-8	8:24	192
04/13/2002	F-5	8:24	192	04/28/2002	F-1	8:11	192
04/14/2002	F-2	8:46	193	04/29/2002	F-5	8:14	192
04/15/2002	F-6	8:19	192	04/30/2002	F-2	8:04	192

There were 30 filter backwashes for the month of April, at an estimated 175,000 gals. each, for a total of 5,250,000 gals. discharged to the lagoons. None of this water was discharged to the river.

City of Battle Creek

Verona Well Field

Well Program for the month of May 2002

Step 1: 45 & 46

Step 2: 45 thru 48

Step 3: 45 thru 50

Step 4: 45 thru 52

Step 5: 45 thru 54

Step 6: 39 & 44 thru 54

Step 7: 14 thru 17, 39, 44 thru 54

Step 8: 14 thru 17, 39 thru 41, & 44 thru 54

Step 9: 14 thru 17 & 39 thru 54

Step 10: 14 thru 17 & 36 thru 54

City of Battle Creek

Verona Pump Station

High Service Program for May 2002

Step 1: # 3

Step 2: # 4

Step 3: # 4 & # 3

Step 4: # 4 & # 1

Step 5: # 4, & # 5, & # 3

Step 6: # 1, # 4, & # 5

ATTACHMENT 3

	Design Flow Rate (gpm)	Actual vs. Design Flow Rate ^{a,b,e} 3/25/02 - 4/22/02			Operational Assessment ^{c,d} 3/25/02 - 4/22/02			
		Average Totalized Flow Rate Excluding Downtime (gpm)	Performance as a Percent of Design Flow	Reason for Variance from Design Rate	Total Amount of Downtime (hours)	Total Hours in Period (hours)	Uptime as % of Total Duration of Reporting Period (%)	Total Hours in Period (hours)
V22	120	105	87.8	Note g	107		84.1	672
V24	120	115	95.7		108		83.9	672
V25	150	149	99.3		107		84.1	672
V26	165	160	97.1		107		84.1	672
V27	190	191	100.4		107		84.1	672
V28	190	187	98.4		107		84.1	672
GMBW-1	225	227	100.7		105		84.4	672
GMBW-2	220	225	102.4		105		84.4	672
GMBW-3	170	166	97.5		105		84.4	672
GMBW-4	160	159	99.1		105		84.4	672
GMBW-5	230	229	99.5		105		84.4	672
GMBW-6	230	228	99.0		105		84.4	672
GMBW-7	220	220	100.1		105		84.4	672
GMBW-8	220	219	99.3		105		84.4	672
GMA-1D	50	50	100.0		101		85.0	672
GMA-2D	50	25	49.1	Note f	101		85.0	672
TOTAL:	2710	2653				672		672
		AVERAGE:	95.3			AVERAGE:	84.3	

^a Avg. Totalized Flow Rate Excluding Downtime (gpm) = (difference in total volume pumped (gallons) for the specific period) / (total minutes of operation during specific period, excluding downtime as noted in progress report (if any)).

^b Performance as % of Design Flow illustrates how well each blocking well performed as compared to its design flow rate. Calculated as ((total well flow rate)/(design flow rate))*100.

^c Downtime details for this reporting period are summarized below:

3/25-4/1/02: No downtime

4/1-4/8/02: Blocking wells V22, and V24-28 were taken offline for 6 hours on 4/5/02 to repair/replace check and gate valves.

Blocking well V24 was offline 1 hour on 4/8/02 for a pipe replacement. Blocking wells GMBW1 through 8 were taken offline for 4 hours on 4/8/02 for valve inspections and cleaning.

4/8-4/15/02: The system was shutdown on 4/11/02 at 12:00 pm due to mechanical failure of the blower, CETC coordinated repairs, and the blower and system were restarted on 4/15/02, after a total of 101 hours of downtime.

4/15-4/22/02: No downtime

^d Uptime as % of Total Duration of Reporting Period reflects the actual percent of time each well was online during the reporting period. Calculated as ((downtime)/(total duration of operating period))*100.

^e Only obvious variances from design rates are noted.

^f Flow rate at Annex well 2D was lower than design rate, apparently due to interconnection with Annex well 1D.

^g Flow rate at blocking well V22 was lower than design rate, apparently due to a faulty gate valve, the valve was replaced and flowrate adjusted.

Performance Evaluation of VWF RA Wells April 2002

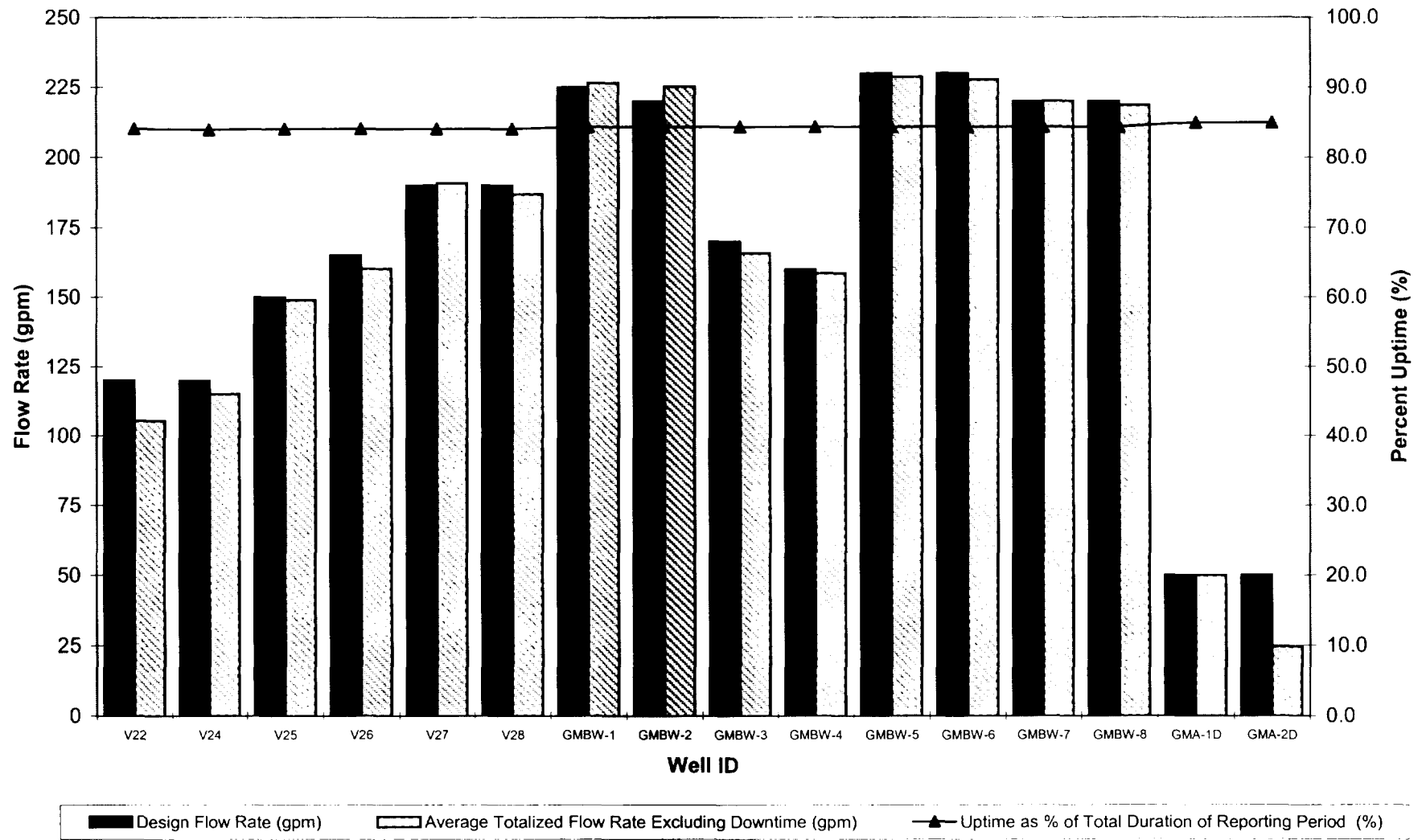


Table 1A. Summary of VWF RA Well Flow Rates and City Production Rates.

Well Name	Design Flow (gpm)	Instant Flow (gpm) 4/1/02	Instant Flow (gpm) 4/8/02	Instant Flow (gpm) 4/15/02	Instant Flow (gpm) 4/22/02	Avg. Instant ^a Flow Rate (gpm) April
V22	120	107	98	120	69	99
V24	120	100	131	123	118	118
V25	150	150	142	150	147	147
V26	165	165	151	165	172	163
V27	190	189	219	190	192	198
V28	190	191	170	190	189	185
GMBW-1	225	228	226	226	227	227
GMBW-2	220	220	219	220	222	220
GMBW-3	170	165	167	171	167	168
GMBW-4	160	162	156	160	158	159
GMBW-5	230	231	226	229	234	230
GMBW-6	230	229	231	230	232	231
GMBW-7	220	221	220	220	217	220
GMBW-8	220	221	220	220	221	221
GMA-1D ⁺	50	59	60	60	60	60
GMA-2D ⁺	50	28	29	28	28	28
TOTAL	2710	2666	2665	2702	2653	2672
Northern BW Avg. Rate (gpm):						887
Southern BW Avg. Rate (gpm):						1678
Annex Wells Avg. Rate (gpm):						88
Avg. City Production Rate (mgd):						9.40

Monitoring of Instantaneous Flow Rates allows the O&M operator to ensure wells are operating at as close to design rates as possible, and adjust the flow control valves as necessary. Instantaneous Flow Rates and flow control valve settings also provide an indication of when well maintenance is necessary.

Notes on last page.

Table 1B. Summary of VWF RA Well Flow Rates and City Production Rates.

		3/25/02 - 4/1/02								
Design Flow	Totalized Flow (gal)	Totalized Flow (gal)	Total Pumped (gal)	Avg. Totalized Flow Rate (gpm) ^b		Percent of Total Flow ^c	Percent of Design Flow ^d	Total Amount of Downtime	% Uptime	
Well Name (gpm)	3/25/02	4/1/02		Total	excl. Downtime*	(%)	(%)	(hours)	for total hrs= 168	
V22	120	290144200	291218200	1074000	107	107	4.1	88.8	0	100.0
V24	120	271779000	272832400	1053400	105	105	4.0	87.1	0	100.0
V25	150	358972300	360437600	1465300	145	145	5.6	96.9	0	100.0
V26	165	444022400	445630100	1607700	159	159	6.1	96.7	0	100.0
V27	190	412313800	414171400	1857600	184	184	7.1	97.0	0	100.0
V28	190	484897300	486767900	1870600	186	186	7.1	97.7	0	100.0
GMBW-1	225	509270600	511508200	2237600	222	222	8.5	98.7	0	100.0
GMBW-2	220	500519900	502726600	2206700	219	219	8.4	99.5	0	100.0
GMBW-3	170	387474600	389104200	1629600	162	162	6.2	95.1	0	100.0
GMBW-4	160	362072600	363631500	1558900	155	155	5.9	96.7	0	100.0
GMBW-5	230	486229200	488493700	2264500	225	225	8.6	97.7	0	100.0
GMBW-6	230	521265600	523525100	2259500	224	224	8.6	97.5	0	100.0
GMBW-7	220	491597900	493771400	2173500	216	216	8.3	98.0	0	100.0
GMBW-8	220	309359300	311525600	2166300	215	215	8.2	97.7	0	100.0
GMA-1D ⁺	50	128130100	128717600	587500	58	58	2.2	116.6	0	100.0
GMA-2D ⁺	50	53736300	54020800	284500	28	28	1.1	56.4	0	100.0
TOTAL	2710	6011785100	6038082300	26297200	2609	2609				
Northern BW Avg. Rate (gpm):				886	886	34.0	94.7			
Southern BW Avg. Rate (gpm):				1637	1637	62.7	97.7			
Annex Wells Avg. Rate (gpm):				87	87	3.3	86.5			
Average% Uptime: 100.0										

Monitoring of Totalized Flow allows for calculation of well flow rates for a specific period of time (between readings, or for an entire month). The calculated value can be corrected to reflect downtime during the specific period of time measured. The resultant flow rate can be compared to the design flow rate to evaluate performance.

Notes on last page.

Table 1C. Summary of VWF RA Well Flow Rates and City Production Rates.

4/1/02 - 4/8/02									
Well Name	Design Flow (gpm)	Totalized Flow (gal) 4/8/02	Total Pumped (gal)	Avg. Totalized Flow Rate (gpm) ^b		Percent of Total Flow ^c (%)	Percent of Design Flow ^d (%)	Total Amount of Downtime (hours)	% Uptime for total hrs= 168
V22	120	292245100	1026900	102	106	3.9	88.0	6	96.4
V24	120	273996900	1164500	116	121	4.5	100.5	7	95.8
V25	150	361866600	1429000	142	147	5.5	98.0	6	96.4
V26	165	447155300	1525200	151	157	5.8	95.1	6	96.4
V27	190	416108700	1937300	192	199	7.4	104.9	6	96.4
V28	190	488544300	1776400	176	183	6.8	96.2	6	96.4
GMBW-1	225	513826600	2318400	230	236	8.8	104.7	4	97.6
GMBW-2	220	504954100	2227500	221	226	8.4	102.9	4	97.6
GMBW-3	170	390800300	1696100	168	172	6.4	101.4	4	97.6
GMBW-4	160	365277100	1645600	163	167	6.2	104.5	4	97.6
GMBW-5	230	490821200	2327500	231	237	8.8	102.8	4	97.6
GMBW-6	230	525846900	2321800	230	236	8.8	102.6	4	97.6
GMBW-7	220	496015600	2244200	223	228	8.5	103.7	4	97.6
GMBW-8	220	313764600	2239000	222	228	8.5	103.4	4	97.6
GMA-1D ⁺	50	128996900	279300	28	28	1.0	55.4	0	100.0
GMA-2D ⁺	50	54172200	151400	15	15	0.6	30.0	0	100.0
TOTAL	2710	6064392400	26310100	2610	2685				
Northern BW Avg. Rate (gpm):				879	912	34.0	97.6	Average% Uptime: 97.4	
Southern BW Avg. Rate (gpm):				1689	1730	64.4	103.3		
Annex Wells Avg. Rate (gpm):				43	43	1.6	42.7		

Monitoring of Totalized Flow allows for calculation of well flow rates for a specific period of time (between readings, or for an entire month).

The calculated value can be corrected to reflect downtime during the specific period of time measured. The resultant flow rate can be compared to the design flow rate to evaluate performance.

Notes on last page.

Table 1D. Summary of VWF RA Well Flow Rates and City Production Rates.

		4/8/02 - 4/15/02							
Design Flow Well Name	(gpm)	Totalized Flow (gal) 4/15/02	Total Pumped (gal)	Avg. Totalized Flow Rate (gpm) ^b Total excl. Downtime*		Percent of Total Flow ^c (%)	Percent of Design Flow ^d (%)	Total Amount of Downtime (hours)	% Uptime for total hrs= 168
V22	120	292745900	500800	50	125	4.4	103.8	101	39.9
V24	120	274513100	516200	51	128	4.6	107.0	101	39.9
V25	150	362536800	670200	66	167	5.9	111.1	101	39.9
V26	165	447917400	762100	76	190	6.7	114.9	101	39.9
V27	190	416920000	811300	80	202	7.2	106.2	101	39.9
V28	190	489384000	839700	83	209	7.4	109.9	101	39.9
GMBW-1	225	514757400	930800	92	232	8.2	102.9	101	39.9
GMBW-2	220	505859600	905500	90	225	8.0	102.4	101	39.9
GMBW-3	170	391483100	682800	68	170	6.0	99.9	101	39.9
GMBW-4	160	365946700	669600	66	167	5.9	104.1	101	39.9
GMBW-5	230	491746900	925700	92	230	8.2	100.1	101	39.9
GMBW-6	230	526774500	927600	92	231	8.2	100.3	101	39.9
GMBW-7	220	496919000	903400	90	225	8.0	102.1	101	39.9
GMBW-8	220	314665100	900500	89	224	7.9	101.8	101	39.9
GMA-1D ⁺	50	129260600	263700	26	66	2.3	131.2	101	39.9
GMA-2D ⁺	50	54298300	126100	13	31	1.1	62.7	101	39.9
TOTAL	2710	6075728400	11336000	1125	2820				
Northern BW Avg. Rate (gpm):				407	1020	36.2	109.1		
Southern BW Avg. Rate (gpm):				679	1703	60.4	101.7		
Annex Wells Avg. Rate (gpm):				39	97	3.4	97.0		
Average% Uptime:									39.9

Monitoring of Totalized Flow allows for calculation of well flow rates for a specific period of time (between readings, or for an entire month).

The calculated value can be corrected to reflect downtime during the specific period of time measured. The resultant flow rate can be compared to the design flow rate to evaluate performance.

Notes on last page.

Table 1E. Summary of VWF RA Well Flow Rates and City Production Rates.

		4/15/02 - 4/22/02							
Design	Totalized	Total Pumped	Avg. Totalized Flow Rate (gpm) ^b		Percent of	Percent of	Total Amount	% Uptime	
Flow	Flow (gal)	(gal)	Total	excl. Downtime*	Total Flow ^c	Design Flow ^d	of Downtime	for total hrs=	
Well Name	(gpm)	4/22/02			(%)	(%)	(hours)	168	
V22	120	293715500	969600	96	96	3.7	80.2	0	100.0
V24	120	275666400	1153300	114	114	4.4	95.3	0	100.0
V25	150	364022000	1485200	147	147	5.7	98.2	0	100.0
V26	165	449454500	1537100	152	152	5.9	92.4	0	100.0
V27	190	418782500	1862500	185	185	7.1	97.2	0	100.0
V28	190	491236800	1852800	184	184	7.1	96.7	0	100.0
GMBW-1	225	516978200	2220800	220	220	8.5	97.9	0	100.0
GMBW-2	220	508185000	2325400	231	231	8.9	104.9	0	100.0
GMBW-3	170	393112900	1629800	162	162	6.2	95.1	0	100.0
GMBW-4	160	367467900	1521200	151	151	5.8	94.3	0	100.0
GMBW-5	230	494012100	2265200	225	225	8.6	97.7	0	100.0
GMBW-6	230	529014800	2240300	222	222	8.5	96.6	0	100.0
GMBW-7	220	499088600	2169600	215	215	8.3	97.8	0	100.0
GMBW-8	220	316794500	2129400	211	211	8.1	96.0	0	100.0
GMA-1D ⁺	50	129843000	582400	58	58	2.2	115.6	0	100.0
GMA-2D ⁺	50	54578100	279800	28	28	1.1	55.5	0	100.0
TOTAL	2710	6101952800	26224400	2602	2602				
Northern BW Avg. Rate (gpm):				879	879	33.8	94.0		
Southern BW Avg. Rate (gpm):				1637	1637	62.9	97.7		
Annex Wells Avg. Rate (gpm):				86	86	3.3	85.5		
Average% Uptime:									100.0

Monitoring of Totalized Flow allows for calculation of well flow rates for a specific period of time (between readings, or for an entire month).

The calculated value can be corrected to reflect downtime during the specific period of time measured. The resultant flow rate can be compared to the design flow rate to evaluate performance.

Notes on last page.

Table 1F. Summary of VWF RA Well Flow Rates and City Production Rates.

		3/25/02 - 4/22/02						
Well Name	Design Flow Flow (gpm)	Total Pumped (gal)	Avg. Totalized Flow Rate (gpm) ^b		Percent of Total Flow ^c (%)	Percent of Design Flow ^d (%)	Total Amount of Downtime (hours)	% Uptime for total hrs= 672
			Total	excl. Downtime*				
V22	120	3571300	89	105	4.0	87.8	107	84.1
V24	120	3887400	96	115	4.3	95.7	108	83.9
V25	150	5049700	125	149	5.6	99.3	107	84.1
V26	165	5432100	135	160	6.0	97.1	107	84.1
V27	190	6468700	160	191	7.2	100.4	107	84.1
V28	190	6339500	157	187	7.0	98.4	107	84.1
GMBW-1	225	7707600	191	227	8.5	100.7	105	84.4
GMBW-2	220	7665100	190	225	8.5	102.4	105	84.4
GMBW-3	170	5638300	140	166	6.2	97.5	105	84.4
GMBW-4	160	5395300	134	159	6.0	99.1	105	84.4
GMBW-5	230	7782900	193	229	8.6	99.5	105	84.4
GMBW-6	230	7749200	192	228	8.6	99.0	105	84.4
GMBW-7	220	7490700	186	220	8.3	100.1	105	84.4
GMBW-8	220	7435200	184	219	8.2	99.3	105	84.4
GMA-1D ⁺	50	1712900	42	50	1.9	100.0	101	85.0
GMA-2D ⁺	50	841800	21	25	0.9	49.1	101	85.0
TOTAL	2710	90167700	2236	2653				
Northern BW Avg. Rate (gpm):			763	907	34.2	97.0		
Southern BW Avg. Rate (gpm):			1410	1671	63.0	99.8		
Annex Wells Avg. Rate (gpm):			63	75	2.8	74.6		
Average% Uptime:							84.3	

Monitoring of Totalized Flow allows for calculation of well flow rates for a specific period of time (between readings, or for an entire month).

The calculated value can be corrected to reflect downtime during the specific period of time measured. The resultant flow rate can be compared to the design flow rate to evaluate performance.

Notes on last page.

April 2002

Table 1G. Summary of VWF RA Well Flow Rates and City Production Rates, Verona Well Field Superfund Site, Battle Creek, Michigan.

Notes:

^a Avg. Instant Flow Rate (gpm) = average of individual, instantaneous weekly well flow rates

^b Avg. Totalized Flow Rate (gpm) - Total = (difference in total volume pumped (gallons) for the specific period) /
(total minutes of operation during the specific period).

or

Avg. Totalized Flow Rate (gpm) - excluding Downtime = (difference in total volume pumped (gallons) for the specific period) /
(total minutes of operation during the specific period, excluding downtime as noted below (if any)).

^c % of Total Flow is based on Avg. Totalized Flow Rate (gpm) - excluding Downtime, each well % = (total well flow rate)/(total system flow rate)*100

^d % of Design Flow is based on Avg. Totalized Flow Rate (gpm) - excluding Downtime, each well % = ((total well flow rate)/(design flow rate))*100

NA not available

NM not measured

gal gallons

gpm gallons per minute

Average City production rates calculated from data provided by City.

* Original design rates for Annex recovery wells was 45 gpm each, rates increased to 50 gpm per request from EPA.

*** Downtime Summary:**

3/25-4/1/02: No downtime

4/1-4/8/02: Blocking wells V22, and V24-28 were taken offline for 6 hours on 4/5/02 to repair/replace check and gate valves.

Blocking well V24 was offline 1 hour on 4/8/02 for a pipe replacement. Blocking wells GMBW1 through 8 were taken offline
for 4 hours on 4/8/02 for valve inspections and cleaning.

4/8-4/15/02: The system was shutdown on 4/11/02 at 12:00 pm due to mechanical failure of the blower, CETC coordinated repairs, and
the blower and system were restarted on 4/15/02, after a total of 101 hours of downtime.

4/15-4/22/02: No downtime

ATTACHMENT 4

CETC, Inc.
11449 Doster Rd.
Plainville, MI 49090
Phone (616) 664-4200

Monthly Operating Report for the Verona
Well Field Remedial Action
Date April 1 Month April Year 2001
Operator ATP

ANNEX	Time	Temperature	Pressure	Flow Rate (gpm)	Total Flow (gal)
Header			30		
Well GMA-1D	9:40	52°	34	59	1287176
Well GMA-2D	9:40		30	25	540208
BLOCKING WELLS					
New BW Header			7		
GMBW-1	9:27		42	225	5115082
GMBW-2			40	220	5027266
GMBW-3			60	165	389042
GMBW-4			50	162	3636315
GMBW-5			51	231	4584937
GMBW-6			51	229	5235251
GMBW-7			51	221	4937714
GMBW-8	9:27		34	221	3115252
V22	9:10		58	184	107121
V24	9:13		45	143	100120
V25	9:16		33	150	2728324
V26	9:17		34	145	3604370
V27	9:19		53	189	4456301
V28	9:21	52°	10	191	4141714
					4867079

Notes/Comments on condition of wells and pump houses:

Review data house 4/3

CETC, Inc.
11446 Foster Rd.
Plattville, MI 48060
Phone (616) 764-4200

Monthly Operating Report for the Verona
Well Field Remedial Action
Date 8 Month April Year 2002
Operator RP

ANNEX	Time	Temperature	Pressure	Flow Rate (gpm)	Total Flow (gal)	
Header			2.8			
Well GMA-1D	11:02		32	60	1289969	00
Well GMA-2D			30	29	541722	00
BLOCKING WELLS						
New BW Header			8			
GMBW-1	3:58		43	226	5138266	00
GMBW-2			40	219	5049541	00
GMBW-3			39	167	3908003	00
GMBW-4			53	156	3652771	00
GMBW-5			51	226	4908212	00
GMBW-6			52	231	5258469	00
GMBW-7			51	220	4960156	00
GMBW-8	3:58		34	220	3137646	00
V22	10:27		86/80	98/120	2922451	00
V24	10:30		42/44	131/120	2739969	00
V25	10:32		39/38	142/150	3618666	00
V26	10:35		70/68	151/166	4471553	00
V27	10:37		50/55	219/190	4161887	00
V28	10:41		10/10	170/190	4885443	00

Notes: Corrects on condition of wells and pump houses.

ANNEX SHOWED 0 FLOW TOWARD PUMP OFF AND TANK ON GET FLOW
TIPICATOR LIGHTS WERE ON



7-03-1999 1:15PM

FROM

CECO, Inc.
11449 Duster Rd.
Plainville, NJ 08860
Phone (616) 664-4200

Monthly Operating Record for the VERONA
Well Field Remedial Action
Date 15 Month APRIL Year 2002
Operator _____



ANNEX	Time	Temperature	Pressure	Flow Rate (gpm)	Total Flow (gpi)
Header			30		
Well GMA-1C	5:04		30	1292606	60
Well GMA-2D			30	542983	28
BLOCKING WELLS					
New BW Header					
GMBW-1	5:17		41	226	5147574
GMBW-2	5:17		29	220	5058596
GMBW-3			39	171	3914831
GMBW-4			53	160	3659467
GMBW-5			47	229	4917469
GMBW-6			46	230	5267745
GMBW-7			50	220	4969190
GMBW-8	5:17		34	220	3146651
V22	5:01		77	120	2927957
V24	5:03		43	123	2745131
V25	5:05		38	150	3625368
V26	5:07		69	165	4479174
V27	5:11		64	190	4169200
V28	5:13		10	190	4893840

Notes/Comments on condition of wells and pump houses

SYSTEM TIME BACK ON WPS

CETC, Inc.
11449 Doster Rd.
Plainville, MI 49080
Phone (616)564-2200

Monthly Operating Report for the Verona
Well Field Remedial Action
Date 12 Month April Year 2002
Operator R.P.



ANNEX	Time	Temperature	Pressure	Flow Rate (gpm)	Total Flow (gal)
Header			29		
Well GMA-1D	10:22	52°	33	60	1298430
Well GMA-2D	10:22	52°	29	28	395781
BLOCKING WELLS					
New BW Header			8		
GMBW-1	10:10	52°	43	227	5169782
GMBW-2			43	222	5081850
GMBW-3			60	167	3931129
GMBW-4			55	158	3674679
GMBW-5			49	234	4940121
GMBW-6			52	232	5290148
GMBW-7			54	217	4990886
GMBW-8	10:10		34	221	3167945
V22	9:54		71/62	69/119	2937155
V24	9:56		44	118	2756664
V25	9:58		39	147	3640220
V26	10:00		69/70	172/165	4494545
V27	10:02		55	192	4187825
V28	10:03	52°	10	189	4912368

Notes/Comments on condition of wells and pump houses: