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Phone 414-474-4529 ♦ Fax 414-474-4639

September 30, 1997

Mr. Paul Kozol, P.E.
Wisconsin Department of Natural Resources
3911 Fish Hatchery Road
Fitchburg, WI 53711

Re: Monthly Monitoring Report for the Oconomowoc Groundwater Treatment Facility

Dear Mr. Kozol:

Attached is the Monthly Monitoring Report for September, 1997 for the above referenced project. Questions regarding these reports should be directed to Syed Ihtheshamuddin at the treatment plant. The treatment plant phone number is (414) 474-4529.

Thank you for your cooperation and assistance with this project.

Sincerely,

Syed Ihtheshamuddin

Syed Ihtheshamuddin , Project Manager
Kapur & Associates

cc: Arne Thomsen, USACE, St. Paul District
Steve Peterson, USACE, Omaha District
Randy Sitton, USACE
Tom Williams, USEPA
Mike Boehlar, Black and Veatch
Marilyn and Rick Warrington, Warrington Builders, Inc.

MONTHLY MONITORING REPORT
FOR THE
OCONOMOWOC ELECTROPLATING
GROUNDWATER TREATMENT FACILITY

ASHIPPUN, WISCONSIN

Prepared for:

U.S. ARMY CORPS OF ENGINEERS
ST. PAUL DISTRICT
HASTINGS, MINNESOTA
CONTRACT DACW45-95-C-0064

Prepared by:

Kapur & Associates, Inc.
7711 North Port Washington Road
Milwaukee, Wisconsin 53217

September 30, 1997

1.0 Introduction

This report summarizes the monthly effluent monitoring results for the Oconomowoc Electroplating Groundwater Treatment Plant (OEGTP) for September, 1997. The OEGTP is located at the site of the former Oconomowoc Electroplating Company, in Ashippun, WI.

A summary of the laboratory results of influent and effluent sampling is included in Table 1. The plant sampling was conducted by Syed Ihtheshamuddin and Matt Hahm, of Kapur & Associates, Inc. (K&A). Laboratory analysis was provided by En Chem, Inc., 802 Deming Way, Madison, Wisconsin 53707. All sampling and analyses were conducted in accordance with the Oconomowoc Electroplating Groundwater Treatment System's Chemical Data Acquisition Plan (CDAP). The parameters tested for, frequency of testing, sample type, and limits are set forth in the Final Discharge Limits, Table 1 of the Oconomowoc Electroplating Superfund Site Limits and Requirements for Discharge of Treated Groundwater, issued by the Wisconsin Department of Natural Resources (WDNR) on September 24, 1996. This report is submitted in accordance with the reporting requirements of the WDNR permit.

1.1 Site Background Review

The OEGTP is located at 2572 Oak Street in Ashippun, Wisconsin, in the NW 1/4 of the SE 1/4 of Section 30, Township 30 North, Range 17 East. The site consists of approximately 10 acres, which includes approximately 3.5 acres of the former electroplating facility. The site is bounded by Oak Street (Highway 'O') and Eva Street to the North, and Davey Creek and the Town of Ashippun's garage facilities to the South. The property directly across Oak Street is occupied by Thermogas, Inc. A residential area is located across Eva Street, and a wetlands surrounds Davey Creek.

The contact person for the plant operation is Arne Thomsen of the U.S. Army Corps of Engineers (USACE). Mr. Thomsen's phone number is (612) 438-3076, Fax (612) 438-2464. Kapur & Associates Inc. supplies the treatment plant operators for Warrington Builders, who were contracted by the USACE to operate and maintain the plant. The contact person for K&A is Syed Ihtheshamuddin, who can be reached at the plant at (414) 474-4529, Fax (414) 474 4639, or at the K&A office in Milwaukee, Wisconsin at (414) 351-6668, Fax (414) 351-4117.

Table 1
Oconomowoc Ground Water Treatment Plant
Summary Result - Plant Influent & Effluent

Parameter	September 03		September 10		September 17		September 24		
	Influent	Effluent	Influent	Effluent	Influent	Effluent	Influent	Effluent	WDNR Site Permit
pH	10.00	7.00	10.00	7.50	7.60	7.10	7.60	7.10	Monitor
TSS	54.00	MONTH	18.00	ND	9.00	MONTH	10.00	MONTH	Monitor (mg/l)
Arsenic	ND	ND	ND	3.50	ND	ND	ND	ND	5
Barium	140.00	97.00	100.00	38.00	130.00	180.00	96.00	22.00	400
Cadmium	ND	ND	ND	ND	ND	ND	ND	ND	0.5
Cadmium Total Recove	NT	ND	NT	ND	NT	ND	NT	ND	Monitor
Chromium Total	ND	ND	ND	ND	ND	ND	ND	ND	Monitor
Chromium +6	ND	ND	9.50	10.00	ND	6.80	ND	ND	10
Copper	4.50	ND	4.80	4.50	6.60	ND	4.80	8.50	Monitor
Iron	340.00	68.00	390.00	90.00	980.00	220.00	820.00	250.00	Monitor
Lead	ND	ND	1.20	0.78	ND	1.40	ND	ND	1.5
Manganese	23.00	2.30	48.00	7.80	190.00	28.00	110.00	16.00	Monitor
Mercury	0.12	ND	ND	ND	ND	ND	ND	ND	0.2
Nickel	9.90	5.80	24.00	ND	47.00	6.50	42.00	16.00	20
Selenium	ND	ND	ND	ND	ND	ND	ND	ND	10
Silver	ND	ND	ND	NA	ND	ND	ND	ND	10
Thallium	ND	ND	ND	ND	ND	ND	ND	ND	0.4
Zinc	1.80	12.00	4.20	6.00	5.40	8.80	15.00	12.00	Monitor
Cyanide	0.0014	ND	ND	ND	0.0100	ND	ND	ND	40
Cyanide Free	NT	ND	NT	0.0021	NT	ND	NT	ND	Monitor
1,1-dichloroethane	8.60	ND	34.00	ND	49.00	ND	43.00	ND	85
1,2-dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	0.5
1,1-dichloroethene	ND	ND	7.20	ND	10.00	ND	8.40	ND	0.7
1,2-dichloroethene cis	9.60	ND	56.00	ND	80.00	ND	78.00	ND	7
1,2-dichloroethene tran	1.40	ND	11.00	ND	15.00	ND	12.00	ND	20
Ethylbenzene	ND	ND	ND	ND	ND	ND	0.87	ND	140
Methylene Chloride	ND	ND	ND	ND	ND	ND	ND	ND	0.5
Tetrachloroethene	ND	ND	6.60	ND	11.00	ND	11.00	ND	0.5
Toluene	ND	ND	3.10	ND	ND	ND	0.64	ND	68
1,1,1-trichloroethane	14.00	ND	110.00	ND	150.00	ND	260.00	ND	40
1,1,2-trichloroethane	ND	ND	ND	ND	ND	ND	0.62	ND	0.5
TCE	50.00	ND	750.00	ND	960.00	ND	1300.00	ND	0.5
Vinyl Chloride	ND	ND	ND	ND	3.40	ND	2.00	ND	0.2
Xylene Total	ND	ND	ND	ND	ND	ND	1.40	ND	124
COD	NT	MONTH	NT	**5.80**	NT	MONTH	NT	MONTH	Monitor (mg/l)
Phosphorus total	NT	MONTH	NT	**0.19**	NT	MONTH	NT	MONTH	Monitor (mg/l)
Nitrate + Nitrite	NT	MONTH	NT	**0.41**	NT	MONTH	NT	MONTH	Monitor (mg/l)
Ammonia Nitrogen	NT	MONTH	NT	**ND**	NT	MONTH	NT	MONTH	Monitor (mg/l)

1.2 Project Objectives

The objective of this project is to prevent the spreading of any plume of contamination that may exist at the site. Contaminated groundwater is pumped from five extraction wells, treated for cyanide, metals, suspended solids, and volatile organic compounds (VOC's). The treated water is then transferred to a groundwater influent gallery, located south of Elm Street, near Davey Creek.

1.3 Effluent Monitoring

Weekly monitoring was conducted on September 3, 10, 17, and 24. Monthly monitoring samples (24-hour composite) were collected on September 10. All samples were tested by En Chem, Inc. None of the results of the effluent monitoring tests for the samples taken exceeded the limits of the WDNR effluent discharge permit.

1.4 Monitoring Results

A summary of the results from weekly influent and effluent monitoring is shown in Table 1. This summary table shows the results of effluent monitoring parameters listed in the Monitoring Requirements of the Oconomowoc Electroplating Superfund Site Substantive WPDES Permit Requirements Summary (9/96). None of the effluent parameters exceeded the WDNR permit limits. High concentration of iron and copper in the plant effluent is discussed in a separate report, entitled "*Monthly Operation and Maintenance Report for the Oconomowoc Electroplating Groundwater Treatment Facility.*"

2.0.0 Plant Operation and Shut Down

During the month of September 1997, the only major change in plant operation was to bypass one of the carbon filters starting September 11, 1997. Effluent samples between the carbon filters and after the two filters were analyzed. Both samples had non-detectable limits of the discharge parameters including Arsenic and VOCs. After discussion and concurrence by Mr. Paul Kozol of the WDNR and Mr. Randy Sitton of the USACE, it was decided to treat water through only one filter at a time. After exhaustion of the carbon adsorption capacity of one filter, the other filter would be utilized.

The following Table summarizes the plant down time.

Table 2 - Plant Down Time Summary

Date(s)	Hours Shut Down	Reason
9/4	1	Clogged influent line from the EQT-100/Cleaned lines
9/10 - 9/11	20	DAS-500 not emptying/Reattach float to the flap valve.
9/11	11.5	High pH at NPDES/SAP-752 was primed
9/15	19	TF-600 sand was removed and cleaned/1000 lbs of new sand was also added.
9/16	12	High pH at NPDES / SAP-752 was primed
9/18	0.5	Clarifier (C-400) sludge build up/Cleaned tank
9/21	5	FC-100 not functioning correctly-shut MOV-113
9/22	0.5	Clarifier (C-400) sludge build up/Cleaned tank
9/23	0.5	Clarifier (C-400) sludge build up/Cleaned tank
9/24	1	Clarifier (C-400) sludge build up/Cleaned tank Clogged influent line from the EQT-100/Cleaned lines
9/25	0.5	Clarifier (C-400) sludge build up/Cleaned tank
9/26	1	Clogged influent line from the EQT-100/Cleaned lines
9/29	0.5	Clarifier (C-400) sludge build up/Cleaned tank
Total	68	

2.1.1 Shut Down Due to Clogged Influent Lines

During normal plant operation, the influent flow has shown a tendency of gradually reducing from about 28 gpm to as low as 19 gpm. On September 4, September 24, and September 26, the influent flow had reduced from about 28 gpm to 19 gpm, 24 gpm and 24 gpm respectively. On each of these days, the influent flow was shut down and the pipe from the influent pumps to CRT-201 was soaked in very dilute Muriatic acid for 15 to 20 minutes. This procedure essentially washed away the accumulated sludge in the pipe and the pipe capacity was restored.

2.1.2 Shut Down Due to The Air Stripper (DAS-500)

On September 10, 1997, the Air Stripper Unit (DAS-500) overfilled and the pumps (GFP-620 and GFP - 621) stopped pumping the air stripper effluent into the carbon filters. This also caused the entire plant to shut down. Upon opening the discharge at the back of DAS-500 unit, the air stripper was emptied and the float ball came out of the unit. Upon review of the shop drawings, it was discovered that the float, which would be screwed onto a flap valve at the pump inlet, had come unscrewed causing the flap valve to shut down. Since the air stripper unit had to be disassembled in order to get the unit back in service, the plant was shut down for the night. The air stripper unit was disassembled the next day and the float was reattached. The air stripper unit was assembled and plant operation resumed. A total of 20 hours of plant operation time were lost due to this problem.

2.1.3 Shut Down Due to High pH at The NPDES Station

On September 11, the effluent pH started to rise from 7.0 to about 8.8. Upon investigation, we noticed that the sulfuric acid pump (SAP-752) was not pumping. Upon unsuccessful attempts to prime the pump, we discovered that the feed line was cracked. The line was then replaced and both pumps primed.

On the night of September 16, 1997, the sulfuric acid pump, SAP-752 again lost prime and as a result the effluent pH exceeded 9. This resulted in plant shut down until the following morning. The pump was primed and plant operation resumed.

2.1.4 Shut Down Due to Tertiary Filter (TF-600) Maintenance

As noted in O & M Report for August 1997, the sand in the tertiary filter TF-600 had caked around the circumference of the tank and as a result led to short filter cycles and required frequent manual backwash. 1,000 pounds of new sand was ordered to replenish reduced volume of sand. On September 15, sand from the tertiary filter was emptied, washed, and replaced and the new sand was also added to the filter. The plant was shut down for 19 hours for this operation

2.1.5 Shut Down Due to FC-100 Malfunctioning

In the early hours of September 20, 1997, the motor operated valve, MOV 113, shut down due to some unknown reason and the equalization tank level (EQT-100) rose to over 90%. This caused the plant to shut down. Upon our arrival at the plant in the morning, the power to the unit was turned off and the MOV-113 operated manually to turn the plant back on again. This problem caused the plant to be shut down for 5 hours.

2.1.6 Shut Down Due to Sludge Buildup in The Clarifier (C-400)

The small diameter (2 inch) sludge inlet ports in the inlet chamber of the clarifier are restricting the flocculation tank effluent from entering the inclined plate clarifier. The floc settles on the walls of the inlet chamber and after the sludge blanket builds up, the sludge slides down and plugs the inlet ports. This builds up back pressure and creates negative hydraulic pressure restricting the flow. When this occurs, the influent flow has to be stopped and the sludge tank emptied. A total of 4 hours of plant operation were lost due to this problem. This is a constantly occurring problem and can be corrected by providing greater cross sectional area for liquid transfer between the two processes.

3.0 Summary

Groundwater treatment plant influent and effluent monitoring was conducted on September 3, 10, 17, and 24. 24-hour composite samples were collected on September 10. Summary of the laboratory results of these samples are included in Table 1. The effluent sampling results show that all contaminants listed in the Requirements of the Oconomowoc Electroplating Superfund Site Substantive WPDES Permit Requirements Summary (9/96) comply with the permit limits. During the month of September 1997, a total of 407,570 gallons of water was extracted from the wells and treated. During the month of September, the plant was shut down for a total of 68 hours. See Table 2 for shut down times and reasons. All equipment operation and maintenance related issues are detailed in a separate report, entitled "*Monthly Operation and Maintenance Report for the Oconomowoc Electroplating Groundwater Treatment Facility.*"

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Phone 414-474-4529 ♦ Fax 414-474-4639

September 30, 1997

Mr. Rick Warrington
P.O. Box 790
Keshena, WI 54135

Re: Monthly O&M Report for the Oconomowoc Groundwater Treatment Facility

Dear Mr. Warrington:

Attached is the Monthly O&M Report for September, 1997, for the above referenced project. Questions regarding this report should be directed to Syed Ihtheshamuddin at the treatment plant. The treatment plant phone number is (414) 474-4529.

Thank you for your cooperation and assistance with this project.

Sincerely,

Syed Ihtheshamuddin

Syed Ihtheshamuddin , Project Manager
Kapur & Associates

cc: Arne Thomsen, USACE, St. Paul District
Steve Peterson, USACE, Omaha District
Randy Sitton, USACE
Tom Williams, USEPA
Paul Kozol, WDNR
Mike Boehlar, Black and Veatch

MONTHLY OPERATIONS AND MAINTENANCE REPORT
FOR THE
OCONOMOWOC ELECTROPLATING
GROUNDWATER TREATMENT FACILITY

2572 Oak Street
ASHIPPUN, WISCONSIN

Prepared for:

Warrington Builders, Inc.
P.O. Box 790
Keshena, WI 54135

Prepared by:

Kapur & Associates, Inc.
7711 North Port Washington Road
Milwaukee, Wisconsin 53217

September 1997

1.0 Introduction

This report is submitted to provide information concerning the operations and maintenance (O&M) problems encountered at the Oconomowoc Electroplating Groundwater Treatment Plant during the month of September, 1997. O&M problems that led to plant shut down are discussed in the *Monthly Monitoring Report for the Oconomowoc Electroplating Groundwater Treatment Facility.*

The O&M difficulties encountered in September include:

1. Cyanide Metals Treatment (CP-440):
- Main disconnect switch for the control panel does not work.
- Flocculation tank (RMT-301) is leaking.

2. Sodium Hypochlorite Feed System:
- Flanged nozzle at the sodium hypochlorite tank (SCT-250) is corroding and leaking.

3. Sodium Hydroxide:
- Pump surge supressors for pumps SHP-361 and SHP-262 are leaking.

4. Clarifier (C-400):
- Clarifier (C-400) tank had constant sludge build up problem.
- Clarifier thickening drive seal leaking and auto mode not working.
- Sludge pump (TSP-410) not working.

5. Air Stripper (DAS-500):
- Float for the flap valve came off.

6. Tertiary Filter (TF-600):
- Level of the filter medium, sand, is below the recommended level. Sand along the walls of the tank is caked and is not being effective for filtration.

7. NPDES Station (NMS-740): Measuring probes need to be calibrated.
8. All sampling ports provide evidence of corrosion of the process piping (iron pipes).
9. Sulfuric Acid Feed System: Corrosion of electrical conduits.

2.0.0 Process Difficulties

The O&M problems listed above are repeated from August O&M report with addition of difficulties related to sludge build up in the clarifier (C-400) and detachment of float valve in the air stripper unit (DAS-500). None of the O&M difficulties contributed to exceedence of effluent permit limits. For other related information regarding plant shut

down times, see the *Monthly Monitoring Report for the Oconomowoc Electroplating Groundwater Treatment Facility.*

2.0.01. Cyanide / Metals Treatment System

The main disconnect switch for CP-440 panel is shot. Operation of the power control of the panel is currently being done manually. The equipment supplier has contacted us and stated that this is not a warranty item. A new switch needs to be purchased.

The flocculation tank (RMT-301) has a leak in the middle of the tank. The equipment supplier has agreed to repair the leak during the early part of October.

2.0.02. Sodium Hypochlorite Feed System

As noted in the August Report, the flanged nozzle of the sodium hypochlorite tank (SCT-250) is corroding and leaking. The equipment manufacturer has been notified and the warranty status negotiations are underway. This problem does not affect the treatment plant operation immediately, however, if left unattended, will lead to problems in the future.

2.0.03 Sodium Hydroxide Pumps

Surge suppressors for the sodium hydroxide pumps (SHP-361 & SHP-262) continue to leak. This problem does not affect the plant operation at this time. However, the equipment supplier should be contacted to remedy the situation as a Warranty issue.

2.0.04 Clarifier

The sludge inlet ports in the clarifier inlet chamber restrict the flocculation tank effluent from entering the inclined plate clarifier. The floc settles on the inlet chamber walls and slides down and plugs the inlet ports. This restricts the flocculation tank effluent. The clarifier has to be emptied very frequently resulting in lost operation time. We suggest

that the cross sectional area for the clarifier inlet be increased to reduce the sludge build up problem.

Since the restart of the treatment system, the Clarifier Thickening Drive (TD401) has been leaking water and sludge. The clarifier thickening drive does not affect the treatment plant operation immediately, however, if left unattended, will lead to problems in the future.

2.0.05. Tertiary Filtration System

The filter media (sand) in the Tertiary Filtration System (TF-600) was below the recommended level for efficient operation. Sand along the walls of the tank was caked and hardened and would not loosen up during the continuous or manual backwash cycle. This provided reduced surface area and volume for filtration, leading to higher pressure drop across the filter. 1,000 pounds of sand was ordered from the filter manufacturer to make up for the lost sand. The filter was emptied, washed and the sand replaced. This procedure has helped to reduce the problem with the Tertiary Filtration System.

2.0.06. Air Stripper Unit (DAS-500)

The float at the outlet of the air stripper unit (DAS-500) came unscrewed and shut the flap valve, thereby stopping the flow to the carbon filters. This caused flooding of the air stripper unit and shutting down the plant. This problem was resolved by the operators in-house.

2.0.07. NPDES Station

The temperature and conductivity measuring probes for the effluent at the NPDES Station (NMS-740) are out of calibration. These should be calibrated as a warranty item.

2.0.08. Iron Pipes

Laboratory analysis of the influent and effluent samples continue to have high concentration of iron and copper in the effluent. This is due to corrosion of the iron piping and copper fittings. Corrosion of iron process piping is further evidenced at the sampling ports. The sampling ports have iron particles and iron filings when opened after a few hours of process operation. This was also evident when the air stripper (DAS-500) was disassembled for maintenance during the month. The chemicals in the process stream appear to be corroding the pipes. This is causing high concentrations of iron in the effluent, and if left unattended, will continue to cause deterioration and further damage to the piping. This issue should be resolved as soon as possible by replacing the iron piping with non-corrosive material such as fiber glass, PVC, or lined pipes. A suitable time for this replacement could be at the time of modifications to the Air Stripper Unit (DAS-500) as discussed in Other Recommendations in the August Report.

2.0.09. Sulfuric Acid Feed System

Due to the corrosive nature of the chemical, the area surrounding the sulfuric acid feed system is exposed to corrosive fumes. Over the past year's operation, this has caused severe corrosion of the electrical conduits. This is a potentially dangerous situation and should be corrected by replacing the conduits with noncorrosive material. In addition, the feed pumps pressure relief system, which has been disconnected, still needs to be installed.

3.0. Other Recommendations

3.0.01. Backup Mechanical Equipment and Spare Parts

Since restarting the treatment plant, we have used some of the spare parts for the mechanical equipment at the plant. However, in most cases, spare parts were purchased and in some cases, replacement equipment was purchased. As evidenced in our operation of the treatment system, some of the pumps including influent pumps, and chemical feed pumps would need servicing by the manufacturer or need replacement parts. It is essential that these parts are available at the site to maintain the equipment and operate the treatment system with minimum interruptions.