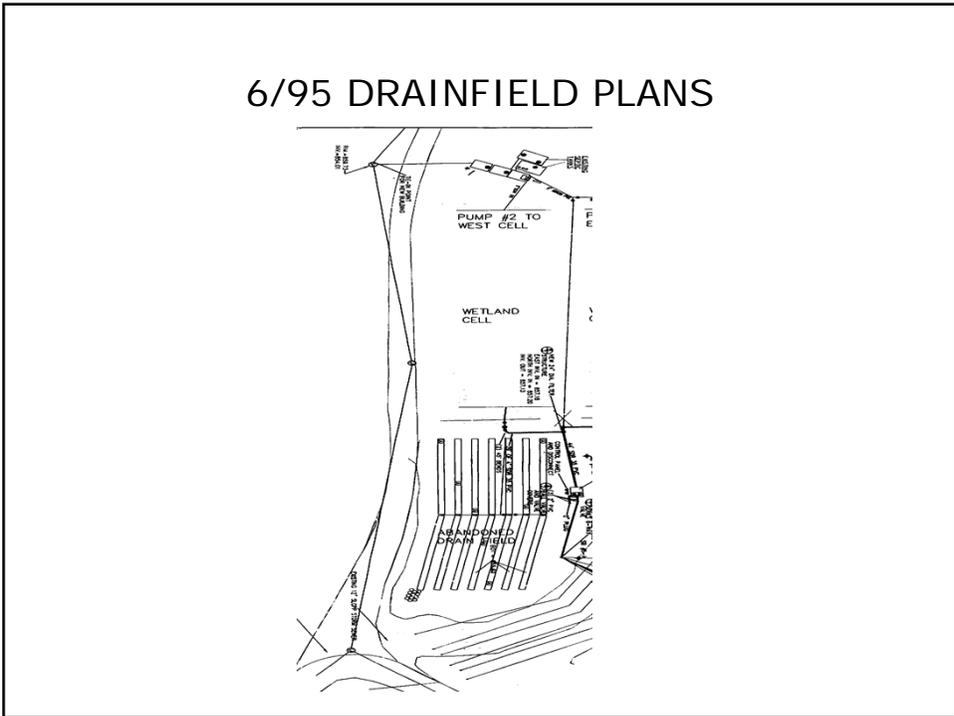


Constructed Wetlands

SHERMAN LAKE YMCA
OUTDOOR CENTER

Timeline

- 1995 Constructed Wetlands \$65,000
- 1999 Added major facility development and went from 5000 gpd to 25,000 gpd peak usage
- 1998 Added 2nd cell in preparation for \$10M expansion
- 2000 drain field failed
- 2003 added a new cell and absorption field
- 2004 Sewer Authority began weekly inspections
- 2007 hooked up to sewer



COST OF THE 1995 WETLAND

NOTICE OF AWARD

Dated 5-4, 1995

TO: J.L. EXCAVATING, INC.
 ADDRESS: 11970 N. MINNICH RD.
DECATUR, IN 46733

OWNER'S PROJECT NO. _____
 PROJECT SHERMAN LA. YMCA CONSTRUCTED WETLANDS

OWNER'S CONTRACT NO. _____
 CONTRACT FOR _____

(Each state of Contract as it appears in the Bidding Documents)

You are notified that your Bid dated APRIL 24TH 95 for the above Contract has been considered. You are the apparent successful bidder and have been awarded a contract for THE WORK DEFINED BY THE CIVIL ENGINEERS, INC. PLANS AND YOUR ATTACHED BID.

The Contract Price of your contract is SIXTY ONE THOUSAND THREE HUNDRED SEVENTY Dollars (\$ 61,370.00).

OWNER: Y.M.C.A. Camping & Retreat Services of Battle Creek and Kalamazoo, Inc.
 10203 E. M-89
 Suite A
 P.O. Box 589
 Richard, MI 49083-0589

BID ON 1995 WETLANDS

J.L. Construction & EXCAVATING, INC.
 11970 N. Minnich Road
 Decatur, Indiana 46733
 Office: 219-724-4044
 Mobile: 219-433-5076

CIVIL ENGINEERS INC.
 1827 E. MICHIGAN AVENUE
 BATTLECREEK MICHIGAN 49017

Clear woods at outlet piping to ditch.	\$ 1,500.00
20 square yds. of riprap with fabric X \$15/eqyd	300.00
270 feet of 12 inch ADS pipe X \$1ft	2,900.00
Infiltrator drain field	
8 lines at 50 foot each	
0 to 5 foot deep with lines and cleanouts, labor, equipment, and material.	4,500.00
One outlet box	450.00
Liner- 30 ml PVC installed	6,000.00
Insulation board, 54 sheets X\$22/sheet	1,188.00
444 ton - 2" to 4" stone X \$13 ton	5,772.00
146 ton- pea gravel X \$10 ton	1,460.00
Plants	4,950.00
Netting	750.00
Piping and valves	3,000.00
Septic tank as shown	8,000.00
Electrical wiring	2,500.00
Labor and equipment for construction	12,000.00
Total Project	\$56,270.00

Bid does not include sanitary line between 1,2,3.
 Bid starts at septic tank, includes, tank, wetland, infiltrator system, drainage pipe thr woods.
 All grades are to with in 1 tenth of A foot.
 Bid does not include any testing or inspections or permits.
 Built to plans drawn by HSB, Revised 4.4.95 for Sherman Lake Y.M.C.A.

CHANGES AND ADDITIONS



Jim & Lori Grose

11970 N. Minnich Road
Decatur, Indiana 46733

Office: 219-724-4044
Mobile: 219-433-5076

TO: CIVIL ENGINEERS INC.
1967 E. Michigan Avenue
Battletcreek Michigan 49017

CHANGES AND ADDITIONS AS OF 4-20-95

- 1. Includes sewer line from Manhole 1 to septic tank.
 - 2. All necessary clearing of trees and brush stock piles on site, not hauled off site or burned. 250.00
 - 3. Septic tank, includes interior wiring, pumps (tank to be reused) (electrical wiring supplied to tank by owner.)
 - 4. Seeding, mulch, fertilizer for project within 20' of systems. 4,500.00
 - 5. Move gravel road west approximately 200' long haulin 20 ton of new stone to cap drive. 350.00
 - 6. Substantial completion by June 1, 1995.
- ? 7. Payments are \$30,000 down, balance upon substantial completion.

ESCALON ?

Total Project
\$61,370.00

SITE PREPARATION



1995 DIGGING THE CELL



LINING THE CELL



HOLDING TANKS AT THE HEAD OF THE WETLANDS



PLANTING THE WETLANDS



PLANTED WETLANDS



STANDING PIPES



5/99 LAB REPORT

LABORATORY REPORT

Client: *Sherman Lake YMCA Outdoor Center*

KAR Project No. : **992094**
Date Reported : **05/20/99**

Project Description : *Sampling and analysis of simulated wetlands.*

Sample ID : **"Influent"**
Sampled By : *SNH of KAR Laboratories*
Sample Date : **5/6/1999**
Sample Time : **9:20am**
Date Received : **5/6/1999**
Sample Type : **aqueous**
KAR Sample No. : **992094-01**

Test	Result	Units of Measure	Method	Analyzed	Analyst	Comments
Bacteria, total coliform(MF)	6,800,000	colonies/100ml	SM 10 9222 B	05/06/99	ALC	
BOD	127	mg/L	SM 10 5210 B	05/06/99	JMS	
Nitrogen, total kjeldahl	33.7	mg/L	EPA 381.1	05/11/99	ALC	
Suspended solids, total	19	mg/L	EPA 381.1	05/11/99	LAE	

Sample ID : **"Effluent"**
Sampled By : *SNH of KAR Laboratories*
Sample Date : **5/6/1999**
Sample Time : **9:34am**
Date Received : **5/6/1999**
Sample Type : **aqueous**
KAR Sample No. : **992094-02**

Test	Result	Units of Measure	Method	Analyzed	Analyst	Comments
Bacteria, total coliform(MF)	42	colonies/100ml	SM 10 9222 B	05/06/99	ALC	
BOD	3	mg/L	SM 10 5210 B	05/06/99	JMS	
Nitrogen, nitrate	13.5	mg/L	EPA 381.1	05/11/99	ALC	
Nitrogen, total kjeldahl	15.0	mg/L	EPA 381.1	05/11/99	ALC	
Suspended solids, total	35	mg/L	EPA 160.2	05/11/99	LAE	

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KAR Laboratories, Inc.
(610) 381-9666
Page 2

4/00 LAB REPORT

Client: *Sherman Lake YMCA Outdoor Center*

Project Description: *Sampling and analysis of simulated wetlands.*

Sample Description: **"Influent"**

Test	Positive Result Concentration	
BOD	127	mg/L
Bacteria, total coliform(MF)	13,000,000	colonie
Nitrogen, total kjeldahl	33.7	mg/L
Suspended solids, total	19	mg/L

Sample Description: **"Effluent"**

Test	Positive Result Concentration	
BOD	13	mg/L
Bacteria, total coliform(MF)	42,000	colonie
Nitrogen, total kjeldahl	13.5	mg/L
Suspended solids, total	32	mg/L

Sample Description: **"Effluent #2"**

Test	Positive Result Concentration	
BOD	42	mg/L
Bacteria, total coliform(MF)	11,000	colonie
Nitrogen, total kjeldahl	15.0	mg/L
Suspended solids, total	35	mg/L

9/05 LAB REPORT

LABORATORY DETAIL REPORT

Client: *Sherman Lake YMCA Outdoor Center*

Project

Desc. : *Sampling and analysis of simulated wetlands.*

Sample ID : **"Influent"**

Sampled By : *SSD of KAR Laboratories, Inc.*

Sample Date : *9/8/2005*

Sample Time : *2:05pm*

Test	Result	Units of Measure	Method	Analyze
Bacteria, total coliform(MF)	4,600,000	colonies/100mL	SM 9222 B	09/08/05
BOD	48	mg/L	SM 5210 B	09/09/05
Nitrogen, nitrate	<0.1	mg/L	EPA 353.2	09/09/05
Nitrogen, total kjeldahl	22.4	mg/L	EPA 351.2	09/15/05
Suspended solids, total	29	mg/L	EPA 160.2	09/12/05

Sample ID : **"Effluent #1"**

Sampled By : *SSD of KAR Laboratories, Inc.*

Sample Date : *9/8/2005*

Sample Time : *2:15pm*

Test	Result	Units of Measure	Method	Analyze
Bacteria, total coliform(MF)	14,000	colonies/100mL	SM 9222 B	09/08/05
BOD	3	mg/L	SM 5210 B	09/09/05
Nitrogen, nitrate	0.4	mg/L	EPA 353.2	09/09/05
Nitrogen, total kjeldahl	9.0	mg/L	EPA 351.2	09/15/05
Suspended solids, total	6	mg/L	EPA 160.2	09/12/05

Sample ID : **"Effluent #2"**

Sampled By : *SSD of KAR Laboratories, Inc.*

Sample Date : *9/8/2005*

Sample Time : *2:20pm*

Test	Result	Units of Measure	Method	Analyze
Bacteria, total coliform(MF)	7000	colonies/100mL	SM 9222 B	09/08/05
BOD	3	mg/L	SM 5210 B	09/09/05
Nitrogen, nitrate	0.6	mg/L	EPA 353.2	09/09/05
Nitrogen, total kjeldahl	6.6	mg/L	EPA 351.2	09/15/05
Suspended solids, total	<4	mg/L	EPA 160.2	09/12/05

9/07 LAB REPORT

LABORATORY DETAIL REPORT

Client: *Sherman Lake YMCA Outdoor Center*

Project

Desc. : *Sampling and analysis of simulated wetlands.*

Sample ID : **"Influent, 8/28/06"**

Sampled By : *SSD of KAR Laboratories, Inc.*

Sample Date : *8/28/2006*

Sample Time : *12:05pm*

Test	Result	Units of Measure	Method	Analyze
Bacteria, total coliform(MF)	33,000,000	colonies/100mL	SM 9222 B	08/28/06
Nitrogen, nitrate	<0.1	mg/L	EPA 353.2	08/29/06
Nitrogen, total kjeldahl	40.9	mg/L	EPA 351.2	08/29/06
Suspended solids, total	56	mg/L	EPA 160.2	08/29/06

Sample ID : **"Effluent #1, 8/28/06"**

Sampled By : *SSD of KAR Laboratories, Inc.*

Sample Date : *8/28/2006*

Sample Time : *12:15pm*

Test	Result	Units of Measure	Method	Analyze
Bacteria, total coliform(MF)	26,000	colonies/100mL	SM 9222 B	08/28/06
Nitrogen, nitrate	2.7	mg/L	EPA 353.2	08/29/06
Nitrogen, total kjeldahl	17.2	mg/L	EPA 351.2	08/29/06
Suspended solids, total	<4	mg/L	EPA 160.2	08/29/06

Sample ID : **"Effluent #2, 8/28/06"**

Sampled By : *SSD of KAR Laboratories, Inc.*

Sample Date : *8/28/2006*

Sample Time : *12:20pm*

Test	Result	Units of Measure	Method	Analyze
Bacteria, total coliform(MF)	170,000	colonies/100mL	SM 9222 B	08/28/06
Nitrogen, nitrate	4.6	mg/L	EPA 353.2	08/29/06
Nitrogen, total kjeldahl	17.7	mg/L	EPA 351.2	08/29/06
Suspended solids, total	<4	mg/L	EPA 160.2	08/29/06

2001ish: WHY DID THE DRAIN FIELDS FAIL? A biomass formed underneath the absorption fields.

1. Some distribution lines outside the tanks broke and caused some of the effluents to come to the surface and drain back into the dosing chambers
2. Only one wetland cell was receiving the majority of the effluent and was under designed at that capacity.
3. Heavy soils and improper channeling of surface waters.
4. Our influent during peak times was 2x the design.

9/02 FAILED DRAINFIELDS

Project #010903

9/9/2002

Sherman Lake YMCA Drainfield Expansion Meeting Summary

The following is a summary of the occurrences during a meeting between the Kalamazoo County Health Department (KCHD) and Civil Engineers, Inc. (CEI), on September 4, 2002.

CEI delivered the spreadsheets to KCHD that were provided by the YMCA, which detailed daily pump counts from 2/19/02 to 8/19/02. The spreadsheets also broke down the number of people that used the facility each day and the gallons per day per person, for intermittent days from 2/19/02 to 4/2/02. CEI explained to KCHD that the YMCA had seen in those 2 months that usage was never more than 1 gppd/person. The YMCA decided at that point to stop with the collection of usage numbers because they had not seen flows anywhere near 10,000 gpd.

KCHD commented that the number of doses per day was 1000 gph, and the dose volume should be revised to lower the amount of doses to 3-4 per day. KCHD used the 1 gppd/person value to calculate a flow for the maximum amount of users recorded in a single day. The usage was multiplied by 125%, to add a factor of safety. The result was roughly 8800 gpd which would be under the design limit of 10,000 gpd.

KCHD expressed a major concern over proper flow monitoring and water quality sampling. They related that they had not received the proper paperwork as required from the original permit. They stated that the last water quality report they had received was from October of 2001, and that the operator had not contacted them when the field had failed. They inquired as to how they could be sure that the proper protocol would be followed if construction of the replacement drainfield was allowed to progress. KCHD suggested that they would like to see a contract between the YMCA and a qualified professional, wherein maintenance would be provided on a regular basis, and a contract between the YMCA and a testing company, wherein water samples and flow monitoring data would be taken on a regular basis. They stated that contracts such as these would help them to assuage their concerns about improper reporting.

KCHD also stated that under state rules, any system discharging between 6,000 and 10,000 gallons per day is required to have a flow monitoring device, and to submit to MDEQ review.

KCHD asked CEI why the original system failed. CEI stated that there were a multitude of factors which likely contributed to the failure. The distribution lines outside the dosing tank experienced some sort of break (which has been fixed in the interim) that caused the effluent from one of the pumps to come up to the surface and drain back into the dosing chamber. This meant that only one of the wetland cells was receiving a majority of the effluent. When this occurred, the water was not being treated as efficiently. Other possible factors include heavy soils and the improper channeling of surface water.

MFS

Civil Engineers, Inc.

Page 1 of 2

Appl (CEI)
flow to
dosing tank
was 1000 gph

...dosing tanks to dose
1000 gph
per dose

KCHD
asked CEI
to provide
sample
log

Appl
dosing

...dosing tank
drainfield

PG 2 FAILED DRAINFIELDS

Project #010903

9/9/2002

KCHD explained that under a new rule, the project would require a "permit to construct" from MDEQ and it would take a good amount of time for the permit to pass, so an application should be sent in as soon as possible.

KCHD asked for justification for the 2 gpd/sft application rate used for the new drainfield. CEI explained that soils in the proposed field are much more permeable, that the new field will be pressure dosed (eliminating progressive failure typical of gravity systems), that the 2 gpd/sft application rate is based on flow into the septic tanks, which is more than the actual quantity that will exit the wetland cells (reduction due to evapotranspiration), and that the proposed application rate is 1/2 of the typical 4 gpd/sft commonly used with constructed wetland designs.

The meeting was adjourned with each party planning to address issues brought up by the other party. KCHD would contact MDEQ about the application rate to find out their stance on the project. CEI would determine the feasibility of contracts for maintenance and water quality monitoring, as well as begin the process of applying for an MDEQ permit to construct, and submitting final plans to KCHD. CEI also would confirm the current volume of dose, to confirm the flow data recorded over the past 6 months.

The above meeting summary represents CEI's understanding of items discussed at this meeting. Copies of this meeting summary have been sent to all present at the meeting.

Sincerely,



Mark Stoor, EIT
Assistant Project Engineer
Civil Engineers, Inc.

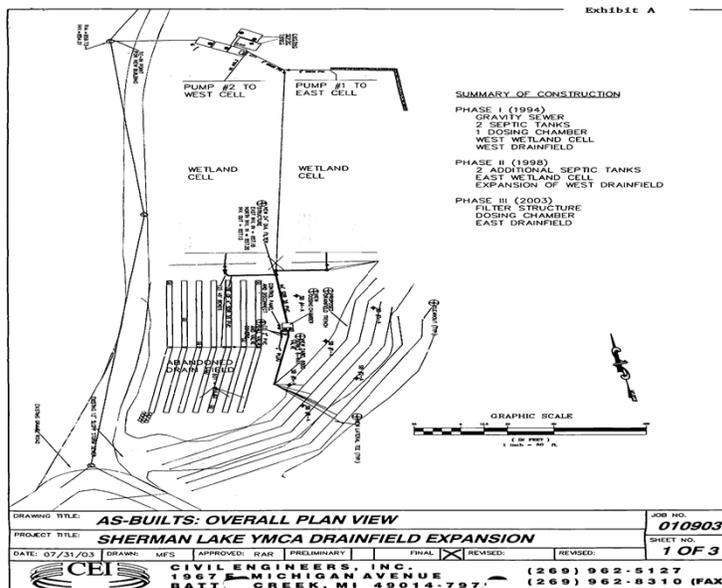
Pc: Deb Werner, KCHD
Carolyn Hobbe-Kroeger, KCHD
Luke Austenfeld, YMCA

MFS

Civil Engineers, Inc.

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7/03 DRAINFIELD EXPANSION AS-BUILTS



2/03 LAB REPORT

LABORATORY DETAIL REPORT

Client: Sherman Lake YMCA Outdoor Center

KAR Project No. : 030815
Date Reported : 02/28/03

Project Desc. : Sampling and analysis of simulated wetlands.

Sample ID : "Influent"
Sampled By : SSD of KAR Laboratories
Sample Date : 2/17/03
Sample Time : 1:50pm
Date Received : 2/17/03
Sample Type : aqueous
KAR Sample No. : 030815-01

Test	Result	Units of Measure	Method	Analyzed	Analyst	Comments
Bacteria, total coliform(MPF)	12,000,000	coliforms/100mL	SM 19.9222 B	02/17/03	DMC	Positive for E. coli bacteria.
BOD	103	mg/L	SM 19.9210 B	02/18/03	EKS	
Nitrogen, nitrate	+0.1	mg/L	EPA 353.2	02/18/03	MTW	
Suspended solids, total	46	mg/L	EPA 160.2	02/20/03	DMC	

Sample ID : "Effluent"
Sampled By : SSD of KAR Laboratories
Sample Date : 2/17/03
Sample Time : 2:15pm
Date Received : 2/17/03
Sample Type : aqueous
KAR Sample No. : 030815-02

Test	Result	Units of Measure	Method	Analyzed	Analyst	Comments
Bacteria, total coliform(MPF)	100,000	coliforms/100mL	SM 19.9222 B	02/17/03	DMC	Positive for E. coli bacteria.
BOD	54	mg/L	SM 19.9210 B	02/18/03	EKS	
Nitrogen, nitrate	+0.1	mg/L	EPA 353.2	02/18/03	MTW	
Suspended solids, total	27	mg/L	EPA 160.2	02/20/03	DMC	

Sample ID : "Effluent #2"
Sampled By : SSD of KAR Laboratories
Sample Date : 2/17/03
Sample Time : 2:15pm
Date Received : 2/17/03
Sample Type : aqueous
KAR Sample No. : 030815-03

Test	Result	Units of Measure	Method	Analyzed	Analyst	Comments
Bacteria, total coliform(MPF)	310,000	coliforms/100mL	SM 19.9222 B	02/17/03	DMC	Positive for E. coli bacteria.
BOD	19	mg/L	SM 19.9210 B	02/18/03	EKS	
Nitrogen, nitrate	1.3	mg/L	EPA 353.2	02/18/03	MTW	
Suspended solids, total	4	mg/L	EPA 160.2	02/20/03	DMC	

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Laboratory Detail Report
Page 1 of 2

"In climates with cold winters, bacteria and plants living in the constructed wetland's soil die back.

Not only does this slow or stop nutrient removal during hard freezes, but there can be substantial nutrient releases as the organisms previously removing and storing nutrients die in winter and release their own nutrients back into the system.

In large enough systems (city-wide, for instance), this sudden nutrient release can impact local streams the same way the original effluent would have (though for a shorter period of time, and during the dormant season)."

8/03 LAB REPORT

LABORATORY DETAIL REPORT

Client: Sherman Lake YMCA Outdoor Center

KAR Project No. : 033997
Date Reported : 08/18/03

Project Desc. : Sampling and analysis of simulated wetlands.

Sample ID : "Influent"
Sampled By : SSD of KAR Laboratories
Sample Date : 8/5/03
Sample Time : 3:30pm
Date Received : 8/5/03
Sample Type : aqueous
KAR Sample No. : 033997-01

Test	Result	Units of Measure	Method	Analyzed	Analyst	Comments
Bacteria, total coliform(MPF)	24,000,000	coliforms/100mL	SM 9222 B	08/05/03	DMC	Negative for fecal coliform bacteria.
BOD	117	mg/L	SM 9210 B	08/05/03	EKS	
Nitrogen, nitrate	+0.1	mg/L	EPA 353.2	08/05/03	DEA	
Nitrogen, total Kjeldahl	66.1	mg/L	EPA 353.2	08/14/03	DMC	
Suspended solids, total	57	mg/L	EPA 160.2	08/08/03	DMC	

Sample ID : "Effluent"
Sampled By : SSD of KAR Laboratories
Sample Date : 8/5/03
Sample Time : 3:35pm
Date Received : 8/5/03
Sample Type : aqueous
KAR Sample No. : 033997-02

Test	Result	Units of Measure	Method	Analyzed	Analyst	Comments
Bacteria, total coliform(MPF)	720,000	coliforms/100mL	SM 9222 B	08/05/03	DMC	Positive for E. coli bacteria.
BOD	13	mg/L	SM 9210 B	08/06/03	EKS	
Nitrogen, nitrate	+0.1	mg/L	EPA 353.2	08/05/03	DEA	
Nitrogen, total Kjeldahl	25.6	mg/L	EPA 353.2	08/14/03	DMC	
Suspended solids, total	17	mg/L	EPA 160.2	08/08/03	DMC	

Sample ID : "Effluent #2"
Sampled By : SSD of KAR Laboratories
Sample Date : 8/5/03
Sample Time : 3:35pm
Date Received : 8/5/03
Sample Type : aqueous
KAR Sample No. : 033997-03

Test	Result	Units of Measure	Method	Analyzed	Analyst	Comments
Bacteria, total coliform(MPF)	400,000	coliforms/100mL	SM 9222 B	08/05/03	DMC	Positive for E. coli bacteria.
BOD	19	mg/L	SM 9210 B	08/06/03	EKS	
Nitrogen, nitrate	+0.1	mg/L	EPA 353.2	08/05/03	DEA	
Nitrogen, total Kjeldahl	19.0	mg/L	EPA 353.2	08/14/03	DMC	
Suspended solids, total	30	mg/L	EPA 160.2	08/08/03	DMC	

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Laboratory Detail Report
Page 1 of 1

10/03 MONTHLY MAINTENANCE OBSERVATIONS

	A	B	C	D	E
1	Sherman Lake Y-Camp			Y-camp wetlands check list	Date: _____, 200
2	Monthly Maintenance Observations			Page 1 of 2	Time Arrived on-site
3				Submitted Date	Time Departed
4				Mailed to Y-Camp	Those present:
5	The Gull Lake Sewer and Water Authority, in conjunction with the YMCA-Sherman Lake			Mailed to H Dept	GLSWA
6	Camp, proposes to observe the Y-Camp's Wetlands Treatment Facility as follows:				GLSWA
7					Y-Camp
8	March, June, July, August, September, December				Y-Camp
9					Other:
10					
11					
12					
13	Item description	Type of Observation	Notations Appears okay	Notations To be reviewed by Y-camp	Other Notations of interest
14					
15	Septic tank #1	Visual after opening hatch cover			
16	Septic tank #2	Visual after opening hatch cover			
17	Septic tank #3	Visual after opening hatch cover			
18	Septic tank #4	Visual after opening hatch cover			
19	Zabel Filter #1	Pull and observe			
20	Zabel Filter #2	Pull and observe			
21	Zabel Filter #3	Pull and observe			
22	Upstream Duplex pump station	Observe wet well			
23		Check High water float + alarm			
24		Check Low water float + alarm			
25		Check Amperage of pump #1			
26		Check Amperage of pump #2			
27		Event counter pump #1			
28		Event counter pump #2			
29		Events pump #1 since last ck			
30		Events pump #2 since last ck			
31		Pump hours pump #1			
32		Pump hours pump #2			
33		Pump #1 hours since last ck			
34		Pump #2 hours since last ck			

10/03 PUMP DRAW DOWN TESTING

Y-Camp Pump Drawdown Testing Exhibit C
10/21/2003
Final
On-site measurements: Barry Bowman; Duane Chambers; Rich Pierson

Raw Influent Tank: Also known as the upstream tank.

Dimensions: field verified	
Length	96.5 inches = 8.04 feet
Width	60.5 inches = 5.04 feet
Volume w/ 1 foot height	40.54 cubic feet
Gallons (7.48 gallons per cu ft)	303.26 gallons per 1 foot height
	25.27 gallons per inch
Inflow:	0.25 inches in 2 minutes = 3.1 gal/min
Drawdown: Raw Influent Tank, as measured in field	
Pump 1:	1.0 inches in 2 minutes = 0.5 in/min
Pump 2:	0.8 inches in 2 minutes = 0.4 in/min
Pump 1:	15.79 gal per minute
Pump 2:	13.27 gal per minute

Note: Plugged discharge headers may cause backpressure affecting readings

Effluent Discharge tank: Also known as the downstream tank.

Dimensions: these were field verified	
Length	90 inches = 7.50 feet
Width	52.8 inches = 4.40 feet
Volume w/ 1 foot height	33.00 cubic feet
Gallons (7.48 gallons per cu ft)	246.8 gallons per 1 foot height
	20.57 gallons per inch
Inflow:	0.0 inches = 0.0 gallons
Drawdown: Effluent Discharge Tank, as measured in field	
Pump 1:	4.0 inches in 2 minutes
Pump 2:	4.0 inches in 2 minutes
Pump 1:	41.14 gal per minute
Pump 2:	41.14 gal per minute

10/03 METER RUN TIMES

Y Camp Hour Meters Run Times
Revision Date: 10-21-03

Station #1 Upstream

Exhibit D 1

Date	Pump 1 Hrs Totalizer	Pump 2 Hrs Totalizer	Total Hrs Ran	Total Hrs Ran	Total Gal P1 Est. 15.79gpm	Total Gal P2 Est. 13.27 gpm	Total Gal. Per Period	Gal/Day Per Period
10/21/03	0	0	0	0			0	0
10/28/03	9.9	19.4	9.9	19.4	17178.48	25247.16		0
11/04/03	9.9	38.5	0	19.1	0	24856.74	24,857	3,551
11/11/03	9.9	160.0	0	121.5	0	158120.1	158,120	22,589
11/18/03	23.3	319.8	13.4	159.8	23251.68	207963.7	231,215	33,031
11/25/03	64.9	490.3	41.6	170.5	39411.84	135752.1	175,164	25,023
12/02/03	96.6	540.8	31.7	50.5	30032.58	40208.1	70,241	10,034

Note: Data prior to 11/25 was based on "old" pumps. New pumps installed 11/25 with gpm of 15.79 + 13.27

10/03 HOUR RUN TIMES

Y Camp Hour Run Times
Revision Date: 10-21-03

Station #2 Downstream

Exhibit D 2

Date	Pump 1 Hrs Totalizer	Pump 2 Hrs Totalizer	Total Hrs Ran	Total Hrs Ran	Total Gal P1 Est. 41.14gpm	Total Gal P2 Est. 41.14gpm	Total Gal. Per Period	Gal/day
10/21/03	0.0	0.0	0	0			0	0
10/28/03	7.3	7.1	7.3	7.1	18019.32	18019.32	36,039	5,148
11/04/03	15.4	15.3	8.1	8.2	19994.04	19994.04	39,988	5,713
11/11/03	21.3	21.0	5.9	5.7	14563.56	14563.56	29,127	4,161
11/18/03	27.6	27.1	6.3	6.1	15550.92	15550.92	31,102	4,443
11/25/03	41.7	41.2	14.1	14.1	34804.44	34804.44	69,609	9,944

10/03 HOUR METERS RUN TIMES

Y Camp Hour Meters Run Times
Revision Date: 10-21-03

Station #1 Upstream

Date	Pump 1 Hrs Totalizer	Pump 2 Hrs Totalizer	Total Hrs Ran	Total Hrs Ran	Total Gal P1 Est. (15.79gpm)	Total Gal P2 Est. (13.27 gpm)	Total Gal. Per Period	Gal/Day Per Period
10/21/03	0	0	0	0			0	0
10/28/03	9.9	19.4	9.9	19.4	17178.48	25247.16	0	0
11/04/03	9.9	38.5	0	19.1	0	24856.74	24,857	3,551
11/11/03	9.9	160.0	0	121.5	0	158120.1	158,120	22,589
11/18/03	23.3	319.8	13.4	159.8	23251.68	207983.7	231,215	33,031
11/25/03	64.9	490.3	41.6	170.5	39411.84	135752.1	175,164	25,023
12/02/03	96.8	541.0	31.9	50.7	30222.06	40367.34	70,589	10,084
12/09/03	116.5	543.9	19.7	2.9	18663.78	2308.98	20,973	2,996
12/23/03	133.8	554.4	17.3	10.5	16390.02	8360.1	24,750	1,768
12/30/03	139.2	557.2	5.4	2.8	5115.98	2229.36	7,345	1,049

RECEIVED: 11/17/04 12:30PM; 2004 731 2096 - JAT/RS, M/S/O; Page 1 of 2; P.01/02
 -PUMP- 2004 731 2096 - JAT/RS, M/S/O; Page 1 of 2; P.01/02
 -PUMP- 2004 731 2096 - JAT/RS, M/S/O; Page 1 of 2; P.01/02
 -PUMP- 2004 731 2096 - JAT/RS, M/S/O; Page 1 of 2; P.01/02

Looks normal, last 7 day period = inflow For 7 days.
 : outflow (next page)
 Call me at your convenience. For 7 days.

R. Jones

2004 WEEKLY INSPECTION

DRAFT

- 2004 weekly inspection -

A	B	C	D	E
1 Sherman Lake Y-Camp			Y-camp wetlands check list	Date 200
2 Quarterly Maintenance Observations				Time Arrived on-site
3 December / March / June / September				Time Departed
4			Mailed to Y-Camp	Those present:
5 The Gill Lake Sewer and Water Authority, in conjunction with the YMCA-Sherman Lake			Mailed to H Dept.	SLSWA:
6 Camp, proposes to observe the Y-Camp's Wetlands Treatment Facility on a quarterly				Y-Camp:
7 basis as follows:				Other:
8				
9				
10				
11				
12				
13				
14 Item description	Type of Observation	Notations Appears okay	Notations To be reviewed by Y-camp	Other Notations of interest
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2nd pump 2/1/04

10/03 PUMP RUN TIMES

Y Camp Hour Run Times
Revision Date: 10-21-03

Station #2 Downstream

Exhibit D 2

Date	Pump 1 Hrs Totalizer	Pump 2 Hrs Totalizer	Total Hrs Ran	Total Hrs Ran	Total Gal P1 Est. 41.14gpm	Total Gal P2 Est. 41.14gpm	Total Gal. Per Period	Gal/day
10/21/03	0.0	0.0	0	0			0	0
10/28/03	7.3	7.1	7.3	7.1	18019.32	18019.32	36,039	5,148
11/04/03	15.4	15.3	8.1	8.2	19994.04	19994.04	39,988	5,713
11/11/03	21.3	21.0	5.9	5.7	14563.56	14563.56	29,127	4,161
11/18/03	27.6	27.1	6.3	6.1	15550.92	15550.92	31,102	4,443
11/25/03	41.7	41.2	14.1	14.1	34804.44	34804.44	69,609	9,944

3/05 SAMPLING AND ANALYSIS OF WETLANDS

KAR Laboratories, Inc.

INVOICE

4025 Manchester Road
Kalamazoo, MI 49001
Phone 269 381-9958
Fax 269 381-9958

Sherman Lake YMCA Outdoor Center
4225 N. 39th St.
Augusta, MI 49012

Attn: Mr. Luke Austenfeld

Project No.: 050838
Date Activated: 2/28/05
Date Reported: 3/11/05
PO#: _____

Project Desc.: Sampling and analysis of simulated wetlands.

Quan	Item	Each	Total
2	BOD	35.00	70.00
2	Bacteria, total coliform(MF)	40.00	80.00
2	Nitrogen, nitrate	20.00	40.00
2	Nitrogen, total kjeldahl	30.00	60.00
2	Suspended solids, total	15.00	30.00

			SUBTOTAL 280.00

			280.00

			0.00

			280.00

	Sampling fee		75.00

			TOTAL DUE \$ 355.00

Please indicate Project No. 050838 on check stub or voucher.

I.D. #38-2476290
A FINANCE CHARGE OF 1 1/2% PER MONTH (18% PER YEAR)
WILL BE ADDED TO BALANCES AFTER 4/10/2005.
ORIGINAL INVOICES ARE SENT TO ACCTS. PAYABLE.

2007 Abandoned Wetlands

- Received Grant of \$500,000
- We were pumping out our solids almost quarterly
- 2007 - Hooked on to the Gull Lake Sewer
 - Service fees quarterly \$1342.25 off a set charge of 20.6 units (house) X \$65 payable quarterly
 - Send our pooh to Kalamazoo

For More Information

- For more information on constructed wetlands to treat residential wastewater,
- contact your local and state health agencies; the National Environmental Services Center at (800) 624-8301 for technical information and free and low-cost information materials;
- Purdue University, West Lafayette, Indiana, (765) 494- 4773,
- for a copy of Constructed Wetland Design Manual for Individual Residences; Michael Ogden, Natural Systems International, (505) 988-7453; Bob Crawford, Louisiana Department of Environmental Quality, (225) 219-3465; and Bill Grant, LaGrange County, Indiana, Health Department, (260) 499-6341.