State of Wisconsin \ DEPARTMENT OF NATURAL RESOURCES

MEMO

To: File
From: Liz Victor
Date: August 3, 2017
Site Name/BRRTS: Kewaunee Marsh Arsenic Spill (02-31-000508)
Re: Field Activities Report for May 3, 2017

Who: Liz Victor, DNR NER
Cheryl Bougie, DNR NER, Jim Killian, DNR NER (separate mobilization)

Purpose of Field Visit:

- Complete field work activities initiated on March 22, 2017 (removed bailers, collect groundwater elevation data, find benchmarks).
- Replace existing river staff gauge (broken) and survey in the elevation of the new gauge.
- Collect slough mouth surface water samples.

Equipment:
GPS Units Used: Garmin eTrex 20 Sof
Camera Used: DNR's Canon Powershot SX 210 IS

Scope of Work for Field Visit: No formal Scope of work was prepared.

Work Performed: Bougie and Killian installed a new the river staff gauge, surveyed the staff gauge with respect to KMO1-A, and assisted in surface water collection. Victor removed bailers, measured total depth, and collected groundwater elevation data from nearly all wells. Wells between the fence and the river were not accessed because this area was flooded due to high river levels. Both staff gauges were read, and surface water samples (river samples) were collected from the north and south sloughs. GPS coordinates were recorded for GW01-1, sts-mp6 and GW01-9. PVC well markers were placed at GW-09 and GW-08.

Comments:

- Benchmarks: The benchmarks were located prior to this mobilization by Killian. KMO1-A was located and uncovered. KMO1-B was located but it was bent and unusable.
- River Staff Gauge: The old gauge was left in place. The new gauge was installed on one of the bridge supports. Because of the high river levels, the lower portion of the gauge was not installed.
- Bailers: As noted in the 3/22/2017 Field Activities Report, most of the bailers are submerged in the water columns making collecting water elevation data problematic because the bailers need to be removed before data collection and well recharge is slow.
- Groundwater elevation data: For remote wells I allowed about 5 minutes for equilibration after the bailers were removed. This was not enough time for most of the wells, as documented in the few wells that were left to equilibrate for a longer period. All the wells (except "sts-" and "GW-" wells) are vented, either through the cap or through the casing. For future readings, as long as there are no bailers in the wells, the wells should be equilibrated when opened.
- Sloughs/slough samples: It was intended to collect samples of the sloughs at the mouth and upstream (at the fence); however, because the river level was so high, only one sample was collected from each slough. SW17-1 was collected from the south slough as far as close as the boat could get to the fence and SW17-2 was collected from the north slough near the weir. These samples are considered river water samples because of the high river water levels.
-

MAP FOR SPRING 5/3/17 FIELD WORK

TAKE WLS, remove bailers

NO WLS.

KEWAUNEE MARSH PHOTOS
Taken During Field Work 5/03/2017

Photo #:	004
Date/Time of Photo:	05/03/2017
Photo Location:	Kewaunee Marsh
Photo By:	Liz Victor
Photo Description:	Location of old (East) staff gauge. View to E-NE

Photo #:	005
Date/Time of Photo:	05/03/2017
Photo Location:	Kewaunee Marsh
Photo By:	Cheryl Bougie
Photo Description:	S. Slough surface water sample location: SW17-1 GPS Coordinates: 44.47440N 87.51355W

Photo #:	006
Date/Time of Photo:	05/03/2017
Photo Location:	Kewaunee Marsh
Photo By:	Liz Victor
Photo Description:	N. Slough surface Water Sample Location: SW17-2 WPT 82 44.47498N 87.51305W

KEWAUNEE MARSH PHOTOS
Taken During Field Work 5/03/2017

Photo #:	007
Date/Time of Photo:	05/03/2017
Photo Location:	Kewaunee Marsh
Photo By:	Cheryl Bougie
Photo Description:	Monitoring Well MW04-12 Note: PVC was pulled up while removing cap. As a result, protective casing cover could not be locked

Above Photo: Pond 9 View to ~north. Arrow points to STS-mp6
Photo by: Liz Victor

Photo #:	008
Date/Time of Photo:	05/03/2017

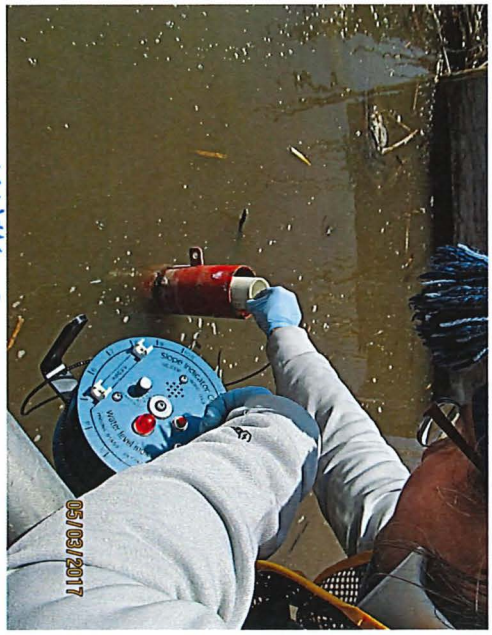
Above Photo: Pond 8 View to ~north. Photo by: Liz Victor

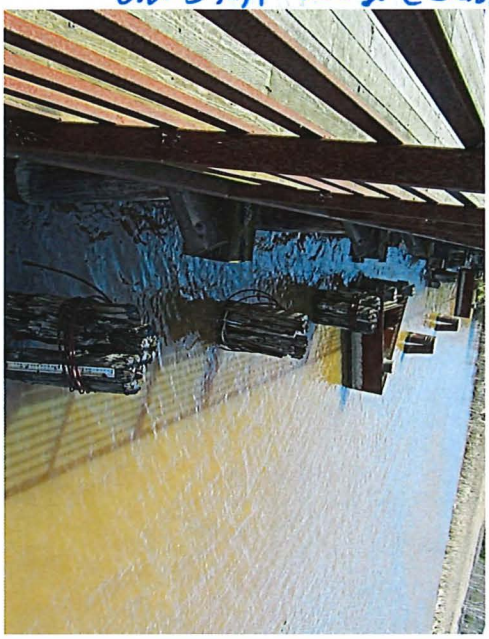
Photo #:	009
Date/Time of Photo:	05/03/2017

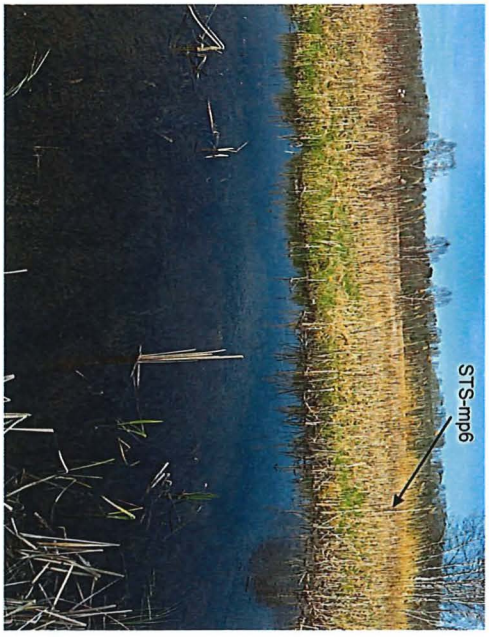
New Staff gauge (west)

old Staff bauge (East)

MW04-12







New Staff Gauge

Old Staffgauge

New staff Gauge (west)





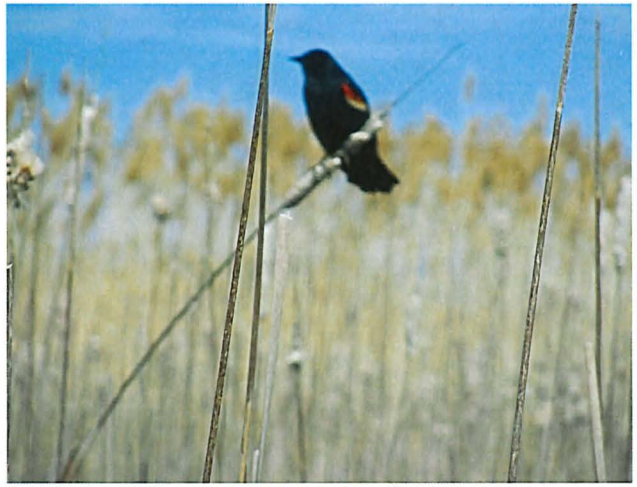




Distressed veg

Distressed veg

Distressed veg



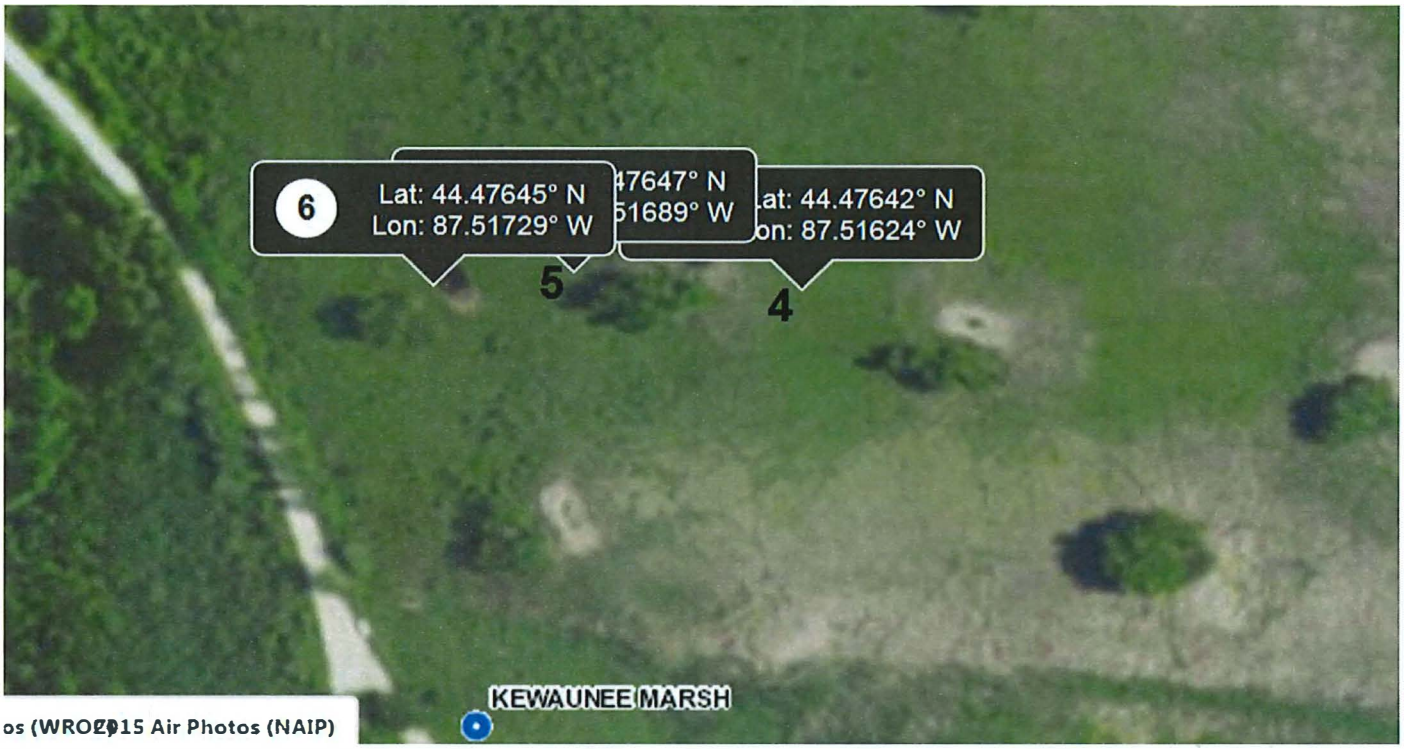
Distressed veg


05/03/2017

GPS COORDINATES MEASURED IN FIELD

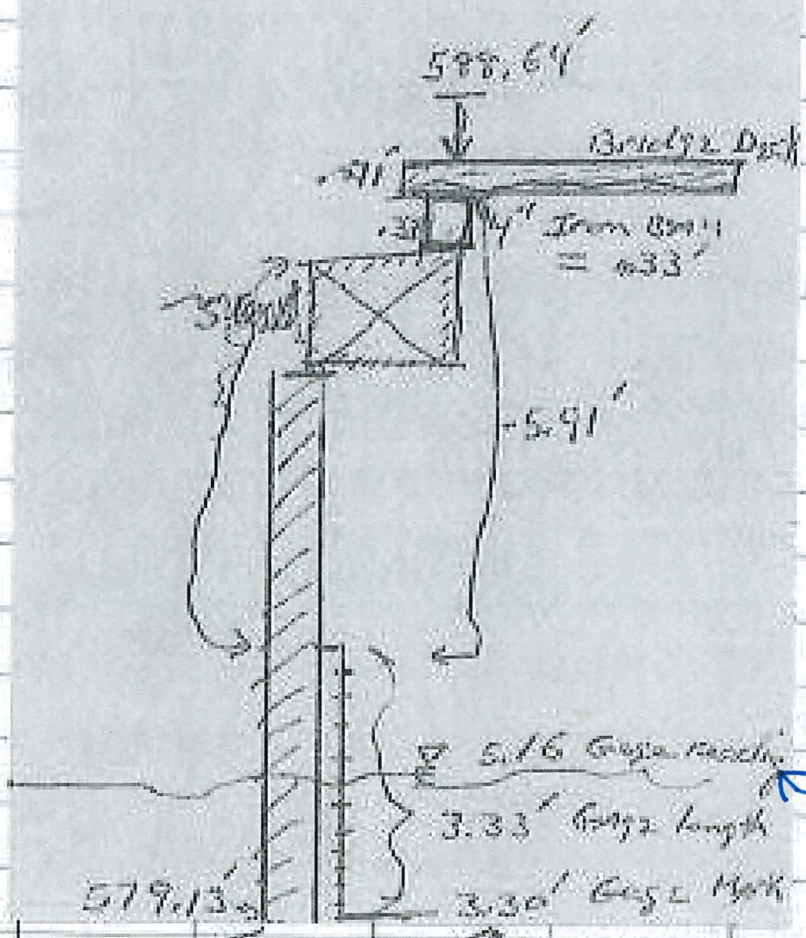
Features measured using garmin eTrex 20 Sof by E. Victor during field event on May 3, 2017

STS-mp6	44.47647	-87.51689	5
Pond	44.47645	-87.51729	6
MW04-9	44.4752	-87.51685	7
GW01-9	44.47511	-87.51672	8
GW01-1	44.47642	-87.51624	4
SW17-2	44.47499	-87.51307	1 n slough, mouth
SW17-2	44.47498	-87.51305	2 n slough, mouth
SW17-1	44.4744	-87.51355	3 s. slough, mouth



NEW STAFF GAUGE SKETCH (WEST)
by J. Killian

Per C. Bougie: The Kewaunee River gage reading on 5/3/17 was 5.16'



Copies of this key.

→ The shallow PVC stickup wells GW-09, STS-MP1, GW-08, and GW-07 → I did not try to take WLs on these wells - all the other shallow wells were frozen. I forgot to secure the caps on these wells.

→ The bailers have nylon string or polyethylene string - some of the bailers were filthy, some were very clean. Pulled bailers from these wells I could. These I plan on de-coning & re-using. All bailers are marked (w/ a sharpie) which wells they belong to.

GW

FIELD VISIT - MAY 3, 2017

SCOPE OF WORK

1. OPEN ALL WELLS EXCEPT "GW-" SERIES, REMOVE & MARK BAILERS, LEAVE WELLS UNCAPPED.

2. GPS COORDINATES FOR:
   - ✓ STS-MP06
   - ✓ GW01-1
   - GW01-4
   - GW01-8
   - GW01-9

3. ✓ MEASURE TD of GW01-11
   - IF TD is < 5' btc, then look for nearby well STS-MP4 (6.7' TD)

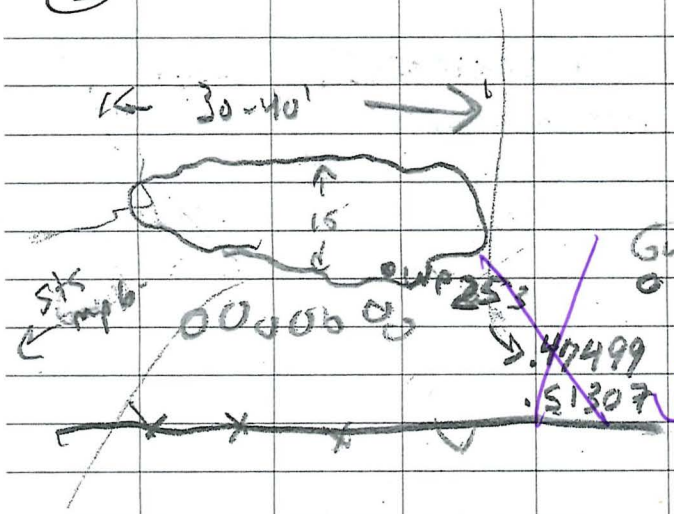
4. COLLECT WATER LEVELS, LOCK UP WELL. + STAFF GAUGE

5. PLACE PVC MARKER ON
   ✓ GW-09 - ✓ GW-08

GW01-11: 8.21' 3.17' / 3.20' *
GW01-7: 1.86' 4.9'
*1.88' = *depth to S.W.
taken from outside
casing.
- Looks like these wells
are screening SW /
water table.

MW02-6i: 3.25' 12.85'
MW02-6: 7.97' 2.80'
SIS-MP-2 2.94 8.24
SIS-MP-3 2.70 8.19
GW01-8 1.72 4.94
MW02-4dr 1.54 22.8
MW02-4i 3.27 12.84
MW02-4 2.97 7.95 11:30 AM
1138 - Jim & Chege all
- they are in the boat
heading to the staff
gauge

MW02-5 2.73 7.75
MW02-5i 3.23 12.87
SIS MP-1 2.76 8.23
GW01-5 1.60 4.95
GW01-3 2.17 4.92
MW02-3d: 2.69 22.65
MW02-3i 3.43 12.83
MW02-3: 3.43 7.98
12:09 - waiting for wells
to equilibrate.
There are a few 2 to 3"
of standing water at
nearly all wells outside
of Bop.
Less SW at MW02-3 -
(less than 1").
Stressed veg area
has ±1-2" standing water
The area is very
mossy. In areas has
foam on SW.
- Wells that had bailers
in them were left to
equilibrate for ± 5 MIN
after bailers removed.



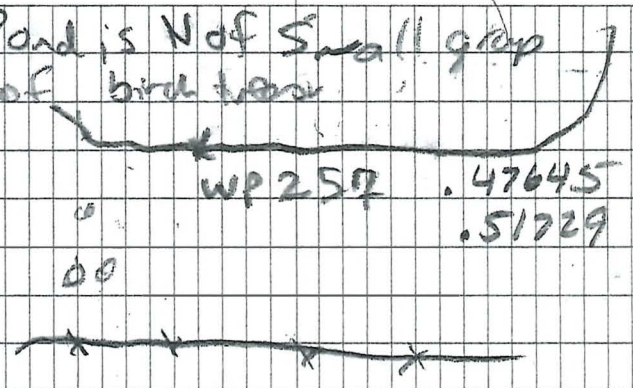
STS MP-6 WP # 256
44.47647
87.51689

STS MP-6 8.25
3.00 - DT SW
NOT EQUAL 4.25 - DTW

POND #9

2ND POND N of FENCE →
20 X 30? open water
looks shallow - can see
bottom ± 1' below water.

Pond is N of small group of birch trees



MW01-9 2.36 8.70
WP 258
44.47520
87.51685
↳ appears to be at edge of cap.

GW01-9: 2.27', 4.90' } GPS WP # 260
2.27' = DT SW.

MW02-8	6.55	1.95	
MW02-8i	11.55	2.18	
MW11-3	3.08	9.55	HAD TO SET SENSITIVITY TO (+) high conductance?
MW11-3i	3.19	14.80	
MW11-1i	3.42	14.5	
MW11-1	3.28	9.40*	
MW11-2	3.50	9.65	

.47511
.51722

South

State of Wisconsin
Department of Natural Resources
and Laboratory of Hygiene

Test Request – Inorganic Surface Water & Microbiology

Form 4800-024 (R 8/15)

Billing and Reporting

Account Number	Field Number (Bottle Label ID)	Report to Address (Non-DNR only)		
RR049	SW17-1			
DNR User ID	**Report To Name**	**City**	**State**	**ZIP**
victoe	Liz Victor			
Date Results Needed (mm/dd/yyyy)		**Report to Email (Non-DNR only)**		
06/04/2017				

Date and Time of Sample Collection

Date (mm/dd/yyyy)	Time (24-hr clock)	End Date (mm/dd/yyyy)	End Time
05/03/2017	13:55	05/03/2017	13:55

Sample Type

Sample Type: (select one)

- (•) SU Surface Water
- ( ) NP Storm Water
- ( ) EF Effluent (Treated Wastewater)
- ( ) IF Influent (Untreated wastewater)
- ( ) D Public Drinking Water
- ( ) MW Monitoring Well
- ( ) PO Private Well
- ( ) SE Sediment
- ( ) SL Sludge
- ( ) SO Soil
- ( ) TI Tissue
- ( ) _____

Who collected the sample

Collected By Name	Telephone	Email
Liz Victor	(920) 303-5424	elizabeth.victor@wisconsin.gov

Where the sample was collected

Station ID (STORET #)	Sample Address or Location Description	
10038144		
County	**Waterbody ID (WBIC)**	**Point / Outfall (or SWIMS Fieldwork Seq No)**
Kewaunee		

Sample Details

Sample Description / Device Description

S. Slough, mouth / grab

Enforcement? ( ) Yes (•) No
If yes, include chain of custody form.

Is Sample Disinfected? ( ) Yes (•) No
If yes, how? _____

If Field QC Sample (select one):
( ) Duplicate ( ) Blank (•) none

Grant or Project Number
02-31-000508

Depth of Sample: 5 ( ) ft ( ) m (•) in ( ) cm

Or Top and Bottom of Sample Interval:
_____ - _____ ( ) ft ( ) m ( ) in ( ) cm

Analyses Requested

If field filtered, indicate by checking the box on this sheet and noting on the lid of the sample bottle.

Plastic Quart Bottle (No chemical preservation)

☐ Sample field filtered? (Check box if yes)

- ☐ Alkalinity, pH, Conductivity
- ☐ Color
- ☐ BOD_5 Dissolved
- ☐ Fluoride
- ☐ BOD_5 Total (900 ml needed)
- ☐ MBAs Screening
- ☐ $CBOD_5$ Total (carbonaceous)
- ☐ pH only (non compliance)
- ☐ Chloride
- ☐ Sulfate
- ☐ Chlorophyl A (if Field Filtered, give ml _____ filtered)
- ☐ Turbidity
- ☐ _____

Solids

- ☐ Suspended Sediment
- ☐ % Sand, Silt, Clay
- ☐ Total Dissolved Solids
- ☐ Total Suspended Solids (500 ml needed)
- ☐ Total Solids
- ☐ Total Vol. Susp. Solids (includes Total Susp. Solids)
- ☐ Total Volatile Solids (includes total solids)

60 ml Bottle (No chemical preservation)

☐ Sample field filtered? (Check box if yes)

- ☐ Orthophosphate
- ☐ NO_2+NO_3 as Nitrogen (drinking water)
- ☐ Silica
- ☐ Nitrite (NO_2) as Nitrogen

250 ml Metals Bottle (Acidify w/ Nitric Acid)

☐ Sample field filtered? (Check box if yes)

☐ Low Level Metals. Note: Clean sampling with special bottles

☐ TCLP (Toxicity Characteristic Leaching Procedure - use mason jar)

Total recoverable metals will be run unless otherwise instructed.

☐ Aluminum	☐ Copper	☐ Selenium
☐ Antimony	☐ Hardness-as $CaCO_3$	☐ Silver
☒ Arsenic	☐ Iron	☐ Sodium
☐ Barium	☐ Lead	☐ Strontium
☐ Beryllium	☐ Magnesium	☐ Thallium
☐ Boron	☐ Manganese	☐ Titanium
☐ Cadmium	☐ Mercury	☐ Vanadium
☐ Calcium	☐ Molybdenum	☐ Zinc
☐ Chromium, Total	☐ Nickel	☐ _____
☐ Cobalt	☐ Potassium	☐ _____

250 ml Nutrients Bottle (Acidify w/ Sulfuric Acid)

☐ Sample field filtered? (Check box if yes)

- ☐ Tot.-Phosphorus
- ☐ NO_2 + NO_3 as Nitrogen
- ☐ Total Kjeldahl-N
- ☐ Ammonia-N
- ☐ COD
- ☐ Total Nitrogen
- ☐ Tot. Dis. Phosphorus (filter, then acid preserve in 60 ml)

250 ml Round Bacteria Bottle

- ☐ n-potable
- ☐ N, non-potable

of Hygiene.

Glass Amber (Acidify w/Sul

☐ TOC

enclose this form in the mailer
al parameters or instructions

05/04/17 14:59
SW17-1
313763001

TEMP
Ray Gun
Glass 7 Plastic 6 8
☐ ICED

HNO3
ID's IN/AN313
Bottle ID
A B C D
E F G

pH
pH R2 13 20
Bottle ID
A B C D
E F G

05/04/17 14:59
RR049

For lab use:
Sample
☐ Iced
313763

North

State of Wisconsin
Department of Natural Resources
and Laboratory of Hygiene

Test Request – Inorganic Surface Water & Microbiology

Form 4800-024 (R 8/15)

Billing and Reporting

Account Number	Field Number (Bottle Label ID)	Report to Address (Non-DNR only)		
RR049	SW17-2			
DNR User ID	**Report To Name**	**City**	**State**	**ZIP**
victoe	Liz Victor			
Date Results Needed (mm/dd/yyyy)		**Report to Email (Non-DNR only)**		
06/04/2017				

Date and Time of Sample Collection

Date (mm/dd/yyyy)	Time (24-hr clock)	End Date (mm/dd/yyyy)	End Time
05/03/2017	14:05	05/03/2017	14:05

Sample Type

Sample Type: (select one)

- (●) SU Surface Water
- ( ) NP Storm Water
- ( ) EF Effluent (Treated Wastewater)
- ( ) IF Influent (Untreated wastewater)
- ( ) D Public Drinking Water
- ( ) MW Monitoring Well
- ( ) PO Private Well
- ( ) SE Sediment
- ( ) SL Sludge
- ( ) SO Soil
- ( ) TI Tissue
- ( ) _____

Who collected the sample

Collected By Name	Telephone	Email
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Where the sample was collected

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10038143		
County	**Waterbody ID (WBIC)**	**Point / Outfall (or SWIMS Fieldwork Seq No)**
Kewaunee		

Sample Details

Sample Description / Device Description

N. Slough, mouth / grab

Enforcement? ( ) Yes (●) No
If yes, include chain of custody form.

Is Sample Disinfected? ( ) Yes (●) No
If yes, how? _____

If Field QC Sample (select one):
( ) Duplicate ( ) Blank (●) none

Grant or Project Number
02-31-000508

Depth of Sample: 5 ( ) ft ( ) m (●) in ( ) cm

Or Top and Bottom of Sample Interval:
_____ - _____ ( ) ft ( ) m ( ) in ( ) cm

Analyses Requested

If field filtered, indicate by checking the box on this sheet and noting on the lid of the sample bottle.

Plastic Quart Bottle (No chemical preservation)

☐ Sample field filtered? (Check box if yes)

- ☐ Alkalinity, pH, Conductivity
- ☐ Color
- ☐ BOD_5 Dissolved
- ☐ Fluoride
- ☐ BOD_5 Total (900 ml needed)
- ☐ MBAs Screening
- ☐ $CBOD_5$ Total (carbonaceous)
- ☐ pH only (non compliance)
- ☐ Chloride
- ☐ Sulfate
- ☐ Chlorophyl A (if Field Filtered, give ml ____ filtered)
- ☐ Turbidity
- ☐ _____

Solids

- ☐ Suspended Sediment
- ☐ % Sand, Silt, Clay
- ☐ Total Dissolved Solids
- ☐ Total Suspended Solids (500 ml needed)
- ☐ Total Solids
- ☐ Total Vol. Susp. Solids (includes Total Susp. Solids)
- ☐ Total Volatile Solids (includes total solids)

60 ml Bottle (No chemical preservation)

☐ Sample field filtered? (Check box if yes)

- ☐ Orthophosphate
- ☐ NO_2+NO_3 as Nitrogen (drinking water)
- ☐ Silica
- ☐ Nitrite (NO_2) as Nitrogen

250 ml Metals Bottle (Acidify w/ Nitric Acid)

☐ Sample field filtered? (Check box if yes)

☐ Low Level Metals. Note: Clean sampling with special bottles

☐ TCLP (Toxicity Characteristic Leaching Procedure - use mason jar)

Total recoverable metals will be run unless otherwise instructed.

☐ Aluminum	☐ Copper	☐ Selenium
☐ Antimony	☐ Hardness-as $CaCO_3$	☐ Silver
☒ Arsenic	☐ Iron	☐ Sodium
☐ Barium	☐ Lead	☐ Strontium
☐ Beryllium	☐ Magnesium	☐ Thallium
☐ Boron	☐ Manganese	☐ Titanium
☐ Cadmium	☐ Mercury	☐ Vanadium
☐ Calcium	☐ Molybdenum	☐ Zinc
☐ Chromium, Total	☐ Nickel	☐ _____
☐ Cobalt	☐ Potassium	☐ _____

250 ml Nutrients Bottle (Acidify w/ Sulfuric Acid)

☐ Sample field filtered? (Check box if yes)

- ☐ Tot.-Phosphorus
- ☐ NO_2 + NO_3 as Nitrogen
- ☐ Total Kjeldahl-N
- ☐ Ammonia-N
- ☐ COD
- ☐ Total Nitrogen
- ☐ Tot. Dis. Phosphorus (filter, then acid preserve in 60 ml bottle)

250 ml Round Bacteria Bottle

- ☐ ...PN, non-potable
- ☐ ... by MPN, non-potable

...e Lab of Hygiene.

For lab use:

Sample Temp _____ °C

☐ Iced

...ml Glass Amber (Acidify ...

☐ TOC

...e enclose this form in the ...onal parameters or instru...

05/04/17 14:59
SW17-2
313763002

TEMP	HNO3	pH
Ray Gun: Glass 7 / Plastic 6 8	ID's IN/AN313	pH R2 13 20
☑ ICED	Bottle ID: A B C D E F G	Bottle ID: A B C D E F G

State of Wisconsin
Department of Natural Resources

Chain of Custody Record

Form 4100-145 (R 03/09)

Sample Collector(s) Name	Return Report As: (select one)	Email or Postal Address	Phone Number (include area code)
Liz Victor, Cheryl Bougie	◉ Email ○ Hard Copy	elizabeth.victor@wisconsin.gov	(920) 303-5424
Property Owner	**Property Address**		**Phone Number (include area code)**
Kewaunee Marsh	Kewaunee, WI		

Split Samples: Offered? ○ Yes ◉ No
Accepted? ○ Yes ◉ No Accepted By (Signature): [signature]

Field ID No.	Date	Time	No. of Containers	Station Location Sample Description	Lab ID Number	Lab Use Only: Cracked / Broken	Improperly Sealed	Good Condition	Other Comments
SW17-1	05/03/2017	1:55 PM	1	S. Slough, mouth surface water sample	31376309			✓	
SW17-2	05/03/2017	2:05 PM	1	N. Slough, mouth surface water sample	313763002			✓	

Method of Shipment:

- ◉ Staff
- ○ U.S. Postal Service
- ○ UPS
- ○ FedEx
- ○ Other–specify: _____

Reason for Sample Collection:

- ○ Anhydrous Ammonia Spill
- ○ Animal Waste
- ○ Open Burning
- ○ Dairy Product Spill
- ○ Construction/Storm Water Runoff
- ○ Pesticide Spill * – Specify Pesticide: _____
- ○ Hazardous Waste Release *
- ○ Petroleum Product Release * – Specify Product: _____
- ○ Industrial Spill/Runoff * – Specify Industry Type: _____
- ◉ Other–specify: BRRTS Case: 02-31-000508

*** Contact the laboratory with product information and for consultation. Also, include sample of suspected spilled product.**

Was the sample shipping container sealed on receipt? ○ Yes ○ No

Certification

I hereby certify that I received and properly handled these samples as noted below:

Relinquished By (Signature)	Date / Time	Received By (Signature)	Date / Time
[signature]	5/3/17/14:45	[signature]	5/3/17/1456
[signature]			
[signature]		[signature]	5.4.17 12:40 CK

Disposition of Unused Portion Sample:

- ◉ Dispose
- ○ Return
- ○ Retain until further notice
- ○ Other _____

If you need additional room for notes, use the back of this form.

Wisconsin Department of Natural Resources
Laboratory Report

Laboratory: **Wisconsin State Laboratory of Hygiene** *DNR ID* **113133790**
2601 Agriculture Dr
Madison **WI** **53718**
Phone : **800-442-4618** *Fax Phone :* **608-224-6213**

Sample:

Field #:	**SW17-1**	*Sample #:*	**313763001**
Collection Start:	**05/03/2017 01:55 pm**	*Collection End:*	**05/03/2017 01:55 pm**
Collected by:	**LIZ VICTOR**	*Waterbody/Outfall Id:*	
ID #:	**10038144**	*ID Point #:*	
County:	**Kewaunee**	*Account #:*	**RR049**
Sample Location:			
Sample Description:	**S. SLOUGH, MOUTH/GRAB**		
Sample Source:	**Surface Water**	*Sample Depth:*	**5I**
Date Reported:	**05/16/2017**	*Sample Status:*	**COMPLETE**
Project No:	**02-31-000508**	*Sample Reason:*	
Comment:			

Analyses and Results:

Analysis Method	*Analysis Date*	*Lab Comment*
SM3113B	**05/11/2017**	

Code	*Description*	*Result*	*Units*	*LOD*	*Report Limit*	*LOQ*
978	**ARSENIC TOTAL RECOVERABLE**	**16.0**	ug/L	1.00		3.00