

DATE: August 19, 1997

FILE REF: 3200

TO: Jennifer Huffman - NER

FROM: Tom Janisch - WT/2 *Tom Janisch*

SUBJECT: Results for Arsenic Analysis Of June 18 - 19, 1997 Surface Water Samples From Kewaunee Marsh.

In my June 24 memo to you I outlined a number of study components we carried out on the above dates. I have recently received the results of the surface water samples and have summarized them below along with some preliminary observations.. We are still awaiting the bug and small mammal tissue and river sediment analytical results for arsenic.

The 6 surface water samples designated **KMWT** were taken in sloughs associated with the marsh that connect to the river or at river locations upstream and downstream from the site. These samples were brought back to the Biomonitoring Laboratory for toxicity testing. The 7 samples designated **SW** were surface water samples taken at locations on the marsh around the cap. The attached map shows the sampling locations. As a points of reference, the acute and chronic toxicity levels for arsenic (+3) in NR 105 are 340 and 152 ug/L, respectively, for the protection of aquatic life. The water quality criteria for arsenic in NR 105 for the protection of human health is 50 ug/L.

| Slough and River Surface Water Samples Taken For Toxicity Testing |                |   |
|---|----------------|---|
| Sample Site   | Arsenic - ug/L | Comments                                  |
| KMWT-01   | < 1.0          | Upriver Background Site                   |
| KMWT-02   | 24             | North Slough-Upper reach at fence         |
| KMWT-03   | 7              | North Slough-Mouth at juncture with river |
| KMWT-04   | 9              | South Slough-Upper reach at fence         |
| KMWT-05   | 2              | South Slough-Mouth at juncture with river |
| KMWT-06   | 1.0            | Downstream south of railroad bridge       |

Note that the arsenic levels in the upper reaches of both sloughs are slightly elevated (24 and 9 ug/L), but well below the acute and chronic toxicity levels. Given these levels, it is assumed that the results of the toxicity testing will come back showing no impacts to the aquatic test organisms.

The results of the surface water samples taken on the marsh around the cap in a counterclockwise direction are shown in the table below.

| Surface Water Samples Taken On the Marsh Around the Cap   |                            |                                   |  |
|---|----------------------------|-----------------------------------|--|
| Sample Site   | Arsenic-ug/L               | Water Depth at Sample Site-Inches | Comments                                 |
| SW-9  | 260 >c <sup>1</sup>        | 8                                 | Between cap and railroad.                |
| SW-10   | 86                         | 11                                | 50 ft SE of cap                          |
| SW-11   | 120                        | 10.5                              | 50 ft. east of cap                       |
| SW-12   | 320 > c                    | 4 inches over floating mat        | Depressed area in filled Pond 12         |
| SW-13   | 530 >a <sup>2</sup> and >c | 4.5                               | N. of cap, midway between Pond 7 and cap |
| SW-14   | 810 >a and >c              | 4.5                               | 30 ft. NW of Pond 10                     |
| SW-15   | 26                         | 17                                | Collected in Pond 9                      |
| <p>1. &gt; c = Exceeds the chronic toxicity value of 152 ug/L.<br/>           2. &gt; a = Exceeds the acute toxicity value of 340 ug/L.</p> |                            |                                   |  |

It is noted in the above table that the arsenic concentrations in the surface water collected to the southwest (SW-9), north (SW-12 and SW-13), and northwest (SW-14) of the cap exceed the chronic and acute toxicity criteria for the protection of aquatic life (assumes that all or the majority of the arsenic is in the trivalent toxic form and bioavailable). All of the values with the exception of the sample from SW-15 exceed the 50 ug/L value for the protection of human health. The highest concentration of arsenic (810 ug/L) in the water was found to the northwest of the cap at SW-14.

It was noted while sampling in both sloughs that currents would reverse periodically such that flow direction was from the marsh towards the river for a time and then from the river toward the marsh. River water may be diluting the arsenic concentrations in surface waters the east of cap and in the sloughs. When river water levels drop and the predominant flow direction is from the marsh towards the river, there is a possibility that arsenic concentrations in the flows off the marsh may be higher than what was measured during our June sampling event.

The above monitoring data will be integrated along with the data already collected into an ecological risk assessment for the site which I will be writing up in the next few months. I will provide you with the results of the June sampling for sediments, bugs, and small mammals as soon as it becomes available. This data will also be folded into the ecological risk assessment.

Based on an understanding with Jim Reyburn, I routinely copied STS on sampling information as contained in this memo. Since I'm not sure how you prefer to handle this, I have not copied STS on this memo. Please let me know how you would like me to handle this in the future.

If you have any questions or comments, please call me (608-266-9268).

cc: Lee Liebenstein - WT/2  
Duane Schuettpelz - WT/2  
Jim Amrhein - FH/2  
Dennis Weisensel - NER  
Ron Fassbender - NER

bc: Mike Berger - STS

Phone Tom on 8/20/97.  
Asked him to send  
future results to  
Mike Berger Directly,  
SBH

# JUNE 18-19, 1997 SURFACE WATER SAMPLING LOCATIONS ON KEWAUNEE MARSH AND RIVER

## MARSH SURFACE WATER SAMPLE SITES

|       |               |       |
|-------|---------------|-------|
| SW-9  | SW-12         | SW-14 |
| SW-10 | SW-13         | SW-15 |
| SW-11 | PROPERTY LINE |       |

## WATER TOX SAMPLING SITES

|         |         |
|---------|---------|
| KMWT-01 | KMWT-04 |
| KMWT-02 | KMWT-05 |
| KMWT-03 | KMWT-06 |

