CORRESPONDENCE/MEMORANDUM — State of Wisconsin

DATE: September 9, 1997 FILE REF: 3200

TO: Jennifer Huffman - NER

FROM: Tom Janisch - WT/2

SUBJECT: Results of 1997 Summer Sampling On Kewaunee Marsh

In my August 19, 1997 memo to you, I noted that we were awaiting the results of arsenic analysis on insect and small mammal tissues collected from the site and off site river sediment samples. We have now received these results and they are summarized below with some preliminary comments. As I indicated in the earlier memo, all of the data will be incorporated into an ecological risk assessment for the site in which the data will be more thoroughly reviewed.

Arsenic Levels In Emerged Flying Adult Insects

Light traps were set up on the berm along the eastern edge of the capped area over several nights during the summers of 1996 and 1997. However, due to less than ideal seasonal conditions, neither the mass or variety of species needed were collected in either year. What insects were collected during both summers were combined in one sample in order to yield the minimal amount of mass needed to run the analytical analysis. The larval stage of the insects living in the site water or on the vegetation would absorb or ingest arsenic and incorporate it into their tissues. The arsenic would remain in the tissues as the insects metamorphosed into the flying adult stage. The light traps collected mostly moths, midges, and mosquitoes. Because of time and logistics, the traps were not set up at a reference site so the only arsenic value is from the light traps from the impacted site. **The arsenic concentration in the composited insects from the site was 1.7 mg/kg. I**t cannot be assumed that the arsenic concentration in insects from a reference site would be minimal or below the level of detection (LOD = 0.1 mg/kg). Data from a study of metals in insects from western Lake Michigan drainages would indicate that insects from clean sites can accumulate arsenic in their tissues to comparable levels as the above from natural sources.

Small Mammal Trap Lines

Trap lines were set up within the fenced area of the impacted wetland and unimpacted references sites in 1995 and 1996. For both years, the total number of small mammals trapped on the impacted area was 3 compared to 8 for the reference sites.

The 8 small mammals from the reference sites were composited for one analysis. The three small mammals from the impacted area were subject to separate analysis.

The results of the analysis were as follows:

References Sites	Impacted Wetland Within Fence		
Arsenic Concentration (mg/kg) Whole Body Skin On			
Composite of 8 Small Mammals	Masked Shrew	Red Backed Vole	Jumping Mouse
0.1	0.5	2.0	0.2

Some uptake of arsenic appears to be occurring. Whether the uptake is through ingestion of contaminated food or water or externally from adherence of arsenic to the fur is not known. The literature will be surveyed to determine if there is any significance to these levels in tissue.

River Sediments

The attached map shows the river sediment sampling locations. Since no off site downriver sediment sampling had been done for the site, the purpose of the sediment sampling was to give a preliminary indication if any arsenic from the contaminated wetland area had moved off site and downriver in the past or more currently. This was done by coring and segmenting the retrieved cores for analysis. The results of the segment analysis for each sampling site was as follows:

SO-16		SO-17		SO-18	
Sediment Depth cm	Arsenic mg/kg	Sediment Depth cm	Arsenic mg/kg	Sediment Depth cm	Arsenic mg/kg
0 -20	17	0 - 20	6	0 - 43	11
20 - 49.5	13	20 - 60	< 3	43 - 55	15
		60 - 69	< 3	55 - 83	4

Preliminarily based on previous sampling of river sediments above the site, background concentrations of arsenic are in the range of 2 to 4 mg/kg. This would mean the upper two segments from SO-16 and SO-18 show slightly elevated levels above background. Based on recently published sediment quality guidelines, an arsenic level of 11 is at the threshold effect level which is a level if exceeded leads to occasional effects to benthic macroinvertebrates. Levels exceeding 48 mg/kg leads to probable or frequent effects to benthic invertebrates.

All data for the site is now available and can be included into the ecological risk assessment for the site which I will be writing over the next couple of months. If you have any questions or comments on this data, any previous data, or the status of the ecological assessment writeup, please give me a call. Based on our previous discussion, I am sending a copy of this memo to Mike Berger of STS.

cc: Duane Schuettpelz - WT/2
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Jim Amrhein - FH/2
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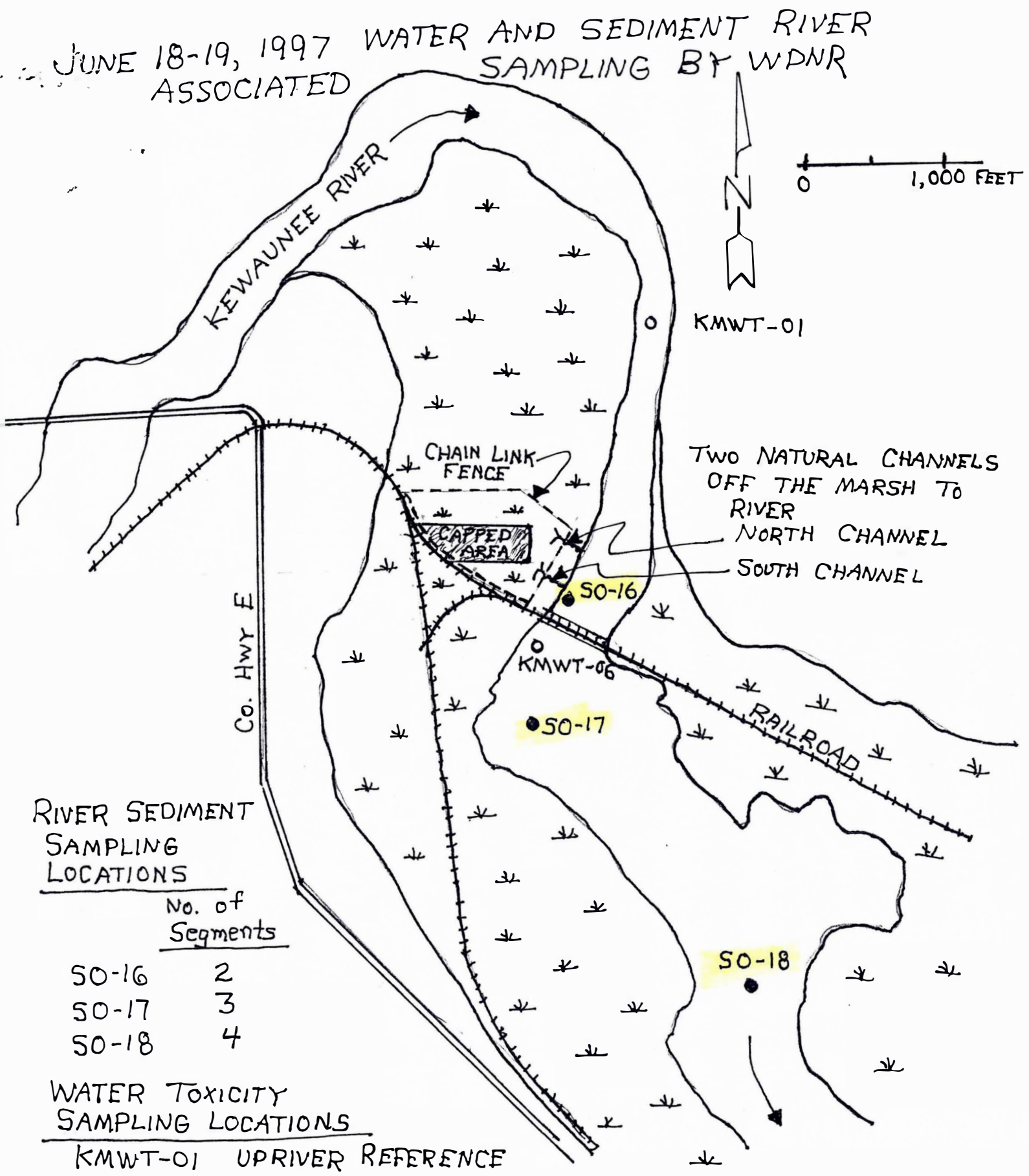
JUNE 18-19, 1997 WATER AND SEDIMENT RIVER SAMPLING BY WDNR ASSOCIATED
KEWAUNEE RIVER
N
0
1,000 FEET
KMWT-01
CHAIN LINK FENCE
CAPPED AREA
TWO NATURAL CHANNELS OFF THE MARSH TO RIVER
NORTH CHANNEL
SOUTH CHANNEL
SO-16
KMWT-06
SO-17
RAILROAD
Co. Hwy E
SO-18
RIVER SEDIMENT SAMPLING LOCATIONS
No. of Segments
SO-16 2
SO-17 3
SO-18 4
WATER TOXICITY SAMPLING LOCATIONS
KMWT-01 UPRIVER REFERENCE
KMWT-02 - At fence
KMWT-03 - At mouth
} ASSOCIATED WITH NORTH CHANNEL
KMWT-04 - At fence
KMWT-05 - At mouth
} ASSOCIATED WITH SOUTH CHANNEL
KMWT-06 DOWNRIVER SITE