GREAT LAKES INDIAN FISH AND WILDLIFE COMMISSION

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• MEMBER TRIBES •

MICHIGAN	WISCONSIN		MINNESOTA
Bay Mills Community	Bad River Band	Red Cliff Band	Fond du Lac Band
Keweenaw Bay Community	Lac Courte Oreilles Band	St. Croix Chippewa	Mille Lacs Band
Lac Vieux Desert Band	Lac du Flambeau Band	Sokaogon Chippewa	

Via Electronic Mail

January 31, 2017

Mr. Erik Smith
Industrial Division
Minnesota Pollution Control Agency
520 Lafayette Rd. N, St. Paul, MN 55155

Dear Mr. Smith,

Thank you for the opportunity to comment on the draft NPDES permit for the US Steel Minntac facility. These comments follow up on, and expand on, my email of December 23rd, 2016 and represent GLIFWC staff comments on the proposed permit and associated Fact Sheet.

GLIFWC is acting in coordination with our member tribes, including Fond du Lac, to review and contribute to the Minntac water discharge permitting process. As you may know, GLIFWC is an agency exercising delegated authority from 11 federally recognized Ojibwe (or Chippewa) tribes in Wisconsin, Michigan and Minnesota.[1] Those tribes have reserved hunting, fishing and gathering rights in territories ceded in various treaties with the United States. GLIFWC's mission is to assist its member tribes in the conservation and management of natural resources and to protect habitats and ecosystems that support those resources. The Minntac tailings basin is located within the territory ceded by the Treaty of 1854 and impacts treaty protected resources in that territory.

The MN-PCA's approach to permitting water discharges from the Minntac tailings basins does not adequately protect surface water resources, primarily because it does not follow Clean Water Act (CWA) requirements to protect downstream surface waters. While it is understandable that bringing the facility into compliance is complicated by the lack of enforcement for many years, now is not the time to further delay the necessary actions. Identified below are several areas where the draft permit falls short of what is necessary to protect downstream surface waters. Referenced materials are available on-line as indicated in the References section of this document.

1) Inconsistent identification of waters subject to NPDES permitting:

The PCA Fact Sheet identifies "ponded features" as subject to a NPDES permit (pg.7). Yet there are surface waters surrounding the basin that fit this description and are not proposed for regulation under a NPDES permit. For example:

1 GLIFWC member tribes are: in Wisconsin -- the Bad River Band of the Lake Superior Tribe of Chippewa Indians, Lac du Flambeau Band of Lake Superior Chippewa Indians, Lac Courte Oreilles Band of Lake Superior Chippewa Indians, St. Croix Chippewa Indians of Wisconsin, Sokaogon Chippewa Community of the Mole Lake Band, and Red Cliff Band of Lake Superior Chippewa Indians; in Minnesota -- Fond du Lac Chippewa Tribe, and Mille Lacs Band of Chippewa Indians; and in Michigan -- Bay Mills Indian Community, Keweenaw Bay Indian Community, and Lac Vieux Desert Band of Lake Superior Chippewa Indians.

a) a seep is circled (Figure 1) just to the south of SD002 that has a connection to Admiral Lake by a continuous channel visible in Google Earth. Additional ponded features touching the basin berm and stream channels leading from those ponded features are visible in attached aerial photos from 2015 (Figure 2a and 2b) and 2013 (Figure 3a and 3b).

b) seepage at SD002 is incompletely captured and escaped seepage is visible in Google Earth photos. The pool in Figure 3b at the foot of the berm appears to be receiving direct overland discharge from the collection system. Even if there is not overland flow of seepage, the ponding of water immediately outside the containment wall indicates that uncaptured basin water is traveling only a very short distance to emerge as surface water. Water samples should be collected in that ponded feature to confirm the source of its water.

c) other areas of ponded water at the toe of the basin are too numerous to list but are visible in aerial photos of the site (white highlighted in Figure 4). Most of these ponded areas are connected by visible channels to waters of the state and the U.S. In particular, some of the near-basin ponded areas are connected to the Sand River by visible stream channels (Figure 3b and 5).

d) the ponded features abutting the berm within a few feet of, but outside, the collection system (Figure 3b) and the discolored ponded waters downgradient and within 100 feet of the basin berm (Figure 2b) suggest that basin discharge is adversely impacting surface waters. Water quality in those surface water features must be protected.

2) Distinction between "Discharge(H)" and "Discharge(NPDES-CWA)" in order to avoid NPDES permitting for the basin's east side discharges is unsupported by the facts:

The CWA applies to waters of the U.S. which include waters connected to navigable waters and wetlands connected to other waters the U.S. At the toe of the basin there are many wetlands, ponds and channels that are receiving water from the basin through the basin berm and bottom. It is difficult to find a rationale for regulating some of the water passing through the berm (i.e. SD001) with a NPDES permit, yet not regulating other water that passes through that berm in an identical manner (e.g. uncaptured seepage near SD002 and seepage at other points near the toe of the east and west berms that form ponded features and stream channels). The conclusion made by the PCA on page 8 of the Fact Sheet:

> "Therefore, in this permit the MPCA finds the transfer of pollutants via deep groundwater from the tailings basin to distant surface water (not adjacent to the basin) does not meet the CWA definition of a point source. Consequently, it is not a discharge (NPDES) under the CWA."

is not particularly relevant because the water is not traveling "to distant waters" but emerging and ponding near the toe of the basin and then traveling in surface water channels to the Sand River. A NPDES compliance point should exist in the headwaters of the Sand River (i.e. the channel near the basin east berm that leads to Admiral Lake).

3) Seepage emerging near the east toe of the basin does not travel as in a deep aquifer:

The concept, proposed in the Fact Sheet, that deep seepage travels substantial distances underground to receiving waters such as the Twin Lakes may be partially true, yet does nothing to address the fact that much, if not most, seepage never travels any significant distance through the underlying aquifer but discharges to surface waters immediately adjacent to the basin berm and is not captured.

Upward gradients at toe of basin.- Well nests near the toe of the east dam of the basin but outside the capture system show strong upward gradients (for example PZ 5, Figure 2.9 and Table 2.1 in CRA 2013a (see references). In the words of the CRA report on modeling:

> "Downgradient the toe of the basin dike from PZ-5 to MW-12 well-nests, an upward vertical hydraulic gradient was observed within the glacial outwash aquifer in part due to the presence of the bedrock surface depression and the elevated pressure head from the Minntac Tailings Basin pools. The upward vertical hydraulic gradient in the majority of the well-nests was observed consistently between the August 2010 and April 2012 monitoring events, as presented in Table 2.1."

Piezometer PZ-5 is 150 feet from the basin north-east dike and MW-12 is 350 feet from the dike. There are no piezometers closer to the dike. Both are outside the Seep Collection and Return System (SCRS) system that was installed in 2010. At the closest of these wells (PZ-5), which is screened at the top of the water table, water is contaminated by sulfate (Table 2.2, CRA 2013a) at a level similar to that found in the tailings basin (~900 mg/L). Unfortunately, there are no piezometers near SD002 where water has ponded immediately adjacent to the basin berm, but there is no reason to think that upward flow of basin water does not occur there as well.

It is not surprising that there are upward gradients and discharge near the toe of the basin dam. Why would basin water remain trapped below the land surface in the relatively thin surficial aquifer and travel to distant surface water features? Head pressures, and the path of least resistance, would quickly drive the water to the land surface where it can flow easily as surface water. Particle tracking in CRA's second report (CRA, 2013b and attached Figure 6) indicates that water from the basin would discharge to the nearest available wetland. Although CRA did not do particle tracking near the headwaters of the Sand River and Admiral Lake (adjacent to SD002), the conclusion would certainly be the same: discharge to the nearest available surface water feature. The nearest ponded features and wetland to the basin dike in that area abut the dike.

High heads drive basin waters to nearby surrounding surface waters.- The state recognizes that "basin-impacted groundwater is currently reaching surface waters and having an impact on those surface waters" (Fact Sheet pg.38), yet maintains the tenet that the water travels over extensive distance as deep seepage before discharging to surface waters and therefore the discharge is not covered by the CWA. That tenet is not supported by observation, basic hydrogeology, or even the company contracted modeling identified above.

Because of the high heads in the basin compared to the surrounding aquifer, any reasonable analysis of groundwater flow will show that virtually all the water in the aquifer in the vicinity of the basin has its origin in the tailings basin and is flowing from the basin to nearby receiving waters such as the headwaters of the Sand River, Admiral Lake and the shallow ponds adjacent to the basin berm. The factual information on site hydrogeology in the Fact Sheet page 11 supports this. The Fact Sheet states "considerable emergent flow at and near the base of the dams is expected and has been observed." It is clear from the Fact Sheet, from aerial photographs, from water quality measures and from basic concepts of hydrology, that basin water is emerging adjacent to and in close proximity to the basin dam, ponding and then flowing as surface water to the headwaters of the Sand River and into Admiral Lake.

4) The draft permit overlooks existing water quality standards for the Sand River watershed:

The Fact Sheet clearly states that the tailings basin is causing an exceedance in downstream water quality

standards (Fact Sheet: pg.17, pg.35), yet the draft permit ignores the current sulfate 10 mg/L surface water standard in the Twin Lakes. The exceedance of the 10 mg/L sulfate standard is extremely well documented, has been occurring for many years and has not been remedied by the attempted capture of seepage at SD002. While the draft permit considers some of the water quality standards in the Dark River when setting compliance goals for water quality in the tailings basin, it ignores the water quality standards in the Sand River and Twin Lakes. The permit and compliance schedule is written as if there is no existing sulfate wild rice standard nor any identified wild rice waters downstream of the basin. Neither of these is the case.

5) The schedule of compliance appears to have no schedule for actual compliance with surface water standards in the Sand River watershed:

There appears to be no deadline or even interim targets for meeting surface water quality standards in the Sand River watershed. The permit has only requirements for research and descriptions of possible steps toward pollutant reduction. The rational seems to be the MN legislature's move to prevent enforcement of the state sulfate standard. The applicant is being asked to repeat, or simply polish, past work rather than take real steps toward reducing contaminant load.

The compliance schedule described in the Fact Sheet under "SDS Schedule for Deep Seepage - Final Compliance Plan" (pg.40) makes no mention of the need to reduce sulfide load to meet downstream water quality standards in the Sand River. The only goal appears to be to meet the groundwater standards by reducing concentrations in the basin. Without identification of specific reductions within the permit period and with no requirement that standards be met within any defined period, this permit requires no concrete steps toward meeting surface water quality standards in the Sand River basin.

6) The NPDES permit for the headwaters of the Dark River overlooks important pollutants:

In 2015 and 2016, GLIFWC staff cooperated with the University of Wisconsin in sampling the upper reaches of the Dark River and found exceedances or near exceedances of multiple water quality parameters. For example: in July 2016, at the Sherwood Anderson Road (Co. Rd. 668) bridge, approximately 7 km downstream of the basin, the Dark River was high in specific conductance (1490-1585 uS/cm), TDS (1170 mg/l), alkalinity (415 mg/l), sulfate (476 mg/l), Mg (152 mg/l), P (84 ug/l), Ca (82 mg/l), Se (4.1 ug/l), and moderately high in pH (8.0), fluoride (0.43 mg/l), chloride (45 mg/l), bromide (0.34 mg/l), Li (8.2 ug/l), B (143 ug/l), Na (34 mg/l), K (6.4 mg/l), Mn (127 ug/l), Rb (5.4 ug/l), Sr (219 ug/l), Cs (0.11 ug/l), Ba (35 ug/l), and U (1.4 ug/l), and was low in DO (5.7 mg/l, 69%).

The water at this sample site was in exceedance of the state specific conductance criterion of 1000 uS/cm, the TDS criterion of 700 mg/l, and the water hardness criterion of 500 mg/l. The water was also in exceedance of the state phosphorus criterion (30 ug/l). In addition, the selenium concentration exceeded the 2016 EPA recommended criterion for streams and rivers (3.1 ug/l) and manganese exceeded the EPA human health criterion and would exceed the state standard for trout waters. For rice waters in the Dark River, the sulfate concentration far exceeds the state criterion of 10 mg/l. Sampling was conducted up and downstream on the Dark River and indicated that the concentration of several parameters increased as one sampled closer to the basin. A complete report of the sampling in the upper Dark River will be released in mid-2017.

Curiously, Table 5 of the Fact Sheet predicts concentration of manganese (Mn) to be 78.97 ug/L which would exceed the state 1B waters standard of 50 ug/L, yet limits on manganese are not proposed.

The parameter list for monitoring and limits in the draft permit are inadequate and should be expanded to include those parameters identified above that may be exceeded during the 5-year permit period. Including those parameters in sampling requirements for "Application for Permit Reissuance" (pg. 31 of the draft permit) is inadequate, particularly since permits have not been renewed in a timely manner in the past.

7) The NPDES permit for the headwaters of the Dark River overlooks wild rice water quality standards for Dark Lake:

Dark Lake is recorded to have wild rice and is on the list of rice waters in the MPCA Wild Rice Waters database of July 19, 2016 (MN-PCA, 2016b). It was also part of the MPCA's field survey of rice waters in 2013 (MN-PCA, 2015). In multiple locations on Dark Lake, MPCA found wild rice. Measurements by GLIFWC and the PCA of sulfate levels above and below Dark Lake exceed the wild rice sulfate standard. The NPDES and SDS permits for the Dark River discharge must be formulated to prevent exceedance of the 10 mg/L rice standard in Dark Lake.

8) The Upper Sand River and Admiral Lake are Minnesota Protected (Public) Waters and Waters of the U.S:

The portion of the Sand River between the Minntac tailings basin and Little Sandy Lake is mapped as "Protected (i.e. Public) Water" by the Minnesota DNR: (http://www.dnr.state.mn.us/waters/watermgmt_section/pwi/maps_ne.html) and is listed on page 50 of the St. Louis Co. Protected Waters: (http://www.dnr.state.mn.us/waters/watermgmt_section/pwi/download_lists.html and Attachment 1). It is listed as originating in section 15 (T59, R18) near Co. Hwy. 568 before flowing into the Sandy Lakes. While County Hwy. 568 has been flooded out by the tailings basin for many years, the road's footprint is still visible in aerial photographs, as is the channel of this section of the Sand River (Figure 5).

The section of Sand River flowing from the basin to Admiral Lake, and Admiral Lake itself, are represented as perennial water bodies on USGS topographic maps at least as far back as 1951 (Figure 7). While the very upper reaches of the Sand River were covered with tailings in the 1960s and '70s, the river downstream of the basin remains on state and federal maps of the area. The most recent Minnesota GIS data of state Protected/Public waters (https://gisdata.mn.gov/dataset/water-mn-public-waters) shows the upper Sand River as originating at the toe of the Minntac tailings basin. The latest (2016) USGS topographic map of the area continues to show the upper reaches of the Sand River and Admiral Lake as perennial water bodies (Figure 8).

The map record, dating back to at least 1951 and recent maps and aerial photographs indicate that the Sand River has its origins within feet of the Minntac tailings basin, is a perennial water body and is a Minnesota Protected/Public Water. As such, water quality and water quantity in this water body must be protected from Minntac tailings basin discharges.

9) The system on the east side captures only approximately 43% of basin seepage into the Sand River.

Calculations by the MN-PCA (MN-PCA, 2016a) indicate that less than half the seepage from the tailings basin is being captured by the SCRS in the headwaters of the Sand River. This actual capture efficiency is in line with, although less than, the earlier projections by U.S. Steel consultants of a capture efficiency of 59% for the SCRS (STS, 2007).

More than 50% of the water discharging from the basin is not captured by the collection system and enters the Sand River. Given the origin of the Sand River at the toe of the Minntac tailings basin east dam and the continued discharge from the basin to the river, a NPDES permit and permits limits are needed for the discharge to the river. A weir in the Sand River between Admiral Lake and the basin or at the outlet of Admiral lake would allow for monitoring and limiting of pollutants leaving the basin.

In summary, the draft permit is incomplete or inadequate for the following reasons:

- The draft permit overlooks the discharges to the Sand River basin because of inconsistent identification of waters subject to NPDES permitting.

- While some seepage may travel relatively long distances, seepage emerging near the east toe of the basin and entering the Sand River does not travel as "deep seepage" over significant distances.

- The draft permit overlooks existing water quality standards and has no schedule for actual compliance with existing surface water standards in the Sand River watershed.

- The NPDES permit for the headwaters of the Dark River overlooks important pollutants that appear to exceed water quality standards for trout waters and rice waters.

- The Upper Sand River and Admiral Lake are Minnesota Protected (Public) Waters and Waters of the U.S and are, therefore, subject to the Clean Water Act. Since the system on the east side of the Minntac basin captures only approximately 43% of basin seepage into the Sand River, limits on pollutants need to be set to protect the Sand River water quality.

We look forward to a revised draft permit that takes these issues into account.

Sincerely,

John Coleman

John Coleman, GLIFWC Environmental Section Leader

cc: Jonathan Gilbert, Director, GLIFWC Biological Services Division
Ann McCammon Soltis, Director, GLIFWC Division of Intergovernmental Affairs
Nancy Schuldt, Water Projects Coordinator, Fond du Lac Environmental Program
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References:

(available at: https://gis.lic.wisc.edu/wwwlicgf/glifwc/Minntac/NPDES2016/)

STS, 2007. Subsurface Exploration and Seepage Evaluation, Minntac Tailings Basin, Iron Mountain, Minnesota, U.S. Steel Corporation.

CRA, 2013a. Groundwater Flow And Sulfate Transport Modeling Report, Minntac Tailings Basin, U. S. Steel Corporation Mountain Iron, Minnesota. June 2013.

CRA, 2013b. Estimate of Time of Travel between the Tailings Basin and the Twin Lakes Minntac Tailings Basin, United States Steel Corporation, Mountain Iron, Minnesota. July 11, 2013.

MN-PCA, 2015. Wild_field_survey_updated_Feb_6_2015.xlsx

MN-PCA, 2016a. Memo to File MN0057207. U.S. Steel Minntac Tailings Basin – Sulfate in Sand River and Twin Lakes – SCRS impacts

MN-PCA, 2016b. MPCA Wild Rice Waters database (July 19, 2016)

Figures

Figure 1. Minntac basin east berm, seep SD002, surrounding wetlands and adjacent surface waters (circled).

Figure 2a. Google Earth image (2015) of Minntac basin, Admiral Lake and upper Sand River.

Figure 2b. Google Earth image (2015) of seep SD002, pump house, and discolored surface waters (circled).

Figure 3a. Seep SD002 and surface water features connecting to the Sand River.

Figure 3b. Seep SD002, pump house, stained ground, ponded surface water features at the base of the tailings basin dam and surface water channels leading from those features.

Figure 4. Minntac basin and ponded water features (outlined in white) along the east side of basin dam.

Figure 5. Minntac basin east berm, ponded features and channels leading to the Sand River.

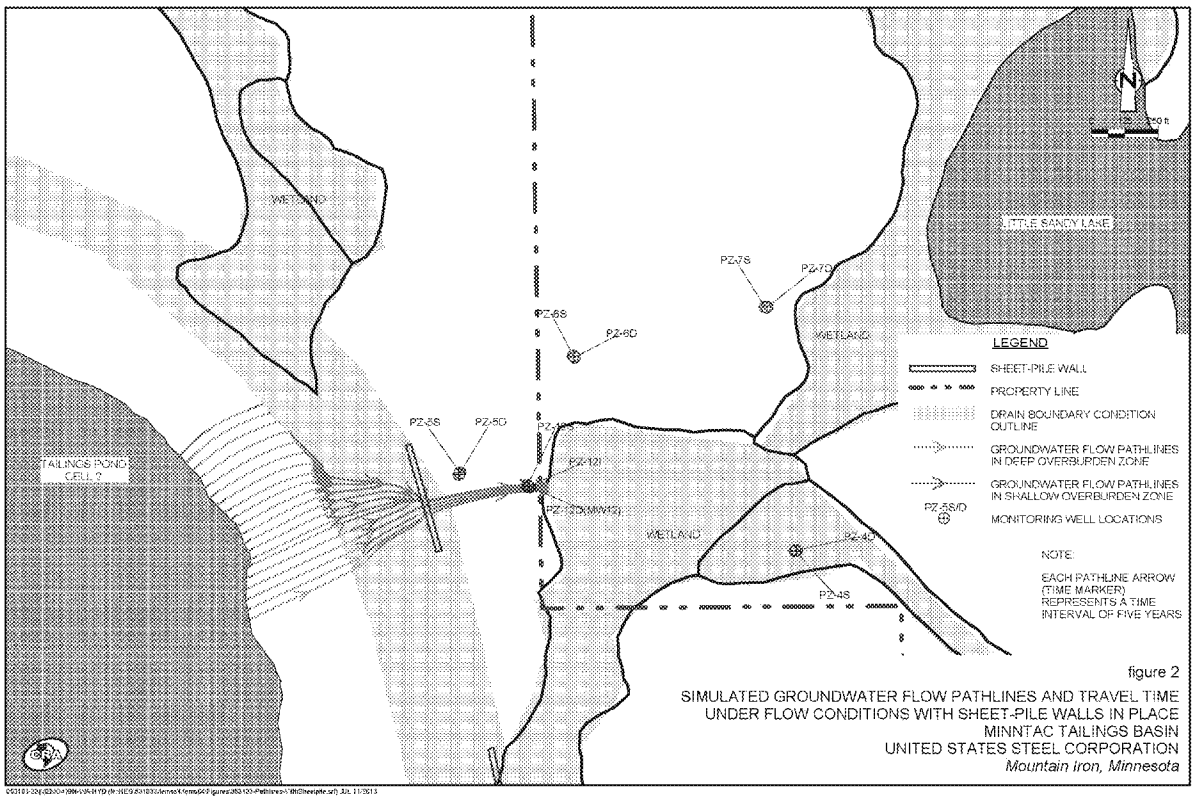

Figure 6. Figure 2 of CRA report titled: "Estimate of Time of Travel between the Tailings Basin and the Twin Lakes Minntac Tailings Basin, United States Steel Corporation, Mountain Iron, Minnesota. July 11, 2013."

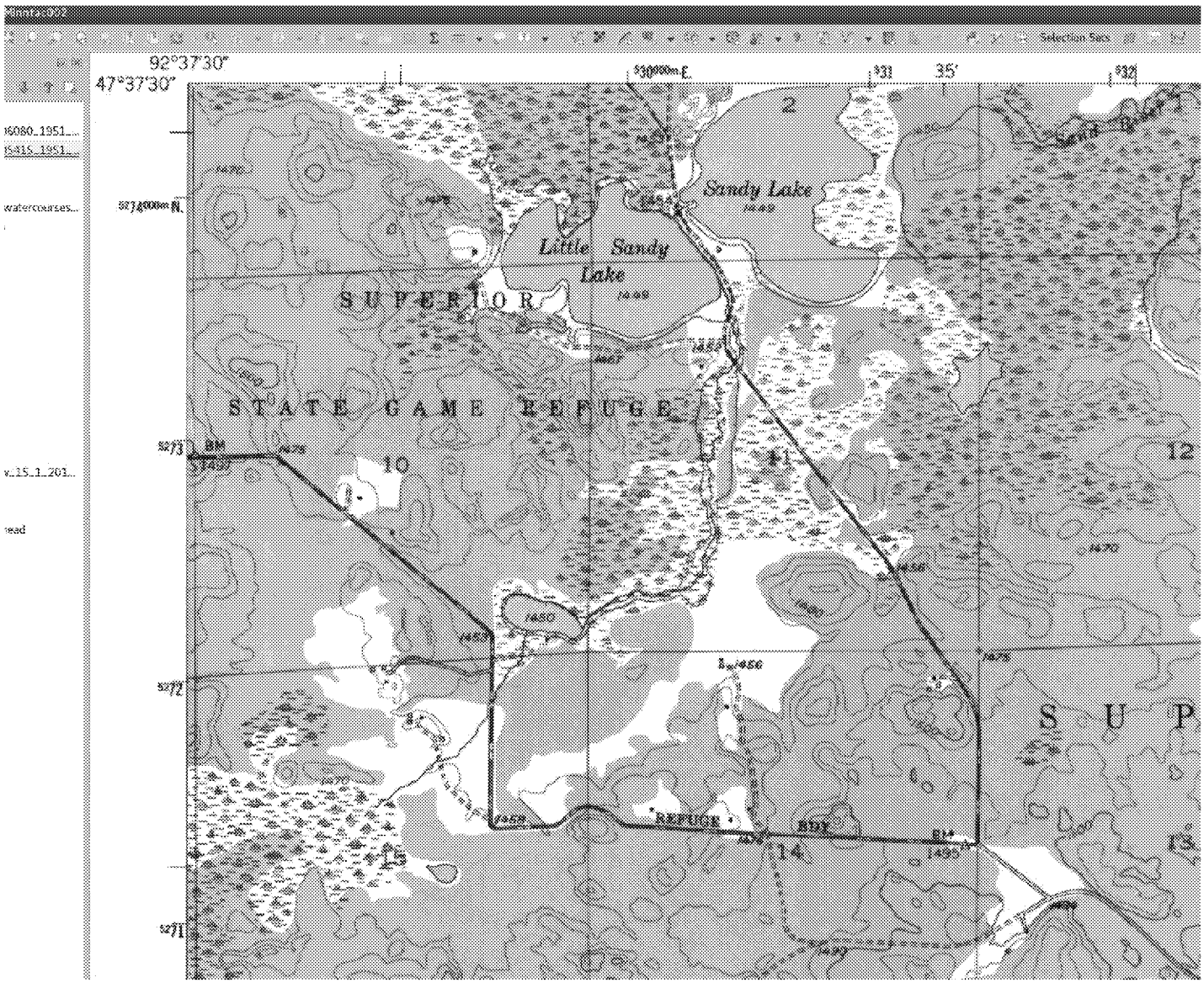

Figure 7. USGS topographic map published in 1951, based on aerial photos from 1947, showing the origin of the upper Sand River in a wetland that is currently covered by the Minntac tailings basin. County Hwy. 568, which is no longer passable, is visible just west of Admiral Lake.

Figure 8. USGS topographic map published in 2016. The upper Sand River is shown flowing from the Minntac basin in Section 15 to Admiral Lake and from there to the Sand Lakes.