Attachment C

Preapplication Notification Information
Pursuant to s. 295.465(2), Wis. Stats.

March 10, 2014

WDNR Protocols and Sampling Methodologies

Set forth below are examples of how WDNR might conduct monitoring, laboratory, and quality assurance strategies and protocols. Equivalent methodologies and approaches that are in conformance with federal and state statutes and regulations can be proposed for consideration. In addition, the department has available electronic copies of standard operating procedures and other guidance documents for surface water, lakes, streams and wetlands monitoring. Copies can be provided to GTAC or its consultants upon request. Specific parameters such as timing, distances and sample frequency are not intended to serve as requirements at this point, but as further examples. These parameters will be finalized as part of the final monitoring strategy and may change as new information becomes available. Less flexibility is available for methods and protocols that are prescribed by statute or administrative code.

WDNR field sampling protocols

- Biological
  - Fisheries (Index of Biotic Integrity (IBI), Catch Per Effort (CPE), Proportional Stock Density/Relative Stock Density (PSD/RSD), Age, Growth)
    - a) All streams within the mine site (a stream would be considered "within" if any portion of the stream falls within the Mine Site) would be sampled between June 15 and Sept. 15; sample 1 site every 3 stream miles (minimum of 2 sites/stream < 3.0 miles in length, with at least one site within and one site outside the Project area; minimum of 3 sites/stream ≥ 3.0 miles in length, with at least 1-2 sites within and 1-2 sites outside the Project area) with a site length of 35 times the mean stream width (minimum of 100 m), collecting all fish species. A stream shocker (towed-barge) would be preferred, but if access is difficult or the stream is relatively small and shallow, a back-pack electrofishing unit may be used.

    - b) Select streams within the mining vicinity. Note: In order to establish current conditions for potentially-impacted fisheries resources, the department would begin by characterizing resources in close proximity to the mine site. The majority of surface waters closest to the anticipated impact area are found to drain within Federal Hydrologic Unit (HUC) 12 level watersheds #040103020202 (Middle Tyler Forks) and #040103020304 (Devils Creeks-Bad River). In addition to these close-proximity waters, other fisheries resources within the mining vicinity that are anticipated to be impacted would need to be characterized. An example sampling strategy would include the following: Between June 15 and Sept. 15; sample 1 site every 3 stream miles (2 sites/stream < 3.0 miles; 3 sites/stream ≥ 3.0 miles) with a site length of 35 times the mean stream width (minimum of 100 m), collecting all fish species. A stream shocker (towed-barge) is preferred, but if access is difficult or the stream is relatively small and shallow, a back-pack electrofishing unit may be used.

    - c) A set of undisturbed reference streams (outside the area of expected mining-related impacts) that are in close proximity to the impacted areas (mine site and mining vicinity) would serve as controls and would be used to monitor natural variation and other regional factors (e.g., climate). These sites would also be valuable in helping to understand

and evaluate impacts observed in streams located closer to the mining site. An appropriate sampling strategy would be the same as the strategy used in b) above in order to appropriately evaluate any potential changes.

- d) Assess fish communities in lakes that may be impacted directly or indirectly by the activity. This would involve a Spring Electrofishing II survey following the lake sampling protocol below:

- Lake Sampling Protocol (modified from Simonson et al. 2008)

Protocol	Gear	Temp. Range	Species	Data	Metrics
Spring Electrofishing II (SE II - Centrarchid CPE)	Boom shocker, 3/8" mesh dip net bags	55 – 70 F	Identify and count all fish; measure all gamefish; measure and count all panfish in index stations and measure 250 of each species	Length frequency; counts; distance and time shocked; aging structures	CPE, PSD/RSD, age and growth

- Data Reported, Information and Date:
  Stream Surveys:
  - Gear and settings used along with a description of the sampling conditions.
  - Survey Station Characteristics – station length, mean stream width, GPS coordinates (starting and ending locations).
  - Fishery Survey Results – Raw Data: complete sampled species list with number of each species captured, all gamefish measured. Data Summary: species list with number sampled, index of biotic integrity (IBI) score and integrity rating, catch-per-unit-effort (number per mile) and a length frequency histogram for each gamefish species.

  Lake Surveys:
  - Gear and settings used along with a description of the sampling conditions.
  - Survey Station Characteristics – GPS coordinates (starting and ending locations), distance and time sampled/shocked.
  - Fishery Survey Results – Raw Data (within each individual survey station): complete sampled species list with number of each species captured and all gamefish/panfish measured (250 fish minimum for each panfish species within each individual survey station). Data Summary: species list with number sampled and catch-per-unit-effort (number per mile) value, length frequency histogram for each gamefish and panfish species along with relative stock density (RSD) values, and mean length at age estimates (along with number sampled at each age and standard deviation) from an aged sub-sample of each gamefish and panfish species.

- The department would also monitor for macroinvertebrates (kick and hester dendy, and metrics, Hilsenhoff Biotic Index (HBI), Macroinvertebrate Index of Biotic Integrity (MIBI)), conduct point intercept surveys, and utilize critical habitat methods.

- Lakes
    - Lakes include all lakes that may be impacted directly or indirectly by mining activities. Lakes would be monitored to assess the potential impacts of groundwater withdrawal, surface runoff (via disturbed land in the watershed), and aerial contamination (e.g. dust particles that may result in the deposition of metals, sulfate, and/or phosphorus). Lakes would be sampled for water levels, water quality, aquatic plant surveys, and sediment cores for metals. A subset of these lakes would be monitored for mercury and selenium in zooplankton and fish tissue. Water levels would be sampled every 2 weeks throughout the ice-free period. Aquatic plant surveys would occur annually between July 1 and August 15. Sediment cores would be taken once prior to mining. Water quality samples would be taken once mid-winter, once during spring and fall turnover, and every two weeks between the spring and fall mixing periods.

- Wetlands: Wetland ecological evaluation methods would be used to assess the wetland functional values of a proposed discharge or other activity. The proposed methodologies include the following (subject to U.S. Army Corps of Engineers approval):

    - The Wisconsin Rapid Assessment Methodology provides the framework for assessment of the wetlands expected to be impacted, within the context of wetland functions throughout the watersheds in which they occur. Wisconsin DNR is finalizing minor revisions to the Wisconsin Rapid Assessment Methodology (WRAM), which provides for both evaluation of the level of performance of wetland functional values by a wetland assessment area, and also an assessment of biological condition of the assessment area. The US Army Corps of Engineers is currently reviewing the WRAM for use in its regulatory program. Wisconsin law (s. 295.60(4)(e), Stats.) requires that any wetland assessment method used in a ferrous mining wetland review process be approved by the US Army Corps of Engineers.

    - Because of the number of wetlands in the project area it would not be efficient to conduct separate evaluations for every possible wetland assessment area. Further, WRAM evaluation requires consideration of many factors, including the surrounding watershed characteristics, immediate land cover characteristics, the habitat context of the assessment area and surrounding habitat, and nearby habitat patches. Typically a 12-digit Hydrologic Unit is recognized as the appropriate scale for the functions of storm and floodwater storage and water quality protection. for groundwater protection, wetlands in a headwater position or near a groundwater divide should be identified, and seeps, springs and other indicators of groundwater presence would also be identified in the field. For shoreline protection wetland position relative to adjacent water

bodies is a critical factor. For fish and aquatic life habitat identification of a connection or lack of connection to the stream network and lakes and ponds is necessary. For wildlife habitat, size and juxtaposition of the assessment area and adjacent habitat is needed.

- A Landscape Level Wetland Functional Assessment using NWI+ mapping conventions would be conducted to assist the assessment of wetland function. Wetland functional assessment requires understanding each wetland's placement within the landscape, water network and watershed context. This can be efficiently organized by mapping these characteristics throughout both the expected project impact area and the entire 12 digit watersheds which might be affected. In addition to the Cowardin classification system used by the Wisconsin Wetland Inventory, hydrogeomorphic classification, the NWI+ system would be used to facilitate the efficient consideration of wetland landscape position, landform, waterbody and water flow path in determining the significance of wetland functional performance. As wetlands are delineated in the field, they can be assigned the proper hydrogeomorphic classification in a GIS layer. This method allows a preliminary landscape level wetland functional assessment for the entire watershed.

- Floristic Quality Assessment using timed meander surveys within a probabilistic sampling design would be used to support assessment of Floristic Integrity. Floristic integrity is assessed separately in WRAM based on vegetative characteristics or based on conducting a plant inventory of the assessment area using Floristic Quality Assessment (FQA) benchmarks that were developed in the Southeastern Glacial Plains ecoregion. WDNR has been working with UW-Superior's Lake Superior Research Institute over the past 2 years conducting timed meander surveys of all the non-coastal wetland plant communities in the Lake Superior Basin. Research is expected to be completed in March 2014, resulting in establishment of benchmarks for FQA metrics to distinguish plant community condition levels for inland wetlands in the Lake Superior Basin (Hlina, Danz, Bernthal in prep). Methods are documented in the study's Quality Assurance Project Plan.

- Wisconsin Wetland Inventory (WWI). Map all wetlands as they occur on the ground in a GIS, creating polygons for all wetlands greater than 1/10 acre (4,356 sq ft or 66 ft by 66 ft), points for wetlands smaller than 1/10 acre. Characterize wetland vegetation and hydrogeomorphic type by applying Cowardin classes (WWI system), and landscape position, landform, water flow path and waterbody type descriptors (NWI+ system) to all wetland polygons, and to points where possible. This would be necessary to facilitate efficient functional assessment of the many wetlands in the project area.

- Suggested Protocols for Wildlife Surveys

  - Small Mammal Monitoring Protocol. Small mammal monitoring should follow the protocols contained in Chapter 5 of the USDA

Multiple Species Inventory and Monitoring Technical Guide, Gen. Tech. Report WO-73 (2006).

- Bird Monitoring Protocol. Bird surveys should follow protocols outlined by U.S. Fish and Wildlife Service Team Technical Report BMT-2008-01, SOP#5; Landbird Monitoring Protocol for the U.S. Fish and Wildlife Service, Midwest and Northeast Regions. SOP #5 details the bird point count protocol.

- Track Count Protocol The department has a specific protocol for performing furbearer winter track counts. This document will be available with the various wildlife survey forms and worksheets by request.

Laboratory Protocols and Methods

a. Many of the environmental monitoring requirements, including what approved methods and limits may apply and what laboratory certification is necessary, are specified in statutes or administrative rules. The approved methods applicable to the Clean Water Act (CWA) are set forth in the Federal Register, 40 CFR, part 136. Approved methods and technologies for the environmental analysis of non-drinking water samples in Wisconsin can be found in ch. NR 219, Wis. Adm. Code. Please note that for wastewater discharge samples, the SW846 methods will not apply in the next revision of NR 219 and are no longer acceptable to the EPA. Technologies for environmental analysis of solid matrices are listed in appendices of NR 149. If parameters are not listed by any of the programs or included in the regulations (e.g., methyl mercury), those methods should be reviewed by department staff for applicability and sensitivity.

b. Laboratory tests are to be performed by a laboratory certified or registered for the matrices and parameters being analyzed. Exceptions for certain tests are noted in s. 295.64(2), Stats. The Department of Agriculture, Trade and Consumer Protection (DATCP) also certifies laboratories that test drinking water samples for bacteria. The American Industrial Hygiene Laboratory Accreditation Program (AIHA-LAP) certifies industrial hygiene laboratories for testing methods of air samples for EPA regulated pollutants.

c. Laboratory protocols for method detection limit studies and confirmation procedures are included in ch. NR 149, Wis. Adm. Code. The accuracy and precision criteria are indicated in the analytical method or method reference, including the applicability of laboratory performance based control limits. Method detection limits must be below regulatory standards and sufficient to meet project objectives. Consideration for the sensitivity of the technique chosen must meet the specified data quality objectives wherever possible.

Quality Assurance and Quality Control (QA/QC)

a. General – for monitoring of all surface waters and wetlands
    i. A Quality Assurance Project Plan would be developed
    ii. Standard Operating Procedures would be documented

iii. Extensive and detailed requirements for laboratory QC procedures are typically specified in the methods. If not specified by the method, the type and frequency of field QC samples would be determined prior to collecting samples for a specific project. Quality control samples are prepared in the field and at the laboratories to monitor the bias and precision of the sample collection and analysis procedures.
iv. Field blanks and replicates would be obtained and analyzed in approximately 10% of the samples