



Crooked and Eagle Lakes Dewatering Update
Water Resources Division

As a result of monitoring reports indicating possible damage to downstream water resources, Texas Township was notified on September 25, 2019, that the Department of Environment, Great Lakes, and Energy (EGLE) was reducing the maximum allowable pump rate out of Crooked Lake from 2000 gallons/minute down to 1000 gallons/minute. In the same communication, EGLE also waived the permit requirement for a two-day break for every 13 days of pumping. Together, these actions will effectively reduce the maximum pumping allowed out of Crooked Lake by approximately 50 percent. The effects of the reduced pumping rates have been modeled by Texas Township's engineering firm, and while at a slower rate, they will continue the ongoing steady drawdown of Eagle, Crooked, and Pine Island Lakes. EGLE will also continue to work with Texas Township to find the optimal pumping rate that balances the need for continued lake level reductions, while minimizing impacts on downstream properties and public resources.

Since the reduction in pumping rates was announced, there have been several inquiries by concerned residents that are impacted by the decision. The most common questions and concerns are addressed below:

What information did EGLE use to make this decision?

EGLE utilized monitoring reports submitted by Texas Township's consulting firm and EGLE staff inspections confirming the information collected in the monitoring reports. The reports first documented biological stress in downstream wetland vegetation in July 2019. The impacts to vegetation grew more severe and more widespread throughout August and September 2019. EGLE's decision to limit pumping in late September 2019 was intended to give the downstream ecosystems an opportunity to recover before the dormant season. See below for a synopsis of the monitoring reports. The reports themselves can be viewed on Texas Township's Web site:

<https://onedrive.live.com/?authkey=%21ADxRpvky288gW58&id=6848A5038272B2EE%21106&cid=6848A5038272B2EE>.

How does EGLE know that the downstream impacts are being caused by pumping and not the high groundwater levels?

Water level monitoring from before pumping began and after the September 2019 rate reduction indicate that the pumping is a substantial factor in the downstream water levels and contributing to the documented ecosystem stress. Although the high groundwater levels could also be contributing to the downstream impacts, it is clear that the pumping is a contributing factor. Reducing the pumping rate and tracking the water level response will help EGLE and Texas Township better understand these contributing factors and implement adaptive management techniques to adjust pumping rates and schedules that alleviate lake level impacts and minimize downstream impacts.

Why are a few inches in water level change and plant stress such a big deal?

Hydrologic stress can affect wetland functions in many ways, including reduction in flood storage capacity, reduction in erosion control and sediment filtration capacity, decreasing biodiversity, and degrading fish and wildlife habitat. The downstream natural resources from this project are dependent on those functions. While all the potential functional loss may not be immediately apparent, the increasingly severe plant stress is indicative that some of those functions are at risk. Some of the wetland types that are being affected can regenerate quickly. Others, such as Tamarack Swamp, will take a very long time, if they will recover at all. EGLE believes that, at least temporarily, a reduced pumping rate (which still provides a steady drawdown of Crooked, Eagle, and Pine Island Lakes) is necessary to protect the integrity of downstream public natural resources. We will continue to work with Texas Township to identify the most appropriate pumping rates and schedules that will provide relief to flooded upstream lakefront property owners and long-term protection of the downstream properties and public natural resources.

Synopsis of Submitted Monitoring Reports

Since mid-July 2019, the permittee-submitted monitoring reports have consistently documented symptoms of hydrological stress in woody vegetation within the wetland monitoring sites. This has manifested in the forms of leaf spotting, early color change in foliage, leaf wilting, early dropping of foliage, and some apparent mortality. At first, the symptoms were limited to certain woody species within the sites that were the most saturated at the time of baseline monitoring. However, throughout the summer, even during a prolonged period of hot and dry weather in July and August 2019, increased signs of stress to woody species was noted. This timing correlated to GEI Consultants, Inc's observation that multiple sites that previously only had stagnant standing water contained areas of free-flowing water forming channels within the vegetation. Wilting, color change in foliage, and leaf drop were increasingly noted in multiple woody species distributed across all sites, even when water surface elevations and maximum pool depths remained stable. Starting in late July 2019, discoloration and color change in foliage of herbaceous vegetation was first noted, and it has since spread to all sites. This is much earlier timing than the normal senescence period that typically occurs in this area by late October. At several sites, surface water levels have remained consistently higher than the May 2019 baseline conditions; some sites have increased approximately eight inches. A late August 2019 monitoring report states that all Poison Sumac shrubs were browning and dropping leaves. This is a groundwater fen indicator species, typically capable of tolerating stable, saturated soil conditions. While stable wetland systems are adapted to seasonal and some annual fluctuations in hydrology, extreme short-term changes, taking place here over just four months, appears to be reaching the stress tolerance capacity of many individual species, and thus adversely impacting the entire wetland community.