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TECHNICAL MEMORANDUM

To: Jim Deaton, Chairman, Dearborn County Redevelopment Commission
Mike Perleberg, Executive Director, One Dearborn Incorporated

From: Rhett Moore, PE, INTERA Incorporated
Brad Schroeder, PE, INTERA Incorporated

Date: March 10, 2025

Re: Project Fresh Water Impacts Analysis

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1 Introduction

Whitewater Processing has proposed a new 90,000 square foot turkey processing plant in West Harrison, Indiana along the Whitewater River (Figure 1). The Dearborn County Redevelopment Commission (DCRC) and One Dearborn want to ensure that the proposed water withdrawals and wastewater discharges will not negatively impact the river, the local aquifer, or the users of either. INTERA was contracted by DCRC to perform a due diligence evaluation of the potential impacts of the proposed project (Project Fresh) on the water resource. INTERA's scope consists of a desktop study and a review of available information. The goal of project is twofold, 1) to assess the potential impacts of the new withdrawals on existing water users and 2) evaluate the water-quality and quantity impacts to the river from the proposed wastewater facilities.

2 Project Fresh

Plans for Project Fresh include using 2 million gallons per day (MGD) of water. Of the 2 MGD total, 1.8 MGD will be sourced from onsite production wells for non-contact cooling water (Figure 2). The remaining 0.2 MGD is currently planned to be provided by Tri-Township Water Corporation (TTWC), with 0.18 MGD for turkey production, chilling, and sanitation and 0.02 MGD for public supply for employees (Figure 2).

The non-contact cooling water will be pumped to an unlined lagoon for cooling purposes (Figure 3). The waste from production and public supply will be treated by a new wastewater treatment plant (WWTP) . Discharge from both the lagoon and the WWTP will be released to the river via a permitted outfall.

3 Water Supply

The following section discusses the water supply needs for Project Fresh, the sources of supply for the necessary water, and an analysis of the potential impact of the operations on 1) the groundwater levels and 2) on flows in the Whitewater River.

Whitewater Processing plans to pump 1.8 MGD total from three production wells located by the production facility for non-contact cooling water and rely on 0.2 MGD of potable water to be supplied by TTWC (Figure 3). The entire 2.0 MGD of supply would rely on production wells pumping from the Whitewater Valley Aquifer System. Below we discuss background on the water resource, current plans for sourcing raw and treated water, and the potential quantity impacts of the proposed system on the water resource.

3.1 Whitewater Valley Aquifer System

The Whitewater Valley Aquifer System (WVAS) is by far the most productive aquifer system in the county and is the only system with the potential to consistently meet the needs of high-capacity users (IDNR, 1988). The aquifer system consists of substantial volumes of sand and gravel, deposited by glaciers, which now fill the major stream valleys. Figure 4 shows the extent of the aquifer system near the project site. The sediments include highly transmissive boulder zones, layers of coarse gravel and often fine sand with clay.

As the glaciers melted, they released sediment in quantities too large for the streams to carry, causing the valleys to continue filling with coarse-grain sediment. Deposits of glacial meltwater (outwash), consisting of sand and gravel accumulated in the valleys of the Whitewater River and its tributaries during this process. The saturated thickness of WVAS ranges from about 10 to 80 feet, but the typical aquifer thickness is 20 to 40 feet (Schrader, 2006). Reported yields of high-capacity wells in the county pumping from the aquifer range from 160 to 1,000 gallons per minute (GPM) (0.2 -1.4 MGD) (Schrader, 2006).

3.1.1 The surface water/groundwater connection

The Whitewater River interacts with the WVAS and production wells within the valley (IDNR, 1988). The interaction takes place in three different ways (Figure 5). The river gains water naturally from inflow of groundwater through the riverbed (Figure 5A). A high capacity well placed near the river will intercept groundwater that would have naturally discharged to the river (Figure 5B). If the well is pumped at a higher rate, it can intercept additional groundwater that would have discharged to the river and induce water from the river to the well (induced recharge) (Figure 5C).

3.1.2 Flows in the Whitewater River

The U.S. Geological Survey has measured flows in the Whitewater River at a stream gage in Brookeville since the 1920's (USGS, 2025). The gage is located below the Brookeville Dam and below the confluence of the Whitewater and East Fork Whitewater Rivers. Figure 6 shows a flow-duration curve based on observed daily flow values since the dam was put into operation in 1975. A flow-duration curve displays the cumulative frequency of flows for the period of interest. Functionally, it shows the percentage of time a river's flow equaled or exceeded a certain value. For example, 50% of time, flows have exceeded 520 MGD.

A flow-duration curve has many uses but illuminating the low-flow frequencies are of the most interest for this project. In terms of low flows, 90% of time, flows have exceeded 139 MGD and 99% of time, flows have exceeded 80 MGD. Low flows at the project site will be higher than observed at the gage in Brookeville due to the contribution from tributaries, groundwater inflow, and NPDES outfalls downstream of the gage to the project site.

3.2 Non-contact cooling water

The plans to supply 1.8 MGD of non-contact cooling water from three onsite wells is conceptual at this point, which is typical for a project at this stage. While the WVAS is generally capable of supplying the needs of the project, well yields vary by location. Based on well logs and drilling records in the IDNR well log database, the total thickness of the outwash deposits above bedrock varies from 20 – 75 feet in the area of the project site (IDNR, 2020). Reported yields of high-capacity wells in the county pumping from the aquifer range from 160 to 1,000 gallons per minute (GPM) (0.2 -1.4 MGD) (Schrader, 2006). However, there are no borings available that have been advanced to bedrock. Whitewater Processing will need to drill test borings onsite to gauge the geometry and productivity of the aquifer and advance the design of the well field.

3.3 Potable Water Supply

Whitewater Processing has been in discussions with Tri-Township Water Corporation (TTWC) to supply 0.2 MGD of potable water to the project site. TTWC is a non-profit rural water utility that provides service in portions of Dearborn and Franklin Counties (PWSID:5215009). The sole purpose of TTWC is to serve potable water to area customers.

TTWC has five active production wells that all pump from the WVAS (IDNR, 2025). Three wells are located at its Jamison operation south of the project site and two wells are located at its Cedar Grove operation in north of the project site. Water from all the wells is blended before distribution. Based on the reported design capacities of all the wells (total approximate 6 MGD) and average reported usage between 2021 through 2023 (approximately 1 MGD), the utility appears to have sufficient source capacity to deliver 0.2 MGD to the project site.

In terms of distribution, the TTWC reportedly has a 12-inch service main near the project site (J. Kinker, personal communication, 3/27/25). TTWC is reportedly conducting a hydraulic analysis of its system to identify any constraints to delivering the requested water (R. Kopps, personal communication, 3/4/25). We have not been able to confirm when the results of the analysis will be available.

Currently, there is no formal agreement in place between Whitewater Processing and TTWC (R. Kopps, personal communication, 3/4/25). Presumably, this is a work in progress as the hydraulic study is being conducted. Typically, a utility will produce a “will serve letter”, a formal document that confirms that the utility will provide services to a proposed project. It's important to get these letters from all relevant utilities during the early stages of a project. Will serve letters confirm that the utility understands the project's scope of work and ensures that the utility can meet current and future demands of the project.

If TTWC cannot meet the potable water needs of the project, Whitewater Processing plans to satisfy potable water needs by pumping the additional 0.2 MGD from the planned production wells and developing a public water supply onsite (R. Kopps, personal communication, 3/4/25). The source water would be obtained from additional withdrawals of groundwater. This would be within the scope of Whitewater Processing’s knowledge and experience. The company has operated a non-transient, non-community system (PWSID: OH3136212) at its Harrison facility for decades (OEPA, 2025). Similar to the proposed project, water for the facility is supplied from two wells that pump groundwater from the WVAS.

3.4 Potential effects of planned operations on water quantity

Here we consider the potential impacts of planned groundwater withdrawals from the project site, including groundwater levels and flows in the river.

3.4.1 River flows

The planned use of water for Project Fresh is a small percentage of the lowest observed flows in the river (Section 3.1.2) and the effect on the overall, long-term surface water budget will be minimal. The planned production wells at the site will 1) intercept groundwater that would otherwise discharge to the river under natural conditions and, 2) induce recharge from the river. Based on the modelling analysis, the steady state portion of the groundwater pumped at the site will consist of approximately 20% of intercepted groundwater and 80% of induced recharge from the river. Therefore, even when the river is at low-flow levels (at the 99% exceedance level of 80 MGD), the total withdrawals would be less than 2.5% of the total river flow.

Most of the total water used at the site will eventually discharge to the river via the outfall. The only significant consumptive losses from the proposed process should only be evaporation of water from the lagoon, which will vary throughout the year. However, we expect this consumptive use will be a small portion of the project's water budget and a negligible amount compared to the lowest flows in the river.

3.4.2 Groundwater levels

Pumping between 1.8 and 2.0 MGD from production wells at the project site will decrease the water level in the aquifer within the surrounding area. Pumping will essentially lower the water table near the wells as water is extracted, creating a "cone of depression" where the water level is lower compared to the surrounding area (Figure 7). This drop in the water level is referred to as "drawdown". The level and the distribution of drawdown is directly related to the pumping rate and the aquifer's ability to replenish itself. Nearby wells can be impacted if the drawdown causes the water level in the well to drop near or below the pump intake (Figure 7).

We performed a groundwater flow modeling analysis to gauge the level and distribution of drawdown that could result from planned pumping at the project site. The groundwater modeling software, GFLOW, was used for the predictive analysis. GFLOW is a two-dimensional, steady-state, single layer, analytic element groundwater modeling software program (Kelson and Haitjema, 1994).

Simulated drawdown is shown in Figure 8. This simulation can be considered a worst-case scenario because 1) we used conservative aquifer parameters based on literature values (Letsinger, 2015; IDNR, 1988; Schrader, 2001) and 2) we simulated a combined 2 MGD of pumping from three production wells at the project site in case Whitewater Processing chooses to source all the water needs onsite.

Simulated drawdown is highest around the production wells and spreads out radially across the valley as well as up and down the valley. Simulated drawdown is between 1-5 feet beyond approximately 1,500 feet from the parcel boundary. We assume that homes and businesses within this radius are supplied by TTWC. Any residential or commercial wells within this radius could be impacted by the drawdown, depending on well construction characteristics such as well depth and pump depth. If a private well is impacted, Whitewater Processing is responsible for either for "timely and reasonable compensation."

Typically, this can mean lowering the pump depth within the well or re-drilling a deeper well to accommodate the lower aquifer levels.

The closest high-capacity wells registered with IDNR (defined as capacity > 100,000 gallons per day) are the City of Harrison production wells downstream and wells belonging to Harrison Sand and Gravel upstream (IDNR, 2025). Both users are well beyond the simulated zone of influence (zero-foot contour).

The drawdown analysis presented here could be refined based on site-specific drilling and testing mentioned in Section 3.2.

4 Wastewater

The wastewater from the turkey processing and office supply water will be treated by a new WWTP on the site. The following section provides background about the water-quality discharged from the WWTP, the Indiana permitting process, and the potential impacts of the planned operations on the Whitewater River.

4.1 Wastewater Water Quality & Flow

Turkey processing generates a waste stream that is high in organic matter made up of fats, oil, and grease, and dissolved and particulate proteins and carbohydrates measured in milligrams per liter (mg/L) of biological oxygen demand (BOD). The BOD concentrations from the processing plant enter the treatment facility typically between 600 - 800 mg/L, with peak flows up to 1,500 mg/L (R. Kopps, personal communication, 2/17/25). Typical waste streams entering a municipal WWTF will have BOD concentrations of around 200 mg/L or less. Total suspended solids (TSS), ammonia, and E-coli are the other important regulated constituents that are present in the waste stream.

The two water streams, cooling water and wastewater, from the facility are proposed to flow to a single discharge outflow in the Whitewater River (Figure 2). The processing plant will produce 0.2 MGD of wastewater that will flow into a wastewater treatment plant at the facility. Up to 1.8 MGD of cooling water will flow through the lagoon before going to the discharge point. The lagoon is designed to cool the water prior to discharging into the river. The lagoon will be unlined, and it is expected that some of water will infiltrate into the ground and an additional portion of the water will evaporate prior to discharging into the river.

4.2 Wastewater Discharge Permitting

The plant will operate under a National Pollutant Discharge Elimination System (NPDES) permit with discharge limits set by the Indiana Department of Environmental Management (IDEM). The discharge limits are based on characteristics of the receiving stream and include both human health-based and ecological criteria. The permit will be set under a single discharge outfall with the combined flow from lagoon and the WWTP. However, it is expected that there will be separate discharge limits for the lagoon and the WWTP with measurements taken before the flows are combined. As of this time, Whitewater Processing has submitted its permit application, but IDEM has not yet set the discharge limits for this facility.

Whitewater Processing has a similar facility in Harrison, OH that also discharges treated wastewater into the Whitewater River at similar flow rates as the proposed project. The NPDES permit limits for this facility are shown in Table 1 for reference. The listed effluent parameter concentrations illustrated in Table 1 are divided into the following categories: summer and winter weekly and monthly averages; and daily minimum and maximum concentrations and monthly average concentrations.

Two municipal utilities in Indiana at Brookville and St. Leon discharge into the Whitewater River. These facilities have monthly average limits for BOD and TSS at 25 mg/L and 30 mg/L respectively (USEPA, 2025). These are higher than the 10 mg/L and 12 mg/L BOD and TSS limits for the Whitewater Processing plant in Ohio. We anticipate the Project Fresh plant to have discharge limits in the range of these examples.

Table 1. NPDES Effluent Limits for Whitewater Processing Facility in Harrison, OH (USEPA, 2025)

		Summer		Winter				
Parameter	**Units**	**Monthly Avg**	**Weekly Max**	**Monthly Avg**	**Weekly Max**	**Daily Minimum**	**Monthly Avg**	**Daily Maximum**
CBOD	mg/l	10	15	10	15			
TSS	mg/l	12	18	12	18			
Ammonia-Nitrogen	mg/l	1.0	1.5	3	4.5			
Oil and Grease	mg/l						8	10
pH						6.5		9.0
Dissolved Oxygen	mg/l					6.0		
E. Coli	Count/100 mls	126	284	126	284			
Phosphorus	mg/l						Monitor	Monitor
Flow	MGD						Monitor	Monitor
TDS	mg/l						Monitor	Monitor
Temperature	C						Monitor	Monitor
Total Kjeldahl Nitrogen	Mg/l						Monitor	Monitor

Notes: mg/l = milligrams per liter; mls= milliliters; TSS = Total Suspended Solids; TSS = Total Dissolved Solids; Monitor = Monitoring only, no limit

4.3 Wastewater treatment plant

A wastewater treatment plant will be installed to treat the 0.2 MGD waste coming from the Project Fresh facility. The design of the plant will be based on meeting the discharge limits imposed by the NPDES permit. Design of the plant has not started because the limits have not been set. Based on similar facilities and a discussion with the design engineer it is anticipated that the plant will have the following major components (K. Chaffee, personal communication, 2/25/25 and R. Kopps, 3/4/25):

- Bar screen to remove large solids
- Dissolved air flotation (DAF) system to remove suspended solids, organic matter, fats, oil and grease

- Moving Bed Biofilm Reactor (MBBR) to remove suspended and dissolved organic matter
- Secondary Filter (possible depending on NPDES TSS limits), remove suspended solids
- Disinfection with either UV or peroxide to kill pathogens and meet E-coli requirements

There will be redundant systems for critical mechanical systems in the plant to ensure the treatment process continues in the event of a mechanical failure. Solids removed for each of these processes will be dewatered and disposed of at a landfill. Water from the dewater process will be returned to the head of the treatment plant.

The treatment plant is set back from the Whitewater River and will be built above the 500-year flood line which will prevent normal floods from potentially upsetting the plant operations and discharging untreated waste.

4.4 Potential effects of planned operations on water quality in the Whitewater River

As discussed in section 3.4.2, the 0.2 MGD discharge of treated wastewater is a very small fraction of the lowest flow in the Whitewater River. The purpose of the NPDES program is to protect the water quality in the river. The limits that will be established by IDEM will drive a treatment system at the plant that will meet these requirements. The NPDES program also includes monitoring to ensure the plant operations will stay in compliance.

5 Conclusions

INTERA performed a due diligence evaluation of the potential impacts of Project Fresh on the water resource. The goal of the evaluation was to 1) to assess the potential impacts of the proposed withdrawals on existing water users and 2) evaluate the water-quality and quantity impacts to the river from the proposed wastewater facilities.

Below, we summarize and conclude with the following key findings:

- The planned use of water for Project Fresh is a small percentage of the lowest observed flows in the river and the effect on the overall, long-term surface water budget will be minimal. Even when the river is at low-flow levels (at the 99% exceedance level of 80 MGD), the total withdrawals would be less than 2.5% of the total river flow.
- Most of the total water used at the site will eventually discharge to the river via the outfall. The only significant consumptive losses from the proposed process should only be evaporation of water from the lagoon, which will vary throughout the year. However, we expect this consumptive use will be a small portion of the project’s water budget and a negligible amount compared to the lowest flows in the river.
- Pumping between 1.8 and 2.0 MGD from production wells at the project site will decrease the water level in the aquifer within the surrounding area. The simulated drawdown is highest around the production wells and spreads out radially across the valley as well as up and down the valley. Simulated drawdown is between 1-5 feet beyond approximately 1,500 feet from the

parcel boundary. Any commercial or residential wells within this radius could be impacted by the drawdown, depending on well construction characteristics such as well depth and pump depth.

- Turkey processing generates a waste stream that is high in organic matter made up of fats, oil, and grease, and dissolved and particulate proteins and carbohydrates measured in milligrams per liter (mg/L) of biological oxygen demand (BOD). Total suspended solids (TSS), ammonia, and E-coli are the other important regulated constituents that will be present in the waste stream.

- The outfall to the river will operate under a National Pollutant Discharge Elimination System (NPDES) permit with discharge limits set by the Indiana Department of Environmental Management (IDEM). The discharge limits are based on characteristics of the receiving stream and include both human health-based and ecological criteria. The permit will be set under a single discharge outfall with the combined flow from lagoon and the WWTP. However, it is expected that there will be separate discharge limits for the lagoon and the WWTP with measurements taken before the flows are combined. As of this time, Whitewater Processing has submitted its permit application, but IDEM has not yet set the discharge limits for this facility.

- The design of the plant will be based on meeting the discharge limits imposed by the NPDES permit. Design of the plant has not started because the limits have not been set. The purpose of the NPDES program is to protect the water quality in the river. The limits that will be established by IDEM will drive a treatment system at the plant that will meet these requirements. The NPDES program also includes ongoing monitoring that is requires to ensure that plant operations stay in compliance.

6 References

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USGS (2025). U.S. Geological Survey Daily Values for the Whitewater River at Brookeville. *https://maps.waterdata.usgs.gov/mapper/*

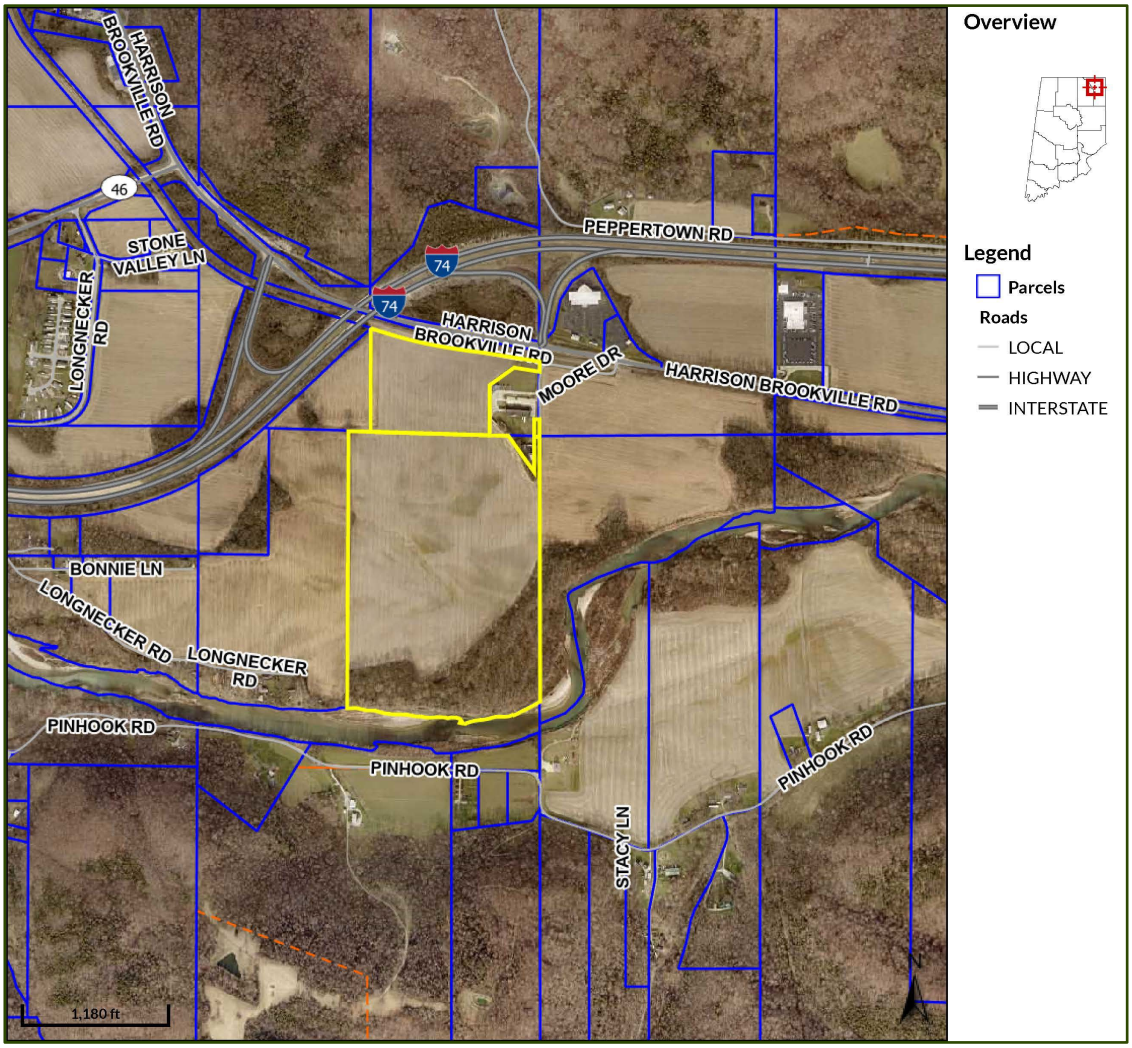

Figure 1. Location of Project Fresh.

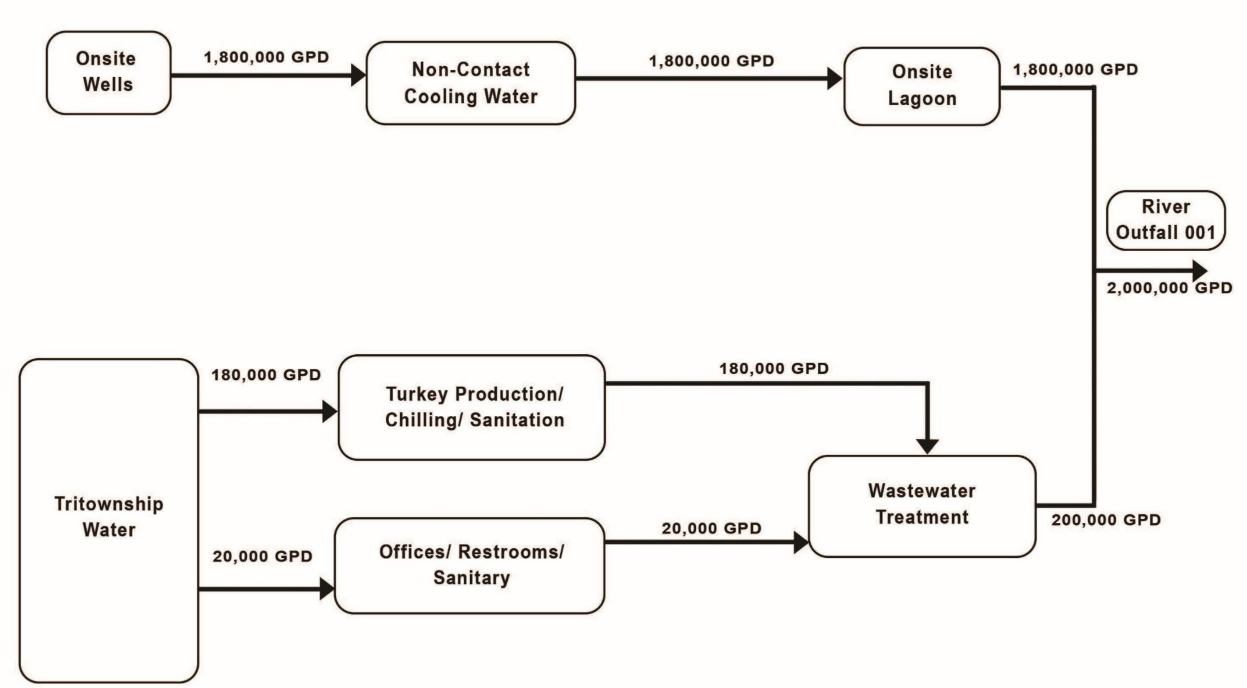

Figure 2. Water process flow chart

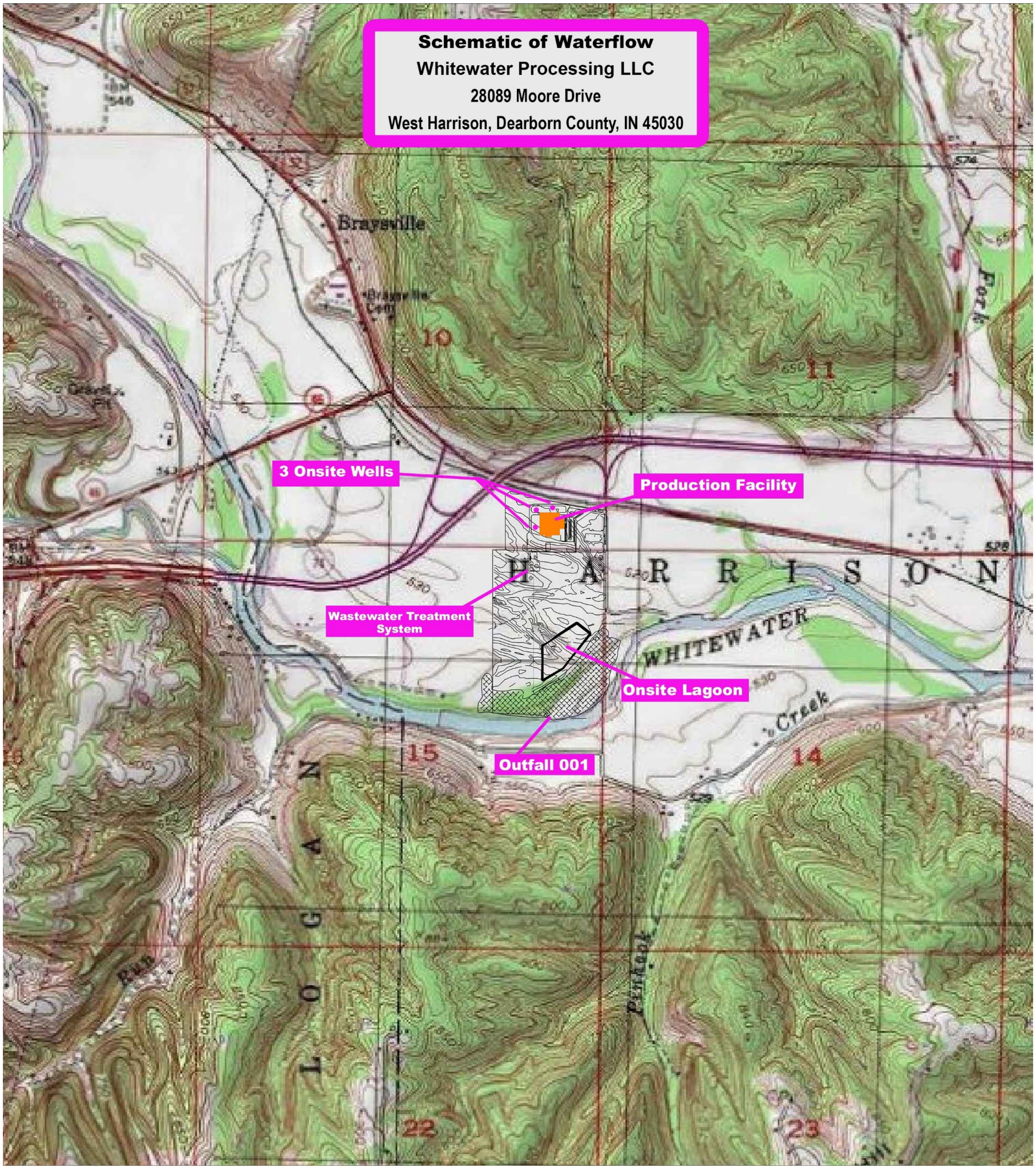

Figure 3. Schematic of water facilities.

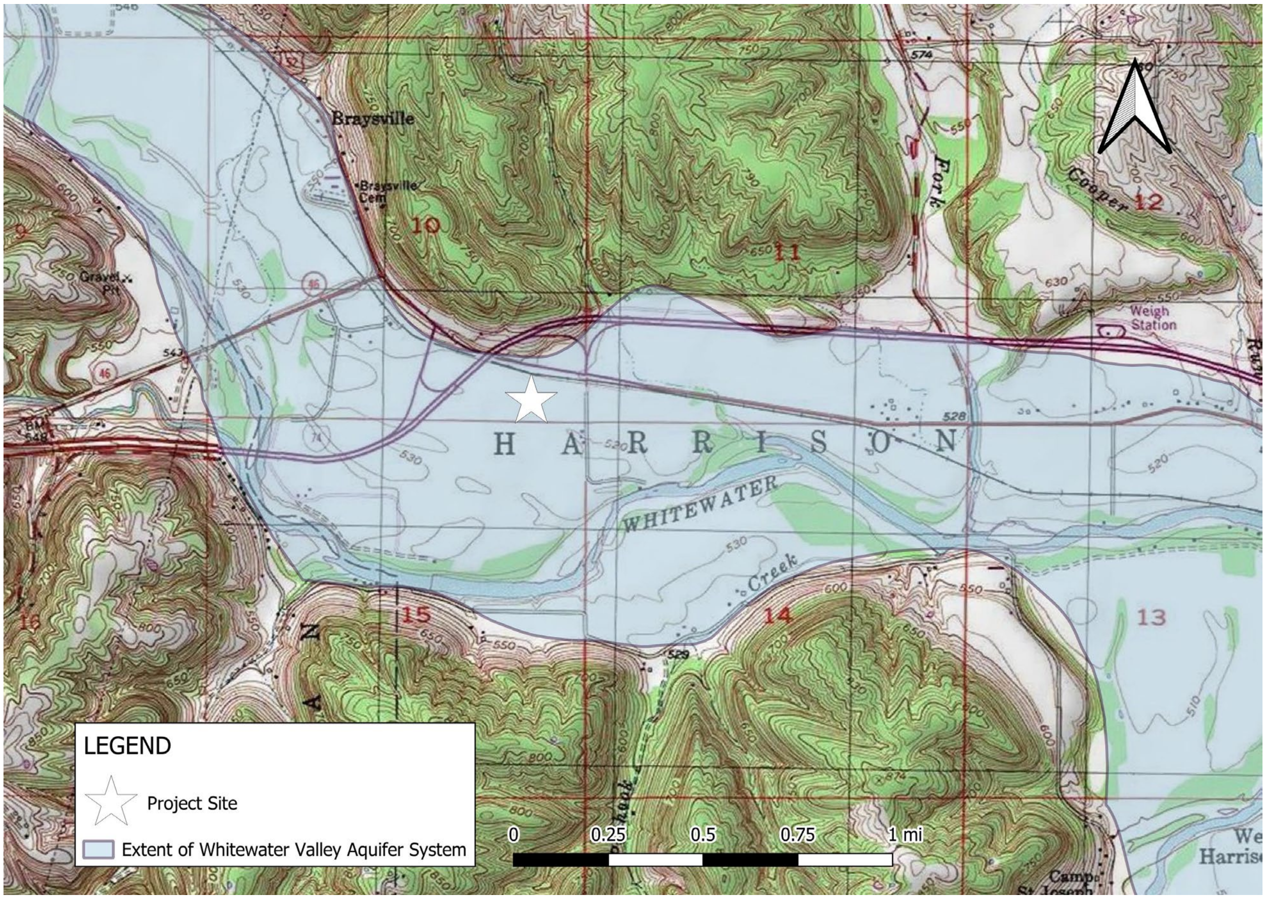

Figure 4. Extent of Whitewater Valley Aquifer System near the project site [Schrader, 2006].

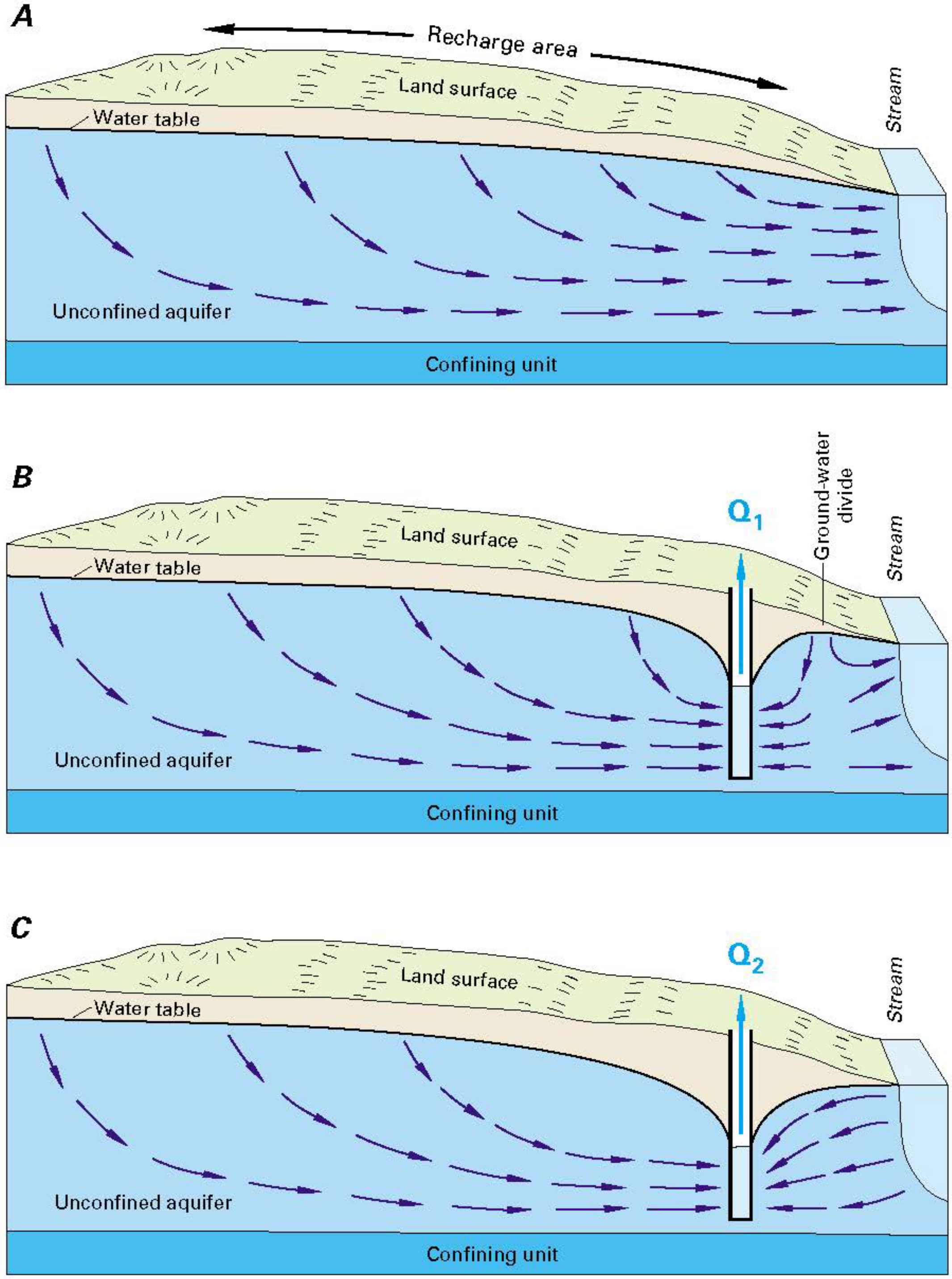

Figure 5. Schematic showing interaction between a shallow aquifer, a well, and stream in a hydrologic setting where a shallow aquifer is hydraulically connected to the stream (USGS, 1998).

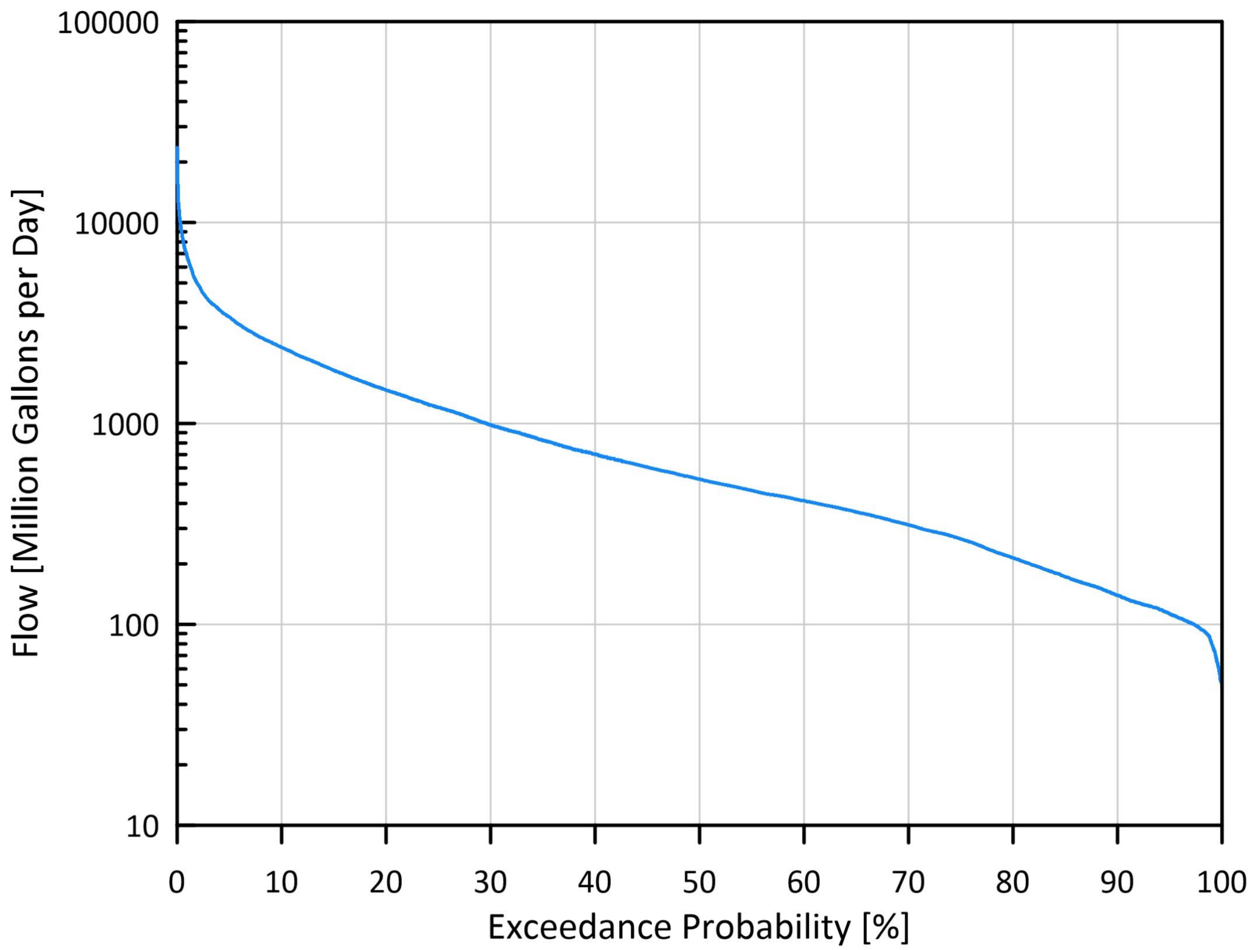

Figure 6. Flow-duration curve for the Whitewater River based on flows recorded at the USGS gage in Brookeville, (1975-2025) (USGS, 2025).

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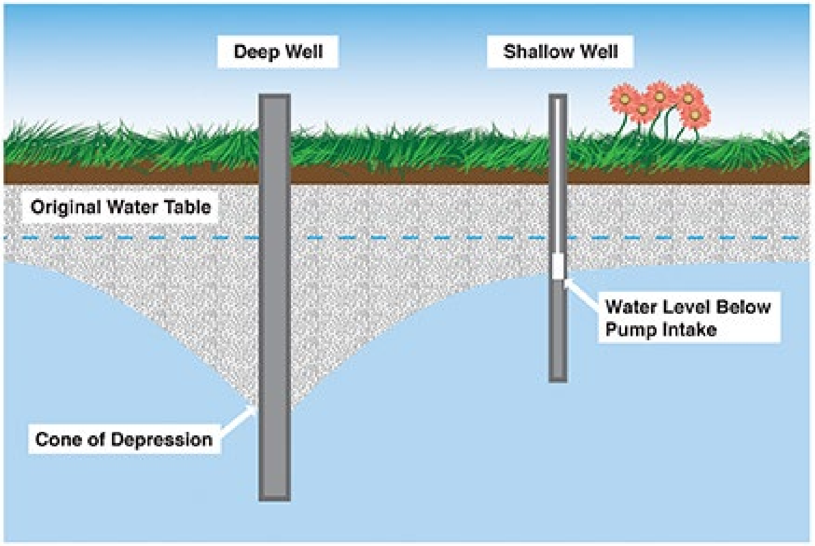

Figure 7. Schematic showing cone of depression resulting from production well.

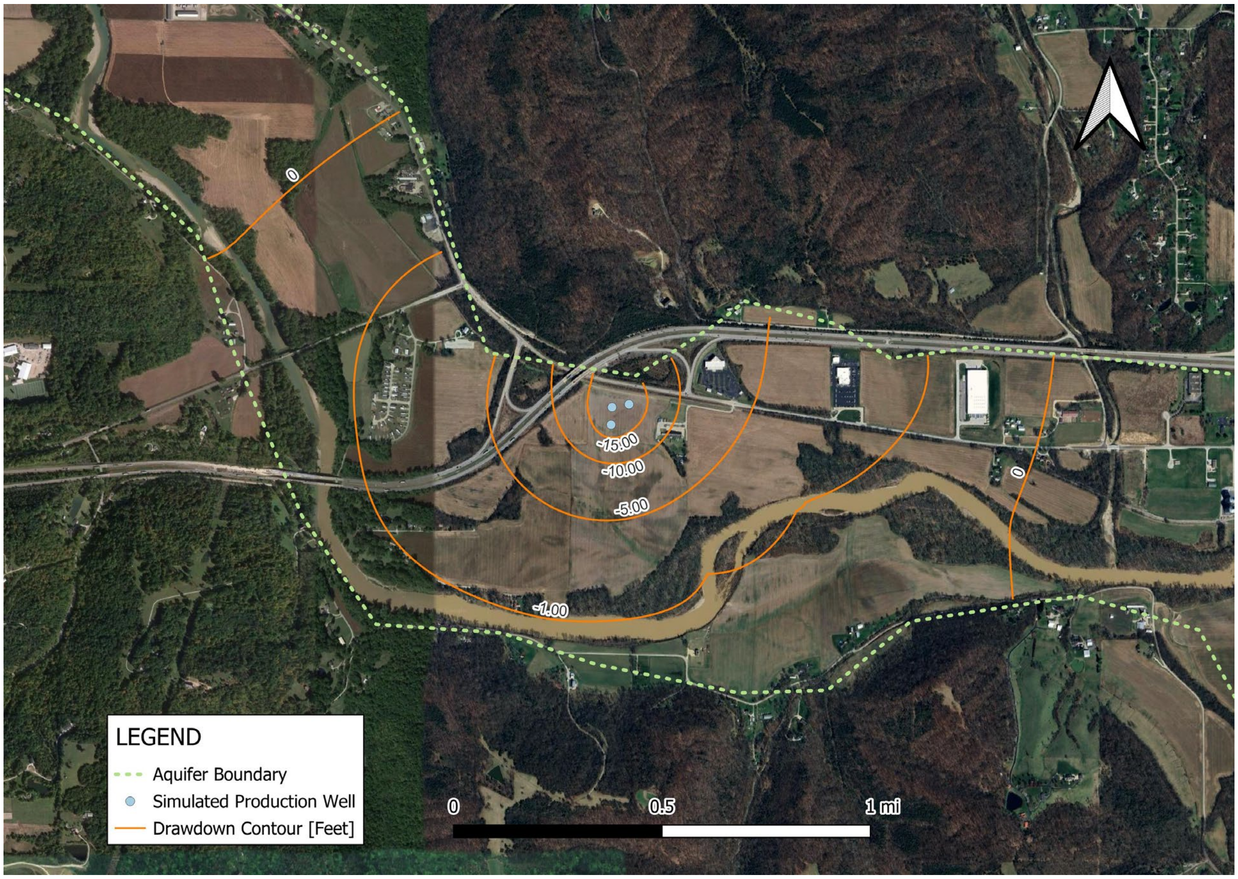

Figure 8. Simulated drawdown resulting from pumping three production wells at the project site for a combined total of 2 MGD.