

STATE OF MISSOURI
DEPARTMENT OF NATURAL RESOURCES
MISSOURI CLEAN WATER COMMISSION



CONSTRUCTION PERMIT

The Missouri Department of Natural Resources hereby issues a permit to:

City of Glasgow
100 Market Street
Glasgow, MO 65254

for the construction of (described facilities):

See attached.

Permit Conditions:

See attached.

Construction of such proposed facilities shall be in accordance with the provisions of the Missouri Clean Water Law, Chapter 644, RSMo, and regulation promulgated thereunder, or this permit may be revoked by the Department of Natural Resources (Department).

As the Department does not examine structural features of design or the efficiency of mechanical equipment, the issuance of this permit does not include approval of these features.

A representative of the Department may inspect the work covered by this permit during construction. Issuance of a permit to operate by the Department will be contingent on the work substantially adhering to the approved plans and specifications.

This permit applies only to the construction of water pollution control components; it does not apply to other environmentally regulated areas.

August 22, 2017
Effective Date

August 12, 2019
Revised Date

Edward B. Galbraith, Director, Division of Environmental Quality

August 21, 2020
Expiration Date

Chris Wieberg, Director, Water Protection Program

CONSTRUCTION PERMIT

I. CONSTRUCTION DESCRIPTION

The existing system is a non-aerated, three-cell, flow-through lagoon with a design flow of 180,000 gallons per day. This project includes the installation of three (3) Reliant Water Technologies Model WQA Water Moving Aerators, each capable of providing 15 lbs of oxygen per hour and moving approximately 9,000,000 gallons of water per day. Two (2) aerators will be installed in Cell No.1 and one (1) will be installed in Cell No. 2. The aerators will provide aeration and mixing to prevent stratification and turnover events.

The outfall will be relocated from the existing discharge location into a Class C stream (Hurricane Creek) approximately 0.25 miles west to directly discharge to the Missouri River. Approximately 1,234 feet of ten-inch gravity sewer line with approximately five (5) manholes will be installed for the new outfall line. A new emergency overflow line from Cell No. 1 to the new outfall line will be installed. Construction of piping and valves in the new outfall line will allow for installation of an ultraviolet disinfection system in the future if it is deemed necessary to meet disinfection requirements.

This project will include general site work appropriate to the scope and purpose of the project and all necessary appurtenances to make complete and useable wastewater treatment facilities.

II. COST ANALYSIS FOR COMPLIANCE

Pursuant to Section 644.145, RSMo, when issuing permits under this chapter that incorporate a new requirement for discharges from publicly owned combined or separate sanitary or storm sewer systems or publicly owned treatment works, or when enforcing provisions of this chapter or the Federal Water Pollution Control Act, 33 U.S.C. 1251 et seq., pertaining to any portion of a publicly owned combined or separate sanitary or storm sewer system or [publicly owned] treatment works, the Department of Natural Resources shall make a "finding of affordability" on the costs to be incurred and the impact of any rate changes on ratepayers upon which to base such permits and decisions, to the extent allowable under this chapter and the Federal Water Pollution Control Act. This process is completed through a cost analysis for compliance. Permits that do not include new requirements may be deemed affordable.

The Department is required to determine "findings of affordability" because the permit applies to a **combined or separate sanitary sewer system for a publically-owned treatment works.**

Cost Analysis for Compliance - The Department has made a reasonable search for empirical data indicating the permit is affordable. The search consisted of a review of Department records that might contain economic data on the community, a review of information provided by the applicant as part of the application, and public comments received in response to public notices of this draft permit. If the empirical cost data was used by the permit writer, this data may consist of median household income, any other ongoing projects that the Department has knowledge, and other demographic financial information that the community provided as contemplated by Section 644. 145.3. A Cost Analysis for Compliance was included with the Missouri State Operating Permit Renewal which was on Public Notice from July 14, 2017 through August 14, 2017.

III. CONSTRUCTION PERMIT CONDITIONS

The permittee is authorized to construct subject to the following conditions:

1. This construction permit does not authorize discharge.
2. All construction shall be in accordance with the plans and specifications submitted by Schulte Engineering & Consulting, LLC on March 21, 2017 and Shafer, Kline & Warren, Inc. on September 23, 2016.
3. The Department must be contacted in writing prior to making any changes to the approved plans and specifications that would directly or indirectly have an impact on the capacity, flow, system layout, or reliability of the proposed wastewater treatment facilities or any design parameter that is addressed by 10 CSR 20-8, in accordance with 10 CSR 20-8.110(8).
4. State and federal law does not permit bypassing of raw wastewater, therefore steps must be taken to ensure that raw wastewater does not discharge during construction. If a sanitary sewer overflow or bypass occurs, report the appropriate information to the Department's Northeast Regional Office per 10 CSR 20-7.015(9)(E)2.
5. This construction permit is invalid for projects required to comply with the requirements contained in 10 CSR 20-4, "Grants and Loans"
6. The wastewater treatment facility shall be located at least fifty feet (50') from any dwelling or establishment.
7. The wastewater treatment facility shall be located above the twenty-five (25)-year flood level.
8. Wastewater treatment facility shall not be located within one hundred feet (100'), and preferably three hundred feet (300') of any water well or water supply structure.
9. Protection of drinking water supplies shall be in accordance with 10 CSR 20-8.120(10). "There shall be no physical connections between a public or private potable water supply system and a sewer, or appurtenance thereto which would permit the passage of any wastewater or polluted water into the potable supply. No water pipe shall pass through or come in contact with any part of a sewer manhole."

10. Sewers in relation to water works structures shall meet the requirements of 10 CSR 23-3.010 with respect to minimum distances from public water supply wells or other water supply sources and structures.
 - A. Sewer mains shall be laid at least 10 feet horizontally from any existing or proposed water main. The distances shall be measured edge-to-edge. In cases where it is not practical to maintain a 10 foot separation, the Department may allow a deviation on a case-by-case basis, if supported by data from the design engineer. Such a deviation may allow installation of the sewer closer to a water main, provided that the water main is in a separate trench or on an undisturbed earth shelf located on either side of the sewer and at an elevation so the bottom of the water main is at least 18 inches above the top of the sewer. If it is impossible to obtain proper horizontal and vertical separation as described above for sewers, the sewer must be constructed of slip-on or mechanical joint pipe or continuously encased and be pressure tested to 150 pounds per square inch to assure water tightness.
 - B. Manholes should be located at least 10 feet horizontally from any existing or proposed water main.
 - C. Manholes shall be located with the top access at or above grade level.
 - D. Sewers crossing water mains shall be laid to provide a minimum vertical distance of 18 inches between the outside of the water main and the outside of the sewer. This shall be the case where the water main is either above or below the sewer. The crossing shall be arranged so that the sewer joints will be equidistant and as far as possible from the water main joints. Where a water main crosses under a sewer, adequate structural support shall be provided for the sewer to maintain line and grade. When it is impossible to obtain proper vertical separation as stipulated above, one of the following methods must be specified:
 - a. The sewer shall be designed and constructed equal to the water pipe and shall be pressure tested to assure water tightness prior to backfilling; or
 - b. Either the water main or sewer line may be continuously encased or enclosed in a watertight carrier pipe which extends 10 feet on both sides of the crossing, measured perpendicular to the water main. The carrier pipe shall be of materials approved by the Department for use in water main construction.
11. In addition to the requirements for a construction permit, 10 CSR 20-6.200 requires land disturbance activities of 1 acre or more to obtain a Missouri state operating permit to discharge stormwater. The permit requires best management practices sufficient to control runoff and sedimentation to protect waters of the state. Land disturbance permits will only be obtained by means of the Department's ePermitting system available online at www.dnr.mo.gov/env/wpp/epermit/help.htm. See www.dnr.mo.gov/env/wpp/stormwater/sw-land-disturb-permits.htm for more information.

12. A United States (U.S.) Army Corps of Engineers (COE) permit (404) and a Water Quality Certification (401) issued by the Department or permit waiver may be required for the activities described in this permit. This permit is not valid until these requirements are satisfied. If construction activity will disturb any land below the ordinary high water mark of jurisdictional waters of the U.S. then a 404/401 will be required. Since the COE makes determinations on what is jurisdictional, you must contact the COE to determine permitting requirements. You may call the Department's Water Protection Program at 573-751-1300 for more information. See www.dnr.mo.gov/env/wpp/401/ for more information.

13. Upon completion of construction;
 - A. The City of Glasgow will become the continuing authority for operation, maintenance, and modernization of these facilities;

 - B. Submit the enclosed form Statement of Work Completed to the Department in accordance with 10 CSR 20-6.010(5)(D) and request the operating permit modification be issued; and

 - C. Submit an electronic copy of the as-builts if the project was not constructed in accordance with previously submitted plans and specifications.

IV. REVIEW SUMMARY

1. AMMONIA

The Department recommends that, when evaluating treatment design options, all permittees consider any foreseeable water quality criteria for which future requirements could be addressed in the design phase without incurring significant cost.

2. CONSTRUCTION PURPOSE

The goal of the proposed improvements is to increase the treatment performance of the existing lagoon system to meet anticipated effluent limitations for an effluent discharge into the Missouri River. The proposed aerations units will be used to reduce the BOD, ammonia, and *E. coli* concentrations in the effluent.

3. FACILITY DESCRIPTION

The existing facility is a three-cell continuous discharge lagoon with a design flow of 180,000 gallons per day that discharges to Hurricane Creek. Proposed construction includes the addition of three aeration units to the existing lagoon system and relocation of the outfall from a Class C stream to the Missouri River.

This facility received a construction permit (CP0001415) in May 2013 to relocate their outfall and convert to a controlled discharge facility; however they have not proceeded with that construction, and applied in 2016 for a construction permit for a modified proposal.

4. COMPLIANCE PARAMETERS

The proposed project is expected to help the facility meet the following final effluent limits:

EFFLUENT PARAMETER(S)	UNITS	DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE
Biochemical Oxygen Demand ₅ ***	mg/L		45	30
Total Suspended Solids***	mg/L		45	30
<i>E. coli</i> ****	#/100mL		1030	206
Ammonia as N	mg/L	*		*
Oil & Grease	mg/L	15		10
Total Phosphorus	mg/L	*		*
Total Nitrogen	mg/L	*		*
pH	SU	**		**

* Monitoring requirement only.

** The pH is to be maintained at or above 6.0 pH units.

*** This facility is required to meet a removal efficiency of 85% or more for BOD₅ and TSS.

**** The facility provided information on the proposed aeration and mixing unit's ability to lower *E. coli* concentrations in the effluent. The department has not reviewed this treatment method for its ability to disinfect and therefore cannot ensure that this method will enable the facility to meet *E. coli* effluent limits. Provisions are being supplied in the new effluent line to the Missouri River where ultraviolet disinfection equipment can be installed in the future if expected treatment results for *E. coli* reduction cannot be achieved.

5. REVIEW of MAJOR TREATMENT DESIGN CRITERIA

Existing major components which will remain in use include the following:

- Lagoon Cell No. 1 – The influent is pumped into Cell No. 1 by an existing lift station on the treatment plant site. Cell No. 1 is currently non-aerated and has a surface area of 9.7 acres and a wastewater volume of 12,137,663 gallons. This cell has 2 ft of freeboard, 4 ft of operating depth, and 2 ft of sludge storage depth. This provides approximately 67 days of retention in Cell No. 1 at the existing design flow.
- Lagoon Cell Nos. 2 and 3 – If Cell No.1 is out of operation because of flooding, incoming flow will be redirected to Cell No.2. The effluent from Cell No.1 is transferred to Cell No.2 by Pump Station because Cell No.2 is higher in elevation than Cell No.1. The flow from Cell No.2 flows by gravity to Cell No.3. The flow from Cell No.3 flows by gravity to the outfall. Cell No. 2 has a surface area of 2.8 acres, total depth of 8 ft, and a wastewater volume of 3,710,310 gallons. Cell No. 3 has a surface area of 1.2 acres, total depth of 10 ft, and a wastewater volume of 2,276,953 gallons. These two cells are currently non-aerated and have 2 ft of freeboard and 2 ft of sludge storage depth. This provides approximately 33 days of retention in Cell Nos. 2 and 3 at the existing design flow.

Construction will cover the following items:

- Construction of approximately 1,194 lf of ten-inch SDR-26 PVC gravity sewer line and 40 feet of ten-inch DIP with approximately five manholes for the outfall line. Construction of approximately 105 lf of ten-inch DIP for emergency overflow from Cell No.1, which will discharge into the outfall line in an emergency, such as lift

station failure. The existing emergency overflow line from Cell No. 1 and the existing outfall line from Cell No. 3 will be abandoned.

- Lagoon Aerators - The installation of three (3) Reliant Water Technologies Model WQA Water Moving Aerators: two (2) in Cell No.1 and one (2) in Cell No. 2. The aerators will provide aeration and mixing to prevent stratification and turnover events. Each aeration unit will supply approximately 15 lb oxygen per hour (360 lbs oxygen per day) and move approximately 9,000,000 gallons of water per day. The two units in lagoon Cell No. 1 will result in approximately 1.5 turnovers per day and the one unit in Cell No. 2 will result in approximately 2.4 turnovers per day.
- Relocated Outfall – The existing outfall discharges to Hurricane Creek (WBID 781). The new outfall location is to the Missouri River, approximately 0.25 miles west of the current outfall location. The outfall consists of riverbank rock blanket and a concrete structure around a discharge pipe with a flanged duck bill valve. The outfall will discharge at an elevation of approximately 605.34 feet. Manhole 3 will be installed and used as a collection point for effluent samples. Construction of piping and valves in the new outfall line will allow for installation of an ultraviolet disinfection system in the future if it is deemed necessary. Stream bank stabilization will be completed for Hurricane Creek near Cells No. 1 and 3 and for the Missouri River bank for the new outfall.

The submitted aeration calculations were completed with a proposed design flow of 99,000 gpd, however after discussion with the engineers for this project, it was determined that the design flow will remain the same at 180,000 gpd. Aeration calculations were checked using 180,000 gpd and it was determined that the proposed aerators would supply sufficient oxygen.

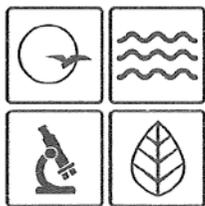
The facility provided information on the proposed aeration and mixing unit's ability to lower *E. coli* concentrations in the effluent. The department has not reviewed this treatment method for its ability to disinfect and therefore cannot ensure that this method will enable the facility to meet *E. coli* effluent limits. Provisions are being supplied in the new effluent line to the Missouri River where ultraviolet disinfection equipment can be installed in the future if expected treatment results for *E. coli* reduction cannot be achieved.

6. OPERATING PERMIT MODIFICATION

Operating permit MO-0034240 will require a modification to reflect the construction activities. The modification was combined with the operating permit renewal for this facility. The renewal/modification was on public notice from July 14, 2017 through August 14, 2017. Upon construction completion submit the enclosed form Statement of Work Completed to the department and request the operating permit modification be issued.

Cailie Carlile, P.E.
Engineering Section
cailie.carlile@dnr.mo.gov

APPENDIX – ANTIDegradation



Missouri Department of dnr.mo.gov

NATURAL RESOURCES

Eric R. Greitens, Governor

Carol S. Comer, Director

JUN 27 2017

Mr. Kevin Atwood
City Administrator
100 Market St.
Glasgow, MO 65254

RE: Water Quality and Antidegradation Review Preliminary Determination for Glasgow WWTF,
Howard County

Dear Mr. Atwood:

Enclosed please find the finalized Water Quality and Antidegradation Review (WQAR) for the *Antidegradation Report for the City of Glasgow Wastewater Lagoon Improvements dated August 2012 with a revised application dated September 15, 2016*, in Howard County. The WQAR contains pertinent antidegradation review information based on the use of existing water quality, effluent limitations, and monitoring requirements for the facility discharge. It was developed in accordance with 10 CSR 20-7.031, the Clean Water Commission approved *Missouri Antidegradation Implementation Procedure (AIP)* dated July 13, 2016, U.S. Environmental Protection Agency (US EPA) guidance, the applicant-supplied antidegradation review documentation, and the State of Missouri's effluent regulations (10 CSR 20-7.015). Please refer to the *General Assumptions of the Water Quality and Antidegradation Review* section of the enclosed WQAR. The WQAR is preliminary and subject to change as new information becomes available during future permit application processing.

Based on the Missouri Department of Natural Resources' Water Protection Programs initial review, preliminary determination is that the applicant-supplied antidegradation review documentation satisfies the requirements of the AIP. This WQAR/preliminary determination may be appealed within 30 days of this letter in accordance with the AIP Section II.F.4.

The department has received your applications for an operating permit modification and antidegradation review public notice, and a construction permit. These submittals are currently undergoing review.

Following the department's public notice of a draft Missouri State Operating Permit modification including the antidegradation review findings and preliminary determination, the department will review any public notice comments received. If significant comments are made, the project may require another public notice and potentially another antidegradation review. If no comments are received or comments are resolved without another public notice, these findings and determinations will be considered final.

Following issuance of the construction permit and completion of the actual facility construction, the department will proceed with the issuance of the operating permit modification.

Mr. Kevin Atwood
Page Two

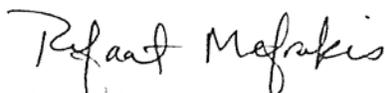
Notice to Permittees: On August 22, 2013, the Environmental Protection Agency (EPA) published a notice in the Federal Register announcing the final national recommended ambient water quality criteria for protection of aquatic life from the effects of ammonia in freshwater. The EPA's guidance, *Final Aquatic Life Ambient Water Quality Criteria for Ammonia – Fresh Water 2013*, is not a rule, nor automatically part of a state's water quality standards. States must adopt new ammonia criteria consistent with EPA's published ammonia criteria into their water quality standards that protect aquatic life in water.

The Water Protection Program (WPP) is providing this notice to inform permittees that EPA's published ammonia criteria for aquatic life protection is lower than the current Missouri criteria. The Department has begun discussions about how these new criteria will be implemented. WPP is suggesting that all permittees consider the lower ammonia criteria and adjust the alternative analysis or proposed alternative's treatment design, if they so choose. Consideration of the future ammonia criteria at this time could avoid a near-future upgrade. More information about the new ammonia criteria for aquatic life protection may be found at: <http://dnr.mo.gov/pubs/pub2481.htm>.

If you should have questions regarding the enclosed WQAR, please contact Ms. Cailie Carlile by telephone at 573-751-1714 by e-mail at cailie.carlile@dnr.mo.gov, or by mail at the Department of Natural Resources, Water Protection Program, P.O. Box 176, Jefferson City, MO 65102.

Sincerely,

WATER PROTECTION PROGRAM



Refaat Mefrakis, P.E., Chief
Engineering Section

RM:ccn

Enclosure

c: Mr. Dennis Stith, P.E., Shafer, Kline, and Warren, Inc.
Ms. Lauren Lewis, Water Protection Program

Water Quality and Antidegradation Review

*For the Protection of Water Quality
and Determination of Effluent Limits for Discharge to the Missouri River*

**by
Glasgow Wastewater Treatment Facility**



May 2017

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1. FACILITY INFORMATION

FACILITY NAME: Glasgow WWTF NPDES # MO-0034240

FACILITY TYPE: POTW – SIC #4952

FACILITY DESCRIPTION: The facility outfall for the existing three cell lagoon system will be relocated from Hurricane Creek to the Missouri River. The design flow will remain the same at 0.18 MGD. The facility will also be adding aerators to the first and second lagoon cells.

COUNTY: Howard UTM COORDINATES: X= 512652/ Y= 4339922

12- DIGIT HUC: 10300102-0104 LEGAL DESCRIPTION: Land Grant #02456

EDU*: Ozark/Moreau/Loutre ECOREGION: Western Corn Belt Plains

* - Ecological Drainage Unit

2. WATER QUALITY INFORMATION

In accordance with Missouri’s Water Quality Standard [10 CSR 20-7.031(3)] and federal antidegradation policy at Title 40 Code of Federal Regulation (CFR) Section 131.12 (a), the Missouri Department of Natural Resources (MDNR) developed a statewide antidegradation policy and corresponding procedures to implement the policy. A proposed discharge to a water body will be required to undergo a level of Antidegradation Review which documents that the use of a water body’s available assimilative capacity is justified. Effective August 30, 2008, and revised July 13, 2016, a facility is required to use *Missouri’s Antidegradation Implementation Procedure (AIP)* for new and expanded wastewater discharges.

2.1. WATER QUALITY HISTORY:

Discharge Monitoring Reports for the last five years (April 2012 through February 2017) indicate that DMRs were not received for August 2015 or from January 2016 through February 2017. BOD limits were exceeded in Apr 2013, Fecal coliform had two exceedances in Apr and May of 2013, pH was exceeded in Mar 2015, and TSS was exceeded in Oct 2012, Apr 2013, and Jan 2015. From April 2012 to present, the mean monthly average flow was 0.045 gallons per day, and the mean daily max flow was 0.053 MGD. The applicant had previously proposed reducing the design flow to 130,000 gallons per day or 99,000 gallons per day, but maintaining the existing design flow was determined to be the most appropriate approach as no changes were proposed that would reduce the treatment capacity of the existing system.

This facility is currently under enforcement for violations including failing to upgrade to meet disinfection requirements, failure to submit required reports, and failure to apply for renewal of the operating permit at least 180 days before expiration.

Low flow values for the Missouri River were calculated using discharge data from October 1, 2000 to April 11, 2017 from USGS Station 06906500, Missouri River at Glasgow, MO.

OUTFALL	DESIGN FLOW (CFS)	TREATMENT LEVEL	RECEIVING WATERBODY	DISTANCE TO CLASSIFIED SEGMENT (MI)
001	0.28	Secondary	Missouri River	0.0

3. RECEIVING WATERBODY INFORMATION

WATERBODY NAME	CLASS	WBID	LOW-FLOW VALUES (CFS)			DESIGNATED USES**
			1Q10	7Q10	30Q10	
Missouri River	P	701	19,636	20,387	21,662	AQL, DWS, HHP, IND, IRR, LWW, SCR, WBC(B), General Criteria

** Irrigation (IRR), Livestock & Wildlife Watering (LWW), Protection of Warm Water Aquatic Life (AQL), Human Health Protection (HHP), Cool Water Fishery (CLF), Cold Water Fishery (CDF), Whole Body Contact Recreation – Category A (WBC-A), Whole Body Contact Recreation – Category B (WBC-B), Secondary Contact Recreation (SCR), Drinking Water Supply (DWS), Industrial (IND), Groundwater (GRW).

RECEIVING WATER BODY SEGMENT #1: Missouri River

Upper end segment* UTM coordinates: X= 512652 / Y= 4339922 (Outfall)

Lower end segment* UTM coordinates: X= 512606 / Y= 4339777 (Mouth of Hurricane Creek)

*Segment is the portion of the stream where discharge occurs. Segment is used to track changes in assimilative capacity and is bound at a minimum by existing sources and confluences with other significant water bodies.

4. GENERAL COMMENTS

Shafer, Kline, & Warren, Inc. prepared, on behalf of the City of Glasgow, the *Antidegradation Report for the City of Glasgow Wastewater Lagoon Improvements* dated August 2012 with a revised application dated September 15, 2016. An antidegradation review was originally completed in 2012 to convert the facility to a controlled discharge lagoon that was planning not to discharge during the recreational season (Apr. 1 – Oct 31.). This antidegradation review will be for continuous discharge.

Applicant elected to determine that all pollutants of concern (POC) are minimally degrading in the receiving stream using existing water quality. This analysis was conducted to fulfill the requirements of the AIP. Information that was provided by the applicant in the submitted report and summary forms in Appendix D was used to develop this review document.

No Geohydrological evaluation was required for this review. The stream is gaining for discharge purposes (Appendix A: Map).

Dissolved oxygen modeling analysis was submitted for review (Appendix C) and was verified by staff with the Streeter-Phelps model. Staff believes that the results of the model are protective of the water quality standards for dissolved oxygen.

A Missouri Department of Conservation Natural Heritage Review Report was obtained (Appendix B); There are records for species listed under the Federal Endangered Species Act, and possibly also records for species listed Endangered by the state, or Missouri Species and/or Natural Communities of Conservation Concern within or near the defined Project Area. The applicant must contact the U.S. Fish and Wildlife Service and the Missouri Department of Conservation for further coordination.

5. ANTIDegradation REVIEW INFORMATION

The following is a review of the *Antidegradation Report for the City of Glasgow Wastewater Lagoon Improvements* dated August 2012 with a revised application dated September 15, 2016.

5.1. TIER DETERMINATION

Below is a list of pollutants of concern reasonably expected to be in the discharge (see Appendix D). Pollutants of concern are defined as those pollutants “proposed for discharge that affects beneficial use(s) in waters of the state. POCs include pollutants that create conditions unfavorable to beneficial uses in the water body receiving the discharge or proposed to receive the discharge.” (AIP, Page 7). Tier 2 was determined for all POCs (see Appendix D).

TABLE 1. POLLUTANTS OF CONCERN AND TIER DETERMINATION

POLLUTANTS OF CONCERN	TIER	DEGRADATION	COMMENT
BOD5/DO	2	Minimal	
Total Suspended Solids (TSS)	**	Minimal	
Ammonia	2	Minimal	
pH	***	Minimal	Permit limits applied
<i>Escherichia coli</i> (<i>E. coli</i>)	2	Minimal	
Oil & Grease	2	Minimal	Permit limits applied

* Tier assumed.

Tier determination not possible: ** No in-stream standards for these parameters. *** Standards for these parameters are ranges

The following Antidegradation Review Summary attachments in Appendix D were used by the applicant:

For pollutants of concern, the attachments are:

Attachment A, Tier 2 with significant degradation.

5.2. EXISTING WATER QUALITY

Existing water quality data for the Missouri River was obtained by the applicant from Stream Team Data (Team 443, 1995 to 1998, 16:00; See Appendix E). Department staff compared the applicant supplied data to data from the Missouri Department of Natural Resources Water Quality Assessment System, and the applicant supplied data for ammonia was found to be as high as, or higher than, the Department's data.

All POCs were considered to be Tier 2 based on the submitted tier analysis.

5.3. NO DISCHARGE EVALUATION

According to 10 CSR 20-6.010 (4)(D), reports for the purpose of constructing a wastewater treatment facility shall consider the feasibility of constructing and operating a no discharge facility. The applicant has already evaluated no discharge options as part of previous submittals (see Section 5.6. DEMONSTRATION OF NECESSITY AND SOCIAL AND ECONOMIC IMPORTANCE).

5.4 LOSING STREAM ALTERNATIVE DISCHARGE LOCATION

Under 10 CSR 20-7.015(4) (A), *discharges to losing stream shall be permitted only after other alternatives including land application, discharge to gaining stream and connection to a regional facility have been evaluated and determined to be unacceptable for environmental and/or economic reasons.*

The facility does not discharge to a losing stream segment or will not discharge within 2 miles of a losing stream segment.

5.5. ASSIMILATIVE CAPACITY CALCULATIONS

The applicant supplied Facility Assimilative Capacity calculations for DO, BOD₅, ammonia, TSS, and oil and grease (Appendix E) and proposed having no effluent limits for ammonia. The applicant supplied calculations used a proposed design flow of 130,000 gpd. FAC and Percent FAC capacity calculations for ammonia used the lowest flow recorded since October 1, 2000 for the Missouri River (18,400 cfs), summer chronic ammonia criteria with no mixing, and average effluent ammonia concentration. FAC and Percent FAC Capacity were recalculated in this review using the design flow of 180,000 gpd, 30Q10 low flow value calculated for the Missouri River, and water-quality based effluent limit daily maximums for summer and winter ammonia for discharge to the Missouri River.

TABLE 2. ASSIMILATIVE CAPACITY CALCULATIONS FOR THE MISSOURI RIVER (AT PROPOSED FLOW)

	Water Quality Standards		Water Quality		Facility Assimilative Capacity		
	Acute Criteria Aquatic Life	Chronic Criteria Aquatic Life	EWQ (mg/L)	WQBEL Daily Max (mg/L)	Discharge Load (lbs/day)	FAC Chronic (lbs/day)	FAC _{ratio} (Existing Load/FAC)
Ammonia - Summer	12.1	1.5	0.35	129.6	194.7	134,368	0.145%
Ammonia-Winter	12.1	3.1	0.35	129.6	194.7	321,313	0.061%

The outfall location for the Glasgow WWTF is being relocated to the Missouri River. Current discharge is to Hurricane Creek approximately 0.4 stream miles from the Missouri River. Table 3 compares existing BOD and TSS loads to proposed loads.

TABLE 3. POLLUTANT LOADS AT GLASGOW WWTF

	Existing Effluent Limit	Existing Loading	Future Effluent Limit	Future Loading	Percent Loading Change
BOD monthly avg.	45 mg/L	67.6 lb/day	30 mg/L	45. ₁ lb/day	-33%
BOD weekly avg.	65 mg/L	97.6 lb/day	45 mg/L	67. ₆ lb/day	-31%
TSS monthly avg.	70 mg/L	105.1 lb/day	30 mg/L	45. ₁ lb/day	-57%
TSS weekly avg.	110 mg/L	165.2 lb/day	45 mg/L	67. ₆ lb/day	-59%

For BOD, TSS, oil & grease, pH, and *E. coli* facility assimilative capacity cannot be determined by use of the Missouri Antidegradation Rule and Implementation Procedure's (AIP's) assimilative capacity equations. For BOD₅, the Streeter-Phelps water quality model was used to verify that the proposed limits are protective of water quality for dissolved oxygen (See Appendix C). For oil and grease, if the facility is publicly owned, the requirements in 10 CSR 20-7.031 Table A apply.

Calculated facility assimilative capacities used were less than 1%. *Missouri's Antidegradation Rule and Implementation Procedure* considers the use of less than 10% of the facility's available assimilative capacity as insignificant degradation. All POCs were insignificant. The procedures indicate that cumulative degradation, as reflected in the segment assimilative capacity, is measured from the time that existing water quality is first determined; therefore, the net increase in loading will only be those of the Glasgow WWTF discharge. Because this antidegradation review serves to establish the existing water quality at this location, the proposed expansion of POCs in Outfall 001 amounts to the sum total of the degradation.

5.6. DEMONSTRATION OF NECESSITY AND SOCIAL AND ECONOMIC IMPORTANCE

Missouri's antidegradation implementation procedures specify that if the proposed activity does not result in significant degradation then a demonstration of necessity (i.e., alternatives analysis) and a determination of social and economic importance are not required. However the applicant elected to perform an Alternatives Analysis on a limited basis to justify the discharge produced by the preferred treatment alternative.

Non-degrading alternatives evaluated included no-discharge land application and subsurface irrigation. These alternatives were considered not practicable due to the high clay and rock content, the slopes of the local soils, and the large amount of land required. Regionalization was considered not practicable due to geographic limitations.

The preferred alternative was to relocate the outfall location for the lagoon. The current discharge is to Hurricane Creek, a Class C stream. Piping to the Missouri River will require about 1,200 feet of pipe and will provide more volume for effluent dilution. The applicant also discussed environmental impacts, technical factors, location, and project schedule in the Alternatives & SEI Analysis section of the *Antidegradation Report for the City of Glasgow Wastewater Lagoon Improvements*. Glasgow voters have already voted to give the City permission to sell bonds to cover the cost of this alternative, which was determined to be the most economically efficient treatment option.

The applicant proposed limits are shown in Table 4. The applicant proposed BOD limits of 45 mg/L monthly average and 65 mg/L weekly average and TSS limits of 80 mg/L monthly average and 120 mg/L weekly average. However, because the applicant is proposing to add aeration to the lagoon, equivalent to secondary TSS and BOD limits will no longer apply and the facility will have to meet the requirements at 10 CSR 20-7.015(2)(A)1. of 45 mg/L weekly average and 30 mg/L monthly average.

TABLE 4: APPLICANT PROPOSED LIMITS

	Monthly Average	Weekly Average
BOD₅	45	65
TSS	80	120
Ammonia	No limit (No Reasonable Potential)	No limit (No Reasonable Potential)
Oils & Grease	10	15

6. GENERAL ASSUMPTIONS OF THE WATER QUALITY AND ANTIDegradation REVIEW

1. A Water Quality and Antidegradation Review (WQAR) assumes that [10 CSR 20-6.010(3) Continuing Authorities and 10 CSR 20-6.010(4) (D), consideration for no discharge] has been or will be addressed in a Missouri State Operating Permit or Construction Permit Application.
2. A WQAR does not indicate approval or disapproval of alternative analysis as per [10 CSR 20-7.015(4) Losing Streams], and/or any section of the effluent regulations.
3. Changes to Federal and State Regulations made after the drafting of this WQAR may alter Water Quality Based Effluent Limits (WQBEL).
4. Effluent limitations derived from Federal or Missouri State Regulations (FSR) may be WQBEL or Effluent Limit Guidelines (ELG).
5. WQBEL supersede ELG only when they are more stringent. Mass limits derived from technology based limits are still appropriate.
6. A WQAR does not allow discharges to waters of the state, and shall not be construed as a National Pollution Discharge Elimination System or Missouri State Operating Permit to discharge or a permit to construct, modify, or upgrade.
7. Limitations and other requirements in a WQAR may change as Water Quality Standards, Methodology, and Implementation procedures change.
8. Nothing in this WQAR removes any obligations to comply with county or other local ordinances or restrictions.
9. If the proposed treatment technology is not covered in 10 CSR 20-8 Design Guides, the treatment process may be considered a new technology. As a new technology, the permittee will need to work with the review engineer to ensure equipment is sized properly. The operating permit may contain additional requirements to evaluate the effectiveness of the technology once the facility is in operation. This Antidegradation Review is based on the information provided by the facility and is not a comprehensive review of the proposed treatment technology. If the review engineer determines the proposed technology will not consistently meet proposed effluent limits, the permittee will be required to revise their Antidegradation Report.

7. MIXING CONSIDERATIONS

Mixing Zone (MZ): One-quarter (1/4) of the stream volume of flow; length one-quarter (1/4) mile. [10 CSR 20-7.031(5)(A)4.B.(III)(a)].

Zone of Initial Dilution (ZID): One-tenth (0.1) of the mixing zone volume of flow, not to exceed 10 times the effluent design flow. [10 CSR 20-7.031(5)(A)4.B.(III)(b)].

	Flow (cfs)	MZ (cfs)	ZID (cfs)
7Q10	20,387	5,097	2.8
1Q10	19,636	4,909	2.8
30Q10	21,662	5,416	2.8

$$AEC\% = \left(\frac{100}{\text{DilutionRatio} + 1} \right) = 100/(2.0/.20 + 1) = 9.1\%$$

8. PERMIT LIMITS AND MONITORING INFORMATION

WASTELOAD ALLOCATION STUDY CONDUCTED (Y OR N): USE ATTAINABILITY ANALYSIS CONDUCTED (Y OR N): WHOLE BODY CONTACT USE RETAINED (Y OR N):

* UAA CONDUCTED ON THE MISSOURI RIVER IN 2005 WITH WBC RETAINED

OUTFALL #001

WET TEST (Y OR N): FREQUENCY: ONCE/PERMIT CYCLE AEC: 9.1% METHOD: MULTIPLE

TABLE 5. EFFLUENT LIMITS FOR OUTFALL 001

PARAMETER	UNITS	DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	BASIS FOR LIMIT (NOTE 1)	MONITORING FREQUENCY
FLOW	MGD	*		*	FSR	TWICE/WEEK
BIOCHEMICAL OXYGEN DEMAND ₅ ****	MG/L		45	30	FSR	ONCE/MONTH
TOTAL SUSPENDED SOLIDS****	MG/L		45	30	FSR	ONCE/MONTH
pH	SU	**		**	FSR	ONCE/MONTH
AMMONIA AS N	MG/L	*		*	MDEL	ONCE/MONTH
WET TESTING	TU	*			FSR	ONCE/PERMIT CYCLE
<i>ESCHERICHIA COLIFORM (E. COLI)</i>	NOTE 1		1030***	206***	FSR	ONCE/WEEK
TOTAL NITROGEN	MG/L	*		*	FSR	ONCE/QUARTER
TOTAL PHOSPHORUS	MG/L	*		*	FSR	ONCE/QUARTER

NOTE 1 – COLONIES/100 ML

NOTE 2– WATER QUALITY-BASED EFFLUENT LIMITATION – WQBEL; OR MINIMALLY DEGRADING EFFLUENT LIMIT –MDEL; OR PREFERRED ALTERNATIVE EFFLUENT LIMIT – PEL; OR TECHNOLOGY-BASED EFFLUENT LIMIT – TBEL; OR NO DEGRADATION EFFLUENT LIMIT – NDEL; OR FEDERAL/STATE REGULATION – FSR; OR NOT APPLICABLE – N/A. ALSO, PLEASE SEE THE **GENERAL ASSUMPTIONS OF THE WQAR #4 & #5**.

* Monitoring requirements only.

** The pH is to be maintained at or above 6.0 pH units.

*** The Monthly and Weekly Average for *E. coli* shall be reported as a Geometric Mean. The Weekly Average for *E. coli* will be expressed as a geometric mean if more than one (1) sample is collected during a calendar week (Sunday through Saturday).

**** This facility is required to meet a removal efficiency of 85% or more for BOD₅ and TSS. Influent BOD₅ and TSS data should be reported to ensure removal efficiency requirements are met.

9. RECEIVING WATER MONITORING REQUIREMENTS

No receiving water monitoring requirements recommended at this time.

10. DERIVATION AND DISCUSSION OF LIMITS

Wasteload allocations and limits were calculated using two methods:

1) Water quality-based – Using water quality criteria or water quality model results and the dilution equation below:

$$C = \frac{(C_s \times Q_s) + (C_e \times Q_e)}{(Q_e + Q_s)} \quad (\text{EPA/505/2-90-001, Section 4.5.5})$$

Where C = downstream concentration

C_s = upstream concentration

Q_s = upstream flow

C_e = effluent concentration

Q_e = effluent flow

Chronic wasteload allocations were determined using applicable chronic water quality criteria (CCC: criteria continuous concentration) and stream volume of flow at the edge of the mixing zone (MZ). Acute wasteload allocations were determined using applicable water quality criteria (CMC: criteria maximum concentration) and stream volume of flow at the edge of the zone of initial dilution (ZID).

Water quality-based maximum daily and average monthly effluent limitations were calculated using methods and procedures outlined in USEPA's "Technical Support Document For Water Quality-based Toxics Control" (EPA/505/2-90-001).

2) Assimilative capacity based – Using existing water quality (EWQ), water quality criteria, and the facility assimilative capacity ratio within the following equation:

New Outfall:

$$C_d = [\text{FAC}_{\text{ratio}} * ((C_c * (Q_s + Q_d)) - (\text{EWQ} * Q_s) * \text{CF})] / Q_d$$

Where: C_c = downstream concentration, the Water Quality Standard (WQS)

Q_s = Stream 7Q10 flow (ft³/s), 30Q10 or 30Q5 flow.

Where: 7Q10 flow is used for toxics; 30Q10 flow is used chronic calculations of ammonia and 30Q5, for human health chronic calculations. Acute ammonia calculations use the 1Q10 flow.

Q_d = Proposed effluent design flow (ft³/s)

EWQ = upstream concentration

C_d = effluent concentration of the proposed facility

C_d with no permitted level and permitted level.

1) For POCs with no permitted discharge, if POC is ammonia, determine WQBEL for all discharges regardless of performance and use the maximum daily limit.

For other POCs with no permitted discharge, C_d is based on monitoring data.

The 99th percentile value of the pollutant monitoring concentrations should be used for C_d for pollutants with monitoring only. A reasonable potential analysis should be conducted for these POCs.

2) For POCs with permitted levels, C_d should be the concentration in the permit.

FAC_{ratio} = facility assimilative capacity (FAC) ratio (calculated or assumed)

CF = Conversion factors are: 0.0054 for ug/L, 5.4 for mg/L.

Chronic wasteload allocations (WLA_c) were determined using applicable chronic water quality criteria (CCC: criteria continuous concentration) and upstream stream flow without mixing considerations. Acute wasteload allocations are only determined in the absence of applicable chronic criteria.

For most toxic and conventional POCs, the minimally-degrading maximum daily limits are determined by applying the WLAc (or applicable WLAa) as the maximum daily (MDL) mass limitation. The WLA mass limitation must be applied as the maximum daily limit because the Antidegradation Implementation Procedure applies the FAC as pounds per day.

Note: Minimally-degrading effluent limits have been based on the authority included in Section III. Permit Consideration of the AIP.

10.1. OUTFALL #001 – MAIN FACILITY OUTFALL

10.2. LIMIT DERIVATION

The process for limit derivation for POCs that are minimally degrading is as follows:

- 1) Determine using method #2 outlined above for all applicable POCs the minimally degrading wasteload allocation and effluent limits (MDEL) that retains the remaining assimilative capacity and does not exceed 10% of the FAC.
- 2) The next step is to develop water quality-based effluent limits. The water quality-based maximum daily and average monthly limit will be compared to the MDEL maximum daily limit as a concentration value. If the MDEL concentration value is greater than the water quality-based maximum and average monthly limits, only the water quality limits will apply. If the MDEL concentration value is less than the water quality-based maximum and average monthly limits, the water quality-based limits and the MDEL maximum daily as a mass limit will apply.
- 3) Determine the need for permit limits of various POCs using reasonable potential analysis. While this process is applied to all applicable POCs, this process is particularly important for POCs having monitoring only requirements for an existing discharge. No POC will exceed the maximum daily limit (MDL). Limits that exceed the MDL of the MDEL may have the MDEL applied. Some POCs may have the limit applied under certain circumstances.
- 4) To determine if any of the above proposed limits are protective of water quality standards, the final step is to develop water quality-based effluent limits. The more stringent of the MDEL and WQBEL will be applied.

TABLE 6. CALCULATIONS OF MINIMALLY DEGRADING EFFLUENT LIMITS

	Chronic Criteria (C _c)	EWQ	FAC (lb/day)	10% FAC (lb/day)	MDEL Max Daily Limit (MDL) (C _d)
Ammonia As N (Apr 1 – Sept 30)	1.5 mg/L	0.35 mg/L	134,368	13,437	8,944 mg/L
Ammonia As N (Oct 1 – Mar 31)	3.1 mg/L	0.35 mg/L	321,313	32,131	21,389 mg/L

$$FAC = (C_c(Q_s + Q_d) - EWQ * Q_s) * CF$$

$$C_d = FACRATIO * \frac{C_c * (Q_s + Q_d) - (EWQ * Q_s)}{Q_d}$$

- C_c Chronic criterion
- Q_s Stream flow: 30Q10 flow is used for ammonia
- Q_d Average daily design flow of new discharge
- CF Conversion factor. A CF of 5.4 is used to derive a load in “lbs/day” when the WQS is represented in mg/L and flow is represented in cfs [(mg/L) · (cfs) · 5.4] = (lbs/day)]
- C_d New discharge concentration (mg/L)
- EWQ Existing water quality (mg/L)

To determine the need for permit limits for ammonia, a reasonable potential analysis was conducted. Statistical analysis of the raw discharge monitoring data was completed, and the reasonable potential to exceed (RPTE calculation) in Table 7 below was determined. The RPA should be conducted such that the maximum daily limit will not exceed the receiving water concentration. No POC exceeded the maximum daily limit.

TABLE 7. REASONABLE POTENTIAL ANALYSIS TO EXCEED MAXIMUM DAILY LIMIT

Parameter	CMC	RWC Acute	CCC	RWC Chronic	n*	Range max/min	CV**	MF	RP Yes/No
Ammonia (Summer) mg/L	12.1	3.80	1.5	0.35	21.00	10/0.1	1.14	3.83	NO
Ammonia (Winter) mg/L	12.1	2.84	3.1	0.35	15.00	7.39/0.1	0.92	3.76	NO

- * If the number of samples is 10 or greater, then the CV value must be used in the WQBEL for the applicable constituent. If the number of samples is < 10, then the default CV value must be used in the WQBEL for the applicable constituent.
- ** Coefficient of Variation (CV) is calculated by dividing the Standard Deviation of the sample set by the Mean of the same sample set.
- RWC – Receiving Water Concentration. The concentration of a toxicant or the parameter toxicity in the receiving water after mixing (if applicable).
- n – Number of samples.
- MF – Multiplying Factor. 99% Confidence Level and 99% Probability Basis.
- RP – Reasonable Potential. Where an effluent is projected or calculated to cause an excursion above a water quality standard based on a number of factors including, as a minimum, the four factors listed in 40 CFR 122.44(d)(1)(ii).

Reasonable Potential Analysis is conducted as per (TSD, EPA/505/2-90-001, Section 3.3.2). A more detailed version, including calculations, of this RPA is available upon request.

- **Flow.** In accordance with [40 CFR Part 122.44(i)(1)(ii)] the volume of effluent discharged from each outfall is needed to assure compliance with permitted effluent limitations. If the permittee is unable to obtain effluent flow, then it is the responsibility of the permittee to inform the Department, which may require the submittal of an operating permit modification.
- **Biochemical Oxygen Demand (BOD₅).** BOD₅ limits of 30 mg/L monthly average, 45 mg/L average weekly limits as per 10 CSR 20-7.015(2)(A)1..

To protect beneficial uses within the Missouri River, dissolved oxygen modeling analysis was submitted for review and was verified by staff with the Streeter-Phelps model (Appendix C). 45 mg/L CBOD₅ was used as input to the Streeter Phelps analysis. Streeter Phelps modeling simulated using the proposed design flow and site specific data for summer indicated a 2.29 mg/L dissolved oxygen deficit below the calculated dissolved oxygen saturation value. The modeled lowest dissolved oxygen or critical dissolved oxygen sag was 5.95 mg/L for summer. Streeter Phelps modeling simulated using the proposed design flow and site specific data for winter indicated a 3.84 mg/L dissolved oxygen deficit below the calculated dissolved oxygen saturation value. The modeled lowest dissolved oxygen or critical dissolved oxygen sag was 9.7 mg/L for winter.

As a result of this analysis, MDNR staff concludes that the above mentioned effluent limits are protective of beneficial uses and existing water quality.

Influent monitoring may be required for this facility in its Missouri State Operating Permit.

- **Total Suspended Solids (TSS).** 30 mg/L monthly average, 45 mg/L average weekly limit as per 10 CSR 20-7.015(2)(A)1. According to EPA, because TSS and BOD are closely correlated, we apply the same limits for TSS as BOD. Influent monitoring may be required for this facility in its Missouri State Operating Permit.
- **pH.** – pH shall be maintained above six (6.0) standard units. Technology based limits [10 CSR 20-7.015] are protective of the water quality standard [10 CSR 20-7.031(5)(E)], due to the buffering capacity of the mixing zone.
- **Total Ammonia Nitrogen.** Monitoring requirement only. The reasonable potential analysis (Table 7) indicated that there was not reasonable potential to exceed either the water quality-based effluent limits calculated below or the minimally degrading effluent limits. The *Total Ammonia Nitrogen Criteria Implementation Guidance* (August 2007) states that “if the results of the RPA indicate reasonable potential does not exist, a monitoring only requirement for total ammonia nitrogen must be in the permit until the next renewal.”

Water Quality-Based Effluent limits for Ammonia were calculated below and compared to the MDELS

WATER QUALITY-BASED EFFLUENT LIMITS:

Early Life Stages Present Total Ammonia Nitrogen criteria apply [10 CSR 20-7.031(4)(B)7.C. & Table B3]. Background total ammonia nitrogen = 0.35 mg/L (applicant supplied existing water quality data for the Missouri River).

Season	Temp (°C)	pH (SU)	Total Ammonia Nitrogen CCC (mg N/L)	Total Ammonia Nitrogen CMC (mg N/L)
Summer	26	7.8	1.5	12.1
Winter	6	7.8	3.1	12.1

Summer

Chronic WLA: $C_e = ((0.28 + 5,416)1.5 - (5,416 * 0.35))/0.28$
 $C_e = 22,362 \text{ mg/L}$

Acute WLA: $C_e = ((0.28 + 2.8)12.1 - (2.8 * 0.35))/0.28$
 $C_e = 129.6 \text{ mg/L}$

$LTA_c = 23,362 \text{ mg/L (0.780)} = 17,449 \text{ mg/L}$ [CV = 0.6, 99th Percentile, 30 day avg.]

$LTA_a = 129.6 \text{ mg/L (0.321)} = 41.6 \text{ mg/L}$ [CV = 0.6, 99th Percentile]

MDL = 41.6 mg/L (3.11) = 129.6 mg/L [CV = 0.6, 99th Percentile]

AML = 41.6 mg/L (1.19) = 49.5 mg/L [CV = 0.6, 95th Percentile, n = 30]

Winter

Chronic WLA: $C_e = ((0.28 + 5,416)3.1 - (5,416 * 0.35))/0.28$
 $C_e = 53,474 \text{ mg/L}$

Acute WLA: $C_e = ((0.28 + 2.8)12.1 - (2.8 * 0.35))/0.28$
 $C_e = 129.6 \text{ mg/L}$

$LTA_c = 53,474 \text{ mg/L (0.780)} = 41,725 \text{ mg/L}$ [CV = 0.6, 99th Percentile, 30 day avg.]

$LTA_a = 129.6 \text{ mg/L (0.321)} = 41.6 \text{ mg/L}$ [CV = 0.6, 99th Percentile]

MDL = 41.6 mg/L (3.11) = 129.6 mg/L [CV = 0.6, 99th Percentile]

AML = 41.6 mg/L (1.19) = 49.5 mg/L [CV = 0.6, 95th Percentile, n = 30]

Season	Maximum Daily Limit (mg/l)	Average Monthly Limit (mg/l)
Summer	129.6	49.5
Winter	129.6	49.5

Table 8 shows the WQBELs and MDELs for ammonia. By comparison, all WQBELs in Table 8 are less than the MDELs, therefore the more stringent water quality-based effluent limits would apply.

TABLE 8. WATER QUALITY-BASED EFFLUENT LIMITS FOR POCs.

Pollutant of Concern (mg/L)	WQBEL		MDEL	
	MDL	AML	MDL	AML
Ammonia – Summer	129.6	49.5	8,944	3,422
Ammonia – Winter	129.6	49.5	21,389	8,184

The discharge monitoring report values for ammonia for the last five years (April 2012 through February 2017) have been consistently below both the MDELs and the WQBELs for ammonia and the reasonable potential analysis indicated no reasonable potential existed. Because of this, monitoring only is being required for ammonia.

Notice to Permittee: On August 22, 2013, the Environmental Protection Agency (EPA) published a notice in the Federal Register announcing the final national recommended ambient water quality criteria for protection of aquatic life from the effects of ammonia in freshwater. The EPA's guidance, *Final Aquatic Life Ambient Water Quality Criteria for Ammonia – Fresh Water 2013*, is not a rule, nor automatically part of a state's water quality standards. States must adopt new ammonia criteria consistent with EPA's published ammonia criteria into their water quality standards that protect aquatic life in water.

The Water Protection Program (WPP) is providing this notice to inform permittees that EPA's published ammonia criteria for aquatic life protection is lower than the current Missouri criteria. The Department has begun discussions about how these new criteria will be implemented. WPP is suggesting that all permittees consider the lower ammonia criteria if they so choose. Consideration of the future ammonia criteria at this time could avoid a near-future upgrade. More information about the new ammonia criteria for aquatic life protection may be found at: <http://dnr.mo.gov/pubs/pub2481.htm>.

- ***Escherichia coli (E. coli)***. Monthly average of 206 per 100 mL as a geometric mean and Weekly Average of 1030 during the recreational season (April 1 – October 31), to protect Whole Body Contact Recreation (B) designated use of the receiving stream, as per 10 CSR 20-7.031(5)(C) and 10 CSR 20-7.015 (9)(B)1.A.]. An effluent limit for both monthly average and weekly average is required by 40 CFR 122.45(d).

For facilities greater than 100,000 gpd: At a minimum, weekly monitoring is required during the recreational season (April 1 – October 31), with compliance to be determined by calculating the geometric mean of all samples collected during the reporting period (samples collected during the calendar week for the weekly average, and samples collected during the calendar month for the monthly average). The weekly average requirement is consistent with EPA federal regulation 40 CFR 122.45(d). Please see **GENERAL ASSUMPTIONS OF THE WQAR #7**.

Whole Effluent Toxicity

- **Acute Whole Effluent Toxicity**. Monitoring requirement only. Monitoring is required to determine if reasonable potential exists for this facility's discharge to exceed water quality standards.

Classified P with other than default Mixing Considerations, the AEC% is determined as follows:

$$\text{Acute AEC\%} = \{[(\text{design flow}_{\text{cfs}} + \text{ZID}_{7\text{Q}10}) / \text{design flow}_{\text{cfs}}]^{-1}\} \times 100 = \#\%$$

$$\text{Acute AEC\%} = \{[(0.28 + 2.8) / 0.28]^{-1}\} \times 100 = 9.1\%$$

The Allowable Effluent Concentration (AEC) is 9.1% with the dilution series being: 100%, 50%, 25%, 9.1%, 4.5%

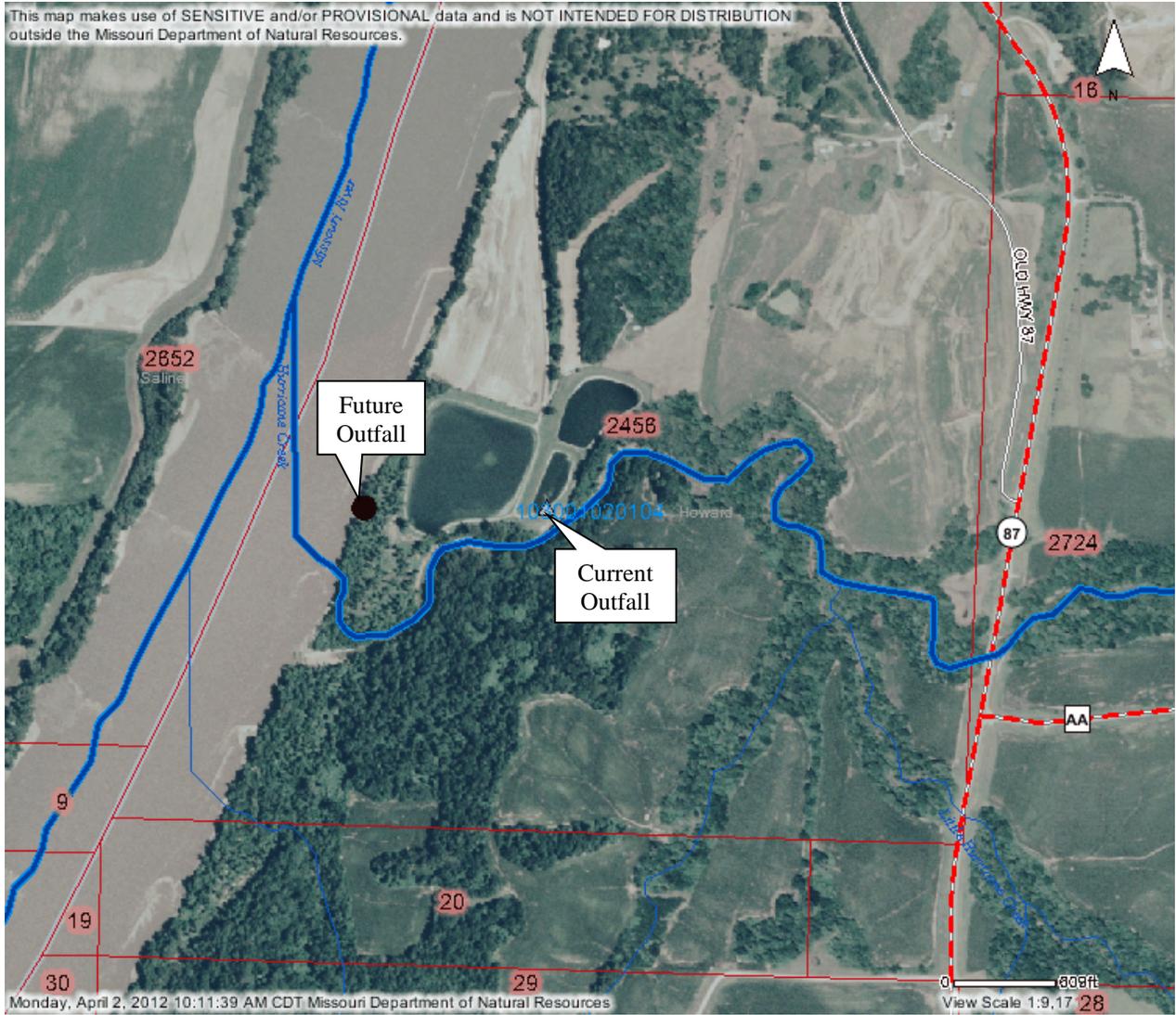
- **Oil & Grease**. Conventional pollutant, [10 CSR 20-7.031, Table A]. Effluent limitation for protection of aquatic life; 10 mg/L monthly average, 15 mg/L daily maximum.
- **Total Phosphorus and Total Nitrogen**. Monitoring required for facilities greater than 100,000 gpd design flow per 10 CSR 20-7.015(9)(D)7. Once per quarter sampling for one permit cycle or up to 5 years if permit cycle is less than 5 years.

11. ANTIDegradation Review Preliminary Determination

The proposed new facility discharge, Glasgow WWTF, 0.18 MGD will result in minimal degradation of the segment identified in the Missouri River. Per the requirements of the AIP, the effluent limits in this review were developed to be protective of beneficial uses and to retain the remaining assimilative capacity. MDNR has determined that the submitted review is sufficient and meets the requirements of the AIP. No further analysis is needed for this discharge.

Reviewer: Cailie Carlile, P.E. CC
Date: 05/04/2017
Unit Chief: John Rustige, P.E. JR

Appendix A: Map of Discharge Location



Appendix B: Natural Heritage Review



Missouri Department of Conservation

Missouri Department of Conservation's Mission is to protect and manage the forest, fish, and wildlife resources of the state and to facilitate and provide opportunities for all citizens to use, enjoy and learn about these resources.

Natural Heritage Review Level Three Report: Species Listed Under the Federal Endangered Species Act

There are records for species listed under the Federal Endangered Species Act, and possibly also records for species listed Endangered by the state, or Missouri Species and/or Natural Communities of Conservation Concern within or near the the defined Project Area. Please contact the U.S. Fish and Wildlife Service and the Missouri Department of Conservation for further coordination.

Foreword: Thank you for accessing the Missouri Natural Heritage Review Website developed by the Missouri Department of Conservation with assistance from the U.S. Fish and Wildlife Service, the U.S. Army Corps of Engineers, Missouri Department of Transportation and NatureServe. The purpose of this website is to provide information to federal, state and local agencies, organizations, municipalities, corporations and consultants regarding sensitive fish, wildlife, plants, natural communities and habitats to assist in planning, designing and permitting stages of projects.

PROJECT INFORMATION

Project Name and ID Number: Glasgow WWTF Outfall Relocation #2672

Project Description: Relocating wastewater treatment facility outfall from Hurricane Creek to the Missouri River

Project Type: Waste Transfer, Treatment, and Disposal, Liquid waste/Effluent, Wastewater treatment plant, Modification

Contact Person: Cailie Carlile

Contact Information: cailie.carlile@dnr.mo.gov or 5737511714

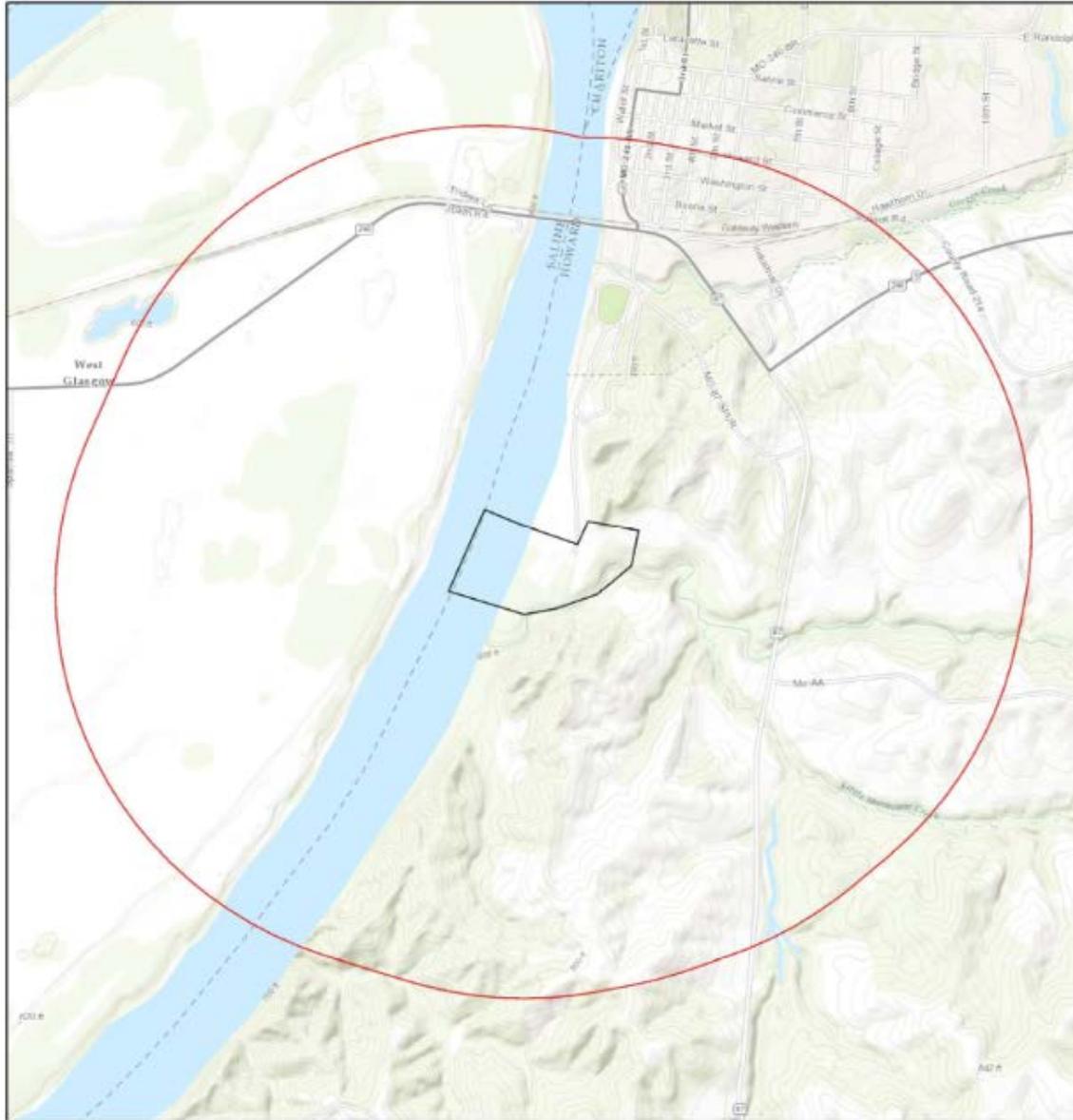
Disclaimer: The NATURAL HERITAGE REVIEW REPORT produced by this website identifies if a species tracked by the Natural Heritage Program is known to occur within or near the area submitted for your project, and shares suggested recommendations on ways to avoid or minimize project impacts to sensitive species or special habitats. If an occurrence record is present, or the proposed project might affect federally listed species, the user must contact the Department of Conservation or U.S. Fish and Wildlife Service for more information. The Natural Heritage Program tracks occurrences of sensitive species and natural communities where the species or natural community has been found. Lack of an occurrence record does not mean that a sensitive plant, animal or natural community is not present on or near the project area. Depending on the project, current habitat conditions, and geographic location in the state, surveys may be necessary. Additionally, because land use conditions change and animals move, the existence of an occurrence record does not mean the species/habitat is still present. Therefore, Reports include information about records near but not necessarily on the project site.

The Natural Heritage Report is not a site clearance letter for the project. It provides an indication of whether or not public lands and sensitive resources are known to be (or are likely to be) located close to the proposed project. Incorporating information from the Natural Heritage Program into project plans is an important step that can help reduce unnecessary impacts to Missouri's sensitive fish, forest and wildlife resources. However, the Natural Heritage Program is only one reference that should be used to evaluate potential adverse project impacts. Other types of information, such as wetland and soils maps and on-site inspections or surveys, should be considered. Reviewing current landscape and habitat information, and species' biological characteristics would additionally ensure that Missouri Species of Conservation Concern are appropriately identified and addressed in planning efforts.

U.S. Fish and Wildlife Service – Endangered Species Act (ESA) Coordination: Lack of a Natural Heritage Program occurrence record for federally listed species in your project area does not mean the species is not present, as the area may never have been surveyed. Presence of a Natural Heritage Program occurrence record does not mean the project will result in negative impacts. The information within this report is not intended to replace Endangered Species Act consultation with the U.S. Fish and Wildlife Service (USFWS) for listed species. Direct contact with the USFWS may be necessary to complete consultation and it is required for actions with a federal connection, such as federal funding or a federal permit; direct contact is also required if ESA concurrence is necessary. Visit the USFWS Information for Planning and Conservation (IPaC) website at <https://ecos.fws.gov/ipac/> for further information. This site was developed to help streamline the USFWS environmental review process and is a first step in ESA coordination. The Columbia Missouri Ecological Field Services Office may be reached at 573-234-2132, or by mail at 101 Park Deville Drive, Suite A, Columbia, MO 65203.

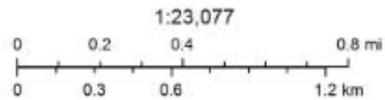
Transportation Projects: If the project involves the use of Federal Highway Administration transportation funds, these recommendations may not fulfill all contract requirements. Please contact the Missouri Department of Transportation at 573-526-4778 or www.modot.mo.gov/ehp/index.htm for additional information on recommendations.

Glasgow WWTF Outfall Relocation



April 12, 2017

- Project Boundary
- Buffered Project Boundary



Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

Species or Communities of Conservation Concern within the Area:

There are records for species listed under the Federal Endangered Species Act, and possibly also records for species listed Endangered by the state, or Missouri Species and/or Natural Communities of Conservation Concern within or near the the defined Project Area. Please contact the U.S. Fish and Wildlife Service and the Missouri Department of Conservation for further coordination.

MDC Natural Heritage Review
Resource Science Division
P.O. Box 180
Jefferson City, MO
65102-0180
Phone: 573-522-4115 ext. 3182
NaturalHeritageReview@mdc.mo.gov

U.S. Fish and Wildlife Service
Ecological Service
101 Park Deville Drive
Suite A
Columbia, MO
65203-0007
Phone: 573-234-2132

Other Special Search Results:

The project occurs on or near public land, STUMP ISLAND PARK ACCESS, please contact MDC.

Project Type Recommendations:

Waste Transfer, Treatment, and Disposal - Wastewater treatment plant: New or Maintenance. Recommendations to help avoid and minimize impacts to fish, forest and wildlife resources are under development.

Project Location and/or Species Recommendations:

Endangered Species Act Coordination - Indiana bats (*Myotis sodalis*, federal- and state-listed endangered) and Northern long-eared bats (*Myotis septentrionalis*, federal-listed threatened) may occur near the project area. Both of these species of bats hibernate during winter months in caves and mines. During the summer months, they roost and raise young under the bark of trees in wooded areas, often riparian forests and upland forests near perennial streams. During project activities, avoid degrading stream quality and where possible leave snags standing and preserve mature forest canopy. Do not enter caves known to harbor Indiana bats or Northern long-eared bats, especially from September to April. **If any trees need to be removed for your project, please contact the U.S. Fish and Wildlife Service (Ecological Services, 101 Park Deville Drive, Suite A, Columbia, Missouri 65203-0007; Phone 573-234-2132 ext. 100 for Ecological Services) for further coordination under the Endangered Species Act.**

The project location submitted and evaluated is within the geographic range of nesting Bald Eagles in Missouri. Bald Eagles (*Haliaeetus leucocephalus*) may nest near streams or water bodies in the project area. Nests are large and fairly easy to identify. Adults begin nesting activity in late December and January and young birds leave the nest in late spring to early summer. While no longer listed as endangered, eagles continue to be protected by the federal government under the Bald and Golden Eagle Protection Act. Work managers should be alert for nesting areas within 1500 meters of project activities, and follow federal guidelines at: <http://www.fws.gov/midwest/MidwestBird/EaglePermits/index.html> if eagle nests are seen.

The project location submitted and evaluated is located within or adjacent to the Mississippi or Missouri rivers. Pallid Sturgeons (*Scaphirhynchus albus*, federal- and state-listed endangered) are big river fish that range widely in the Mississippi and Missouri River system (including parts of some major tributaries). Any project that modifies big river habitat or impacts water quality should consider the possible impact to pallid sturgeon populations. See <http://mdc.mo.gov/124> for Best Management Practices. Additional coordination with the U.S. Fish and Wildlife Service under the Endangered Species Act may be necessary (U.S. Fish and Wildlife Service, Ecological Services, 101 Park DeVille Drive, Suite A, Columbia, Missouri 65203-0007; phone 573-234-2132.)

Invasive exotic species are a significant issue for fish, wildlife and agriculture in Missouri. Seeds, eggs, and larvae may be moved to new sites on boats or construction equipment. Please inspect and clean equipment thoroughly before moving between project sites. See <http://mdc.mo.gov/9633> for more information.

- Remove any mud, soil, trash, plants or animals from equipment before leaving any water body or work area.
- Drain water from boats and machinery that have operated in water, checking motor cavities, live-well, bilge and transom wells, tracks, buckets, and any other water reservoirs.
- When possible, wash and rinse equipment thoroughly with hard spray or HOT water (?140° F, typically available at do-it-yourself car wash sites), and dry in the hot sun before using again.

Streams and Wetlands – Clean Water Act Permits: Streams and wetlands in the project area should be protected from activities that degrade habitat conditions. For example, soil erosion, water pollution, placement of fill, dredging, in-stream activities, and riparian corridor removal, can modify or diminish aquatic habitats. Streams and wetlands may be protected under the Clean Water Act and require a permit for any activities that result in fill or other modifications to the site. Conditions provided within the U.S. Army Corps of Engineers (USACE) Clean Water Act Section 404 permit (<http://www.nwk.usace.army.mil/Missions/RegulatoryBranch.aspx>) and the Missouri Department of Natural Resources (DNR) issued Clean Water Act Section 401 Water Quality Certification (<http://dnr.mo.gov/env/wpp/401/index.html>), if required, should help minimize impacts to the aquatic organisms and aquatic habitat within the area. Depending on your project type, additional permits may be required by the Missouri Department of Natural Resources, such as permits for stormwater, wastewater treatment facilities, and confined animal feeding operations. Visit <http://dnr.mo.gov/env/wpp/permits/index.html> for more information on DNR permits. Visit both the USACE and DNR for more information on Clean Water Act permitting.

For further coordination with the Missouri Department of Conservation and the U.S. Fish and Wildlife Services, please see the contact information below.

MDC Natural Heritage Review
Resource Science Division
P.O. Box 180
Jefferson City, MO
65102-0180
Phone: 573-522-4115 ext. 3182
NaturalHeritageReview@mdc.mo.gov

U.S. Fish and Wildlife Service
Ecological Service
101 Park Deville Drive
Suite A
Columbia, MO
65203-0007
Phone: 573-234-2132

Miscellaneous Information

FEDERAL Concerns are species/habitats protected under the Federal Endangered Species Act and that have been known near enough to the project site to warrant consideration. For these, project managers must contact the U.S. Fish and Wildlife Service Ecological Services (101 Park Deville Drive Suite A, Columbia, Missouri 65203-0007; Phone 573-234-2132; Fax 573-234-2181) for consultation.

STATE Concerns are species/habitats known to exist near enough to the project site to warrant concern and that are protected under the Wildlife Code of Missouri (RSMo 3 CSR 1 0). "State Endangered Status" is determined by the Missouri Conservation Commission under constitutional authority, with requirements expressed in the Missouri Wildlife Code, rule 3CSR 1 0-4.111. Species tracked by the Natural Heritage Program have a "State Rank" which is a numeric rank of relative rarity. Species tracked by this program and all native Missouri wildlife are protected under rule 3CSR 10-4.110 General Provisions of the Wildlife Code.

Additional information on Missouri's sensitive species may be found at <http://mdc.mo.gov/discover-nature/field-guide/endangered-species>. Detailed information about the animals and some plants mentioned may be accessed at http://mdc4.mdc.mo.gov/applications/mofwis/mofwis_search1.aspx. If you would like printed copies of best management practices cited as internet URLs, please contact the Missouri Department of Conservation.

Appendix C: Streeter Phelps Model Results Proposed Design Flow

**WINTER
INPUT**

1. EFFLUENT CHARACTERISTICS			
Discharge (cfs):			0.27852
CBOD5 (mg/L):			45
Ammonia as Nitrogen (mg/L):			7.39
NBOD (mg/L):			33.7723
Dissolved Oxygen (mg/L):			2.5
Temperature (deg C):			12
2. RECEIVING WATER CHARACTERISTICS			
Upstream Discharge (cfs):			20387
Upstream CBOD5 (mg/L):			1.5
Upstream NBOD (mg/L):			0.5
Upstream Dissolved Oxygen (mg/L):			9.7
Upstream Temperature (deg C):			2
Elevation (ft NGVD):			600
Downstream Average Channel Slope (ft/ft):			0.0002
Downstream Average Channel Depth (ft):			13.6
Downstream Average Channel Velocity (fps):			3.3
3. REAERATION RATE (Base e) AT 20 deg C (day⁻¹):			
			Applicable value below here:
Reference	Applic. Vel (fps)	Applic. Dep (ft)	Suggested Values
Churchill	1.5 - 6	2 - 50	0.47
O'Connor and Dobbins	.1 - 1.5	2 - 50	0.47
Owens	.1 - 6	1 - 2	0.38
Tsivoglou-Wallace	.1 - 6	.1 - 2	1.52
4. BOD DECAY RATE (Base e) AT 20 deg C (day⁻¹):			
			0.30
Reference			Suggested Value
Wright and McDonnell, 1979			0.30

OUTPUT

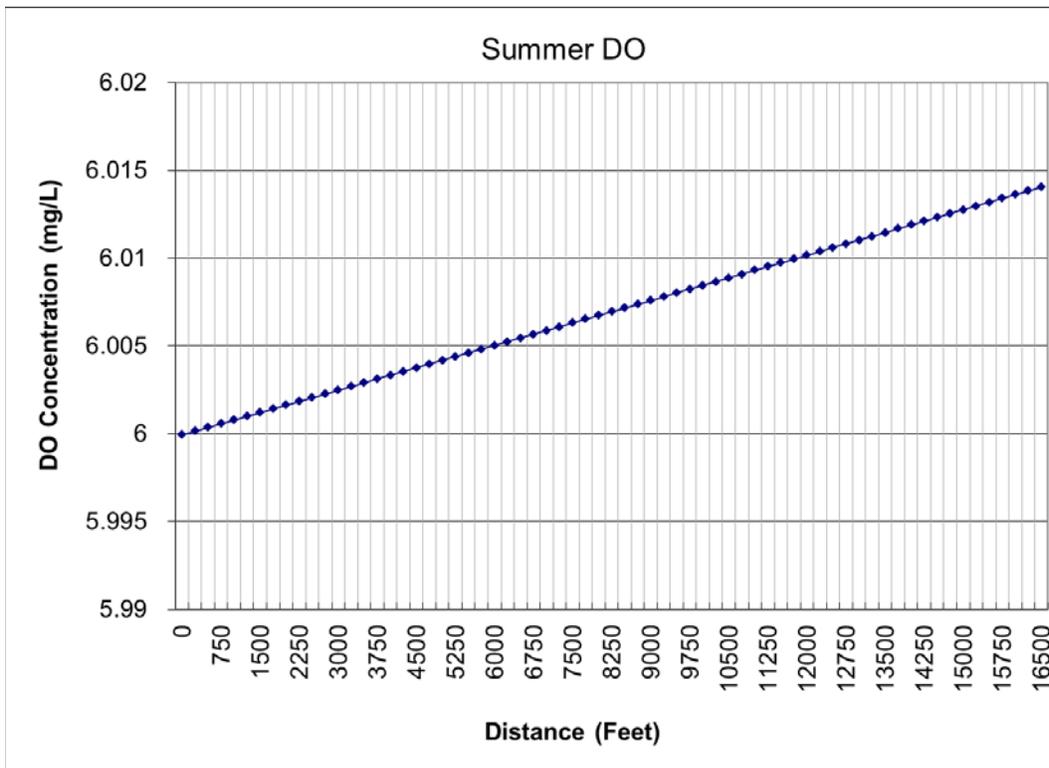
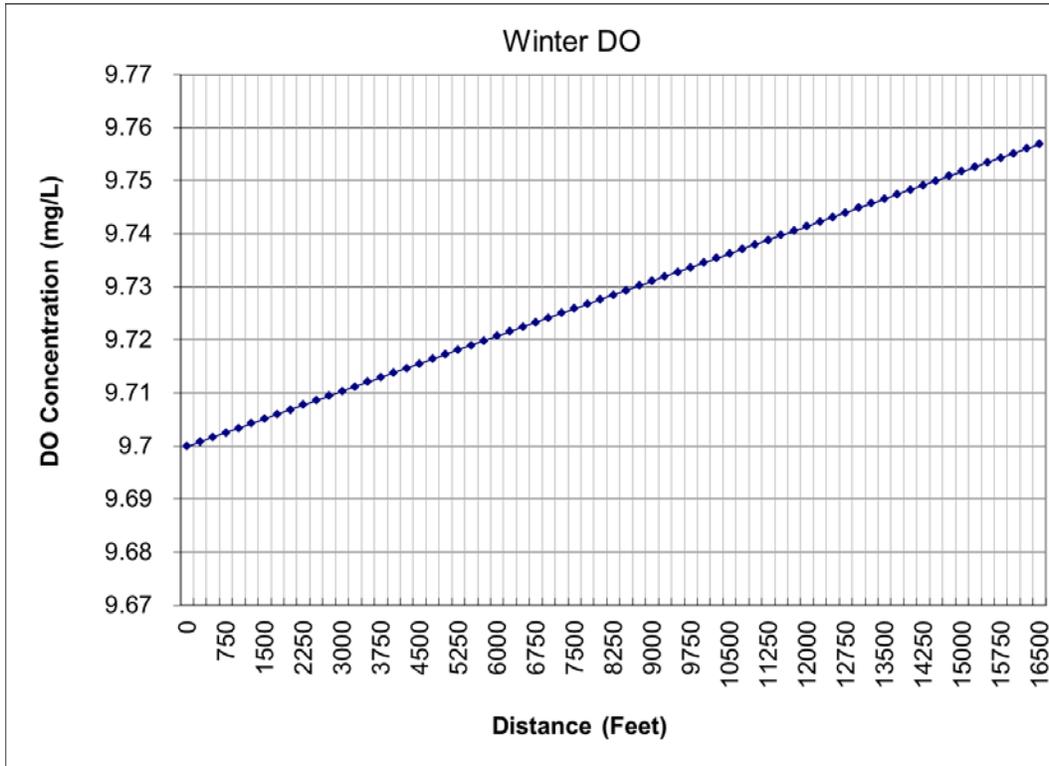
1. INITIAL MIXED RIVER CONDITION	
CBOD5 (mg/L):	1.5
NBOD (mg/L):	0.5
Dissolved Oxygen (mg/L):	9.7
Temperature (deg C):	2.0
2. TEMPERATURE ADJUSTED RATE CONSTANTS (Base e)	
Reaeration (day ⁻¹):	0.31
BOD Decay (day ⁻¹):	0.13
3. CALCULATED INITIAL ULTIMATE CBODU AND TOTAL BODU	
Initial Mixed CBODU (mg/L):	2.2
Initial Mixed Total BODU (CBODU + NBOD, mg/L):	2.7
4. INITIAL DISSOLVED OXYGEN DEFICIT	
Saturation Dissolved Oxygen (mg/L):	13.535
Initial Deficit (mg/L):	3.84
5. TRAVEL TIME TO CRITICAL DO CONCENTRATION (days):	0.000000
6. DISTANCE TO CRITICAL DO CONCENTRATION (feet):	0.00
7. CRITICAL DO DEFICIT (mg/L):	3.84
8. CRITICAL DO CONCENTRATION (mg/L):	9.70

**SUMMER
INPUT**

1. EFFLUENT CHARACTERISTICS			
Discharge (cfs):			0.27852
CBOD5 (mg/L):			45
Ammonia as Nitrogen (mg/L):			10
NBOD (mg/L):			45.7
Dissolved Oxygen (mg/L):			2.5
Temperature (deg C):			23
2. RECEIVING WATER CHARACTERISTICS			
Upstream Discharge (cfs):			20387
Upstream CBOD5 (mg/L):			1.5
Upstream NBOD (mg/L):			0.5
Upstream Dissolved Oxygen (mg/L):			6
Upstream Temperature (deg C):			24
Elevation (ft NGVD):			600
Downstream Average Channel Slope (ft/ft):			0.0002
Downstream Average Channel Depth (ft):			13.6
Downstream Average Channel Velocity (fps):			3.3
3. REAERATION RATE (Base e) AT 20 deg C (day⁻¹):			
			Applicable value below here:
			0.47
Reference	Applic.	Applic.	Suggested
	Vel (fps)	Dep (ft)	Values
Churchill	1.5 - 6	2 - 50	0.47
O'Connor and Dobbins	.1 - 1.5	2 - 50	0.47
Owens	.1 - 6	1 - 2	0.38
Tsivoglou-Wallace	.1 - 6	.1 - 2	1.52
4. BOD DECAY RATE (Base e) AT 20 deg C (day⁻¹):			
			0.30
Reference			Suggested
			Value
Wright and McDonnell, 1979			0.30

OUTPUT

1. INITIAL MIXED RIVER CONDITION	
CBOD5 (mg/L):	1.5
NBOD (mg/L):	0.5
Dissolved Oxygen (mg/L):	6.0
Temperature (deg C):	24.0
2. TEMPERATURE ADJUSTED RATE CONSTANTS (Base e)	
Reaeration (day ⁻¹):	0.52
BOD Decay (day ⁻¹):	0.36
3. CALCULATED INITIAL ULTIMATE CBODU AND TOTAL BODU	
Initial Mixed CBODU (mg/L):	2.2
Initial Mixed Total BODU (CBODU + NBOD, mg/L):	2.7
4. INITIAL DISSOLVED OXYGEN DEFICIT	
Saturation Dissolved Oxygen (mg/L):	8.239
Initial Deficit (mg/L):	2.24
5. TRAVEL TIME TO CRITICAL DO CONCENTRATION (days):	-0.536125
6. DISTANCE TO CRITICAL DO CONCENTRATION (feet):	-152859.88
7. CRITICAL DO DEFICIT (mg/L):	2.29
8. CRITICAL DO CONCENTRATION (mg/L):	5.95



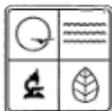
Appendix D: Antidegradation Review Summary Attachments

The attachments that follow contain summary information provided by the applicant, City of Glasgow. MDNR staff determined that changes must be made to the information contained within these attachments. The following were modified and can be found within the MDNR WQAR:

- 1) Water Quality Review Assistance/Antidegradation Review Request: Proposed design flow was changed to 180,000 gallons per day in this review.
- 2) Attachment B: The applicant supplied calculations used a proposed design flow of 130,000 gpd. FAC and Percent FAC capacity calculations for ammonia used the lowest flow recorded since October 1, 2000 for the Missouri River (18,400 cfs), summer chronic ammonia criteria with no mixing, and average effluent ammonia concentration. FAC and Percent FAC Capacity were recalculated in this review using the design flow of 180,000 gpd, 30Q10 low flow value calculated for the Missouri River, and water-quality based effluent limit daily maximums for summer and winter ammonia for discharge to the Missouri River.

The applicant also supplied Facility Assimilative Capacity calculations for DO, BOD₅, TSS, and oil and grease (also in Appendix E), but assimilative capacity was not used for these POCs as discussed in section 5.5 Assimilative Capacity Calculations.

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SEP 23 2016



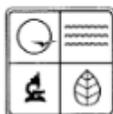
MISSOURI DEPARTMENT OF NATURAL RESOURCES
WATER PROTECTION PROGRAM, WATER POLLUTION CONTROL BRANCH
WATER QUALITY REVIEW ASSISTANCE/ANTIDEGRADATION REVIEW REQUEST
PRE-CONSTRUCTION REVIEW FOR PROTECTION OF BENEFICIAL USES AND DEVELOPING EFFLUENT LIMITS

TYPE OF PROJECT <input type="checkbox"/> Grant <input type="checkbox"/> SRF Loan <input checked="" type="checkbox"/> All Other Projects			
REQUESTER DENNIS STITH		TELEPHONE NUMBER WITH AREA CODE 573-234-2648	
PERMITTEE CITY OF GLASGOW		TELEPHONE NUMBER WITH AREA CODE 660-338-2377	
REASON FOR REQUEST			
<input checked="" type="checkbox"/> New Discharge (See Instruction #9) <input type="checkbox"/> Upgrade (No expansion) (See AIP) <input type="checkbox"/> Expansion			
DESCRIPTION OF PROPOSED ACTIVITY: RELOCATE THE OUTFALL FROM AN INTERMITTENT STREAM TO THE MISSOURI RIVER, REDUCE THE DESIGN FLOW FROM 180,000 GPD TO 130,000 GPD.			
FACILITY INFORMATION			
FACILITY NAME GLASGOW WWTF		MSOP NUMBER (IF APPLICABLE) MO-0034240	
COUNTY HOWARD		SIC / NAICS CODE 4952	
METHOD OF BACTERIA COMPLIANCE <input type="checkbox"/> Chlorine Disinfection <input type="checkbox"/> Ultraviolet Disinfection <input type="checkbox"/> Ozone <input checked="" type="checkbox"/> Not Applicable			
WATER QUALITY ISSUES NONE			
Water quality issues include: effluent limit compliance issues, notice (s) of violation, water body beneficial uses not attained or supported, etc.			
OUTFALL	LOCATION (LAT/LONG OR LEGAL DESCRIPTION)	MAPPED ¹ (CHECK)	RECEIVING WATER BODY ²
1	NW 1/4, SW 1/4, SW 1/4, SEC. 20, T51N, R17W	<input checked="" type="checkbox"/>	Missouri River
		<input type="checkbox"/>	
		<input type="checkbox"/>	
¹ Attach topographic map (See www.dnr.mo.gov/internetmapviewer/) with outfall location(s) clearly marked. For additional outfalls, attach a separate form.			
² See general instructions for discharges to streams.			
OUTFALL	NEW DESIGN FLOW ** (MGD)	TREATMENT TYPE	EFFLUENT TYPES*
1	130,000	CONTINUOUS DISCHARGE	municipal
* Describe predominating character of effluent. Example: domestic wastewater, municipal wastewater, industrial wastewater, storm water, mining leachate, etc.			
** If expansion, indicate new design flow.			
<input checked="" type="checkbox"/> Checked for rare or endangered species and provided determination with this request. See Instruction #8.			
ANTIDEGRADATION REVIEW SUBMISSION:			
See attached Antidegradation instructions. Applicant supplied a summary within:			
<input checked="" type="checkbox"/> Tier Determination and Effluent Limit Summary			
<input type="checkbox"/> Attachment A – Significant Degradation			
<input checked="" type="checkbox"/> Attachment B – Minimal Degradation			
<input type="checkbox"/> Attachment C – Temporary degradation			
<input type="checkbox"/> Attachment D – Tier 1 Review			
<input type="checkbox"/> No Degradation Evaluation – Conclusion of Antidegradation Review			

MO 780-1893 (03-09)

See general instructions. Additional information may be needed to complete your request. Your request may be returned if items are missing. Revised submittal will be considered a new submittal.	
SIGNATURE <i>Dennis E. Stith</i>	DATE 9/15/14
PRINT NAME Dennis E. Stith, P.E.	
E-MAIL ADDRESS Dennis.Stith@skw-inc.com	
Submit request to:	Missouri Department of Natural Resources Water Protection Program Attn: Permits and Engineering Section P.O. Box 176 Jefferson City, MO 65102-0176 Phone: 573-751-1300 Fax: 573-522-9920
The water quality review assistance is a process to determine effluent limits for new facilities or existing facilities seeking to increase loading into the receiving stream. Limits can be calculated by the permittee and submitted for review the department.	
GENERAL INSTRUCTIONS	
<ol style="list-style-type: none"> 1. Please attach: <ol style="list-style-type: none"> A. A list of pollutants expected to be discharged. B. The location of each outfall clearly shown on map(s). A U.S. Geological Survey topographic map is available at www.dnr.mo.gov/internetmapviewer/. 2. Discharge(s) to all gaining streams: Applicant must submit dissolved oxygen analysis (i.e., using Missouri Department of Natural Resources approved models such as Streeter Phelps (www.ecy.wa.gov/programs/eap/pwspspread/pwspsread.html) or Qual2K/Qual2E (Q2K/Q2E) stream water quality study (www.epa.gov/athens/wwqts/index.html)) indicating that the preferred alternative's BOD₅ effluent limitations from the alternative analysis or the technology-based/regulatory BOD₅ effluent limits are protective of Missouri's water quality standard for dissolved oxygen. Note: If Q2K/Q2E is used, wasteload allocation for ammonia must be assumed. All Q2K/Q2E studies must have department approved Quality Assurance Project Plans. Recommended modeling procedures from the department (may differ with discharge) for this analysis are available upon request. 3. Discharge(s) to unclassified gaining stream: Applicant may provide the time of travel to the confluence with the classified stream segment for modeling pollutant decay (See <i>Total Ammonia Nitrogen Criteria Implementation Guidance Policy</i> at www.dnr.mo.gov/env/wpp/permits/antideg-implementation.htm). Otherwise, the applicant may determine limits based on no decay of discharge pollutants, which typically results in lower permit limits. Please use the TR-55 method (<i>Natural Resource Conservation Service, Urban Hydrology for Small Watersheds, Technical Release No. 55, June 1986</i>) for time of travel determination (http://directives.sc.egov.usda.gov/22162.wba). Please include a map, schematic or description of flow segments with your calculations. A worksheet with instructions is available upon request. 4. For all discharges, the chronic water quality criteria point of compliance is the classified stream or the confluence with the classified stream. No mixing is allowed for streams with seven-day Q10 low flow less than 0.1 cfs (10 CSR 20-7.031(4)(A)B(I)), while mixing is allowed for streams with seven-day Q10 low flow greater than 0.1 cfs (10 CSR 20-7.031(4)(A)B(II)). 5. For industrial facilities, a list of all chemicals, compounds, elements, etc. found in the discharge must be submitted with the request. Proprietary names of chemicals are not sufficient, as these chemicals may contain several pollutants for which the department must evaluate separate effluent limits. A pre-construction review meeting is highly recommended. 6. Do not submit water quality review assistance requests for renewals. All water quality-based effluent limits will be determined during the renewal process. 7. 10 CSR 20-7.015(8)(B)3. allows alternative limitations (i.e., lagoon or trickling filters) if a water quality impact study is conducted. This impact study should indicate that equivalent to secondary treatment for lagoons or trickling filters are protective of Missouri Water Quality standards for dissolved oxygen and ammonia. 8. Applicant must check for rare and endangered aquatic species that may be affected by the discharge at http://mdcgis.mdc.mo.gov/heritage/newheritage/heritage.htm. 9. Additional requirements for new facilities: <ol style="list-style-type: none"> A. Division of Geology and Land Survey Geohydrologic Evaluations must be submitted with the request. B. Coordinates of outfall (s) in lat/long or in the public land survey system must be provided. C. Please submit a letter with project timeframe. <p>Note: Lack of response for additional informational within a reasonable timeframe will result in return of request.</p>	

MO 790-1693 (03-09)

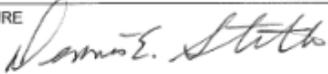


MISSOURI DEPARTMENT OF NATURAL RESOURCES
WATER PROTECTION PROGRAM, WATER POLLUTION CONTROL BRANCH
ANTIDEGRADATION REVIEW SUMMARY
ATTACHMENT B: TIER 2 – MINIMAL DEGRADATION

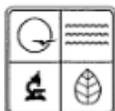
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SEP 23 2016

Water Protection Program

1. FACILITY						
NAME GLASGOW WWTF		TELEPHONE WITH AREA CODE 660-338-2377				
ADDRESS (PHYSICAL) 1 MILE SW OF HWY 87 & HWY 240		CITY GLASGOW	STATE MO			
		ZIP CODE 65254				
2. RECEIVING WATER BODY SEGMENT #1						
NAME MISSOURI RIVER						
3. WATER BODY SEGMENT #2 (IF APPLICABLE)						
NAME N/A						
4. ASSIMILATIVE CAPACITY TABLE						
Determining the facility assimilative capacity, or FAC, and the segment assimilative capacity, or SAC for each pollutant of concern is explained in detail in the Antidegradation Implementation Procedure Section II.A.3. and Appendix 3. POCs to be considered include those pollutants reasonably expected to be present in the discharge per the Antidegradation Implementation Procedure Section II.A. Provide all calculations in the Antidegradation Review report.						
Pollutant of Concern	Facility Assimilative Capacity	New Load	Percent of Facility Assimilative Capacity			
	(lbs/day)	(lbs/day)	(%)			
BOD5	634760	49	0.000001			
TSS	148772	87	0.000006			
NH3-N	113662	2.7	0.000000			
OILS & GREASE	49591	11	0.000002			
Pollutant of Concern	Water Body Segment #1 SAC	Cumulative Net Increase in Load	Cumulative % of Water Body Segment #1 SAC	Water Body Segment #2 SAC	Cumulative Net Increase in Load	Cumulative % of Water Body Segment #2 SAC
BOD5	634760	49	0.000001			
TSS	148772	87	0.000006			
NH3-N	113662	2.7	0.000000			
OILS & Grease	49591	11	0.000002			
Assimilative Capacity Summary						
DUE TO A DILLUTION OF THE EFFLUENT FLOW IN THE STREAM TO A FACTOR OF 91,500 TO 1, THE EFFLUENT'S EFFECT ON ASSIMILATIVE CAPACITY IS INSIGNIFICANT IN RELATION TO THE ALLOWED VALUES FOR ALL POCS.						
Is degradation considered minimal for all Pollutants of Concern? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No						
Degradation is considered minimal if the new or proposed loading is less than 10 percent of the FAC and the cumulative degradation is less than 20 percent of the SAC according to the Antidegradation Implementation Procedure Section II.A.3. If yes, an alternatives analysis and a social and economic importance analysis are not required.						
Comments/Discussion						

MINIMAL DEGRADATION CALCULATIONS ATTACHED	
MO 780-2022 (01/09)	1
5. OIL AND GREASE	
Is this a publicly owned treatment works, or POTW, restaurant, school or other domestic wastewater treatment facility with oil and grease as a Pollutant of Concern? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
In accordance with 10 CSR 20-7.031(3)(B), waters shall be free from oil, scum and floating debris in sufficient amounts to be unsightly or prevent full maintenance of beneficial uses. In accordance with 10 CSR 20-7.031 Table A, oil and grease has a chronic toxicity of 10 mg/L for protection of aquatic life. This facility will meet the effluent limits (MDL and AML of 15 mg/L and 10 mg/L, respectively).	
6. DECHLORINATION	
If Chlorination and Dechlorination is the existing or proposed method of disinfection treatment, will the effluent discharged be equal to or less than the Water Quality Standards for Total Residual Chlorine stated in Table A of 10 CSR 20-7.031?	
<input type="checkbox"/> Yes <input type="checkbox"/> No	
Based on the disinfection treatment system being designed for total removal of Total Residual Chlorine, minimal degradation for Total Residual Chlorine is assumed and the facility will be required to meet the water quality based effluent limits. These compliance limits for Total Residual Chlorine are much less than the method detection limit of 0.13 mg/L.	
7. PROPOSED PROJECT SUMMARY	
RELOCATE THE OUTFALL FROM AN INTERMITTEND STREAM TO THE MISSOURI RIVER, REDUCE THE DESIGN FLOW FROM 180,000 GPD TO 130,000 GPD	
Attach the Antidegradation Review report and all supporting documentation.	
CONSULTANT: I have prepared or reviewed this from and all attached reports and documentation. The conclusion proposed in consistent with the AIP and current state and federal regulations.	
SIGNATURE 	DATE 9/15/16
PRINT NAME Dennis E. Stith, P.E.	
TELEPHONE NUMBER WITH AREA CODE 660-385-6441	E-MAIL ADDRESS DENNIS.STITH@SKW-INC.COM
OWNER: I have read and reviewed the prepared documents and agree with this submittal.	
SIGNATURE 	DATE 9-20-16
CONTINUING AUTHORITY: I have read and reviewed the prepared documents and agree with this submittal.	
SIGNATURE 	DATE 9-20-16

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MISSOURI DEPARTMENT OF NATURAL RESOURCES
WATER PROTECTION PROGRAM, WATER POLLUTION CONTROL BRANCH
ANTIDEGRADATION REVIEW SUMMARY
TIER DETERMINATION AND EFFLUENT LIMIT SUMMARY

Water Protection Pro

1. FACILITY			
NAME GLASGOW WWTF		TELEPHONE NUMBER WITH AREA CODE 660-338-2377	
ADDRESS (PHYSICAL) 1 MILE SW OF HWY 87 & HWY 240		CITY GLASGOW	STATE MO
			ZIP CODE 65254
2. RECEIVING WATER BODY SEGMENT #1			
NAME Missouri River			
2.1	UPPER END OF SEGMENT (Location of discharge) UTM _____ OR Lat 39D12'25.2"N, Long 92D51'14.1"W		
2.2	LOWER END OF SEGMENT UTM _____ OR Lat 39D13'15"N, Long 92D50'54.7"W		
Per the Missouri Antidegradation Rule and Implementation Procedure, or AIP, the definition of a segment, "a segment is a section of water that is bound, at a minimum, by significant existing sources and confluences with other significant water bodies."			
3. WATER BODY SEGMENT #2 (IF APPLICABLE)			
NAME N/A			
3.1	UPPER END OF SEGMENT UTM _____ OR Lat _____, Long _____		
3.2	LOWER END OF SEGMENT UTM _____ OR Lat _____, Long _____		
4. WATER BODY SEGMENT #3 (IF APPLICABLE)			
NAME N/A			
4.1	UPPER END OF SEGMENT UTM _____ OR Lat _____, Long _____		
4.2	LOWER END OF SEGMENT UTM _____ OR Lat _____, Long _____		
5. PROJECT INFORMATION			
Is the receiving water body an Outstanding National Resource Water, an Outstanding State Resource Water, or drainage thereto? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No In Tables D and E of 10 CSR 20-7.031, Outstanding National Resource Waters and Outstanding State Resource Water are listed. Per the Antidegradation Implementation Procedure Section 1.B.3., "any degradation of water quality is prohibited in these waters unless the discharge only results in temporary degradation." Therefore, if degradation is significant or minimal, the Antidegradation Review will be denied.			
Will the proposed discharge of all pollutants of concern, or POCs, result in net increase in the ambient water quality concentration of the receiving water after mixing? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If yes, submit a summary table showing the levels of each pollutant of concern before and after the proposed discharge in the receiving water and then complete Attachment B for the first downstream classified water body segment.			
Will the discharge result in temporary degradation? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If yes, complete Attachment C.			
Has the project been determined as non-degrading? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If yes, complete No Degradation Evaluation – Conclusion of Antidegradation Review form. Submit with the appropriate Construction Permit Application as no antidegradation review is required.			
If yes to one of the above questions, skip to Section 8 - Wet Weather.			

MO780-2025 (01/09)

6. EXISTING WATER QUALITY DATA OR MODEL SUMMARY

Obtaining Existing Water Quality is possible by three methods according to the Antidegradation Implementation Procedure Section II.A.1.: (1) using previously collected data with an appropriate Quality Assurance Project Plan, or QAPP (2) collecting water quality data by approved the Missouri Department of Natural Resources methodology or (3) using an appropriate water quality model. QAPPs must be submitted to the department for approval well in advance (six months) of the proposed activity. Provide all the appropriate corresponding data and reports which were approved by the department Water Quality Monitoring and Assessment Section.

Date existing water quality data was provided by the Water Quality Monitoring and Assessment Section:

Approval date of the QAPP by the Water Quality Monitoring and Assessment Section:

Approval date of the project sampling plan by the Water Quality Monitoring and Assessment Section:

Approval date of the data collected for all appropriate pollutants of concern by the Water Quality Monitoring and Assessment Section:

Comments/Discussion:

Instream Data for DO and NH3 per Level 2 Stream Team Data, TSS & O&G assumed at 95% of intermittent stream eff limits.

7. POLLUTANTS OF CONCERN AND TIER DETERMINATION(S)

Pollutants of Concern to be considered include those pollutants reasonably expected to be present in the discharge per the Antidegradation Implementation Procedure Section II.S. The tier protection levels are specified and defined in rule at 10 CSR 20-7.031 (2).

Water Body Segment One Pollutants of Concern and Tier Determination(s)		
Tier 1	Tier 2 with Minimal Degradation	Tier 2 with Significant Degradation
	BOD5	
	TSS	
	NH3-N	
	OILS & GREASE	

Note: Add an asterisk to items that you only assume are Tier 2 with significant degradation.

Water Body Segment Two Pollutants of Concern and Tier Determination(s)		
Tier 1	Tier 2 with Minimal Degradation	Tier 2 with Significant Degradation

- For pollutants of concern that are Tier 2 with significant degradation, complete Attachment A.
- For pollutants of concern that are Tier 2 with minimal degradation, complete Attachment B.
- For pollutants of concern that are Tier 1, complete Attachment D. Additionally, a Tier 2 review must be conducted for each pollutant of concern on the appropriate water body segment.

8. WET WEATHER ANTICIPATIONS

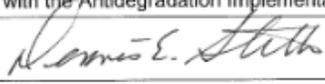
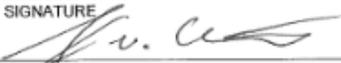
If an applicant anticipates excessive inflow or infiltration and pursues approval from the department to bypass secondary treatment, a feasibility analysis is required. The feasibility analysis must comply with the criteria of all applicable state and federal regulations including 40 CFR 122.41(m)(4). Attach the feasibility analysis to this report.

What is the Wet Weather Flow Peaking Factor in relation to design flow? 1.4

Wet Weather Design Summary:

N/A, BUFFERING CAPACITY IN LAGOON.

MO780-2025 (01/09)

9. SUMMARY OF THE PROPOSED ANTIDEGRADATION REVIEW EFFLUENT LIMITS				
What are the proposed pollutants of concern and their respective effluent limits that the selected treatment option will comply with:				
Pollutant of Concern	Units	Wasteload Allocation	Average Monthly Limit	Daily Maximum Limit
BOD5	MG/L	N/A	45	WEEKLY MAX 65
TSS	MG/L	N/A	80	WEEKLY MAX 120
Dissolved Oxygen	N/A	N/A	N/A	N/A
Ammonia	N/A	N/A	N/A	N/A
Bacteria (E. Coli)	N/A	N/A	N/A	N/A
OILS & GREASE	MG/L	N/A	10	15
These proposed limits must not violate water quality standards, be protective of beneficial uses and achieve the highest statutory and regulatory requirements.				
Attach the Antidegradation Review report and all supporting documentation.				
CONSULTANT: I have prepared or reviewed this form and all attached reports and documentation. The conclusion proposed is consistent with the Antidegradation Implementation Procedure and current state and federal regulation.				
SIGNATURE 			DATE 9/15/16	
NAME AND OFFICIAL TITLES DENNIS E. STITH, P.E., TEAM LEADER				
COMPANY NAME SHAFER, KLINE AND WARREN, INC.				
ADDRESS 107 BUTLER ST		CITY MACON	STATE	ZIP CODE MO 63552
TELEPHONE NUMBER WITH AREA CODE 660-385-6441		E-MAIL ADDRESS DENNIS.STITH@SKW-INC.COM		
OWNER: I have read and reviewed the prepared documents and agree with this submittal.				
SIGNATURE 			DATE 9-20-16	
NAME AND OFFICIAL TITLES KEVIN ATWOOD, CITY ADMINISTRATOR				
ADDRESS 100 MARKET		CITY GLASGOW	STATE	ZIP CODE MO 65254
TELEPHONE NUMBER WITH AREA CODE 660-338-2377		E-MAIL ADDRESS		
CONTINUING AUTHORITY: Continuing Authority is the permanent organization that will be responsible for the operation, maintenance and modernization of the facility. The regulatory requirement regarding continuing authority is found in 10 CSR 20-6.010(3) available at www.sos.mo.gov/adrules/csr/current/10csr/10c20-6a.pdf .				
I have read and reviewed the prepared documents and agree with this submittal.				
SIGNATURE 			DATE 9-20-16	
NAME AND OFFICIAL TITLES KEVIN ATWOOD, CITY ADMINISTRATOR				
ADDRESS 100 MARKET		CITY GLASGOW	STATE	ZIP CODE MO 65254
TELEPHONE NUMBER WITH AREA CODE 660-338-2377		E-MAIL ADDRESS		

Appendix E: Applicant Supplied Minimal Degradation Calculations

Glasgow, MO

Aug. 19, 2012

Antidegradation Review Summary, Attachment B: Tier 2 - Minimal Degradation

4. Assimilative Capacity Table

* Stream Team Data, Team 443, 1995 to 1998, 16:00

USGS data for Missouri River 1Q10, 10/1/2000 to 3/20/2012 18,400.0 cfs = 11,892,230,960 gpd

Date	Instream DO*	Instream NH ₃ *	Effluent Limit TSS	Effluent Limit O&G
2/24/1998	14	0.40		
10/1/1997	10	0.10		
12/4/1996	12	0.25		
10/2/1996	11	0.62		
12/6/1995	10	0.40		
Average mg/l (95% of int. stream eff limit for TSS & O&G)	11.4	0.35	28.5	9.5
Average lb/d (95% of int. stream eff limit for TSS & O&G)	1,130,666	35,110	2,826,664	942,221
CCC, mg/l (min for O ₂)	5.0	1.50	30	10
CCC, lb/d (min for O ₂)	495,906	148,772	2,975,436	991,812
Assimilative Capacity, lb/d	634,760	113,662	148,772	49,591
10% of FAC	63,476	11,366	14,877	4,959
20 or SAC	126,952	22,732	29,754	9,918

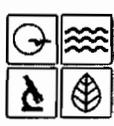
Future Design Flow: 130,000 gpd

Parameter	Average Monthly Limit mg/l	Effluent Data 10/2006 to 9/2011 mg/l	New Load lb/d	Percent of Assimilative Capacity %
BOD ₅	45		48.8	0.000001
TSS	80		86.7	0.000006
NH ₃		2.5	2.7	0.000000
Oils & Grease	10		10.8	0.000002

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AP 25285



MISSOURI DEPARTMENT OF NATURAL RESOURCES
WATER PROTECTION PROGRAM
APPLICATION FOR CONSTRUCTION PERMIT -
WASTEWATER FACILITY

FOR DEPARTMENT USE ONLY	
APP NO.	CP NO.
SEE RECEIVED	CHECK NO.
51000.00	17349
DATE RECEIVED	
9-23-16	

APPLICATION OVERVIEW

The Application for Construction Permit – Wastewater Facility form is for construction pertaining to domestic wastewater treatment facilities, agrichemical facilities, and components thereof. This form has been developed in a modular format and consists of Part A and B. **All applicants must complete Part A.** Part B should be completed for applicants who currently land-apply wastewater or propose land application for wastewater treatment. **Please read the accompanying instructions before completing this form. Submittal of an incomplete application may result in the application being returned.**

PART A – BASIC INFORMATION

1.0 APPLICATION INFORMATION (Note – If any of the questions in this section are answered NO, this application may be considered incomplete and returned.)

- 1.1 Is this a Federal/State funded project? YES N/A Funding Agency: _____ Project #: _____
- 1.2 Is this an application for an agrichemical? YES (See instructions.) N/A
- 1.3 Has the Missouri Department of Natural Resources approved the proposed project's antidegradation review?
 YES Date of Approval: _____
- 1.4 Has the department approved the proposed project's facility plan*?
 YES Date of Approval: _____ NO N/A (If Not Applicable, complete No. 1.5.)
- 1.5 [Complete only if answered Not Applicable on No. 1.4] Is a copy of the engineering report* for wastewater treatment facilities with a design flow less than 22,500 gpd included with this application?
 YES NO
- 1.6 Is a copy of the appropriate plans* and specifications* included with this application?
 YES Denote which form is submitted: Hard copy Electronic copy (See instructions.) NO
- 1.7 Is a summary of design* included with this application? YES NO
- 1.8 Is a general operating permit applicable?
 YES Submit the appropriate operating permit application to the Regional Office at least 60 days prior to operation.
 NO Enclose the appropriate operating permit application and fee submittal. Denote which form: B B2
- 1.9 Is the facility currently under enforcement with the department or the Environmental Protection Agency? YES NO
- 1.10 Is the appropriate fee included with this application? YES NO (See instructions for appropriate fee.)

* Must be affixed with a Missouri registered professional engineer's seal, signature and date.

2.0 PROJECT INFORMATION

2.1 NAME OF PROJECT

Lagoon Outfall Relocation - City of Glasgow, Missouri

2.2 PROJECT DESCRIPTION

The project consists of the construction of 1,234 feet of 10" SDR-26 PVC gravity sewer line (40' being 10" DIP) with five 4' dia. precast concrete manholes, 105 feet of 10" DIP for emergency overflow to Cell No. 1, piping and valves for future UV system and stream stabilization for Hurricane Creek near Cells No. 1 & 3 and stabilization for Missouri River bank for the new outfall of the Glasgow WWTF. Two aeration units will be installed in the First and Second Cells of the Lagoon.

2.3 SLUDGE HANDLING, USE AND DISPOSAL DESCRIPTION

retained in the lagoon.

2.4 DESIGN INFORMATION

A. Current population: 1,103 ; Design population: 1,300

B. Actual Flow: 33,000 gpd; Design Average Flow: 130,000 gpd;
 Actual Peak Daily Flow: _____ gpd; Design Maximum Daily Flow: 138,600 gpd;
 Design Wet Weather Event: _____

2.5 ADDITIONAL INFORMATION

- A. Is a topographic map attached? YES NO
- B. Is a process flow diagram attached? YES NO

2.6 ESTIMATED PROJECT CONSTRUCTION COST

\$ 135,000.00

3.0 WASTEWATER TREATMENT FACILITY

NAME Glasgow WWTF	TELEPHONE NUMBER WITH AREA CODE (660) 338-2377	EMAIL ADDRESS atwood@glasgowmo.org
----------------------	---	---------------------------------------

ADDRESS (PHYSICAL) 1 mi. SW of Hwy 87 & Hwy 240 Intersections	CITY Glasgow	STATE MO	ZIP CODE 65254	COUNTY Howard
--	-----------------	-------------	-------------------	------------------

Wastewater Treatment Facility: Mo- 0034240 (Outfall 1 Of 1)

3.1 Legal Description: ¼, SW ¼, NE ¼, Sec. 20 , T 51N , R 17W
(Use additional pages if construction of more than one outfall is proposed.)

3.2 UTM Coordinates Easting (X): 512639.64 Northing (Y): 4339893.92
For Universal Transverse Mercator (UTM), Zone 15 North referenced to North American Datum 1983 (NAD83)

3.3 Name of receiving streams: Missouri River

4.0 PROJECT OWNER

NAME City of Glasgow	TELEPHONE NUMBER WITH AREA CODE (660) 338-2377	EMAIL ADDRESS atwood@glasgowmo.org
-------------------------	---	---------------------------------------

ADDRESS 100 Market St.	CITY Glasgow	STATE MO	ZIP CODE 65254
---------------------------	-----------------	-------------	-------------------

5.0 CONTINUING AUTHORITY: Permanent organization that will serve as the continuing authority for the operation, maintenance and modernization of the wastewater collection system.

NAME City of Glasgow	TELEPHONE NUMBER WITH AREA CODE (660) 338-2377	EMAIL ADDRESS atwood@glasgowmo.org
-------------------------	---	---------------------------------------

ADDRESS 100 Market St.	CITY Glasgow	STATE MO	ZIP CODE 65254
---------------------------	-----------------	-------------	-------------------

5.1 A letter from the continuing authority, if different than the owner, is included with this application. YES NO N/A

5.2 COMPLETE THE FOLLOWING IF THE CONTINUING AUTHORITY IS A MISSOURI PUBLIC SERVICE COMMISSION REGULATED ENTITY.

A. Is a copy of the certificate of convenience and necessity included with this application? YES NO

5.3 COMPLETE THE FOLLOWING IF THE CONTINUING AUTHORITY IS A PROPERTY OWNERS ASSOCIATION.

A. Is a copy of the as-filed restrictions and covenants included with this application? YES NO

B. Is a copy of the as-filed warranty deed, quitclaim deed or other legal instrument which transfers ownership of the land for the wastewater treatment facility to the association included with this application? YES NO

C. Is a copy of the as-filed legal instrument (typically the plat) that provides the association with valid easements for all sewers included with this application? YES NO

D. Is a copy of the Missouri Secretary of State's nonprofit corporation certificate included with this application? YES NO

6.0 ENGINEER

ENGINEER NAME / COMPANY NAME Shafer, Kline & Warren, Inc.	TELEPHONE NUMBER WITH AREA CODE (660) 385-6441	EMAIL ADDRESS dennis.stith@skw-inc.com
--	---	---

ADDRESS 107 Butler St., P.O. Box 366	CITY Macon	STATE MO	ZIP CODE 63552
---	---------------	-------------	-------------------

7.0 PROJECT OWNER: I hereby certify that I am familiar with the information contained in this application and to the best of my knowledge and belief such information is true, complete, and accurate, and if granted this permit, I agree to abide by the Missouri Clean Water Law and all rules, regulations, orders, and decisions, subject to any legitimate appeal available to applicant under Missouri Clean Water Law. I also understand the issuance of the construction permit does not guarantee the proposed wastewater treatment will meet the required effluent limitations of the issued Missouri State Operating Permit for this facility.

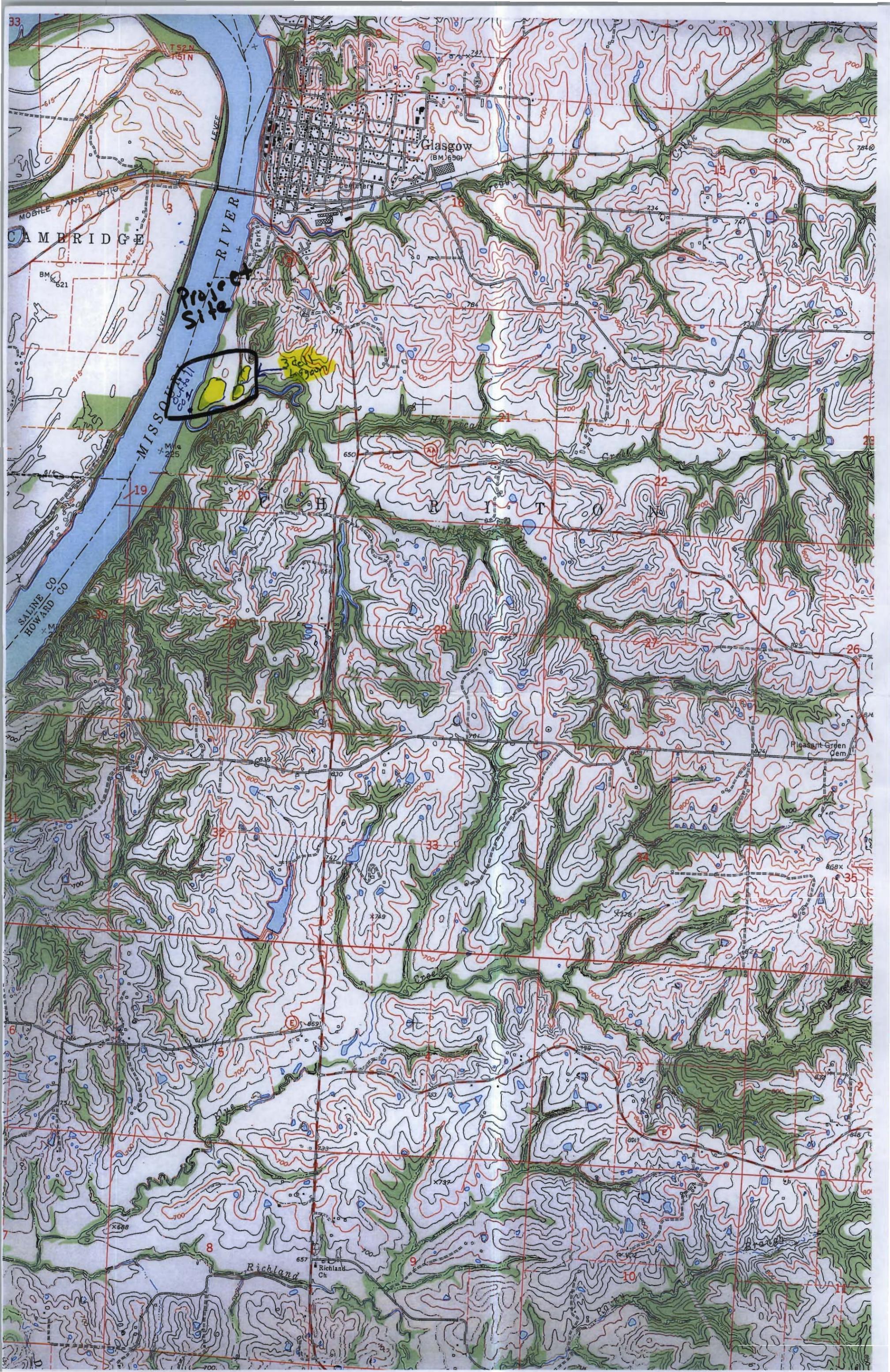
PROJECT OWNER SIGNATURE


PRINTED NAME Kevin Atwood	DATE 7-20-16
------------------------------	-----------------

TITLE OR CORPORATE POSITION City Administrator	TELEPHONE NUMBER WITH AREA CODE (660) 338-2377	EMAIL ADDRESS atwood@glasgowmo.org
---	---	---------------------------------------

Mail completed copy to: MISSOURI DEPARTMENT OF NATURAL RESOURCES
WATER PROTECTION PROGRAM
P.O. BOX 176
JEFFERSON CITY, MO 65102-0176

END OF PART A
REFER TO THE APPLICATION OVERVIEW TO DETERMINE WHETHER PART B NEEDS TO BE COMPLETE.



Project Site



Glasgow
(BM 699)

CAMBRIDGE

MISSISSIPPI RIVER

SALINE CO
HOWARD CO

H B I T O

Pleasant Green Cem

Richland

Richland Ch

