

PERMIT APPLICATION FOR WATER SUPPLY SYSTEMS
 (CONSTRUCTION - ALTERATION - ADDITION OR IMPROVEMENT) AS DESCRIBED HEREIN
Required under the Authority of 1976 PA 399, as amended

This application becomes an Act 399 Permit only when signed and issued by authorized Michigan Department of Environmental Quality (DEQ) Staff. See instructions below for completion of this application.

1. Municipality or Organization, Address and WSSN that will own or control the water facilities to be constructed. This permit is to be issued to: Genesee County Drain Commissioner Division of Water and Waste Services G-4610 Beecher Road Flint, MI 48532 WSSN: 02615	Permit Stamp Area (DEQ use only) MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY PERMIT NO. W 122056 AUG 21 '12 <i>SLA</i> EXAMINED AND APPROVED FOR COMPLIANCE WITH ACT 399, P.A. 1976	
2. Owner's Contact Person (provide name for questions): Contact: John O'Brien, PE Title: Director Phone: (810) 732-7870	3. Project Name (Provide phase number if project is segmented): Lake Huron Water Supply Initiative Contract S-4000 Water Supply Intake	
	4. Project Location (City, Village, Township): Worth Township	5. County (location of project): Sanilac

ISSUED UNDER THE AUTHORITY OF THE DIRECTOR OF THE DEPARTMENT OF ENVIRONMENTAL QUALITY

cc: Sanilac County Health Department
 cc/enc: Rowe Professional Services Company

Issued by:

Reviewed by:

☐ **If this box is marked see attached special conditions.**

Instructions: Complete items 1 through 5 above and 6 through 21 on the following pages of this application. Print or type all information except for signatures. Mail completed application, plans and specifications, and any attachments to the DEQ District Office having jurisdiction in the area of the proposed construction.

Please Note:

- This **PERMIT** only authorizes the construction, alteration, addition or improvement of the water system described herein and is issued solely under the authority of 1976 PA 399, as amended.
- The issuance of this **PERMIT** does not authorize violation of any federal, state or local laws or regulations, nor does it obviate the necessity of obtaining such permits, including any other DEQ permits, or approvals from other units of government as may be required by law.
- This **PERMIT** expires two (2) years after the date of issuance in accordance with R 325.11306, 1976 PA 399, administrative rules, unless construction has been initiated prior to expiration.
- Noncompliance with the conditions of this permit and the requirements of the Act constitutes a violation of the Act.
- Applicant must give notice to public utilities in accordance with 1974 PA 53, (MISS DIG), being Section 460.701 to 460.718 of the Michigan Compiled Laws, and comply with each of the requirements of that Act.
- All earth changing activities must be conducted in accordance with the requirements of the Soil Erosion and Sedimentation Control Act, Part 91, 1994 PA 451, as amended.
- All construction activity impacting wetlands must be conducted in accordance with the Wetland Protection Act, Part 303, 1994 PA 451, as amended.
- Intentionally providing false information in this application constitutes fraud which is punishable by fine and/or imprisonment.
- Where applicable for water withdrawals, the issuance of this permit indicates compliance with the requirements of Part 327 of Act 451, Great Lakes Preservation Act.

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

Permit Application for Water Systems (Continued)

6. **Facilities Description** – In the space below provide a detailed description of the proposed project. Applications without adequate facilities descriptions will be returned. SEE EXAMPLES BELOW. Use additional sheets if needed.

78" water supply intake extending approximately one mile into Lake Huron. Two timber intake cribs are included on the intake pipeline. The intake pipeline is designed to provide a capacity of 85 mgd. Each intake crib has a capacity of 60 mgd. Chemical piping is provided to supply a chlorine solution to diffusers in each intake crib for zebra mussel control. A 30-foot diameter concrete junction chamber is located approximately 200' west of M-25 and 1,000' north of Fisher Road. The west end of the intake pipeline is located at the junction chamber. A valve is provided in the junction chamber on the intake pipeline.

EXAMPLES – EXAMPLES – EXAMPLES – EXAMPLES – EXAMPLES – EXAMPLES

Water Mains	500 feet of 8-inch water main in First Street from Main Street north to State Street. OR 250 feet of 12-inch water main in Clark Road from an existing 8-inch main in Third Avenue north to a hydrant.
Booster Stations	A booster station located at the southwest corner of Third Avenue and Main Street, and equipped with two, 15 Hp pumps each rated 150 gpm @ 200 feet TDH. Station includes backup power and all other equipment as required for proper operation.
Elevated Storage Tank	A 300,000 gallon elevated storage tank located in City Park. The proposed tank shall be spherical, all welded construction and supported on a single pedestal. The tank shall be 150 feet in height, 40 feet in diameter with a normal operating range of 130 – 145 feet. The interior coating system shall be ANSI/NSF Standard 61 approved or equivalent. The tank will be equipped with a cathodic protection system, and includes a tank level control system with telemetry.
Chemical Feed	A positive displacement chemical feed pump, rated at 24 gpd @ 110 psi to apply a chlorine solution for Well No. 1. Chlorine is 12.5% NaOCL, ANSI/NSF Standard 60 approved and will be applied at a rate of 1.0 mg/l of actual chlorine.
Water Supply Well	Well No. 3, a 200 foot deep well with 170 feet of 8-inch casing and 30 feet of 8-inch, 10 slot screen. The well will be equipped with a 20 Hp submersible pump and motor rated 200 gpm @ 225 feet TDH, set at 160 feet below land surface.
Treatment Facilities	A 5 million gpd water treatment plant located at the north end of Second Avenue. The facility will include 6 low service pumps, 2 rapid mix basins, 4 flocculation/sedimentation basins, 8 dual media filters, 3 million gallon water storage reservoir and 6 high service pumps. Also included are chemical feed pumps and related appurtenances for the addition of alum, fluoride, phosphate and chlorine.

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

Permit Application for Water Systems (Continued)

General Project Information – Complete all boxes below.	
7. Design engineer's name, engineering firm, address, phone number, and email address: James E. Redding, PE ROWE Professional Services Company PO Box 3748, Flint, MI 48502 (810) 341-7500	8. Indicate who will provide project construction inspection: ☐ Organization listed in Box 1. ☒ Engineering firm listed in Box 7. ☐ Other - name, address, and phone number listed below.
9. Is a basis of design attached? ☒ YES ☐ NO If no, briefly explain why a basis of design is not needed.	
10. Are sealed and signed engineering plans attached? ☒ YES ☐ NO If no, briefly explain why engineering plans are not needed.	
11. Are sealed and signed construction specifications attached? ☒ YES ☐ NO If specifications are not attached, they need to be on file at DEQ.	
12. Were Recommended Standards for Water Works, Suggested Practice for Water Works, AWWA guidelines, and the requirements of Act 399 and its administrative rules followed? ☒ YES ☐ NO If no, explain which deviations were made and why.	
13. Are all coatings, chemical additives and construction materials ANSI/NSF or other adequate 3rd party approved? ☒ YES ☐ NO If no, describe what coatings, additives or materials did not meet the applicable standard and why.	
14. Are all water system facilities being installed in the public right-of-way or a dedicated utility easement? (For projects not located in the public right-of-way, utility easements must be shown on the plans.) ☐ YES ☒ NO If no, explain how access will be obtained. Improvements are on property under ownership of Genesee County, M-25 ROW, and bottom land easement to be granted by the state.	
15. Is the project construction activity within a wetland (as defined by Section 324.30301(d)) of Part 303, 1994 PA 451? ☐ YES ☒ NO If yes, a wetland permit must be obtained.	
16. Is the project construction activity within a 100-year floodplain (as defined by R 323.1311(e)) of Part 31, 1994 PA 451, administrative rules? ☐ YES ☒ NO If yes, a flood plain permit must be obtained.	
17. Is the project construction activity within 500 feet of a lake, reservoir, or stream? ☒ YES ☐ NO If yes, a Soil and Erosion Control Permit must be obtained or indicate if the owner listed in box 2 of this application is an Authorized Public Agency (Section 10 of Part 91, 1994 PA 451) ☐ Owner is APA.	

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

Permit Application for Water Systems (Continued)

18. Will the proposed construction activity be part of a project involving the disturbance of five (5) or more acres of land?

☒ YES ☐ NO

If yes, is this activity regulated by the National Pollutant Discharge Elimination System storm water regulations?

☒ YES: NPDES Authorization to discharge storm water from construction activities must be obtained.

☐ NO: Describe why activity is not regulated:

Please call 517-241-8993 with questions regarding the applicability of the storm water regulations.

19. Is the project in or adjacent to a site of suspected or known soil or groundwater contamination?

☐ YES ☒ NO

If yes, attach a copy of a plan acceptable to the DEQ for handling contaminated soils and/or groundwater disturbed during construction. Contact the local DEQ district office for listings of Michigan sites of environmental contamination.

20. IF YOU ARE A CUSTOMER/WHOLESALE/BULK PURCHASER, COMPLETE THE FOLLOWING

1) Name and WSSN of source water supply system (seller) 01800

2) Does the water service contract require water producer/seller to review and approve customer/wholesale/bulk purchaser water system construction plans?

☐ YES ☒ NO

If yes to #2, the producer/seller approval letter must be attached when submitted to DEQ.

21. **Owner's Certification** The owner of the proposed facilities or the owner's authorized representative shall complete the owner's certification. It is anticipated that the owner will either be a governmental agency (city, village, township, county, etc.) or a private owner (individual, company, association, etc.) of a Type I public water supply.

OWNER'S CERTIFICATION

I, JEFF WRIGHT (name), acting as the AGENT (title/position) for

(print)

(print)

DIVISION OF WATER & WASTE SERVICE (entity owning proposed facilities) certify that this project has

(print)

been reviewed and approved as detailed by the Plans and Specifications submitted under this application, and is in compliance with the requirements of 1976 PA 399, as amended, and its administrative rules.

Signature*

Date

Phone

8.17.12

810-732-1590

*Original signature only, no photocopies will be accepted.

**GENESEE COUNTY DRAIN COMMISSIONER
DIVISION OF WATER & WASTE SERVICES**

INTAKE BASIS OF DESIGN

6/29/12

A. Intake General

1. Single intake pipe
2. Two cribs spaced approximately 2200' apart, with first crib 3375' off shore
3. Each crib designed for 60 mgd with future 85 mgd to be considered
4. Crib 1 location lake bottom elevation = 557
5. Crib 2 location lake bottom elevation = 551
6. Lake low water elevation = 576, normal = 578
7. On-shore structure to be designed to act as both tunneling pit and wet well for pump station. Structure details to be provided at a later date.

B. Intake Cribs

1. Design: maximum winter flow dictates port size. Worst case maximum winter flow assumed of $\frac{1}{2}$ of future 85 mgd. Limit winter intake velocity to ≤ 0.25 fps and maximum intake velocity (other than winter) to 0.5 fps.

	mgd	gpm	cfs
Design Flow =	85	59,028	131.5
Winter flow rate factor =	1/2		
Assumed max winter flow =	42.5	29,514	65.8
Max. winter velocity =	0.25	fps	
Max. summer velocity =	0.5	fps	
Req'd waterway area =	263.0	sft	
# of ports =	8		
Req'd port area =	32.9	sft	
Square port dim. =	5.734	ft	
Square port dim. =	68.8	in	

2. Crib Sizing

- a) Crib shall be sized to accommodate ballasting required to submerge / sink the crib and hold it in place against buoyancy. Crib to remain buoyant when ballast ports are empty and sink with ballast ports are filled.
- b) Sized to resist expected currents and design wave height of 30'.
- c) Crib shall be 48' x 48' with base courses 52' x 52'.

3. Materials

- a) Timber: #1 Structural Douglas Fir, RC, heavy
- b) Fasteners: drift pins and bolting as per ASTM 36
- c) Stone and rip rap: MDOT 916.01

C. Intake Pipe

1. Design – Pipe capacity designed for 85 mgd. Velocity in 78" intake pipe is 2.80 fps at 60 mgd and 3.97 fps at 85 mgd.
2. Access – 42" access manholes located approximately every 1500'
3. Materials – PCCP, RCP or steel pipe

4. Two stop log chambers shall be constructed, one per branch to each crib, so that each crib can be isolated.
5. After the Y split, the pipe reach from Stop Log Chamber 1 to Crib 1 will be 60" pipe in order to achieve balanced flow with both cribs active. At a Hazen Williams C factor of 135 at initial construction, 49.8% of flow will come from Crib 1 and 50.2% of flow will come from Crib 2. The flow split will be 50/50 when the C factor drops to 132. Detailed calculations are available upon request.
6. If Crib 2 were to be out of service, the flow velocity will be 4.73 fps through the segment of 60" pipe to Crib 1 at 60 mgd.

D. Zebra / Quagga Mussel Control

1. Chemical - chlorine
 2. Piping – dual wall HDPE or CPVC pipe, separate pipe to each crib for redundancy
-

Ashford, Stephen (DEQ)

From: Jim Redding <JRedding@rowepsc.com>
Sent: Tuesday, August 21, 2012 2:35 PM
To: Ashford, Stephen (DEQ)
Cc: Bloemker, Jon (DEQ)
Subject: RE: Lake Huron Intake Project

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

PERMIT NO.

W 122056

AUG 21 '12

SLA

EXAMINED AND APPROVED FOR COMPLIANCE
WITH ACT 399, P.A. 1976

DEQ COPY

Hi Steve,

Regarding your questions,

1. The County plans to provide the ability to back flush the intake; however, these provisions are planned to be incorporated into the pump station piping design. Having two intake cribs will enable us to supply water in the event one is damaged by a boat collision or lost by icing.
2. We don't believe that corrosion of the hardware will be a problem. Underwater, there is typically less available oxygen so corrosion occurs very slowly. Warren Green indicated that a recent video inspection of the Saginaw-Midland intakes showed that the hardware was in good condition. One intake was installed in 1947 and the other in 1994. Warren indicated that hardware on the 1994 intake still has paint on it. The paint specified for our project is a high quality 2 part epoxy. Also, the design for the crib is based on 20% of the strength of the hardware, so substantial loss by corrosion would be needed before there will be an impact to the integrity of the crib.
3. There is a reference in the specification regarding how the timber is to be grade-stamped if the timber will be stained or visible, but we will not be putting a coating or stain on the timber.

If there are other questions, please let me know. Thanks.

Jim Redding

Rowe Professional Services Company

810-869-5166

jredding@rowepsc.com

From: Ashford, Stephen (DEQ) [<mailto:ASHFORDS@michigan.gov>]
Sent: Tuesday, August 21, 2012 10:28 AM**To:** Jim Redding**Cc:** Bloemker, Jon (DEQ)**Subject:** RE: Lake Huron Intake Project

Jim,

I have completed my review of the Lake Huron Water Supply Initiative Intake design and Junction Chamber. I have the following questions:

1. The top of crib 1 is 10 to 12 feet below the water surface. The top of crib 2 is 16 to 18 feet below the water surface. This raises two concerns. The first concern for crib 1 one is whether larger boats will run into the crib. The second concern for both cribs is whether both will plug with frazil ice at the same time. Question: Does the design include intake back flush capability?
2. Specification section 05550, "Bolts, Anchor Bolts, Expansion Anchors, and Concrete Inserts" indicates that submerged non-stainless steel metal parts will receive epoxy coating at a minimum. I am concerned that these coatings will not last 50 years. What is your opinion?
3. Specification section 06130 "Heavy Timber Construction" indicates that the timber on the intake will be stained or have a natural finish applied. Are these finishes NSF approved?

Please respond in writing. If we need to talk prior to the written response, give me a call.

Stephen L. Ashford, P.E. District Engineer
Resource Management Division
Department of Environmental Quality
Saginaw Bay District Office
989-894-6261 (office)
989-891-9213 (fax)

From: Jim Redding [<mailto:JRedding@rowepsc.com>]
Sent: Monday, August 20, 2012 5:16 PM
To: Ashford, Stephen (DEQ)
Subject: RE: Lake Huron Intake Project

Sounds good.

From: Ashford, Stephen (DEQ) [<mailto:ASHFORDS@michigan.gov>]
Sent: Monday, August 20, 2012 5:15 PM
To: Jim Redding
Subject: RE: Lake Huron Intake Project

Got them Jim; I will review both tomorrow Lord willing!

Thanks,

Stephen L. Ashford, P.E. District Engineer
Resource Management Division
Department of Environmental Quality
Saginaw Bay District Office
989-894-6261 (office)
989-891-9213 (fax)

From: Jim Redding [<mailto:JRedding@rowepsc.com>]
Sent: Monday, August 20, 2012 4:57 PM
To: Ashford, Stephen (DEQ)
Subject: Lake Huron Intake Project

Steve,

Attached are two specifications which I did not include in the permit application package.

- Section 05550 Bolts, Anchor Bolts, Expansion Anchors, and Concrete Inserts
- Section 06130 Heavy Timber Construction

These describe the materials used to construct the intake cribs.

Let me know if there are questions. Thanks.

Jim Redding



GENESEE COUNTY DRAIN COMMISSIONER'S OFFICE

- DIVISION OF -

WATER & WASTE SERVICES

G-4610 BEECHER ROAD - FLINT, MICHIGAN 48532-2617

PHONE (810) 732-7870 - FAX (810) 732-9773

JEFFREY WRIGHT
COMMISSIONER

August 20, 2012

Mr. Jon Bloemker, P.E., District Supervisor
Saginaw Bay District Office
401 Ketchum Street
Suite B
Bay City, Michigan 48708

Re: **Lake Huron Water Supply Initiative**
S-4000

Dear Mr. Bloemker:

Enclosed please find three (3) sets of construction plans and specifications for the above-mentioned project. This project consists of a junction chamber, intake pipe, cribbing, and associated materials. Please review these plans and issue the required state construction permit(s).

Thank you for your assistance. If you have any questions or concerns, please do not hesitate to contact me directly.

Sincerely,

Matthew T. Raysin, P.E., Division Engineer
Division of Water & Waste Services

MTR/JMW

Enclosures

ec: John F. O'Brien, P.E., BCEE, Director
xc: Rowe Professional Services Company

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