Ballville Dam Removal and Sandusky River Restoration Project Pre-Construction Notification

401/404 Permit Application

Stantec

March 6, 2014

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File: Ballville Dam Removal and
Sandusky River Ecosystem Restoration Project

Joe Krawczyk
USACE- Buffalo District Office (Corp)
1776 Niagara Street
Buffalo, NY 14207

Reference: Ballville Dam Removal and Sandusky River Ecosystem Restoration (Corp ID No. 2011-00046)

Dear Mr. Krawczyk:

Stantec Consulting Services Inc. (Stantec) is applying on behalf of the City of Fremont to remove the Ballville dam and restore almost 2.1 miles of the Sandusky River back to a free-flowing condition that is currently impounded by the dam and not meeting use attainment goals, in Sandusky County, Ohio. The project will restore and stabilize a portion of the Sandusky River once the dam has been removed; therefore, this letter and enclosed attachment address the Pre-Construction Notification (PCN) for a Section 404 and Section 10 application. Enclosed in this package you will find:

- Section 1: 401 Water Quality Certification Application
- Section 2: Section 404 and Section 10 Application
- Section 3: Project Maps
- Section 4: Stream Analysis
- Section 5: Agency Correspondence
- Section 6: Impact Tables and Figures
- Section 7: Construction Plans
- Section 8: Conceptual Wetland Mitigation Report
- Section 9: Literature Cited

PROJECT SUMMARY

The City of Fremont proposes to remove the dam on the Sandusky River near the Tiffin Road Bridge. This project is being funded in part through the U.S. Fish and Wildlife Service (USFWS) Great Lakes Fish and Wildlife Restoration Initiative, the Ohio Environmental Protection Agency (OEPA) Section 319 Clean Water Act and Water Resource Restoration Sponsor Program, and the U.S. Army Corps of Engineers (USACE) Great Lakes Fishery and Ecosystem Restoration Program. It is located approximately 18 river miles upstream

of Lake Erie and it is near the upstream terminus for the Sandusky River walleye migration. Deterioration of the dam and associated sea wall has been noted in successive inspections since 1980. In 2007, the Ohio Department of Natural Resources (ODNR) issued a Notice of Violation (NOV) to the City stating that, as a result of its poor condition, the dam was being operated in violation of the law. In recent years, nitrate levels in the Sandusky River exceeded drinking water standards on numerous occasions prompting concerns for human health. Under findings and orders from the Ohio Environmental Protection Agency, the City of Fremont built an upground raw water reservoir. Now that the reservoir is operational, the removal of the Ballville Dam becomes a viable option. The dam inhibits the river segment upstream of the dam from reaching a use attainment of warm water habitat (WWH). Removal of the dam will open 22 miles (35 km) of the Sandusky River to migratory fish species including economically important sportfish such as walleye (*Sander vitreus*) and white bass (*Morone chrysops*) as well as the State-threatened greater redhorse (*Moxostoma valenciennesi*). Walleye production from the Sandusky River stock is currently constrained by the availability of spawning habitat. Increased production from newly accessible spawning habitats could substantially increase economic activity associated with the sport fishery in the Sandusky River, Lake Erie, the City, and the Region. Ohio DNR supports the project along with other stakeholders such as the Friends of the Lower Olentangy Watershed (FLOW), Ohio Department of Natural Resources, and Battelle.

The project will entail the removal of the dam structure, seawall modification, installation of an ice control structure, and subsequent restoration of the impacted river segment and riparian areas along the banks. The entire dam spans approximately 407 linear feet (LF) across the River. The entire dam structure will be removed in phases starting from the south abutment. The only remaining structure will be the existing carbon feed building located at the north abutment of the dam. The sea wall will also be modified.

Demolition of the dam will be accomplished by the use of a trackhoe with a hoe ram attachment that will notch the dam at a predetermined point on the southern spillway to slowly dewater the impounded area as to not significantly disturb the existing habitat downstream of the dam. Breaching of the dam and dewatering the impounded area is planned for the fall of 2014 toward the end of the low flow period in the river. Demolition of the dam and subsequent restoration activities will continue through summer of 2016.

The restoration includes a floodplain bench to provide geomorphic stability to the area where the dam previously existed, and vegetating riparian areas along the banks that will be exposed due to the drawdown of the impoundment. The improvements will allow the Qualitative Habitat Evaluation Index (QHEI) scores and other indicators to improve to levels that will move the river segment from a use designation of modified warm water habitat (MWH) to WWH.

It is anticipated that a mussel rescue and relocation program will be necessary to minimize potential impacts to the resident fauna. Any mussel rescue and relocation program will undoubtedly be developed in close consultation with USFWS and ODNR. At a minimum, we recommend the following measures for a rescue and relocation program:

- Incremental notching of the dam will be used as a strategy to limit the spatial extent of the exposed bed such that areas can be effectively covered by rescue crews

- Hydrographic survey data can be used to target drawdown elevations to expose bed features that have potential to support dense assemblages

- Demolition will be phased to allow rescue work to proceed for 2-3 days before additional incrementally lowering of the upstream pool.

Project Setting

The Ballville Dam falls within the Marblehead Drift/Limestone Plain ecoregion of the Huron-Erie Lake Plains; this region is typified by limestone-dolomite ridges and islands, and areas of thin glacial drift. Agriculture on artificially drained land is prevalent throughout the Sandusky River watershed. Cropland and deciduous forest occupy over 80 percent of the land in the watershed. Directly surrounding the river is some forested floodplain, adjacent open developed space, and residential areas. The mean annual precipitation is approximately 34 inches. The nearby City of Fremont encompasses approximately 8 square miles with a population of 16,654.

A review of the National Wetland Inventory (NWI) mapping data indicated that the Sandusky River directly upstream of the dam was classified as a Lake (89.3 acres) and the Riverine (R2UBH) classification was designated upstream of the impoundment, and downstream of the dam. There were also three water features within the 0.1 percent annual chance flood hazard area (Figure 3-2). Their NWI classifications are as follows:

- 22.60 acre PFO Wetland (Freshwater Forested/Shrub)
- 7.86 acre PFO Wetland (Freshwater Forested/Shrub)
- 0.32 acre PFO Wetland (Freshwater Forested/Shrub)

The most dominant Natural Resources Conservation Service (NRCS) hydric soil mapping unit within the general study area is Rossburg silt loam, occasionally flooded (51.63 acres). Other hydric soil mapping units identified in the project were Shoals silt loam, frequently flooded (39.48 acres), Dunbridge sandy loam, 1 to 4 percent slopes (35.22 acres), and Belmore loam, 2 to 6 percent slopes (22.7 acres). A complete list of soil mapping units surrounding the project can be found in Figure 3-3 NRCS Soils.

Proposed Action

The project includes the phased removal of the Ballville Dam, seawall modification, ice control structure installation. The work consists of furnishing all labor, tools, equipment, and materials necessary for dam removal and subsequent stream restoration. Detailed engineering design indicates the following activities: mobilization and demobilization, site preparation, construction layout and staking, temporary erosion and sediment control, temporary construction of north and south access roads and staging areas, construction of a temporary causeway and temporary concrete disposal areas in the river, grading the left descending bank surrounding dam, regrading of the sea wall, grading of areas supporting the raw water reservoir intake, pilot channel construction, vegetating banks/margins exposed by the drawdown of the impoundment, riparian seeding, and planting.

The proposed project reach is approximately 9,500 feet in length along the centerline of the Sandusky River. The project area is limited to Ballville Dam, dam impoundment, parcels abutting the dam pool, with some exceptions where above ground resources are at a distance from the river, and where a public road runs along the edge of the river, parcels facing onto the dam pool. Although not with the Area of Potential Effect (APE), the former hydroelectric plant downstream of the dam is considered historical and functionally related to the dam.

MINIMIZATION AND AVOIDANCE

To minimize impacts to the Sandusky River, the dam will be breached in stages during the historic low flow period of the year. The dam will be incrementally removed in phases to manage the release of sediment and to stabilize sediment.

COMPENSATORY MITIGATION

Surface waters within the construction area flow into the Sandusky Bay which drains into Lake Erie. Compensatory mitigation is proposed for wetlands directly filled and indirectly lost due to hydrologic alteration. A detailed discussion of wetland impacts and mitigation is included in the conceptual wetland mitigation plan is --Section 8.

A 401 water quality certification pre-application meeting was conducted with Ohio Environmental Protection Agency on April 11, 2013 in Bowling Green, Ohio. It was further discussed that mitigation would only be required for wetlands directly filled due to project activities. Another meeting was conducted with USACE-Buffalo District on April 25, 2013 to discuss Stantec's conceptual mitigation plan. It was discussed that wetlands indirectly impacted due to hydrologic alteration are considered secondary impacts and the required mitigation ratio would be negotiable.

THREATENED AND ENDANGERED SPECIES

Information regarding review of threatened and endangered species for this project was requested in a letter to USFWS on February 2, 2011. The USFWS identified six federally listed species and one candidate species that are known or likely to occur within Sandusky County, and may occur near the Project Area. These include: Indiana bat (*Myotis sodalis* – endangered), Kirtland's warbler (*Setophaga kirtlandii* – endangered), piping plover (*Charadrius melodus* – endangered), rayed bean mussel (*Villosa fabalis* - endangered), eastern prairie fringed orchid (*Platanthera leucophaea* - threatened), bald eagle (*Haliaeetus leucephalus* - species of concern), and eastern massasauga (*Sistrurus catenatus* - candidate). While suitable habitats for these species are not likely on the project site, potentially suitable habitats will be preserved on-site. Copies of the correspondence letters are included in Section 5.

A study plan for conducting freshwater mussel surveys on the Sandusky River was designed and submitted to the USFWS on July 18, 2011 by Stantec. In response, the USFWS authorized Stantec to proceed. The mussel survey was conducted on September 1 and 2, 2011. The survey was completed to determine the presence or probable absence of federally listed, proposed, and candidate mussels within the areas of the Sandusky River potentially affected by the removal of the dam. No live, fresh dead, or weathered individuals of federally listed, proposed, or candidate species were found. Therefore, USFWS agreed with the assessment that the project will result in long term benefits to the Sandusky River and that the project is not likely to adversely affect any federally listed, proposed, or candidate mussels. One state threatened species, threehorn wartyback (*Obliquaria reflexa*), and one state species of concern deertoe (*Truncilla truncata*) were found during the surveys. Therefore, ODNR was consulted to determine how to proceed, and it was concluded that a mussel rescue during the drawdown of the impoundment will take place to reduce the impacts to freshwater mussels within the project area.

A field survey was conducted in June 2010 by Stantec Consulting to assess the potential presence of primary roosting habitat for the endangered Indiana bat (*Myotis sodalis*). The survey was conducted over two nights approximately 6,000 river feet upstream of the Ballville Dam near the raw water intake for the raw water reservoir. No Indiana bats were captured. The project area provides potential foraging habitat for the Indiana

bat, but large trees with characteristics of providing a maternity roost were not observed during site visits in 2011 and 2012.

The project lies within the range of the bald eagle, a federal species of concern. Both the USFWS (2012) and ODNR (2011) have identified two records of bald eagle nests in and near the Project Area. These nests were active in 2012. The Fremont Nest is located approximately one mile downstream and the Portage Livery Nest is located approximately one mile upstream of the Ballville Dam; however, these nests are outside areas that will be disturbed during the demolition process. The locality of the nests will be carefully monitored to ensure no disturbance occurs during the course of the project. In a letter from ODNR on February 10, 2011, the agency stated that "due to the location of these records (nests) in relation to the project area, the project is not likely to impact the Bald Eagle". A copy of the correspondence letter is included in Section 5.

Information regarding review of state listed species data for this project was requested from ODNR on January 28, 2011. Correspondence with ODNR indicates that a population of state endangered greater redhorse (*Moxostoma valenciennesi*) occurs within the project area and that the state endangered western-banded killifish (*Fundulus diaphanous menona*) is recorded in the lower Sandusky watershed. The state species of concern, river redhorse (*Moxostoma carinatum*), is recorded both upstream and downstream of the Ballville Dam within the vicinity of the project. ODNR recommended that no in-stream work occurs from March 15 to June 30 to reduce impacts to these aquatic species.

On February 6, 2013 Megan Seymour from US fish and wildlife service informed Stantec that the project lies within the range of federally threatened eastern prairie fringed orchid (*Platanthera leucophaea*). A survey was conducted on June 20, 2013 by Stantec and USFWS personnel. Based on the survey results, the USFWS determined that it was unlikely that eastern prairie fringed orchid would occur within the project area, and no effect is anticipated (Finfera & Seymour 2013).

STATE HISTORIC PROPERTY AFFECTED

The initial Project Summary Form was submitted to the Ohio Historic Preservation Office (OHPO) by the OEPA on October 4, 2010 (Section 5). A response to this initial correspondence was sent to OEPA-DEFA on November 2, 2010. In this response, OHPO stated that additional information was needed to continue with the Section 106 review for the project. The OHPO did not agree with the area of impact, recommending further consideration to include a broader area. The Agency also recommended that more consulting parties should be included in the process, that an archaeological survey was to be conducted to identify possible sensitive archaeological deposits, and that additional documentation on the architecture of the dam was needed.

The APE for the Ballville Dam project was determined by the USFWS Region 3 Regional Historic Preservation Officer and coordinated with the State of Ohio Historic Preservation Office (SHPO) in February 2012.

An archaeological survey was conducted by ASC group on May 4, 5, and 13, 2011, a history/architecture survey was conducted May 31 and June 1, 2011. ASC group published their report entitled "Cultural Resources Management Survey for the Proposed Removal of the Ballville Dam, Ballville Township, Sandusky County, Ohio" in September 2011. The report recommended that three buildings within the APE be eligible for inclusion in on the National Register of Historic Places. The three buildings are the Ballville Dam, it's associated Hydroelectric Plant, and the Jacob King Farmhouse. The USFWS Regional Historic Preservation Office agreed with the recommendations for the three properties, and determined that the proposed removal

of the Ballville Dam would constitute an Adverse Effect on the Ballville Dam, but the removal will have No Adverse Effect on the Hydroelectric Plant or the Jacob King Farmhouse.

Coordination with the OHPO on Section 106 of the National Historic Preservation Act is not yet complete. The cultural resource report mentioned above has also been submitted to the USACE. Information in this report as well as in this PCN package can be used by the USACE to complete the Section 106 coordination as requested by the OHPO.

The correspondence discussed in this PCN between Stantec and the governmental agencies (ODNR, USFWS, and OHPO) is ongoing and new information pertaining to the resolution of these matters will be forwarded to the U.S. Army Corps of Engineers.

Please feel free to contact me at (513) 842-8200 or Cody.Fleece@stantec.com with any comments or concerns regarding this Pre-Construction Notification. I will be happy to answer any questions you have and look forward to completing this project.

Sincerely,

STANTEC CONSULTING SERVICES INC.

Cody Fleece
Associate

Attachments

c. Jim Ellis, Mayor of the City of Fremont
Joe Krawczyk, U.S. Army Corps of Engineers, Buffalo District Buffalo Field Office
Steve Malone, Ohio EPA-DEFA
Heather Allamon, Ohio EPA – Division of Surface Water
Megan Seymour, U.S. Fish and Wildlife Service, Ohio Field Office
David Snyder, Ohio Historical Preservation Society Office
John Kessler, Ohio Department of Natural Resources

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1.0 401 Permit Application

1.1 401 PERMIT APPLICATION

APPLICATION FOR OHIO EPA
SECTION 401 WATER QUALITY CERTIFICATION

Effective October 1, 1996
Revised August, 1998

This application must be completed whenever a proposed activity requires an individual Clean Water Act Section 401 Water Quality Certification (Section 401 certification) from Ohio EPA. A Section 401 certification from the State is required to obtain a federal Clean Water Act Section 404 permit from the U.S. Army Corps Engineers, or any other federal permits or licenses for projects that will result in a discharge of dredged or fill material to any waters of the State. To determine whether you need to submit this application to Ohio EPA, contact the U.S. Army Corps of Engineers District Office with jurisdiction over your project, or other federal agencies reviewing your application for a federal permit to discharge dredged or fill material to waters of the State, or an Ohio EPA Section 401 Coordinator at (614) 644-2001.

The Ohio EPA Section 401 Water Quality Certification Program is authorized by Section 401 of the Clean Water Act (33 U.S.C. 1251) and the Ohio Revised Code Section 6111.03(P). Ohio Administrative Code (OAC) Chapter 3745-32 outlines the application process and criteria for decision by the Director of Ohio EPA. In order for Ohio EPA to issue a Section 401 certification, the project must comply with Ohio's Water Quality Standards (OAC 3745-1) and not potentially result in an adverse long-term or short-term impact on water quality. Included in the Water Quality Standards is the Antidegradation Rule (OAC Rule 3745-1-05), effective October 1, 1996, revised October, 1997 and May, 1998. The Rule includes additional application requirements and public participation procedures. **Because there is a lowering of water quality associated with every project being reviewed for Section 401 certification, every Section 401 certification applicant must provide the information required in Part 10 (pages 3 and 4) of this application**. In addition, applications for projects that will result in discharges of dredged or fill material to wetlands must include a wetland delineation report approved by the Corps of Engineers, a wetland assessment with a proposed assignment of wetland category (ies), official documentation on evaluation of the wetland for threatened or endangered species, and appropriate avoidance, minimization, and mitigation as prescribed in OAC 3745-1-50 to 3745-1-54. Ohio EPA will evaluate the applicant's proposed wetland category assignment and make the final assignment.

Information provided with the application will be used to evaluate the project for certification and is a matter of public record. If the Director determines that the application lacks information necessary to determine whether the applicant has demonstrated the criteria set forth in OAC Rule 3745-32-05(A) and OAC Chapter 3745-1, Ohio EPA will inform the applicant in writing of the additional information that must be submitted. The application will not be accepted until the application is considered complete by the Section 401 Coordinator. An Ohio EPA Section 401 Coordinator will inform you in writing when your application is determined to be complete.

Please submit the following to "Section 401 Supervisor, Ohio EPA/DSW, P.O. Box 1049, Columbus, Ohio 43216-1049:

- Four (4) sets of the completed application form, including the location of the project (preferably on a USGS quadrangle) and 8-1/2 x 11" scaled plan drawings and sections.
- One (1) set of original scaled plan drawings and cross-sections (or good reproducible copies).

(See Application Primer for detailed instructions)

1. The federal permitting agency has determined this project: (check appropriate box and fill in blanks)

   a. X requires an individual 404 permit/401 certification- Public Notice # (if known)_____

   b. ____ requires a Section 401 certification to be authorized by Nationwide Permit #_____

   c. ____ requires a modified 404 permit/401 certification for original Public Notice #_____

   d. ____ requires a federal permit under _____ jurisdiction identified by #_____

   e. ____ requires a modified federal permit under_____ jurisdiction identified by #_____

Click to clear all entered information (on all 4 pages of this form) CLEAR

2. Application number (to be assigned by Ohio EPA):

3. Name and address of applicant:

Jim Ellis
323 South Front Street
Fremont, OH 43420

Telephone number during business hours:

(_____)_____(Residence)

(419)334-5900(Office)

3a. Signature of Applicant: Date:

4. Name, address and title of authorized agent:

Cody Fleece
11687 Lebanon Road Cincinnati, OH 45241
Associate Ecologist

Telephone number during business hours:

(513)262-3994(Residence)

(513)842-8238(Office)

4a. Statement of Authorization: I hereby designate and authorize the above-named agent to act in my behalf in the processing of this permit application, and to furnish, upon request, supplemental information in support of the application.

Signature of Applicant: Date:

5. Location on land where activity exists or is proposed. Indicate coordinates of a fixed reference point at the impact site (if known) and the coordinate system and datum used.

Address:

41.32627 -83.13584 NAD 1983 (State Plane Ohio North) HUC 8: 04100011 Sandusky River (River Mile 18)

Street, Road, Route, and Coordinates, or other descriptive location

Sandusky	Sandusky	Ballville	Fremont	OH	43420
Watershed	County	Township	City	State	Zip Code

6. Is any portion of the activity for which authorization is sought complete? _____ Yes X No
If answer is "yes," give reasons, month and year activity was completed. Indicate the existing work on the drawings.

7. List all approvals or certifications and denials received from other federal, interstate, state or local agencies for any structures, construction, discharge or other activities described in this application.

Issuing Agency	Type of Approval	Identification No.	Date of Application	Date of Approval	Date of Denial
Section 1.2 Block 7					

8. **DESCRIPTION OF THE ACTIVITY (fill in information in the following four blocks - 8a, 8b, 8c & 9)**

8a. Activity: Describe the Overall Activity:

Section 1.3 Block 8A: Overall Activity

8b. Purpose: Describe the purpose, need and intended use of the activity:

Section 1.4 Block 8B: Purpose and Need

8c. Discharge of dredged or fill material: Describe type, quantity of dredged material (in cubic yards), and quantity of fill material (in cubic yards). **(OAC 3745-1-05(B)(2)(a))**

Section 1.5 Block 8C: Discharge

9. Waterbody and location of waterbody or upland where activity exists or is proposed, or location in relation to a stream, lake, wetland, wellhead or water intake (if known). Indicate the distance to, and the name of any receiving stream, if appropriate.

Section 1.6 Block 9: Waterbody and Location of Waterbody

10. To address the requirements of the Antidegradation Rule, your application must include a report evaluating the:

- Preferred Design (your project) and Mitigative Techniques
- Minimal Degradation Alternative(s) (scaled-down version(s) of your project) and Mitigative Techniques
- Non-Degradation Alternative(s) (project resulting in avoidance of all waters of the state)

At a minimum, item a) below must be completed for the Preferred Design, the Minimal Degradation Alternative(s), and the Non-Degradation Alternative(s), followed by completion of item b) for each alternative, and so on, until all items have been discussed for each alternative (see Primer for specific instructions). (Application and review requirements appear at **OAC 3745-1-05(B)(2), OAC 3745-1-05(C)(6), OAC 3745-1-05(C)(1) and OAC 3745-1-54)**.

10a) Provide a detailed description of any construction work, fill or other structures to occur or to be placed in or near the surface water. Identify all substances to be discharged, including the cubic yardage of dredged or fill material to be discharged to the surface water. **(OAC 3745-1-05(B)(2)(b))**

10b) Describe the magnitude of the proposed lowering of water quality. Include the anticipated impact of the proposed lowering of water quality on aquatic life and wildlife, including threatened and endangered species (include written comments from Ohio Department of Natural Resources and U.S. Fish and Wildlife Service), important commercial or recreational sport fish species, other individual species, and the overall aquatic community structure and function. Include a Corps of Engineers approved wetland delineation. **(OAC 3745-1-05(C)(6)(a, b) and OAC 3745-1-54)**

10c) Include a discussion of the technical feasibility, cost effectiveness, and availability. In addition, the reliability of each alternative shall be addressed (including potential recurring operational and maintenance difficulties that could lead to increased surface water degradation.) **(OAC 3745-1-05(C)(6)(h, j-k) and OAC 3745-1-54)**

10d) For regional sewage collection and treatment facilities, include a discussion of the technical feasibility, cost effectiveness and availability, and long-range plans outlined in state or local water quality management planning documents and applicable facility planning documents. **(OAC 3745-1-05(C)(6)(i))**

10e) To the extent that information is available, list and describe any government and/or privately sponsored conservation projects that exist or may have been formed to specifically target improvement of water quality or enhancement of recreational opportunities on the affected water resource. **(OAC 3745-1-05(B)(2)(g))**

10f) Provide an outline of the costs of water pollution controls associated with the proposed activity. This may include the cost of best management practices to be used during construction and operation of the project. **(OAC 3745-01-05(C)(6)(g))**

10g) Describe any impacts on human health and the overall quality and value of the water resource. **(OAC 3745-1-05(C)(6)(c) and OAC 3745-1-54)**

10h) Describe and provide an estimate of the important social and economic benefits to be realized through this project. Include the number and types of jobs created and tax revenues generated and a brief discussion on the condition of the local economy. **(OAC 3745-1-5(B)(2)(e), and OAC 3745-1-05(C)(6)(i))**

10i) Describe and provide an estimate of the important social and economic benefits that may be lost as a result of this project. Include the effect on commercial and recreational use of the water resource, including effects of lower water quality on recreation, tourism, aesthetics, or other use and enjoyment by humans. **(OAC 3745-1-05(B)(2)(e,f), and OAC 3745-1-05(C)(6)(e))**

10j) Describe environmental benefits, including water quality, lost and gained as a result of this project. Include the effects on the aquatic life, wildlife, threatened or endangered species. **(OAC 3745-1-05 (B)(2)(e,f), OAC 3745-1-05 (C)(6)(b) and OAC 3745-1-54)**

10k) Describe mitigation techniques proposed (except for the Non-Degradation Alternative):

- Describe proposed Wetland Mitigation (see **OAC 3745-1-54** and Primer)
- Describe proposed Stream, Lake, Pond Mitigation (see Primer)

11. Application is hereby made for a Section 401 Water Quality Certification. I 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. I further certify that I possess the authority to undertake the proposed activities or I am acting as the duly authorized agent of the applicant.

Signature of Applicant	Date	Signature of Agent
	2/19/14	

The application must be signed by the person who desires to undertake the proposed activity (applicant) or it may be signed by a duly authorized agent if the statement in Block 3 has been filled out and signed.

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1.2 BLOCK 7: LIST OF APPROVALS

Table 1-1. List of Approvals

Issuing Agency	Type of Approval	Identification No	Date of Application	Date of Approval	Date of Denial
Army Corps of Engineers	Individual Section 404 and Section 10 Permit	2011-00046	March 2014	TBD	TBD
Ohio EPA	401 WQC	TBD	March 2014	TBD	TBD
US Fish and Wildlife Service	Section 7	Mussel Survey	February 2, 2012	May 2, 2012	N/A
US Fish and Wildlife Service	Section 7	Eastern Prairie Fringe Orchid Survey Report	August 7, 2013	August 7, 2013	N/A
Ohio Historic Preservation Office	Section 106	TBD	TBD	TBD	TBD
Federal Emergency Management Authority	Floodplain Permit	TBD	TBD	TBD	TBD
Ohio Department of Natural Resources	Scenic River Environmental Review	TBD	TBD	TBD	TBD
US Fish and Wildlife Service (Lead Agency)	Record of Decision -- NEPA	Docket No. FWS-R3-FHC-2013-N266	DEIS Published in Federal Register January 24, 2014	TBD	TBD
Ohio EPA	National Pollutant Discharge Elimination System (NPDES)	TBD	TBD	TBD	TBD

1.3 BLOCK 8A: ACTIVITY

The City of Fremont proposes to remove the Ballville Dam from the Sandusky River. Since removal of the dam will change the water surface elevation of the river, stabilization activities are proposed. Exposed sediment areas and areas disturbed from construction activities will be seeded and planted with riparian vegetation. Grading activities will occur surrounding the former dam and if needed additional grading may occur near the newly constructed off-stream reservoir intake. Also, if needed, a pilot channel may be constructed to connect the modified river location to the off-stream reservoir intake. The existing seawall will also be modified.

In addition to the removal of Ballville Dam, the City proposes to install an ice control structure (ICS) as a result of historical accounts of winter ice jams.

The proposed project design will be divided into three separate construction phases. The dates for these activities are tentative.

Phase I (September 2014-November 2014)

In the first phase of the project the existing south spillway will be notched to draw-down the reservoir. An access road will be built to access the south abutment for this activity.

Phase II (March 2015-December 2015)

Following draw-down, the exposed area will be seeded with vegetation. An access road and temporary ramp will be constructed on the north bank leading up to the dam. Following this construction the Ice Control Structure (ICS) will be installed. Following the installation of the ICS, the dam will be demolished. After the dam is demolished and concrete and ramp are hauled off site, the channel will be restored surrounding the construction area.

Phase III (Summer 2016)

If needed additional bank stabilization, planting and in stream work will occur. If needed, a pilot channel will be constructed to convey water to the reservoir intake. Following this activity, the seawall will be modified.

1.4 BLOCK 8B: PURPOSE

The purpose of the proposed project is to remove Ballville Dam from the Sandusky River thereby restoring natural hydrological processes over a 40-mile stretch of the Sandusky River, re-opening fish passage to 22 miles of isolated habitat, restoring flow conditions for fish access to new habitat above the impoundment, improving overall conditions for native fish communities in the Sandusky River system both upstream and downstream of the Ballville Dam, and restoring self-sustaining fish resources.

The Sandusky River is one of Ohio's largest tributaries to Lake Erie, about 210-km in length with a watershed encompassing 3,680 km^2 that drains into the 14,692-hectare, estuarine-like, Sandusky Bay before entering the lake proper. In 1970 approximately 70 miles of the Sandusky River was designated as the state of Ohio's second scenic river. River connectivity is disrupted by a low-head dam near the City of Tiffin, Ohio (64 river km from Sandusky Bay) and by the Ballville Dam (29 river km from Sandusky Bay). Without the Ballville Dam, the Sandusky River would once again be in a free flowing condition between river mile 19—17.

The Ballville dam has altered natural hydrologic and sediment transport functions in the Sandusky River. The supply of such coarse sediments is necessary for the long-term maintenance of downstream spawning habitat, which is important for many native aquatic species utilizing these areas during a series of life stages. The restriction of coarse sediments, while conveying fine sediment downstream, can negatively impact important habitats, including spawning areas, by filling in interstitial spaces. It may significantly improve the habitat for the threated and endangered species threehorn wartyback (*Obliquaria reflexa*) and deertoe (*Truncilla truncata*). Ecologically, the dam represents an impassable barrier to upstream and downstream movements of all aquatic organisms. The expansion of available habitat would benefit many species of migratory fish and mussel species. This would include economically important sportfish such as walleye (*Sander vitreus*) and white bass (*Morone chrysops*) as well as the State-threatened greater redhorse (*Moxostoma valenciennesi*).

Water bodies within the State of Ohio have, by law, designated beneficial uses that are protected by water quality standards. Within the project area, the Sandusky River's Aquatic Life Use Standard is Warm Water Habitat (WWH). The Sandusky River was sampled at five locations between river mile (RM) 5.5 and 18.05 in 2009. The Sandusky River at the Ballville Dam (RM 18.05) was found to be in non-attainment of the WWH designation due to siltation and direct habitat alteration.

The impounded area was used as a source of public water by the City of Fremont from 1959 to 2012. In February 2008, the Ohio Environmental Protection Agency (OEPA) issued a Findings and Orders notification to the City citing numerous Ohio Administrative Code (OAC) Rule violations related to the operation of the Public Water System (PWS) and water quality of the City's PWS. Among the violations were elevated nitrate levels documented from samples taken over a period from June 1999 to June 2007. Within the Findings and Orders, the OEPA ordered the City to prepare plans for construction of an off- stream reservoir that would hold approximately 750 million gallons of raw water to address the nitrate violations. The reservoir which cost in excess of $45 million was completed and became operable in February 2013. It has successfully supplied water utilities to the City of Fremont for over a year now.

Progressive deterioration of Ballville dam and associated sea wall has been noted in successive inspections beginning in 1980, however the last known maintenance performed on the structure occurred in 1969. The ODNR informed the City in 2004 that if a remediation schedule for the dam was not submitted and approved by December 1, 2007 legal enforcement actions could result. In August 2007, the ODNR issued a Notice of Violation (NOV) to the City stating that, as a result of its poor condition, the dam was being operated in violation of the law. In June 2011, the ODNR extended timeframes for bringing the dam into compliance (ODNR 2011b) in recognition that a new PWS reservoir was being completed. This letter noted that extension of the schedule for compliance did not remedy concerns regarding the condition of the dam.

1.5 BLOCK 8C: DISCHARGE

The project's construction limits are confined to approximately 28 acres, which includes activities directly surrounding the dam and exposed reservoir sediment planting areas upstream of the dam (Section 7). The construction limits include temporary access roads and staging areas. There may potentially be some additional bank stabilization, planting and in stream work upstream of the dam near the intake and at River Road. An Ice Control Structure (ICS) will be installed in the Sandusky River approximately 200 feet downstream of the Ballville Dam. In addition, activities may include removing the remaining infrastructure of a small low-head dam (Tucker Dam) which is approximately 0.7 mile upstream of Ballville Dam. The Waters of the U.S. (WUS) features directly impacted on this project will occur below the Ordinary High Water Mark (OHWM) of the Sandusky River or in a jurisdictional wetland (Corp, 2011).

In construction of the access ramp for demolition of the Ballville Dam, approximately 5,275 CY of earthen material (rock and soil) fill will be temporarily placed in Wetland 18 (25 CY), Wetland 19 (34 CY) and in the Sandusky River (5,216 CY) (Figure 6-1).

An estimated 15,000 CY of concrete (demolished dam materials) from the Ballville Dam will be temporarily discharged to the designated disposal areas below the OHWM of the Sandusky River (Figure 6-1).

The channel restoration area surrounding the dam will extend vertically above the south spillway access on the right descending bank to the top of the existing left descending bank, and will extend horizontally toward the upstream bend in the seawall to approximately 560 feet downstream of the dam, dissecting Wetland 19 (Figure 6-1). In construction of this restoration area, approximately 27,774 CY of fill consisting of offsite rock and soil materials as well as some concrete rubble from the demolished dam and leftover access ramp will permanently fill portions of WUS (Table 1-2).

Table 1-2. Channel Restoration Limits--Fill to WUS Summary

Water Feature	Fill (Cubic Yards)
Sandusky River	25,719
Wetland 6	20
Wetland 18	476
Wetland 19	1,559
Total	27,774

The channel restoration area will also consist of 28,478 CY of excavation, 26,428 CY of which will occur in the Sandusky River. Wetland 17 which is located above the dam will also have 250 CY of earth material removed. These excavated materials would be hauled off to an upland disposal site chosen by the contractor. The remaining 1,720 CY of excavated materials would be outside of a JWUS feature.

The Ice Control Structure (ICS) will be a row of 15, 6' diameter concrete piers extending approximately 280 feet across the modified river location. The piers extend on average approximately 12 feet above the channel bottom (Appendix E). An estimated 390 CY of concrete for ICS will be permanently placed into JWUS features to mitigate for ice-jam flooding. There will be 2 piers (52 CY) directly placed into Wetland 18 and 2 piers (52 CY) placed into Wetland 6. The remaining 11 piers (286 CY) will be placed in the Sandusky River.

If needed, approximately 790 CY of soil fill will be placed for bank stabilization upstream of the dam at the intake for the raw water reservoir along approximately 650 linear feet of the Sandusky River near the River Road/Buckland Avenue intersection. There will be approximately 90 CY placed in Wetland 15 and 700 CY of fill will be placed in Wetland 14. Also, if needed, approximately 80 CY of bare earth will be excavated from the Sandusky River to form a pilot channel (~8' wide x ~1.5' depth) allowing flow to reach the reservoir intake (Figure 6-2).

In summary, of the 49,229 CY of fill materials (all values are approximations) to be placed in WUS, 28,954 CY is permanent and 20,275 CY is temporary (Table 1-3). The total amount of excavated earth from the project area (26,758 CY) is permanent removal.

Table 1-3. Summary of Fill and Excavation Activities to WUS

Impact Type	Construction	Type of Materials	Place or Remove	Cubic Yards (CY)	WUS Features Impacted
*Temporary	Access Ramp	Earthen Materials (rock and soil)	Place	5,275	Sandusky River, Wetlands 18 & 19
*Temporary	Ballville Dam	Concrete	Place	15,000	Sandusky River
Permanent	Restoration Area	Earthen Materials (rock and soil)	Place	27,774	Sandusky River (4.34 acres), Wetlands 6, 18 & 19
Permanent	Ice Control Structure	Concrete Piers	Place	390	Sandusky River, Wetlands 6 & 18
Permanent	**Bank Stabilization	Earthen Materials (rock and soil)	Place	790	Wetlands 14 & 15
Permanent	Restoration Area	Present Earth Materials	Remove	26,678	Sandusky River (4.34 acres), Wetland 17
Permanent	**Pilot Channel	Present Earth Materials	Remove	80	Sandusky River
*some ramp materials and dam materials will remain to build up restoration area			**Total Fill Placement**	**49,229**	** construction activity will occur if needed
			Total Earth Removal	**26,758**	

1.6 BLOCK 9: WATERBODY

BLOCK 9: WATERBODY AND LOCATION OF WATERBODY
Ballville Dam Removal and Sandusky River Restoration Project
City of Fremont
Ballville Township
Sandusky County, Ohio

Table 1-4. Proposed Waterbody Impacts

Water Feature ID	General Location in relation to Ballville Dam	Latitude	Longitude	Flow Regime & Corps Descriptions	Receiving Waters	Estimated Amount of Aquatic Resource in Construction Limits (Direct Impacts)	*Estimated Amount of Aquatic Resource Post-Construction (Indirect Impacts)
Sandusky River	below	41.325948	-83.152014	Perennial Stream (TNW)	Lake Erie	577.00 linear feet / 2.09 acres	**0.00 linear feet / 0.00 acres
Sandusky River	above	41.329533	-83.143789	Perennial Stream (TNW)	Lake Erie	589.00 linear feet / 2.29 acres	11,088.00 linear feet / 89.30 acres
Stream 1	above	41.317268	-83.151890	Perennial Stream (RPW)	Sandusky River	0.00 linear feet / 0.00 acres	***0.00 linear feet / 0.00 acres
Stream 2	above	41.320584	-83.153522	Perennial Stream (RPW)	Sandusky River	0.00 linear feet / 0.00 acres	***0.00 linear feet / 0.00 acres
Stream 3	below	41.325337	-83.134816	Intermittent Stream (Non-RPW)	Sandusky River/Wetland 7	0.00 linear feet / 0.00 acres	0.00 linear feet / 0.00 acres
Stream 4	below	41.326886	-83.128919	Intermittent Stream (Non-RPW)	Wetland 8	0.00 linear feet / 0.00 acres	0.00 linear feet / 0.00 acres
Wetland 1	above	41.315585	-83.153461	Emergent/Scrub-Shrub/Forested	Sandusky River/Stream 1	0.00 acres	2.49 acres
Wetland 2	above	41.317931	-83.151265	Emergent/Scrub-Shrub/Forested	Stream 1	0.00 acres	0.04 acres
Wetland 3	above	41.318948	-83.150801	Emergent/Scrub-Shrub/Forested	Stream 1	0.00 acres	0.19 acres
Wetland 4	above	41.327691	-83.145824	Emergent/Scrub-Shrub/Forested	Sandusky River	0.00 acres	34.11 acres
Wetland 5	above	41.328498	-83.141831	Emergent/Scrub-Shrub/Forested	Sandusky River	0.00 acres	2.47 acres
Wetland 6	below	41.325590	-83.135311	Emergent/Scrub-Shrub	Sandusky River	0.01 acres	0.00 acres
Wetland 7	below	41.325557	-83.134511	Emergent	Sandusky River	0.00 acres	0.00 acres

Water Feature ID	General Location in relation to Ballville Dam	Latitude	Longitude	Flow Regime & Corps Descriptions	Receiving Waters	Estimated Amount of Aquatic Resource in Construction Limits (Direct Impacts)	*Estimated Amount of Aquatic Resource Post-Construction (Indirect Impacts)
Wetland 8	below	41.327079	-83.128475	Emergent/Scrub-Shrub/Forested	Sandusky River	0.00 acres	0.00 acres
Wetland 9	below	41.327392	-83.127684	Emergent/Scrub-Shrub/Forested	Sandusky River	0.00 acres	0.00 acres
Wetland 10	below	41.327281	-83.127571	Emergent/Scrub-Shrub/Forested	Sandusky River	0.00 acres	0.00 acres
Wetland 11	below	41.327887	-83.125616	Emergent/Scrub-Shrub	Sandusky River	0.00 acres	0.00 acres
Wetland 12	below	41.327240	-83.128332	Emergent/Scrub-Shrub	Sandusky River	0.00 acres	0.00 acres
Wetland 13	above	41.314761	-83.155426	Emergent/Scrub-Shrub/Forested	Sandusky River	0.00 acres	0.18 acres
Wetland 14	above	41.320804	-83.152944	Emergent/Scrub-Shrub/Forested	Sandusky River/Stream 2	0.06 acres	2.30 acres
Wetland 15	above	41.323744	-83.153455	Emergent/Scrub-Shrub/Forested	Sandusky River	0.03 acres	10.89 acres
Wetland 16	above	41.330170	-83.143294	Emergent/Scrub-Shrub/Forested	Sandusky River	0.00 acres	1.23 acres
Wetland 17	above	41.326710	-83.136471	Emergent	Sandusky River	0.09 acres	0.00 acres
Wetland 18	below	41.326256	-83.135350	Emergent/Scrub-Shrub/Forested	Sandusky River	0.18 acres	0.00 acres
Wetland 19	below	41.326393	-83.134508	Emergent/Scrub-Shrub/Forested	Sandusky River	0.30 acres	0.00 acres
Wetland 20	below	41.328432	-83.125240	Emergent/Scrub-Shrub/Forested	Sandusky River	0.00 acres	0.00 acres
* see mitigation report for details on the proposed outcome of the aquatic resource ** the deposition of suspended solids above the dam will potentially be deposited along a 20 mile stretch of the river between Brady's island to Sandusky Bay *** a net increase in linear stream length due to the draw down					**Total Stream Impacts**	**1,166 linear ft. / 4.38 acres**	**11,088 linear ft.**
					Total Wetlands Impacts	**0.67 acres**	**53.90 acres**

1.7 BLOCK 10A: DETAILED PROJECT DESCRIPTION

On January 13, 2011, the City convened a group of interested stakeholders to discuss objectives associated with the dam removal project. Participants included representatives from a spectrum of interests including State and Federal fish and wildlife managers, local citizens, local and regional watershed groups, various regulatory authorities, and local historical societies. The project goals were based on discussions that occurred in that meeting. The Project Goals include:

- Eliminate safety hazard and financial liability
- Improve water quality
- Restore walleye passage
- Restore natural river function
- Manage impounded sediment
- Increase opportunities for recreation

1.7.1 Preferred Alternative

1.7.1.1 Project Overview

The City of Fremont proposes the incremental removal of Ballville Dam with the installation of an Ice Control Structure (ICS) to address ice jamming and flooding. This alternative includes the removal of the Ballville Dam over a sequence of three (3) phases. Prior to the demolition of the dam, the south spillway will be notched to initiate a slow draw down period (6-8 months) of the reservoir. An access road and small staging area will be constructed for this activity (see south abutment access). This longer notching period will allow for a more controlled release of sediment downstream of the dam. During this period, areas previously impounded will be seeded (see Seeded area) and stranded mussels will be rescued.

Once this drawdown period is over, a temporary ramp leading up to the dam from the north abutment will be constructed. Following this activity the ICS will be installed and demolition of the dam will begin. During the demolition, dam materials will be temporarily placed in the designated disposal areas. The area surrounding the removed dam will be filled and graded to form a stable river restoration area. After the stream restoration filling and grading is complete and the ICS is installed, the existing seawall structure will be modified (Figure 1-1). Some additional bank stabilization may occur upstream of the dam, if it is needed.

Incrementally removing the Ballville Dam would allow for a more controlled release of stored sediments to minimize impacts to the aquatic wildlife community and on recreational use. Other benefits of removing the dam are fish passage to upstream reaches of the river, increased system connectivity, and the elimination of the liability of maintaining the dam. In this alternative federal funding would be provided to the City of Fremont. Removal of the Ballville Dam incrementally would meet the all of the Project Goals, and is also likely to minimize environmental effects of the action. Therefore, this alternative is carried forward in this application.

The benefits of project are summarized below:

- Provide fish passage opportunities in the Sandusky River at the Ballville Dam site in both the upstream and downstream directions
- Restore system connectivity and natural hydrologic processes between the impounded area upstream of Ballville Dam and the lower Sandusky River, which would restore riverine fish and wildlife habitat, resulting in a net gain in the amount of free-flowing riverine habitat.
- Provide flood mitigation to Ballville Township.
- Eliminate liabilities associated with the Ballville Dam including potential threats to private properties both upstream and downstream of Ballville Dam.
- Manage downstream movement of reservoir sediments.
- Achieve Life Use-Attainment (as defined by OEPA) for the lower Sandusky River.
- Improving and increasing aquatic habitat availability in the lower Sandusky River downstream of the Ballville Dam site.
- Increase Opportunities for Recreation

1.7.1.2 Construction Activities

The sequence of dam removal and construction of the ice control structure would consist of the following events:

Phase 1 (September 2014)

- Establishing access to the south abutment from the south shore, to “notch” the south spillway for lowering the reservoir water level
- Notch south spillway and begin slow draw down

Phase 2 (March 2015—December 2015)

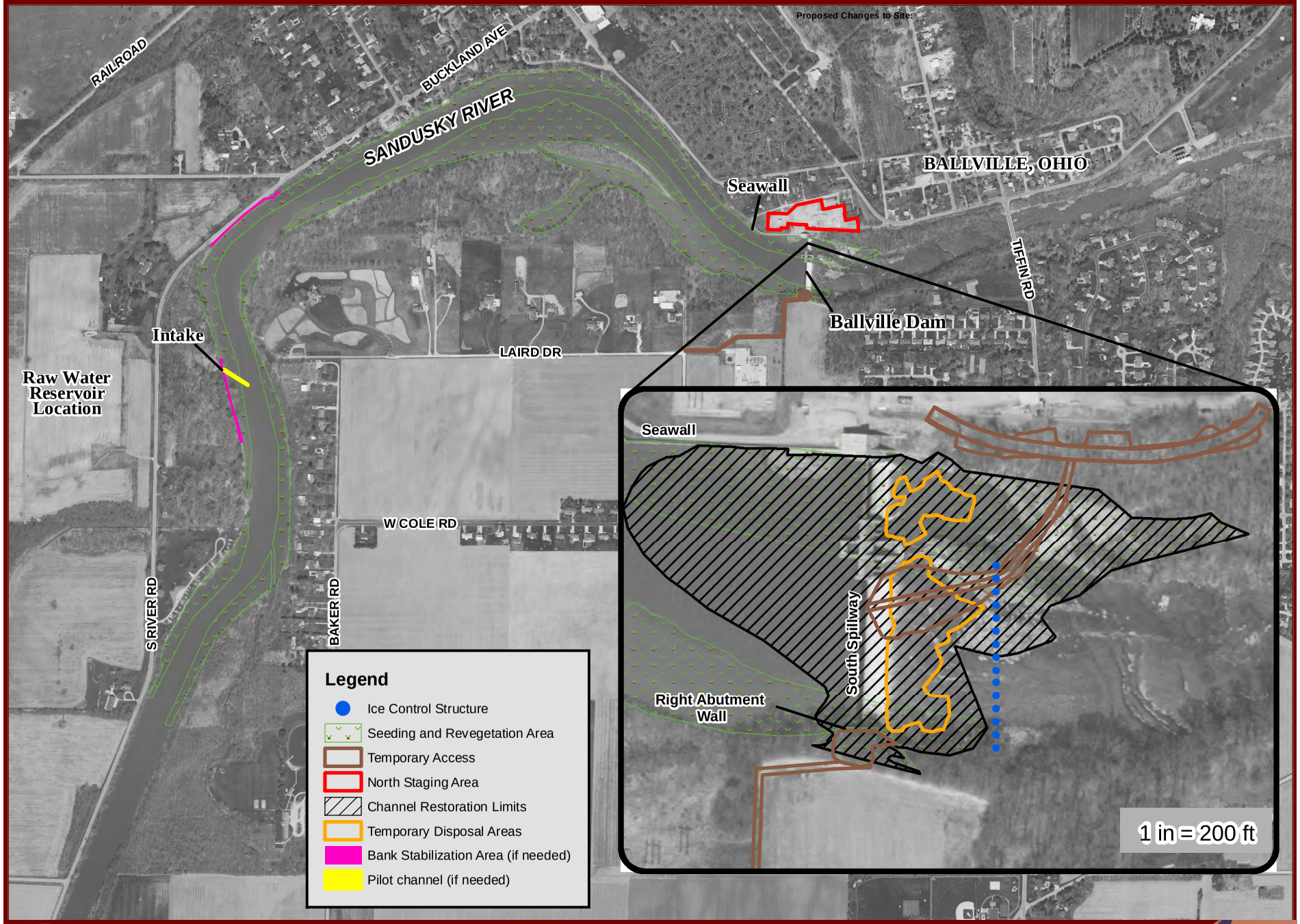
- Begin vegetating exposed sediment in seeded area
- Constructing a temporary access road and ramp leading to dam
- Installing an ice control structure
- Removing the south spillway. Removal would not stop at the central non-overflow section
- Removing the remaining dam structure, up to the carbon feed building
- Removal of temporary access ramp
- Grading and construction of the channel restoration area

- Seeding the remaining sediment along the newly established low-flow stream channel, in order to establish earth-holding vegetation

Phase 3 (Summer 2016)

- Modification to seawall to at-grade elevation
- Additional bank stabilization and pilot stream near reservoir intake (if needed)

The design plans for this alternative are included in Section 7 of this permit application. The details of the ICS are included in Appendix E. The description of fill materials to be placed or removed from JWUS Corp features are described in Block 8c and in Section 6 of this permit application. Further details of indirect impacts to wetlands upstream of Ballville Dam are located in Section 8.



0 500 1,000 2,000 Feet

1 in = 1,000 ft

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Figure 1-1. Preferred Alternative Project Activities

Ballville Dam Removal Project
Fremont, Ohio

1.7.2 Minimal Degradation Alternative

1.7.2.1 Project Overview

The City of Fremont seeks to repair the dam and stabilize the seawall with the intention of bringing the Ballville Dam into compliance with current safety standards. If the Ballville Dam is not removed then extensive repairs would be required to bring the dam to ODNR dam safety standards.

The Ballville Dam has been subject to multiple inspections and analyses since 1980. In 1980, the Ohio Department of Natural Resources (ODNR) Division of Water performed a Phase I inspection of the dam for the U.S. Army Corps of Engineers Pittsburg office. No structural or hydraulic problems of significance were observed during visual inspections (ODNR 1981). This report recommended four areas where further investigation was needed. Those areas were:

1. Evaluations by a structural dam engineer should occur for the right overflow toe, the foundation along noted eroded areas along the entire toe of the dam, stability of the dam and sea wall for the Probably Maximum Flood (PMF), erosion characteristics of the channel rock downstream of the dam, and the left abutment wall foundation related to erosion and deterioration.

2. Repair surface locations where deterioration has occurred.

3. Periodic visual inspection and monitoring of seepage areas.

4. Implementation of standard operation and maintenance procedures.

A stability analysis of the dam was performed in 1984 by Dodson-Lindblom Associates, Inc. Plans for stabilizing the sea wall were prepared in 1987 by Feller, Finch, & Associates, Inc. However, these plans were not implemented by the City of Fremont (City).

The ODNR inspected the dam in 1998 and 2003 (ARCADIS 2005). The 2003 inspection found that concrete conditions observed in 1998 were continuing to deteriorate. Three areas requiring attention and action from the City were identified: 1.) repairs and investigations, maintenance and operation, and 3.) monitoring. These items were not different from what the 1981 inspection report found, however, specifications of maintenance were provided regarding the “lake drain,” or sluice gate. The City was given until December 2007 to meet the required remedial measure identified in the report including implementation of any developed construction plans. However, no remedial actions have occurred to date.

Results from an investigation by ARCADIS FPS, Inc. (ARCADIS) were provided in 2005 to the City in response to the ODNR 2004 inspection report. Their report provided details from investigating the dam and sea wall including the ability to safely pass the Probable Maximum Flood (PMF) and the deterioration of the concrete structures. The report concluded that:

1. The dam could not safely pass the PMF;

2. The spillway and central sections have adequate stability for all loading conditions including the PMF;

3. The sea wall could be unstable for floods greater than the top of the sea wall;

4. Routine maintenance, e.g. vegetation removal, should be performed; and

5. The deterioration of the concrete did not endanger the stability of the structures.

In addition to performing stability analyses and further assessing the deteriorating conditions, ARCADIS prepared probable project costs for the sea wall modification and concrete repairs, as well as provided costs for completion of an operation, maintenance, and inspection manual, and lastly an emergency action plan for the Ballville Dam. In November 2013, The Mannick & Smith Group (MSG) provided an investigation report that updated the findings and cost estimates for rehabilitation of the Ballville Dam based on the 2005 ARCADIS report. The costs and recommendations were developed based on these reports.

These reports recommended the following remediation measures be undertaken to address concerns from ODNR and USACE regarding the dam safety. Specifically, the reports recommended the following:

1. the sea wall should be stabilized using one of two methods: 1.) gravity stabilization with grouted riprap on uphill side, or 2.) post-tensioned anchors through the wall and into bedrock;

2. the concrete on the dam be repaired by removing the deficient concrete, preparation of the surface, placement of reinforced concrete, shotcrete and/or epoxy on structures and in bedrock scour voids; and

3. Steel guards installed on certain structure corners.

The scope of work and cost estimates from these reports will be implemented for this alternative design. The principal items of repair were identified which are intended to bring the dam into compliance with current safety standards. In order to repair concrete deteriorations on the dam, the water level on the reservoir will need to be lowered by opening the sluice gate(s). In order for the sluice gates to be opened, they must first be repaired. This scope of work does not include possible structural concrete deterioration below the normal pool water line. The repair activities will begin in August of 2014 during low flows and not during the walleye spawning season.

Considerable concrete deterioration has occurred on the dam; especially those areas that were repaired in 1969. Additionally, there are some limited undermining along the toe of the spillway sections and central non-overflow section that require filling. ARCADIS (2005) found these conditions nonthreatening to water retaining structures, but recommended their repairs for long term serviceability of the dam. In 2013, MSG found these conditions continuing to deteriorate. Attachments -Plates 1 and 2 provide detail and location where concrete repairs are needed. Differences in the costs were due to percent contingency and design and construction administration activities. Details of the probable costs are presented in 10C. The primarily items are:

1. Replacement of shotcrete on the left abutment downstream training wall;

2. Replacement of shotcrete on all surfaces of the central nonoverflow walls;
3. Installation of formed concrete walls at the downstream end of the central non-overflow section and at the base of the training wall next to the left spillway and non-overflow section;
4. Filling of the void under the toe of the right spillway section;
5. Installation of steel angles on the upstream corners of the raw water intake for protection; and
6. Injection of epoxy into cracks in the left side of the central non-overflow section.

There are several options for replacement of concrete. Replacement of shotcrete would be accomplished by removing all loose material, cutting the void edges with a saw, using anchoring wire mesh in the void, and reapplication of shotcrete. This repair would not be permanent but would likely last approximately 30 years based on previous environmental conditions. A second option to improve concrete conditions would be the application of a polymer modified concrete that has enhanced adhesion properties for reduction in permeability. Polymer modified concrete would likely have a longer lifespan than shotcrete and extend repair life to 50 years (MSG 2013).

The filling of voids along the downstream toe would likely require preparing the surface by cutting the edges and installation of wire mesh that is securely anchored to the prepared surface. Fill below the waterline would tremie concrete to the void in order to fill in the wetted conditions.

ARCADIS (2005) noted that steel plating was used below the water line for protection against debris impact into the structure prior to falling over the spillway. Installation of similar steel plating would likely help against continued deterioration. Installation would require replacement of the shotcrete (as depicted above) and then securing steel plates along the corners with drilled shafts for large welded rebar/steel bars.

Injection of the epoxy into cracks would require surface preparation and cleaning and then injection of the epoxy for filling. This action would help prevent these areas from further deterioration from thaw/freeze and other environmental conditions.

The sea wall was found by ARCADIS (2005) to be at risk of failure in floods that would crest the wall. The overflowing water would erode the backfill and possibly cause collapse. This is similar to the condition that destroyed the dam during construction in 1911 before rebuilding in 1913. Two solutions were developed in order to prevent the sea wall from failing: gravity alternative and post-tension alternative.

The gravity alternative would remove the soil behind the sea wall down to rock and replace it with a non-erodible material that would remain stable during a cresting of the wall. ARCADIS (2005) proposed roller compacted concrete (RCC) or rock fill consolidated with grout as possible materials.

The second alternative is the post-tension alternative. This alternative requires the installation of post-tensioned anchors in the sea wall. This alternative assumes that the concrete in the existing seawall is suitable and that subsurface rock is capable to resist the anchor loads. Extensive geotechnical investigation of both the subsurface rock and the sea wall will be necessary to confirm the feasibility of this alternative.

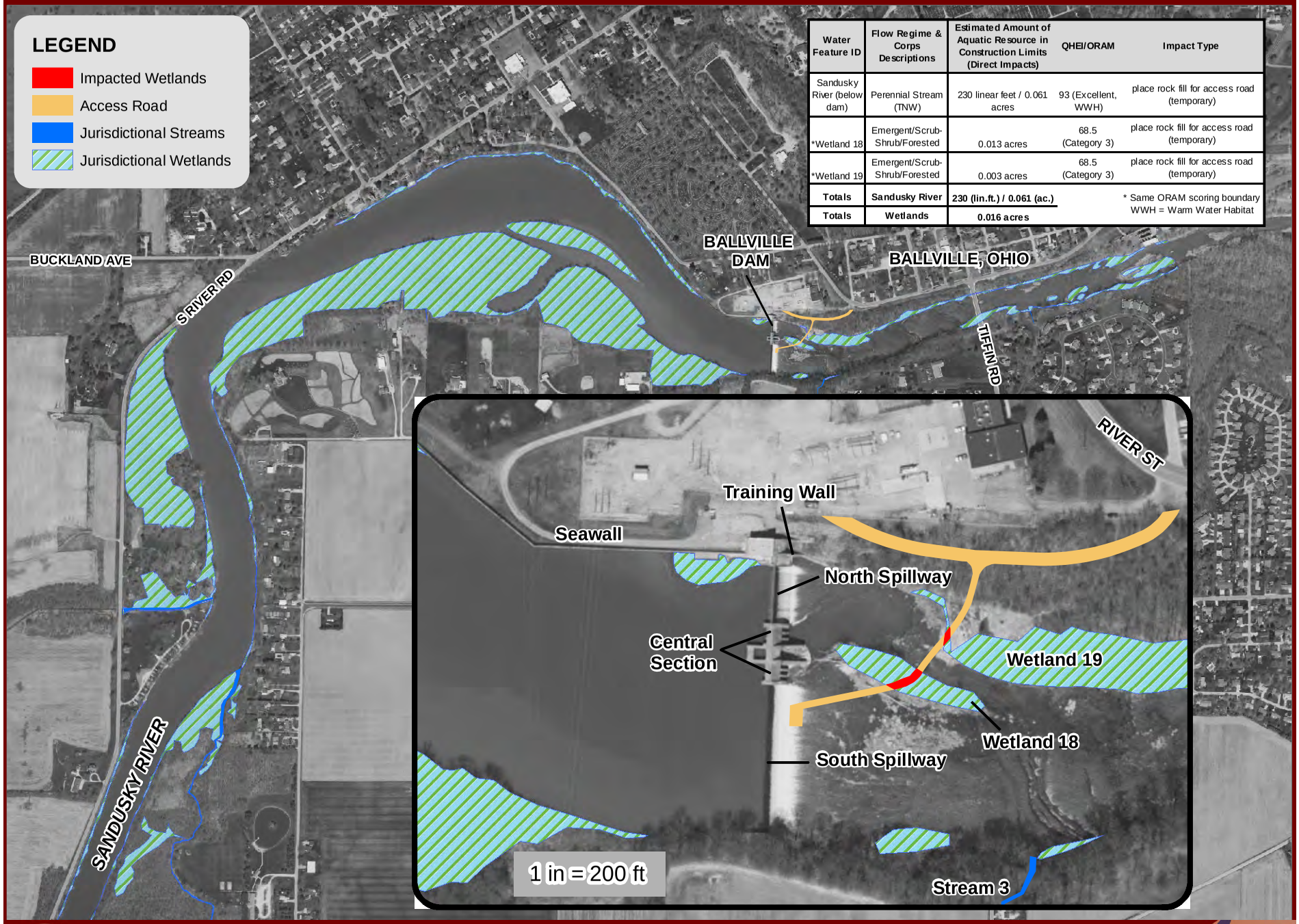
1.7.2.2 Project Activities

In order to perform repairs on the downstream face of dam, an access road will be built on the left bank. This would require clearing some trees along an existing access road on the left bank and temporarily direct fill into WUS (Figure 1-2; Table 1-5).

Table 1-5. Fill Materials to WUS - Minimal Degradation Alternative

Water Feature ID	Flow Regime & Corps Descriptions	Estimated Amount of Aquatic Resource in Construction Limits (Direct Impacts)	QHEI/ORAM	Impact Type
Sandusky River (below dam)	Perennial Stream (TNW)	230 linear feet / 0.061 acres	93 (Excellent, WWH)	place rock fill for access road (temporary)
*Wetland 18	Emergent/Scrub-Shrub/Forested	0.013 acres	68.5 (Category 3)	place rock fill for access road (temporary)
*Wetland 19	Emergent/Scrub-Shrub/Forested	0.003 acres	68.5 (Category 3)	place rock fill for access road (temporary)
Totals	**Sandusky River**	**230 (lin.ft.) / 0.061 (ac.)**	* Same ORAM scoring boundary WWH = Warm Water Habitat	
Totals	**Wetlands**	**0.016 acres**		

Approximately 4,573 CY of rock and soil fill will be placed in Wetland 18 (166 CY), Wetland 19 (2,111 CY) and below the OHWM of the Sandusky River (1,945 CY) in construction of the temporary access road.



Water Feature ID	Flow Regime & Corps Descriptions	Estimated Amount of Aquatic Resource in Construction Limits (Direct Impacts)	QHEI/ORAM	Impact Type
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Totals	**Wetlands**	**0.016 acres**		

0 500 1,000 2,000 Feet

1 in = 1,000 ft

N

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Figure 1-2. Minimal Degradation Alternative Fill to WUS

Ballville Dam Removal Project, Fremont Ohio

The following repair items will be performed when using this access leading up to the downstream face of the dam:

- Replacement of shotcrete on the surfaces of the central non-overflow buttresses
- Installation of formed concrete walls at the central non-overflow section
- Filling void under toe of south spillway section
- Repair of cracks on left side of central non-overflow section by epoxy injection

Also, on the downstream face of the dam, a small barge will be floated along the left abutment to access the training wall. The following repairs will be made to the training wall:

- Replacement of shotcrete
- Installation of formed concrete walls

A small barge will also be used to access the dam on the upstream face. The following repair items will be performed from this access point:

- Replacement of shotcrete on the surfaces of the central non-overflow buttresses
- Installation of protective steel angles on corners of central non-overflow section
- Repair cracks on left side of central non-overflow section by epoxy injection

In addition to the dam repairs, the seawall on the left descending bank will be stabilized to ensure safely passing the probable maximum flood (PFM), approximately 202,000 cfs. Permanent grouted riprap will be placed on the uphill side of the seawall. An existing access road will be used for this construction activity.

After the dam and seawall have passed final inspection and the dam meets safety requirements, the temporary access road downstream of the dam will be removed. Cleared areas will be re-vegetated, where needed (see Section 7 Construction Plans).

1.7.2.3 Operation and Maintenance

In addition to the repair of the dam and stabilization of the seawall, the scope of this project alternative and timeline (Table 1-6) would include the following required items:

- Preparation of an Operations, Maintenance, and Inspection Manual
- Preparation of an Emergency Action Plan
- Routine maintenance such as removal of vegetation from and around the water retaining structures

These documents provide discussion of the various modifications and utilize the results of hydrology and hydraulics modeling. ARCADIS (2005) estimated a cost of $33,000 to prepare these documents

1.7.2.4 Project Timeline

Table 1-6. Approximate Timeline for Minimal Degradation Alternative

Start Date	Project Activity
Early August 2016	Begin Repairs
Early November 2016	Final Inspection

1.7.2.5 Conclusion

The ODNR has identified deficiencies with the Ballville Dam that has been recommended for repair and rehabilitation since 1980. Currently, the dam is not operating in accordance with ODNR safety standards. The 2005 report prepared by ARCADIS and the updated report by Mannick and Smith (2013) are the most current documents that provide analyses on the stability of the dam and sea wall as well as estimated probable costs for remediation to bring the dam into compliance with ODNR safety standards. These reports are the basis for the Minimal Degradation Alternative.

The four major items that the ARCADIS 2005 and MSG 2013 reports focused on included:

- structural stability during the PMF,
- repair of concrete,
- stabilization of the sea wall, and
- standard operation and inspection procedures.

While the dam was found to be stable during the PMF it is in need of concrete repairs. The sea wall was found not to be stable during a quarter of the PMF flow (approximately 50,000 cfs).

Two alternatives were developed to address this instability: gravity and post-tension alternatives. Finally, in order to own and operate a dam in Ohio owners are required to have operation and maintenance manuals on file with ODNR as well as inspection procedures and past reports available. The table below (Table 1-13) provides estimated costs for rehabilitation of the dam to meet ODNR standards.

The Minimal Degradation Alternative does not satisfy all of the Project Goals. The dam will be maintained and brought into compliance with Ohio dam safety regulations, but the City will continue to face financial liability for the structure. Repairing the dam will not improve water

quality, restore walleye passage and natural river function, or increase opportunities for recreation. By maintaining the structure, some of the fine sediment behind the dam will continue to be stored and because the reservoir is “full” some of the fine sediment will be transported downstream.

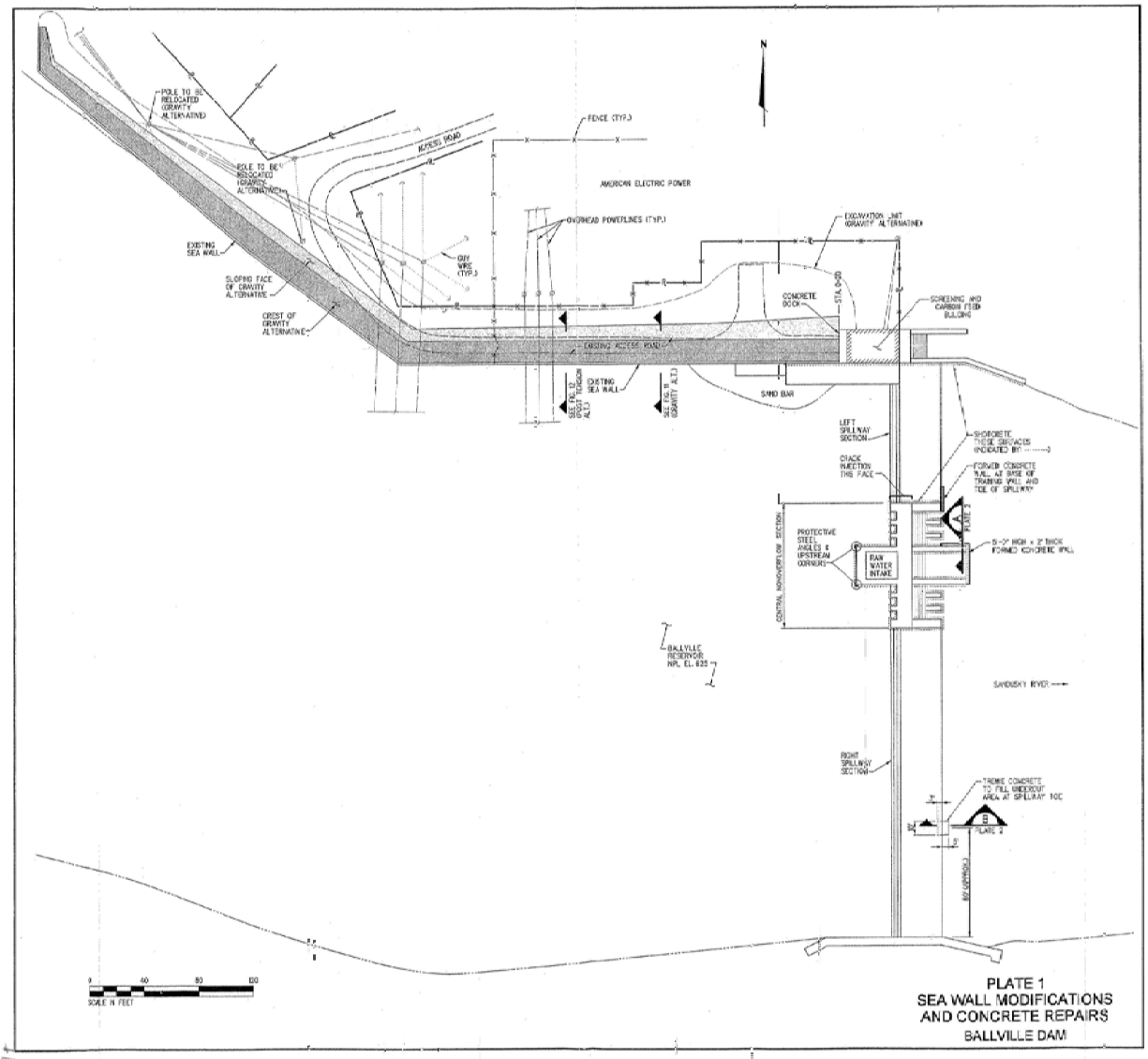
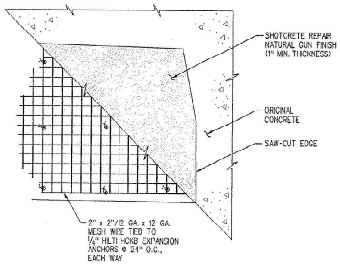


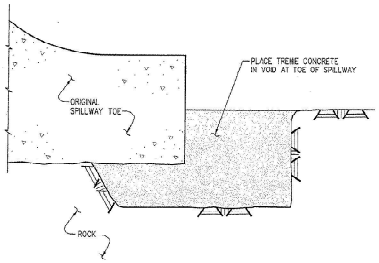
PLATE 1
SEA WALL MODIFICATIONS
AND CONCRETE REPAIRS
BALLVILLE DAM

NOT TO SCALE



TYPICAL SHOTCRETE REPAIR

NOT TO SCALE



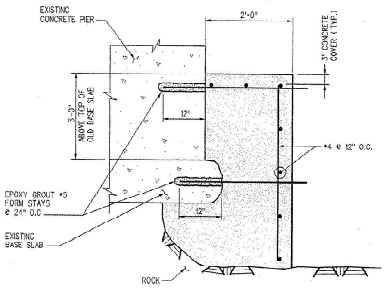
SECTION B

SCALE: 3/8"=1'-0"

0 1 2 3 4 8

SCALE IN FEET

CONCRETE FILL FOR VOID
UNDER TOE OF RIGHT SPILLWAY SECTION



SECTION A

SCALE: 3/4"=1'-0"

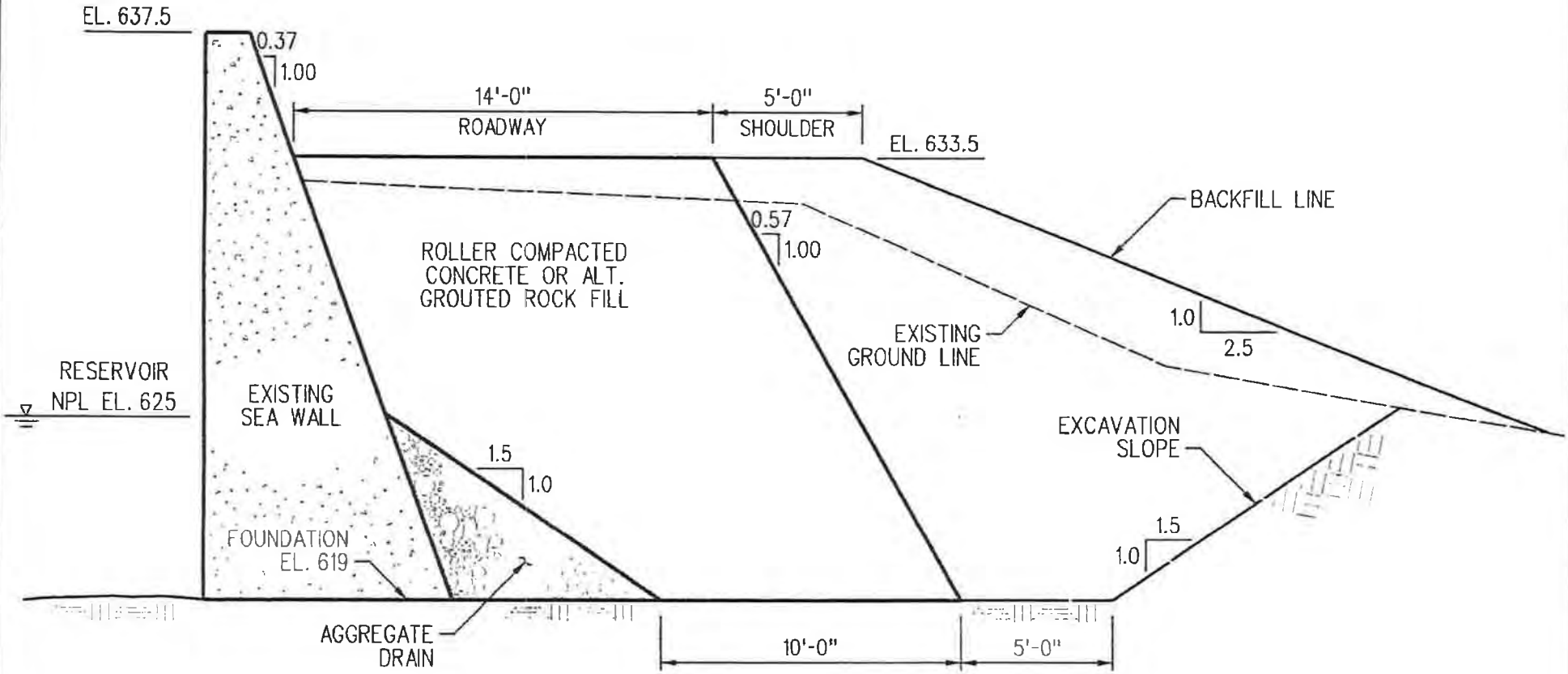
0 1 2 3 4

SCALE IN FEET

FORMED CONCRETE WALL AT
DOWNSTREAM END OF
CENTRAL NONOVERFLOW SECTION

PLATE 2
DETAILS FOR
CONCRETE REPAIRS
BALLVILLE DAM

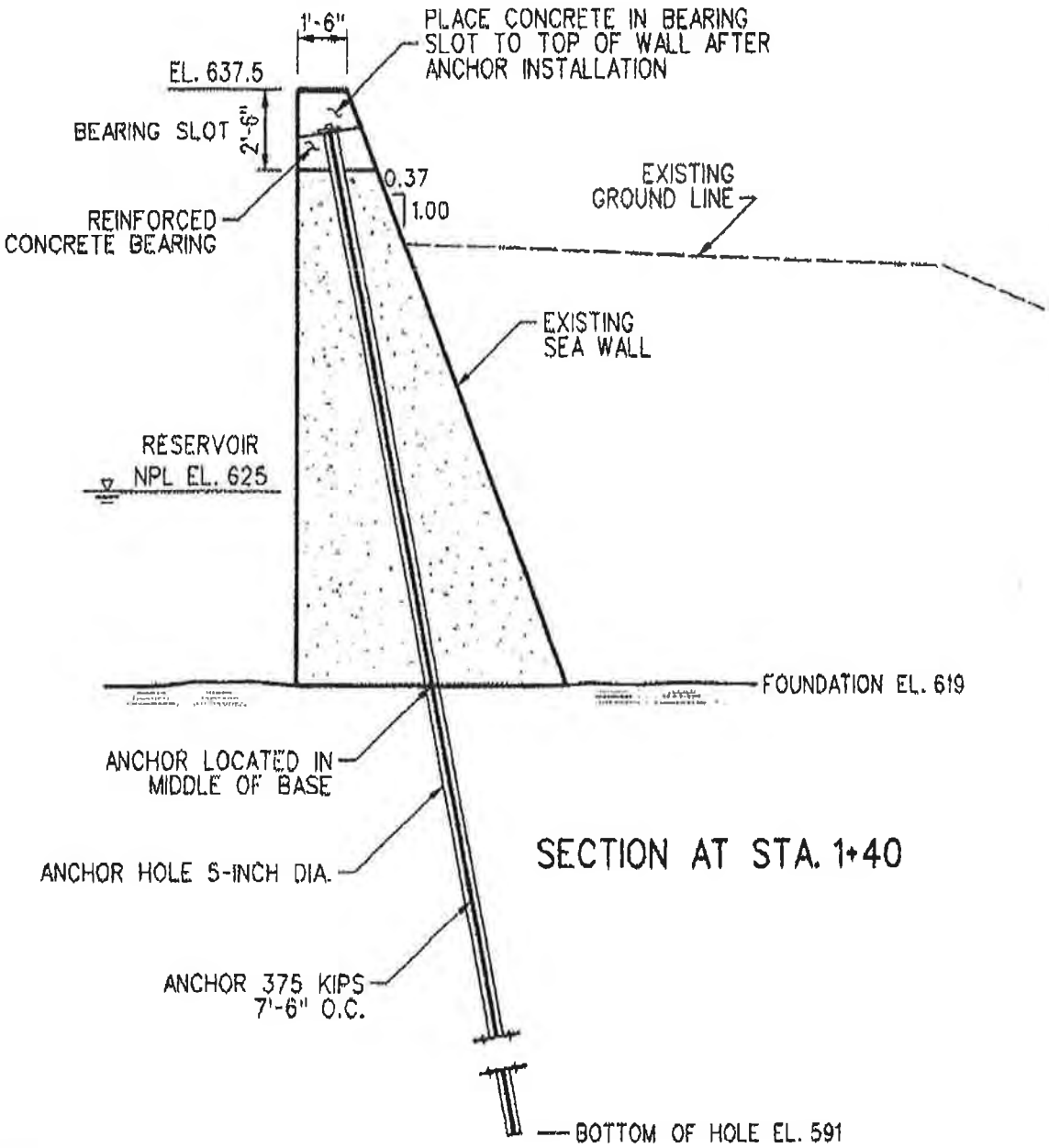
NOT TO SCALE



SECTION AT STA. 1+40

NOTE: 14'-0" WIDE CONCRETE CREST AT EL. 633.5 TO SERVE AS ACCESS ROAD TO CHLORINATION BUILDING.

GRAVITY ALTERNATIVE
BALLVILLE SEA WALL MODIFICATION
FIGURE 11



NOTES:

1. CUT BEARING SLOT IN CREST 2 FT BY 2 FT AT EACH ANCHOR LOCATION.
2. DRILL, GROUT AND REDRILL HOLES BEFORE INSTALLATION OF ANCHOR.

POST-TENSION ALTERNATIVE
BALLVILLE SEA WALL MODIFICATION
FIGURE 12

1.7.3 Non-Degradation Alternative

This alternative is defined as the No-build or No Action alternative and it represents the Non-degradation alternative for this project. This alternative is not a practical option because it does not satisfy the specified project goals discussed above at the beginning of Section 1.7.

1.8 BLOCK 10B: BIOLOGICAL AND PHYSICAL IMPACTS

The importance of restoring Sandusky River habitat is addressed in a formal state management plan of the ODNR, e.g., the Sandusky River Basin Fisheries Tactical Plan (Davies and Tyson 2001). The management objective is to re-establish stream flow conditions in the Sandusky River to mimic natural flow regimes and conveyance in channels." They further add that "removal of the Ballville Dam is a cornerstone in the rehabilitation of aquatic habitats in the Sandusky Hydrological unit," which includes the Sandusky River and Sandusky Bay. Restoration of hydrological connectivity and fish passage in major Lake Erie tributaries is also identified in the ODNR Division of Wildlife's Strategic Plan, and the Lake Erie Tactical Plan, which directing management authorities use when possible to identify, protect, and restore lost or critical habitat in the watershed and minimize impacts to Lake Erie.

The Impact Descriptions ratings (i.e. no effect, negligible etc.) used in this assessment are defined in the Feasibility Study (Stantec, 2012).

1.8.1 Preferred Alternative

1.8.1.1 Fisheries

Notching of the dam would allow concrete to fall into a scour hole directly at the toe of the dam. This could result in some incidental fish mortality; however, the vibration of the hoe-ram notching the dam is expected to cause fish to move away from the location where concrete would fall. The ICS will not act as a barrier to fish during spawning periods. No impacts to fish are expected to occur from modification of the seawall and seeding of the riverbank.

A diverse fish community of 88 native species have used the river and bay system for some or all of their life stages, including walleye (*Sander vitreus*), white bass (*Morone chrysops*), channel catfish (*Ictalurus punctatus*), smallmouth bass (*Micropterus dolomieu*), redhorse suckers (*Moxostoma spp*.), buffalo (*Ictiobus spp.*), and northern pike (*Esox lucius*) (Bogue 2000). In July 2011, Ohio Environmental Protection Agency (OEPA) reported results of fish sampled at River Miles (RM) 15.4 and 16.8 located downstream of dam, 18.5 and 19.5 located within the Ballville Dam impoundment, and 21.3, and 23.4 located upstream of the reservoir. In total, 45 species were collected. Species richness was highest at RM 16.8 (n = 30) and lowest at 18.5 (n = 15). Three species classified as "intolerant" (OEPA 1989) to water quality degradation were collected in the surveys: greater redhorse, river redhorse, and black redhorse. The greater redhorse (Ohio Endangered) was collected both above and below the Ballville impoundment.

Walleye and white bass support significant spring river fisheries in the Sandusky River, providing about ~196,000 angler hours during March-April fisheries in 2009, while ranging from ~102,000 to ~367,000 hours annually since 1975 (ODNR 2010a). The Sandusky River walleye stock is recognized by fisheries managers as one of several discrete walleye stocks that contribute to inter-jurisdictional fisheries in the U.S. and Canada (Biggrigg 2008). Although current migratory walleye and white bass stocks that spawn in the Sandusky River support a smaller percentage of the fisheries in the river and in Lake Erie, it is thought that increases in their abundance would lead to commensurate economic benefits at local, state, and inter-jurisdictional scales (See 10h). ODNR research indicates that the Sandusky River walleye stock is constrained by the amount (~20 acres) of spawning habitat below the dam, and that this extant habitat is likely deteriorating from a lack of gravel replenishment. Their research also indicates that approximately 300 acres of suitable spawning habitat exists upstream of the dam, and that, when relocated to that location, walleye can spawn and produce larvae from the upstream habitat (Davies 1994; Plott 2000; Jones et al. 2003; Cheng et al. 2006). Walleye are broadcast spawners and deposit eggs on a variety of substrates ranging from mud to large rubble. However, hatching success is highest on gravel and cobble substrates (Jones et al. 2003) and these substrates are used in higher proportion than other available substrates (McMahon et al. 1984). Davies (1994) studied walleye spawning habitat in river mile 17, below the dam and in river miles 34, 35, 36, and part of 37 upstream of the dam. He determined that nine acres of spawning habitat existed below the dam and 25 acres was present in the study reach above the dam. Jones et al. (2003) analyzed the combined influence of spawning habitat availability, river discharge, and temperature and estimated that habitats upstream of Ballville Dam could produce between 10,000,000 and a 149,000,000 larval fish on an annual basis. Potential fish production above Ballville Dam was, on average, eight times greater than in the currently accessible habitats below the dam. There is also evidence that walleye will spawn in habitats above the dam if able to access them. In 1997 and 1998, ODW transported nearly 5,000 adult walleye above the dam (Plott 2000). Post-release studies captured three spent females and 19 males. In addition, larval fish sampling conducted in the Ballville Impoundment, miles from the release point, recovered a total of 90 larval walleye, confirming that the spent fish were successfully spawning above the dam. While this research may not guarantee that the Sandusky River stock will immediately find and use new habitat, it does support the premise that the major impediment to walleye reproduction in this system, lack of spawning habitat, would be addressed in part through dam removal (Plott 2000).

Other species support relatively small fisheries on their largely residential (non-migratory) river populations but play important ecological roles in the fish community. The white bass migration, in particular, is an important seasonal fishery. While white bass and yellow perch in the Sandusky River and their associated population limiting factors have been studied less intensively than walleye, it is reasonable to conclude that increased access to upstream spawning habitats will be beneficial. The sauger (*Sander canadense*) was extirpated from the region and prior reintroduction attempts have proven unsuccessful. Because sauger are a highly migratory species, increased connectivity between critical habitats resulting from removal of Ballville Dam may make it possible to reestablish this species in the basin. The freshwater drum, an important host species for freshwater mussels, was collected downstream but not

upstream of the dam (OEPA 2011a). An improved river flow regime with open access to substantially more habitat should increase the abundance of virtually all species, and likely species diversity as well, when compared to present conditions both above and below Ballville Dam.

It is expected that implementation of the preferred alternative would have negligible adverse impacts and major beneficial impacts to fisheries resources in the upstream reach of the Sandusky River. The negligible rating was selected because most species will see little to no effect; largemouth bass is a species that could see minor adverse effects on their population in the impoundment. As the river transitions from a lentic to a lotic system, species that currently live in the impoundment such as largemouth bass and crappie may see an overall habitat loss, therefore, a loss in recreational fishing opportunities specific to lentic fish populations may occur.

Populations of existing invasive species like common carp may be reduced. A major beneficial intensity level was assigned based on the potential for restoration of native migratory species (e.g., walleye, greater redhorse) populations in the Sandusky River relative to their current poor condition.

During a pre-application 401 WQC meeting with OEPA a representative from ODNR reported on the local ecology adaptation to invasive species. Specifically, it was noted that implementation of the preferred alternative would have no effect on the invasion of sea lamprey due to species specific thermal requirements. It was also discussed that the Sandusky River provides suitable habitat for Asian carp, but the implementation of the preferred alternative would not impact this issue either way.

1.8.1.2 Mussels

In the Preferred Alternative the reservoir will be dewatered and a mussel rescue will occur to reduce immediate impacts to stranded mussels. It is expected that removal of the dam would have negligible adverse impacts and major beneficial impacts to mussel habitat in the areas upstream of the dam. Coarser sediments (cobble, gravel, and sand) would replace the silt dominated substrate in some sections of the impoundment. Although much of the substrate of the pooled area is bedrock, the primary benefit to mussels is the movement of host fish

The Ohio State University Bivalve database indicates that valves for northern riffleshell (*Epioblasma torulosa rangiana*; federally endangered), rayed bean (*Villosa fabalis*; federally endangered), black sandshell (*Ligumia recta*; state threatened), kidneyshell (*Ptychobranchus fasciolaris*; state species of concern), round pigtoe (*Pleurobema sintoxia*; state species of concern), wavy-rayed lampmussel (*Lampsilis fasciola*; state species of concern), and purple wartyback (*Cyclonaias tuberculata*; state species of concern) have been found in the Sandusky River. However, most of these records were found prior to 1976, with some found as recently as 1995. Furthermore, most of the historical records are from no closer than approximately 20 miles upstream of the project location. Limited study of the impounded area was conducted in

support of efforts to construct the raw water reservoir intake (EnviroScience 2010). No live or dead mussels were found within the survey area, however, one live giant floater (*Pyganodon grandis*) was found approximately 100 feet downstream. The surveyed area was characterized as having exceedingly poor habitat (i.e. cobble and boulders, exposed bedrock) for freshwater mussels (Stantec 2011). Stantec (2011) surveyed areas from immediately below the dam to the Hayes Avenue Bridge on September 1 and 2, 2011. Eighty-one live animals comprising twelve species and one additional species as a weathered valve were observed. No federally listed taxa were found. However, one live three-horn wartyback (*Obliquaria reflexa*; state threatened) and 23 deertoe (*Truncilla truncata*; state species of concern) were observed.

1.8.1.3 Birds

The noise of demolition and related activities will keep birds away during construction.

Waterfowl, wading birds, and other migratory birds depend on the Sandusky River system for breeding and migration habitat. The Sandusky River drainage is designated as an Important Bird Area (IBA) by the Audubon Society for a number of bird uses including a large number of migrating landbirds (Ritzenthaler 2008). It is expected that the implementation of the preferred alternative would have negligible adverse impacts on birds and their habitat. Open water habitat for waterfowl would decrease slightly, but not enough to affect use of the river by this group of wildlife species.

It is expected that the implementation of the preferred alternative may reduce the forested floodplain wetland acreage and birds dependent on these areas may undergo moderate habitat alteration.

1.8.1.4 Mammals

The noise of demolition and related activities will keep mammals away during construction.

A total of 84 species of mammals are listed by the American Society of Mammologists as having records from the State of Ohio (ASM 2012). Of these records, 41 are listed as “common” within the state and approximately 38 potentially occurring in northwestern Ohio. Those potentially occurring include the opossum, rabbits, bats, 16 rodents (i.e. beaver, voles, squirrels, fox), coyote, fox, raccoon, river otter, skunk, weasel, mink and white-tailed deer (ASM 2012).

Ten species of bat are likely to occur in Ohio (Brack et al. 2010). Bats, in general, are considered tree bats during spring, summer, and fall but generally utilize mines, man-made structures, or caves for hibernacula. During fall they generally migrate south to hibernacula to spend the winter months then migrate back in the spring.

It is expected that the Preferred Alternative would have negligible adverse impacts on mammals and their habitat. The direct impacts to forest habitat as result of construction activities is described in the following Plant Life piece.

1.8.1.5 Amphibians

The noise of demolition and related activities will keep most amphibians species away during construction. It is expected that the implementation of the preferred alternative would alter the hydrology behind the dam which may alter habitat for amphibians. These habitats are expected to be replaced overtime.

1.8.1.6 Plant Life

The Project Area lies within the Eastern Corn Belt Plain Ecoregion. In addition, most of Ohio, including Sandusky County and the Project Area, is part of the Beech-Maple Forest Region. The Beech-Maple Forest Region is dominated by beech (*Fagus grandifolia*) and sugar maple (*Acer saccharum*); however, extensive tracts of elm-ash-maple (*Ulmus spp.-Fraxinus spp.-Acer spp*.) type forests occur in depressions and areas between glacial moraine flats, reaching into the area of the former Great Black Swamp (Braun 1950). The bogs and prairies that are scattered throughout the area increase the vegetation diversity of the Beech-Maple region.

The project area is in the Sandusky River riparian corridor and floodplain. The area is predominantly forest cover with typical riparian species such as silver maple (*Acer saccharinum*), red maple (*Acer rubrum*), green ash (*Fraxinus pennsylvanica*), eastern cottonwood (*Populus deltoides*), box elder (*Acer negundo*), American sycamore (*Plantanus occidentalis*) and American elm (*Ulmus americana*). Many of the surrounding areas are JWUS Corp (USACE JD report, 2011) wetland features with a variety of interspersed shrub and herbaceous floristic communities typical in wetland environments. The invasive species reed canarygrass (*Phalaris arundunacea*) which is on ODNR list Ohio's Top Ten Invasive Non-Native Plants was present and in many cases a dominant part of the plant assemblage. Many of the ash trees within the wetlands are standing dead snags most likely due to emerald ash borer.

The construction of temporary access for project activities will require the removal of some brush and trees. Areas used for access will be seeded with native riparian vegetation following the project. An existing access road/farm field will be used to access the south spillway. Approximately 0.08 acres of forest habitat will be cleared and graded between the open field and the right abutment wall to notch the south spillway (Figure 1-1). On the north bank an existing foot path (Photo ID # 23 & # 24) will be used as an access road. An estimated 0.38 acres will be cleared of trees and brush to create this temporary access road. Construction of the temporary ramp will require an additional 0.07 acres of tree and brush clearing. Upstream of the dam, if needed, approximately 0.38 acres of vegetation will be cleared to access bank stabilization areas upstream of the dam. The total tree clearing acreage from direct impacts related to construction activities is approximately 0.91 acres. Only trees absolutely needed to be cleared for access will be removed. Seasonal tree clearing will be conducted between October 1 to April 1.

A more detailed discussion of the secondary impacts to hydrology alteration to wetland plant life above the dam is discussed in detail in Section 8-Conceptual Mitigation report. The existing

Palustrine Forested (PFO) areas are expected to remain forest since a majority of the tree canopy species are facultative species that can occur in wetland and upland habitat. The species composition of forest canopy species is expected to change overtime to a more upland plant assemblage (sugar maple, white oak, northern red oak, black cherry and shagbark hickory). The obligate shrub and herbaceous communities within this hydrologic regime change are expected to diminish. New exposed areas will be seeded with native riparian vegetation so the forest habitat is expected to increase in size.

1.8.1.7 Rare, Threatened, and Endangered Plants and Animals (including comments from the ODNR and USFWS)

1.8.1.7.1 Federally Listed Species

The USFWS identified six federally listed species and one candidate species that are known or likely to occur within Sandusky County, and may occur near the project area (Table 1-7). These species include four federally endangered species, one federally threatened species, one federally listed species of concern, and one federal candidate species. The four federally endangered species identified as potentially occurring in the Project Area include the Indiana bat (*Myotis sodalis*), Kirtland's warbler (*Setophaga kirtlandii*), piping plover (*Charadrius melodus*), and rayed bean (*Villosa fabalis*). The other three species are the eastern prairie fringed orchid (*Platanthera leucophaea*; federally threatened), the bald eagle (*Haliaeetus leucocephalus*; federally listed species of concern), and the eastern massasauga (*Sistrurus catenatus*; federally listing candidate).

Table 1-7. Federally listed threatened, endangered, and species of concern known or likely to occur in the project area based on the *Federally Listed Species by Ohio Counties* (USFWS 2012a)

Species		Federal Status	State Status	County
Common Name	Scientific Name			
Eastern prairie fringed orchid	*Platanthera leucophaea*	Threatened	Threatened	Sandusky
Indiana bat	*Myotis sodalis*	Endangered	Endangered	Sandusky
Kirtland's warbler	*Setophaga kirtlandii*	Endangered	Endangered	Sandusky
Piping plover	*Charadrius melodus*	Endangered	Endangered	Sandusky
Rayed bean mussel	*Villosa fabalis*	Endangered	Endangered	Sandusky
Eastern massasauga	*Sistrurus catenatus*	Candidate	Endangered	Sandusky
Bald Eagle	*Haliaeetus leucocephalus*	Species of Concern	Threatened	Sandusky

Stantec coordinated with the USFWS and ODNR to obtain data regarding federally listed species in Sandusky County, whether each species would likely be present in the Project Area,

and what the potential impact that the project may have on each species (for full agency correspondence document, see Section 5).

1.8.1.7.1.1 Eastern prairie fringed orchid

The Project Area lies within the range of the federally threatened eastern prairie fringed orchid. This tall, showy orchid is found in wet prairies, sedge meadows, and moist road-side ditches. There are no current records of eastern prairie fringed orchid within the Project Area, however known populations occur in Riley Township, Sandusky County, located just east of the Project Area. This is known from nearby populations including the State of Ohio's largest at Pickerel Creek State Wildlife Area, and smaller populations in Riley Township. Correspondence from USFWS dated March 2, 2011 (Section 5.2) stated that impacts to habitat are not anticipated.

On June 20, 2013, a survey for Eastern prairie fringed orchid was conducted by Jenny Finfera and Megan Seymour from USFWS and biologist with Stantec Consulting. Based on the survey results (Section 5-Agency Correspondence), the USFWS determined that it was unlikely that eastern prairie fringed orchid would occur within the project area, and no effect is anticipated (Finfera & Seymour 2013; USFWS, 2014).

1.8.1.7.1.2 Indiana Bat

The Project Area lies with the range of the federally endangered Indiana bat; however, there are no current records of Indiana bats known from the Project Area. The closest record is approximately 12 miles southeast of the project area in Seneca County. An Indiana bat survey was conducted during June 2010 approximately 6,000 river feet upstream of the Ballville Dam near the raw water intake for the raw water reservoir. A total of three bats representing two species (two little brown bats [*Myotis lucifugus*]; one big brown bat [*Eptesicus fuscus*]) were captured during two nights of netting. No Indiana bats were captured (Stantec 2011). There is approximately 107 acres of deciduous forest within the Project Area. However, not all deciduous forest is suitable for roosting by Indiana bats. Roosting habitat is limited to the riparian zones along the Sandusky River within the Project Area and upstream and downstream. Potential foraging habitat also includes the riparian zones along the Sandusky River and includes the open water as well. This area represents approximately 526 acres. The Indiana bat is known to forage in a mosaic of habitats throughout its range (USFWS 2007). While foraging habitat was present within the Project Area; large trees with characteristics of providing a maternity roost for Indiana bats were not observed during site visits adjacent to the dam in 2011 and 2012.

Wetland surveyors observed four potential roosting trees in wetlands upstream of the dam (Wetland 1, Wetland 4, and Wetland 15). None of the potential roosting trees are located in tree clearing areas, and therefore there will be no impact to these trees.

In summary, due to the proposed avoidance and minimization measures discussed in Section 1.8.1.6 (Plant Life) the construction phase of the Preferred Alternative is not likely to adversely affect Indiana bats (USFWS, 2014).

1.8.1.7.1.3 Rayed Bean

The Project Area lies within the range of the federally endangered rayed bean. The rayed bean is generally known from smaller, headwater creeks, but records exist in larger rivers. They are usually found in or near shoal or riffle areas, and in the shallow, wave-washed areas of lakes. Substrates typically include gravel and sand, and they are often associated with, and buried under the roots of vegetation, including water willow (*Justicia americana*) and water milfoil (*Myriophyllum sp*.). There are no current records of rayed bean known from the project area (ODNR 2011a and USFWS 2012a). In a formal correspondence from USFWS dated March 2, 2011 and March 2, 2012 it was discussed that project lies within the range of rayed bean (Section 5.2). A freshwater mussel survey was completed for the construction of the raw water intake during summer 2010 and did not locate any rayed bean within the footprint of the intake structure (EnviroScience 2010). Similarly, a mussel survey conducted during September 2011 within downstream areas of the Ballville Dam found no rayed bean or other federally listed species within the Project Area (Stantec 2011). Both surveys, EnviroScience (2010) and Stantec (2011), indicate a lack of suitable substrate habitat for the rayed bean. Stantec (2011) documented substrates that were coarse-grained, silt/clay, and/or exposed bedrock; all of which are unsuitable for the rayed bean. Since habitat is not present in the project area, the Preferred Alternative would have no effect (USFWS, 2014). .

1.8.1.7.1.4 Kirtland's Warbler

The Project Area lies within the migratory range of the federally endangered Kirtland's warbler. This species migrates through Ohio in the spring and fall, traveling between breeding locations in Michigan, Wisconsin, and Ontario and wintering locations in the Bahamas. While migration occurs in a broad front across the entire state, approximately half of all observations in Ohio have occurred within three miles of the shore of Lake Erie. There are no current records for Kirtland's warbler within the Project Area; however, records exist in neighboring Seneca, Ottawa, and Erie Counties. Suitable migration stopover habitat exists adjacent to the river, and includes forest and shrub/scrub habitat. Kirtland's warbler is a transient species during migratory seasons throughout Ohio (ODNR 2011a) and no records for these species are known from within the Project Area. . Correspondence from USFWS dated March 2, 2011 (Section 5.2) stated that impacts to habitat are not anticipated. The Preferred Alternative may affect, but is not likely to adversely impact Kirtland's warbler (USFWS, 2014).

1.8.1.7.1.5 Bald Eagle

The project lies within the range of the bald eagle, a federal species of concern. Both the USFWS (2012b) and ODNR (2011a) have identified two records of bald eagle nests in and near the Project Area. This information was also presented in correspondence from USFWS dated March 2, 2011 and March 2, 2012 (Section 5.2). The Fremont Nest is located approximately one mile downstream and the Portage Livery Nest is located approximately one mile upstream of the Ballville Dam. These nests were both active in 2012. Additional bald eagle nests exist both upstream and downstream of the Project Area, along the Sandusky River. The Preferred

Alternative is not expected to impact the Bald Eagle as work on the project would occur greater than 1-mile away (USFWS, 2014). .

1.8.1.7.1.6 Eastern massasauga

There are no known records of the eastern massasauga rattlesnake in the vicinity of the Project Area (ODNR 2011a). In addition, no appropriate habitat for this species was identified within or adjacent to the project area. Due to the lack of appropriate habitat, the Preferred Alternative is not likely to adversely impact the Eastern massasauga. Correspondence from USFWS dated March 2, 2011 (Section 5.2) stated that impacts to habitat are not anticipated. Since habitat is not present in the project area, the Preferred Alternative would have no effect (USFWS, 2014).

1.8.1.7.1.7 Piping plover

Correspondence from USFWS dated March 2, 2011 (Section 5.2) stated that impacts to habitat are not anticipated. Since habitat is not present in the project area, the Preferred Alternative would have no effect (USFWS, 2014).

1.8.1.7.2 State Listed Species

A total of thirteen state listed species were identified by the ODNR as potentially occurring in or near the Project Area. Six other species were identified through searching records found online at www.dnr.state.oh.us. Their inclusion is warranted due to either historic or current records not identified by resource agencies. These thirteen state listed species (Table 1-8) have known records of occurrence within the lower Sandusky River watershed including within, or near the Project Area. Six of these species are federally listed (i.e. eastern prairie fringed orchid, Indiana bat, rayed bean, Kirtland's warbler, piping plover, and eastern massasauga rattlesnake). Three species, bobcat, American bittern, and king rail, do not have records from within the Project Area or are not expected to occur. A total of ten state listed species have known records from the lower Sandusky River watershed and habitat that includes or potentially could include the Project Area. Those species are northern harrier, trumpeter swan, western banded killifish, greater redhorse, river redhorse, threehorn wartyback, deertoe, purple wartyback, kidney shell, and round pigtoe. Table 1-8 provides a summary of these species general habitat conditions and records or potential to occur within the Project Area.

Correspondence with ODNR indicates that a population of state endangered greater redhorse occurs within the project area and that the state endangered western-banded killifish is recorded in the lower Sandusky watershed. The Agency recommended that no in-water work occurs from March 15 to June 30 to reduce impacts to these aquatic species.

Table 1-8. State Listed Species of Ohio including habitat and occurrence in Project Area (Federally Listed species that are also State Listed species are not included in this table)

Species		State Listing[1]	General Habitat Description	Occurrence in Project Vicinity
Common Name	Scientific Name			
Bobcat	*Lynx rufus*	E	Variety of habitat from forested mountain areas to lowland swamps.	As of 2011, no verified sightings have been recorded from Sandusky County. Not expected to occur in the Project Area.[2,3]
American bittern	*Botaurus lentiginosus*	E	Large undisturbed wetlands that have scattered small pools amongst the dense vegetation. They occasionally occupy bogs, large wet meadows, and dense shrubby swamps.	Records exist within Sandusky County. Habitat is not present in the vicinity of the project. No records from the vicinity of the project. Not expected to occur in the Project Area.[2,4]
King rail	*Rallus elegans*	E	Large cattail marsh and wetland complexes and their margins.	Records exist within Sandusky County. Habitat is not present in the vicinity of the project. No records from the vicinity of the project. Not expected to occur in the Project Area.[2,4]
Northern harrier	*Circus cyaneus*	E	Large contiguous grasslands, marshes, low intensity agriculture and pasture/hayfields.	Records exist within Sandusky County. No records from the vicinity of the project. May occur as a transient along the periphery of the vicinity of the project.[2,4]
Trumpeter swan	*Cygnus buccinators*	E	Large marshes and lakes ranging in size from 40 to 150 acres.	Records exist within Sandusky County. No records from the vicinity of the project. May occur as a transient within the vicinity of the project.[2,4]
Greater redhorse	*Moxostoma valenciennesi*	E	Medium to large rivers in the Lake Erie drainage system of Ohio	Records occur upstream and downstream of the Ballville Dam within the vicinity of the project[2]
River redhorse	*Moxostoma carinatum*	SOC	Only the largest rivers of the Ohio and Lake Erie drainage systems	Records occur upstream and downstream of the Ballville Dam within the vicinity of the project[5]
Western banded killifish	*Fundulus diaphanous menona*	E	Areas with an abundance of rooted aquatic vegetation, clear waters, and with substrates of clean sand or organic debris free of silt.	Records occur within the lower Sandusky watershed.[2,6]
Threehorn wartyback	*Obliquaria reflexa*	T	Large rivers in sand or gravel; may be locally abundant in impoundments	Historic records occurring within the Sandusky River watershed. No records from the 2011 survey[7, 8]
Deertoe	*Truncilla truncata*	SOC	Medium to large rivers in mud, sand, or gravel	Historic records occurring within the Sandusky River watershed. No records from the 2011 survey[7, 8]

Species		State Listing[1]	General Habitat Description	Occurrence in Project Vicinity
Common Name	Scientific Name			
Purple wartyback	*Cyclonaias tuberculata*	SOC	Medium to large rivers in gravel or mixed sand and gravel	Historic records occurring within the Sandusky River watershed. No records from the 2011 survey[7, 8]
Kidneyshell	*Ptychobranchus fasciolaris*	SOC	Medium to large rivers in gravel	Historic records occurring within the Sandusky River watershed. No records from the 2011 survey[7, 8]
Round pigtoe	*Pleurobema sintoxia*	SOC	Medium to large rivers in mud, sand, or gravel	Historic records occurring within the Sandusky River watershed. No records from the 2011 survey[7, 8]

1 Listing Status: E = State Endangered, T = State Threatened, SOC = State Species of Concern
2 Source: ODNR correspondence, February 10, 2011
3 Source: ODNR website: 2011-12 Wildlife Population Status Report 2012
4 Source: ONDR Division of Wildlife Ohio Breeding Bird Atlas II website: preliminary results 2011
5 Source: OEPA 2011a: Biological and Water Quality Study of the Lower Sandusky River Watershed
6 Source: Trautman 1981; the Fishes of Ohio
7 Source: Watters et al. 2009; The Freshwater Mussels of Ohio
8 Source: Stantec 2011

1.8.1.8 Aquatic Habitat and Physical Characteristics and Flow Patterns of Water Body

The substrate in free flowing portions of the Sandusky River is composed of gravel and limestone bedrock with smaller amounts of boulder, cobble and sand substrates (OEPA 2011). The free flowing reaches in the Sandusky River generally had good habitat that supported diverse fish and macroinvertebrate communities. Species such as mimic shiners (*Notropis volucellus*) and redhorse species were distributed throughout the mainstem, and the presences of these species indicates good habitat conditions in the river. The removal of the dam will allow a pollution intolerant species, shorthead redhorse (*Moxostoma macrolepidotum*), to move upstream in the watershed (OEPA 2011a). Once the dam is removed, the coarser substrates upstream of the impoundment will be transported downstream, improving habitat conditions in the former impoundment and downstream. The QHEI score will likely improve after the drawdown and reflect the scores both directly upstream and downstream of the impoundment (See Figure 4-1).

The Sandusky River's Aquatic Life Use Standard is Warm Water Habitat within the Project Area, upstream of the impoundment, and downstream of the impoundment. The Sandusky River has also been designated for Public Water Supply, Agricultural Water Supply, Industrial Water Supply, and Primary Contact Recreation. In practice, water quality standards based on aquatic life use criteria are often the most difficult to attain. The Sandusky River was sampled at five locations between river miles 5.5 and 18.05 in 2009. Table 1-9 illustrates OEPA narrative criteria for Aquatic Life Use in the Eastern Corn Belt Plain as well as the performance of sample locations in the Sandusky River with respect to those standards.

Table 1-9. Ohio EPA Aquatic Life Use Designations for Ohio Streams (2011a)

Biological Criteria		IBI (Boat)	Mlwb (Boat)	ICI (Boat)	Status	Causes
EWH		48	9.6	46	-	-
WWH		34	8.6	34	-	-
MWH		20	5.7	22	-	-
Locality	River Mile					
Sandusky River adjacent to South River Road	21.30	54	9.7	58	FULL	
Sandusky River adjacent to South River Road	19.00	44	8.0*		PARTIAL	Siltation and direct Habitat alteration - dam
Sandusky River US Ballville Dam	18.05	35	7.2*	6*	NON	Siltation and direct habitat alteration - dam
Sandusky River at Fremont, US Roger Young Park	17.7	41	9.9	34		
Sandusky River at Fremont, US Roger Young Park	16.8	41	9.9	34		
Sandusky River at Fremont @ State Street	15.4	38	9.7	G	FULL	
Sandusky River Opposite Fremont Yacht Club	12.8	26*	9.2	67	Non	Siltation and Nutrient Eutrophication (Biological Indicators
Sandusky River US Wightmans Grove	5.5	32*	8.7*	14	Non	Siltation, Nutrient Eutrophication (Biological indicators), and Embedded Substrates.

* - Indicates significant departure from applicable biocriteria (>4 IBI or ICI units, or >0.5 MIwb units). Underlined scores are in the Poor or Very Poor range.
IBI = Index of Biotic Integrity, MIwb = Modified Index of Well-being, ICI = Invertebrate Community Index
G = Good, F = Fair, P = Poor

Impacts to aquatic habitat resulting from removal of Ballville Dam would occur as a result of surcharging of sediment into the downstream reach of the Sandusky River due to its release from the impoundment. Most (greater than 99 percent) of the accumulated sediment in the dam impoundment is comprised of material finer than sand (diameter of less 0.25 millimeters), however, the sediment transport analyses indicate that this material will be transported

downstream of the reach identified as walleye spawning habitat in the vicinity of the upstream end of the levee system, which is approximately bounded by HEC-RAS cross-section Station 82000 at its upstream end and cross-section Station 77000 at its downstream end. Accumulated sediment depths in the channel invert at the end of the evaluated water years (2001, 2008) were less than 0.1 feet at Stations 82000 and 77000. This result suggests that fine-grained sediments, which comprise most of the sediment load delivered by the watershed and the material in the impoundment, are washed through the reach of the river where walleye spawning habitat has been identified. The model results indicate that suspended sediment concentrations will increase by approximately 10 percent in the area identified as walleye spawning habitat under base and high flow conditions. For example, the 2008 water year scenario indicates that calculated base flow and high flow concentrations are in the range of 50 and 500 mg/L for both the existing conditions and dam removal cases, indicating that high-flow sediment concentrations are approximately an order-of-magnitude greater than low-flow sediment concentrations.

The implementation of the preferred alternative is expected to lower the current water surface by an estimated 30 feet in the impounded area. A model of the future 6000 cfs at ½ bankfull shows the expected channel configuration (Figure 8-10). Similar to the habitat downstream of the dam, the impounded area is expected to form depositional bars and islands with the formation of riffles, pools, runs and glides with various depths and flows. The preferred alternative also will address ice jam flooding with the installation of Ice Control Structures (ICS).

1.8.1.9 Streams/Wetlands

The habitat of the Sandusky River was evaluated using the Qualitative Habitat Evaluation Index (QHEI), 2006 methods for assessing habitat in flowing waters. The result of this analysis was published in the 2009 biological and water quality study of the lower Sandusky River Watershed (OEPA 2010). These results were also summarized in Figure 4-1, including sampling point locations by river mile for two locations in the impounded area and one location downstream of the impoundment.

The tributaries (headwater streams) to the Sandusky River with a watershed greater than 1.0 mi^2 were evaluated using the QHEI sampling procedure. For primary headwater habitat (PHWH) streams that have a watershed area less than 1.0 mi^2, the rapid Headwater Habitat Evaluation Index (HHEI), 2002 evaluation was used. The results of these surveys are included in Section 3 of this permit application.

The impacts to streams from the preferred alternative can be found in Section 6 of this permit application. The direct impacts to streams will be confined to the Sandusky River. Therefore, the headwater streams surrounding the project area will not be directly impacted by the construction activities. Indirect impacts to streams due to hydrology alteration will occur upstream of the dam on both the Sandusky River and unnamed tributary 1 and 2. The reservoir area will be drained which will decrease the Sandusky River channel width and location in the

impounded area. The linear feet of unnamed tributary 1 and 2 are expected to increase which is a result of the Sandusky River's new channel alignment.

The assessment of the function and quality of wetlands within the project area was evaluated using the Ohio Rapid Assessment Method (Mack 2001) for Wetlands. The results of the ORAM evaluations are included in Appendix A of this permit application. A detailed assessment of wetlands assessment/development is in Section 8 of this permit application.

The sediment currently suspended behind the dam will be deposited along an approximate 20 mile stretch of the river between Brady's Island to the Sandusky Bay. It is expected that a more controlled release of this sediment will mitigate impacts to the downstream wetlands and margins of the Sandusky River. However, these impacts are not quantifiable to a specific JWUS Corp (USACE JD report, 2011) feature below the dam. For further discussions associated with deposition of suspended solids see the feasibility study (Stantec 2011b).

1.8.1.10 Present Land Use in Project Area

This land use analysis is based on publicly available data from the National Land Cover Dataset (USGS 2006) and information from Ballville Dam Removal Feasibility Study (Stantec 2011b). Prior to settlement of the region, the Sandusky River watershed consisted primarily of beech forests and elm-ash swamp forests (Braun 1950). Currently, agricultural practices dominate the watershed and the majority of the old forests and swamps has been cleared and drained (OEPA 2011a).

The Project Area is approximately 526 acres in size and consists of nine different land uses (see Figure 3-7). Seventy-seven percent of the Project Area can be categorized into three different land uses: open water (i.e. Sandusky River), developed-open space (i.e. future park spaces; residential spaces; River Cliff Golf Course), and deciduous forest located throughout the Project Area (see Figure 3-7 & Table 1-10).

Table 1-10. Land Uses within the Project Area

Land Use Type	Percentage	Acres
Open Water	28	147.0
Developed, Open Space	28	148.7
Developed, Low Intensity	5	26.6
Developed, Medium Intensity	<1	1.6
Deciduous Forest	21	107.9
Grassland/Herbaceous	1	5.6
Cultivated Crops	13	67.1
Woody Wetlands	<1	1.3
Emergent Herbaceous Wetlands	4	20.4
Total	**100**	**526.2**

Source: USGS 2006

The open water category is exclusively comprised of the Sandusky River. Developed, Open Space is an aggregate of primarily four areas. The largest area is River Cliff Golf Course downstream of the Ballville Dam. There are residential areas present downstream of the dam. There are several residential areas upstream of the Ballville Dam on the south side of the river off of Laird Road between private residences and the Sandusky River that are categorized as "developed, open space" as well. A third area, upstream of the Ballville Dam and north of the river, is the future site of a Ballville Township park. This future park is adjacent to the new City of Fremont raw water reservoir. Lastly, further upstream of the Dam is a future Ballville Township park. This area is downstream of the Tindall Bridge and within the project area.

Deciduous forests are located along the banks of the Sandusky River with the largest woodlots upstream of the Ballville Dam. In addition, there are riparian forests downstream of the dam opposite the River Cliff Golf Course.

The drawdown of the impoundment from the implementation of the Preferred Alternative will change the acreage of the open water category within the project area. Approximately 23.05 acres of open water will be lost, changing the open water land use to 123.95 acres. These areas will become riparian habitat (riparian forest) surrounding the new channel alignment.

The temporary land use changes during construction consist of:

- The north staging area is 2.31 acres (developed open space).
- The south staging area is 0.06 acres (deciduous forest).
- The south access road is 0.27 acres (developed open space).

- The north access road and causeway are 1.11 acres (deciduous forest and open water).
- The staging area in the river is 0.26 acres (developed low intensity).

Depending on the private land owners and the specification of the original deed agreement, there is a possibility that the owner's property could increase in size. For example, if deed reads to water's edge, the owner will see an increase in property size. If deed reads to within the river, then their property boundary will not change as much (Figure 3-7). The impacts to wetlands are in included in Section 6 of the report. Further explanations of wetland conditions before and after dam removal are discussed in the Conceptual Mitigation Report (Section 8).

1.8.2 Minimal Degradation Alternative

1.8.2.1 Fisheries / Wildlife / Plants

It is expected that this alternative would have no effect to fisheries resources in the upstream or downstream reach of the Sandusky River. This alternative may have some short-term negligible adverse effect on fisheries in the impoundment during construction of the dam repairs. This alternative would result in major opportunistic loss in migratory fish passage. The Lake Erie fisheries (especially walleye) would continue to suffer from lost riverine production. It is expected that this alternative would have temporary short-term negligible adverse impacts to wildlife resources in the vicinity of the Ballville Dam and impoundment associated with structural repairs. There is a major opportunistic loss for aquatic and riparian connectivity improvement, sport fish productivity increases, mussel migration and propagation, and food and habitat delivery for these organisms.

Trees will be removed to create the access road on the north bank of the Sandusky River, and trees will be replanted after the access road is removed when the repairs are finished. An estimated 0.6 acres of forest will be cleared to allow for repair equipment to access the dam.

1.8.2.2 Threatened and Endangered Species

It is expected that this alternative "will result in no effect to" threatened and endangered species in the vicinity of the Ballville Dam and impoundment associated with structural repairs.

1.8.2.3 Aquatic Habitat and Physical Characteristics of Flow Patterns of Water Body

It is expected that this alternative would have negligible impacts to physical processes, but the opportunistic loss is major given the continued presence of the dam. Natural riverine processes such as flood storage capacity and sediment transport are interrupted by the dam. The deposition of fine sediments behind the impoundment may have initially been beneficial. Under current conditions it is believed that the impoundment has no additional capacity to store incoming sediment. Therefore a negligible beneficial impact intensity level was assigned to this alternative. Implementing this alternative will have a major opportunistic loss for sediment

transport regime in the Sandusky River. The natural coarse grained substrate replenishment in the spawning reach will not happen if this alternative is selected. Implementing this alternative will have little to no impact on flood risk so a negligible impact was assigned. Inconsequential flood elevation increases may be calculated for the post construction condition depending on the repair design. Implementing this alternative will have no effect on ice jam risk. This alternative will have a negligible impact downstream and major opportunistic adverse impact upstream of the dam on water quality due to the continued presence of the dam. In its current state the impoundment is unlikely to meet its designated beneficial use for aquatic life. Further, the impoundment may provide suitable habitat for harmful algal blooms (HABs) that would not be present in a functional riverine system.

1.8.2.4 Streams / Wetlands

There will be no permanent fill materials placed or removed within a JWUS Corp (USACE JD report, 2011) feature for the Minimal Degradation Alternative (Figure 1-2). The activities involved in repairing the dam are temporary impacts to WUS. The current flood regime behind the dam will not be altered allowing the current floodplain wetlands to stay active. This assumes that the reservoir will not be drained.

This alternative would have temporary direct effects on existing wetland and stream resources in the vicinity of the Ballville Dam and impoundment (Table 1-11).

Table 1-11. Minimal Degradation Alternative – Temporary, Direct Impacts to WUS

Water Feature ID	Flow Regime & Corps Descriptions	Estimated Amount of Aquatic Resource in Construction Limits (Direct Impacts)	QHEI/ORAM
Sandusky River (below dam)	Perennial Stream (TNW)	230 linear feet / 0.061 acres	93 (Excellent, WWH)
*Wetland 18	Emergent/Scrub-Shrub/Forested	0.013 acres	68.5 (Category 3)
*Wetland 19	Emergent/Scrub-Shrub/Forested	0.003 acres	68.5 (Category 3)
Totals	**Sandusky River**	**230 (lin.ft.) / 0.061 (ac.)**	* Same ORAM scoring boundary WWH = Warm Water Habitat
Totals	**Wetlands**	**0.016 acres**	

1.8.2.5 Proposed Land Use in Project Area

It is expected that the Minimal Degradation Alternative would have temporary short-term negligible adverse impacts to wildlife resources including fisheries in the vicinity of the Ballville Dam and impoundment associated with structural repairs. There is a major opportunistic loss for aquatic and riparian connectivity improvement, mussel migration and propagation, food and habitat delivery, and sport fish productivity increases due to the continued presence of the dam. The Minimal Degradation Alternative would result in major opportunistic loss in migratory fish passage. The Lake Erie fisheries (especially walleye) would continue to suffer from lost riverine production.

Furthermore, the Minimal Degradation Alternative will have a major opportunistic loss for sediment transport regime in the Sandusky River. The natural coarse grained substrate replenishment in the spawning reach will not happen if this alternative is selected. The land uses within the project area will not change under the Minimal Degradation Alternative.

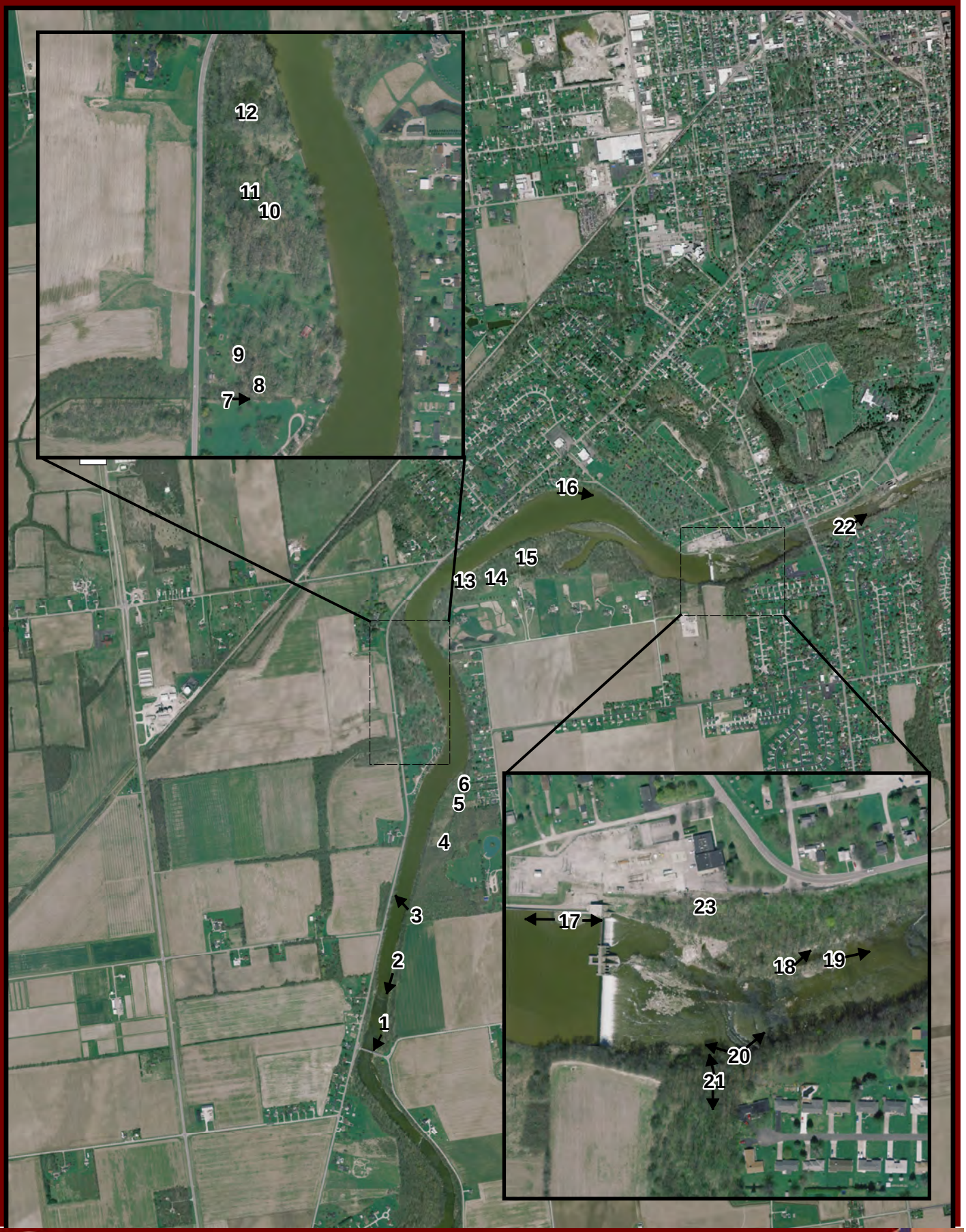
1.8.3 Non-Degradation Alternative

Because the Non-Degradation Alternative is a No-build Alternative, it will have no effect to water-quality. The land uses within the project area will not change under the Non-Degradation Alternative. This alternative would experience the same opportunistic losses that the Minimal Degradation alternative proposes.

1.8.4 Photo Log

A photo log for this section is located in Appendix B (Appendix B-1 Photo Log Block 10B).

Photographs were taken on May 22 and May 23, 2012



0 500 1,000 2,000 Feet

1 inch = 2,000 feet

N

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Figure 1-7. General Site Photo Locations

Ballville Dam Removal and Sandusky River Restoration Project
Fremont, OH

1.9 BLOCK 10C: APPLICANT'S PROJECT COSTS

1.9.1 Preferred Alternative

The Preferred Alternative is available, cost effective, and technically feasible. A similar ice control structure (ICS) design has been used on smaller projects by the U.S. Army Corps of Engineers (Stantec 2013b). The construction techniques and associated Best Management Practices (BMPs) that would be used to remove the dam have been used on other Stantec projects in Ohio (Englewood, 5th Avenue). The techniques used to remove the dam have proven to be reliable and cost effective.

The estimated total cost to construct the Preferred Alternative is $8.70 million (Table 1-12).

Under the Preferred Alternative, the City has been awarded some grants to help pay for the design and implementation of dam removal based on providing fish passage in the lower Sandusky River. Funding sources include:

- U.S. Fish and Wildlife Service – Great Lakes Fish and Wildlife Restoration Initiative ($2.0 million); funds will expire in September of 2014
- Ohio Environmental Protection Agency – Water Resource Restoration Sponsor Program ($5.8 million)

A total of $7.8 million is available for this project from state and federal grants.

Table 1-12. Itemized Costs of the Preferred Alternative Construction Activities

No.	Item	Unit	Quantity	Unit Price	Total Cost
Construction Phase					
1	Mobilization / Demobilization (~5percent)	LS	1	$250,000	$250,000
2	Stabilized construction entrance w/ culverts	L.F	500	$500	$250,000
3	Concrete hoe-ramming.	C.Y.	8,100	$290	$2,349,000
4	Concrete Disposal	B.C.Y.	10,500	$15	$157,500
5	Loading out concrete for disposal	C.Y.	10,500	$15	$157,500
6	Hauling concrete off site	L.C.Y.	10,500	$5	$52,500
7	Channel tuning with excavator	B.C.Y.	4,000	$15	$60,000
8	Erosion control barrier	L.F.	2,000	$7	$14,000
9	ICS Coffer dam for water diversion	Ea.	15	$5,000	$75,000
10	Floodplain protection (rock or wood bollards)	Ea.	6	$2,000	$12,000
11	ICS Dewatering pump/treatment system	Day	60	$1,500	$90,000

No.	Item	Unit	Quantity	Unit Price	Total Cost
Construction Phase					
12	ICS caissons	V.L.F.	760	$500	$380,000
13	ICS Caisson rock excavation	C.F.	3,534	$100	$354,000
14	ICS Caisson rig mob/demob.	Ea.	4	$15,000	$60,000
15	Steel Reinforcing	TN	67.8	$3,350	$228,000
16	Topsoil	C.Y.	525	$40	$21,000
17	Plantings (containarized trees)	Ea.	200	$50	$10,000
18	Plantings (bare-root seedlings)	Ea.	9,500	$2	$19,000
19	Soil conditioning (limestone)	M.S.F.	100	$10	$1,000
20	Seeding (drilling and broadcasting)	PLS lbs	2,000	$60	$56,000
21	Seeding (livestaking)	Ea.	11,000	$4	$43,000
22	Erosion Control Blanket	S.Y.	3,150	$4	$12,600
		Total Construction:			**$4,652,100**
		Construction contingency (30 percent)			**$1,395,630**
Operation and Maintenance					
1	North Abutment and Carbon Feed				$200,000
2	Bank Stabilization				$200,000
		Total Operation and Maintenance Cost:			**$400,000**
Design and Permitting					**$1,200,000**
Construction Manager At Risk (CMAR) Costs					**$1,060,327**
		Total Dam Removal Costs:			**$8,708,057**

1.9.2 Minimal Degradation Alternative

This project alternative includes dam rehabilitation to meet State of Ohio dam safety standards. These repairs are technically feasible, cost effective, and available. Any possible impacts to water quality during the construction phase of this alternative would be minimized through the use of BMPs.

In 1980, the ODNR identified deficiencies with the Ballville Dam that has been recommended for repair and rehabilitation. Currently, the dam and sea wall are not operating in accordance with ODNR safety standards. The table below provides estimated opinion of costs for rehabilitation of the dam to meet ODNR standards based on the revised cost estimates from MSG (2013). The Minimal Degradation Alternative ranges from $9.9 to $11.7 million based on 2013 estimates (Table 1-13). The increased concrete repair costs from 2005 are based on differences in the

design and administration of construction. These costs are approximately $4.9 to $5.6 million more than estimates prepared in 2005.

Cost estimates varied between 2005 and 2013 based on, but not limited to, the following: method of concrete rehabilitation, increase in rehabilitation amounts needed, pricing of concrete removal, increase in overall material costs, mobilization increases, other items not previously considered, increase in design and construction engineering and administration that are likely to be realized (MSG 2013). These are the current cost estimates and they could be much more.

There are no funds available from the USFWS or OEPA to carry out this alternative.

Table 1-13. Minimal Degradation Summarized Project Costs

Item	Costs
Concrete Repairs*	$6.4 Million
Sea Wall Stabilization*	
Gravity Alternative	$2.4 Million
Post-tension Alternative	$4.2 Million
Operational Manuals^	$33 Thousand
CMAR Costs	1.0 Million
Total Estimated Costs*	$9.9 - $11.7 Million

Source: Mannik & Smith Group 2013; ^ ARCADIS 2005

1.9.3 Non-Degradation Alternative

There are no construction or maintenance costs associated with this alternative. However, as the dam continues to age, risk for costly repairs and potential failure will increase.

1.10 BLOCK 10D: SEWAGE PROJECTS

The Preferred Design, Minimal Degradation Alternative and the Non-Degradation Alternative are not regional sewer projects or part of a regional sewer collection facility. Therefore this section does not apply for this alternatives analysis.

1.11 BLOCK 10E: OTHER RELATED PROJECTS

1.11.1 Lake Erie Protection and Restoration Plan 2008

The plan outlines actions that the Ohio Lake Erie Commission and its member agencies will take towards restoration of Lake Erie and its watershed. One of the actions in this report is the development and implementation of Watershed Action Plans (OLEC 2008).

1.11.1.1 Sandusky River – Tiffin Watershed Action Plan

This Watershed Action Plan is based on the findings from the “TMDLs for the Upper Sandusky River Watershed” report (OEPA 2004). It was endorsed on April 27, 2006. The report includes programs, tasks, and BMPs that, if implemented, will improve water quality in the watershed

(Riddle 2006). These BMPs include the use of filter strips, increasing riparian forest buffer zones, and wetland developments or restorations. Other potential aquatic habitat improvement projects mentioned in the plan include fish passage structure implementation or dam removal in the City of Tiffin, and removal of Bacon's Dam in the City of Tiffin.

1.11.1.2 Honey Creek Watershed Action Plan

The Honey Creek Watershed Action Plan was prepared by staff from the National Center for Water Quality Research at Heidelburg College and the Sandusky River Watershed Coalition and was submitted for endorsement on February 24, 2006. The plan was developed to mitigate causes of water quality impairment within the watershed, and is based on the findings in the "TMDLs for the Upper Sandusky River Watershed" report (OEPA 2004). The two main impairments to water quality in the watershed are high rates of nutrient and sediment export and impaired biological communities within the streams (Loftus et al. 2006). The programs and tasks in the plan promote the use of agricultural BMPs to limit the amount of non-point source sediment and nutrients entering the watershed and reducing point source inputs into streams by monitoring effluent and National Pollutant Discharge Elimination System (NPDES) permit limits.

1.11.1.3 Honey Creek Targeted Watershed Grant

The grant is a five year (2008 – 2013), $900,000 award to Heidelburg College's National Center for Water Quality Research in order to implement BMPs within the Honey Creek Watershed. The grant will help farmers and agricultural producers in the watershed to adopt BMPs. The two goals of the grant are to reduce phosphorus and nitrogen through incentive programs, and to conduct biological studies in maintained drainage ditches of the Sandusky watershed (SRWC 2013). Biologists surveyed 15 segments of agricultural ditches and headwater streams in the Sandusky River basin twice between spring and fall in each of the years 2008-2011 (total of 60 segments). The results of the study will determine what types of macroinvertebrates and fish are colonizing previously channelized headwaters and drainage ditches in the Honey Creek Watershed.

1.11.2 Western Lake Erie Basin Water Resources Protection Plan

The plan establishes a goal of reducing sediment loading in the Lake by 67 percent. In order to meet the goals of the plan, farmers must adopt agricultural BMPs such as conservation tillage, cropland conversion, and filter strips. Farm Bill programs and other Federal, State, local, and nonprofit programs are available to assist landowners to adopt these BMPs.

Since the authorization of the Farm Security and Rural Investment Act of 2002 (Farm Bill), there have been 555 contracts in Sandusky County totaling $532,621.27, and 17 contracts in Seneca County totaling 22,098.10 (NRCS 2005). These programs are ongoing within the Western Lake Erie basin.

1.11.3 Great Lakes Restoration Initiative Grants

1.11.3.1 Phragmites Control in the Coastal Wetlands of Western Lake Erie

The project has a budget of $497,331.00 by a grant from the Great Lakes Restoration Initiative (GLRI). Several public, non-profit, and private partners, including The Nature Conservancy, Winous Point Marsh Conservancy, USFWS-Private Lands, and Michigan DNR, will participate in an effort to manage the invasive *Phragmites australis* on nearly 2,000 acres of wetlands in the western Lake Erie basin including some wetlands in Sandusky Bay.

1.11.3.2 Implementation of Ohio Aquatic Nuisance Species Management Plan

The project has a budget $901,092.00 by a grant from the GLRI. The State of Ohio will target specific plants and animals listed in its Aquatic Nuisance Species (ANS) State Management Plan for early detection, monitoring, and prevention. The target species include zebra mussels, round goby, and Asian carp.

1.11.4 Other Grants/Programs

1.11.4.1 Water for Yields in Your Fields Grant

The Loss Creek Sub-Watershed within Crawford County is the recipient of the Water for Yields in Your Fields Grant. This program includes payment incentive options such as cost share, monetary soil saving incentives, and phosphorus reduction savings. To date, funding has led to reduction of the Phosphorus Index Risk Score from high or medium to low on eleven farms within the watershed. Furthermore, one sediment reduction practice was installed, reducing sediment loading in the watershed by 147.7 tons over the next ten years, and 451 acres of cover crops and nine drainage management structures have been approved for funding (SRWC 2013). Enrollment is open to landowners within the watershed.

1.11.4.2 Low Income Home Sewage Treatment System Repair Program

This program was established in 2011 under the Ohio EPA Water Pollution Control Loan Fund Contract Process. The program was implemented in Crawford, Erie, Sandusky, Seneca and Wyandot Counties. The results of the program to date include:

- 40 systems replaced in all five counties
- 672.4 lbs/year in total phosphorus reduction
- 1,777.76 lbs/year in total nitrogen reduction (SRWC 2013).

1.11.4.3 City of Fremont Water Pollution Control Center Expansion

The City of Fremont is upgrading and expanding the Water Pollution Control Center beginning in spring of 2013 and work will proceed until 2016. The $57,000,000 expansion project is designed to increase the capacity of the Wastewater Treatment Facility from 10 million gallons

per day to 24 million gallons per day. The renovation will, improve the water quality of the Sandusky River by reducing the number of combined sewer overflows from the City of Fremont (City of Fremont 2013).

1.12 BLOCK 10F: WATER POLLUTION CONTROLS

1.12.1 Preferred Alternative

The BMPs used in this alternative include notching the dam to contain sediment, implementing bank stabilization measures, and placing silt fence around all construction areas.

Prior to the demolition of the dam, the spillway will be notched to initiate a slow draw down period (6-8 months) of the reservoir. An access road and small staging area will be constructed for this activity. This longer notching period will allow for a more controlled release of sediment downstream of the dam. During this period, areas previously impounded will be seeded and stranded mussels will be rescued.

During the drawdown phase, stabilization measures will be implemented to reduce the amount of sediment contributed to the river from the newly exposed margins/banks. One stabilization measure includes vegetating exposed sediment to reduce erosion from the main channel as the pool is lowered during the first notch and vegetating exposed sediment at the newly established low-flow stream channel after the dam is completely removed (23.05 acres). Other stabilization measures are the creation of a floodplain bench to reinforce the stream channel and removing the sea wall to at-grade elevation to restore the riverbank.

Silt fence will be installed downhill of all improvements within the construction limits including the ice control structure installation area, access roads, staging areas, concrete disposal areas, stream grade control structures for Streams 1 and 2, floodplain bench, and the Seawall removal area.

The costs of these BMP's are listed below:

- Erosion Control Barrier ($14,000)
- ICS Bank Stabilization ($250,000)
- Plantings (72,000) (bare-root seedlings, containerized trees and live-stakes)
- Seeding ($56,500) (drilling main seed mix and broadcasting cover crop)
- Erosion Control Blanket ($12,600)
- Operation & Maintenance Bank Stabilization ($200,000)

The total cost of implement the BMP's for the Preferred Alternative is $605,100.

No other water pollution controls are proposed in this alternative.

1.12.2 Minimal Degradation Alternative

The BMPs used in this alternative include seeding areas that were cleared for access to make repairs, install silt fencing around work areas, using existing access roads to avoid and minimize impacts, providing alternatives to seawall repair, and using the most cost efficient methods by defining the principal items of repair intended to bring the dam into compliance with current safety standards. Silt fence will be installed downhill of all improvements within the construction limits including the access roads, staging areas, and the Seawall stabillization area.

The City of Fremont seeks to repair the dam and stabilize the seawall with the intention of bringing the Ballville Dam into compliance with current safety standards. If the Ballville Dam is not removed then extensive repairs would be required to bring the dam to ODNR dam safety standards.

The costs of these BMP's are listed below:

- Cleanup and Site Restoration ($5,000)
- Seeding ($10,000)
- Silt Fencing ($4,000)

The total cost of implement the BMP's for the Minimal Degradation is $19,000.

No other water pollution controls are proposed in this alternative.

1.12.3 Non-Degradation Alternative

There are no BMPs used in this alternative. BMPs do not apply for this alternative since it is the No-Build or No-Action alternative.

1.13 BLOCK 10G: HUMAN HEALTH IMPACTS

The City of Fremont was under findings and orders from the OEPA to solve the recurring nitrate problem in its water supply, the Sandusky River (RM 18.02). The city of Fremont exceeded the nitrate WQS criterion in finished water and was in violation of the Safe Drinking Water Act five times during the past five years. Most recently, Fremont posted water quality advisories due to elevated nitrate in January and February of 2010. In considering options over the past decade or so, the City decided that building a raw water reservoir would best suit its long term needs as economic assistance ($5 million grant) for the project was available from ODNR. The raw water reservoir was completed and has replaced Ballville Dam impoundment as the drinking water source. The new surface water intake for this reservoir is located approximately 6,000 feet upstream of the dam. Within the Project Area and the segment of the Sandusky River both upstream and downstream of the Project Area, the Sandusky River's Aquatic Life Use Standard is Warm Water Habitat (WWH). A survey conducted by OEPA in 2011 stated that the Sandusky River at RM 18.05 is in non-attainment of its WWH status (Table 1-9).

The QHEI score of the impoundment at RM 18.05 is 52, which is a narrative rating of fair (Table 1-14). The QHEI score in a free flowing section of the river upstream of the dam is 76 with a narrative rating of excellent, and the downstream site of the dam has a QHEI of 93 which is a narrative rating of excellent.

Table 1-14. QHEI scores on the Sandusky River upstream of the project area, within the project area, and downstream of the project area (data from OEPA 2011a)

River Mile	River Status	QHEI Score	Rating
21.3	Free Flowing	76	Excellent
19	Impounded	59	Fair
18.05	Impounded	52	Fair
17.7	Free Flowing	93	Excellent
15.4	Lacustuary	67	Good

Water bodies with a designated recreational use of PCR "…are waters that, during the recreation season, are suitable for one or more full-body contact recreation activities such as, but not limited to, wading, swimming, boating, water skiing, canoeing, kayaking and SCUBA diving" [OAC 3745-1-07 (B)(4)(b)]. Streams designated PCR Class A generally have public access points and allow primary contact recreation. The surveyed reach of the Sandusky River was designated as Class A PCR by OEPA (Table 1-15). The *E. coli* criteria that apply to PCR Class A streams include a geometric mean of 126 and 161 cfu/100 ml, and a maximum value of 298 and 523 cfu/100 ml, respectively (OEPA 2011a).

Table 1-15. A selection of E.Coli data for locations sampled in the Sandusky River

River Mile	Recreation Use	# of Samples	Geometric Mean	Maximum Value	Recreational Attainment Status	Probable Source(s) of Bacteria
20.25	PCR Class A	9	287	1600	NON	Unknown
18.05	PCR Class A	5	67	440	FULL	
17.7	PCR Class A	5	94	790	FULL	
15.4	PCR Class A	7	445	1800	NON	Fremont CSO's

Sampled June 4 – October 5, 2009. Recreation use attainment is based on comparing the geometric mean to the applicable water quality criterion: Primary Contact Recreation (PCR) Classes A or B geometric mean water quality criterion of 126 or 161 cfu/100ml and (Ohio Administrative Code 3745-1-07). All values expressed in colony forming units (cfu) per 100 ml of water. Red shaded values exceed the applicable PCR Class A or B geometric mean criteria (OEPA 2011a).

1.13.1 Preferred Alternative

Overall, implementation of the preferred alternative will improve water quality in the impoundment. Removing the dam should not change the current PCR Class A status. Sediment movement from the impoundment to downstream reaches of the river will be temporary and should not negatively impact river users because it will occur in late fall/winter when recreation activities are seldom taking place.

Removal of the dam also offers several tangible and immediate environmental and ecological benefits. For decades, water quality in the impoundment has been impaired and will be improved. Within the Project Area and the segment of the Sandusky River both upstream and downstream of the Project Area, the Sandusky River's Aquatic Life Use Standard is Warm Water Habitat. Once the dam is removed and the construction in the project area is finished, it is likely that the IBI, ICI, MIwb, and QHEI scores for RM 18.05 and RM 19 will reflect the scores of the upstream site at RM 21.3, which is currently in full attainment of the WWH Aquatic Life Use Standard and has a QHEI narrative rating of excellent.

1.13.2 Minimal Degradation Alternative

The impoundment is currently in full attainment for PCR Class A usage, and poses no threats to human health from exposure to *E.Coli*.

Within the Project Area and the segment of the Sandusky River both upstream and downstream of the Project Area, the Sandusky River's Aquatic Life Use Standard is Warm Water Habitat, but the impounded section of the river is in Non-Attainment of the Aquatic Life Use Standard. The impoundment will continue to be in Non-Attainment as long as the dam remains in place.

After the implementation of the Minimal Degradation Alternative the Ballville Dam will be in compliance with current ODNR safety standards but nitrate levels will remain the same in the reservoir.

1.13.3 Non-Degradation Alternative

With the implementation of the Non-Degradation Alternative, high nitrate levels will remain in the reservoir, the dam will continue to be in non-attainment of the Aquatic Life Use Standard and the dam will not be in compliance with ODNR safety standards.

1.14 BLOCK 10H: JOBS CREATED AND REVENUE GAINED

This project is considered part of the Great Lakes Restoration Initiative (GLRI). The Great Lakes Commission estimates that implementing the Great Lakes Restoration Strategy in Ohio would result in $50 billion in long term economic benefits; $30 - $50 billion in short term benefits; and reduce costs to local communities by $50-$125 million. Benefits will be realized in part by improved tourism, decreased pollution, and restoration of habitat for fisheries. The Project's potential long-term benefits associated with the Preferred Alternative and a free-flowing river are

boating, wildlife viewing, and recreational fishing. These benefits were demonstrated following dam removal on the Kennebec and Sebasticook Rivers (Crane 2009).

Population declines have been observed in Sandusky County, Ballville Township, and the City of Fremont between 2000 and 2010 (Table 1-16). During that 10 year period, population in Ballville Township and the City of Fremont declined by approximately 6.4 percent and 3.6 percent, respectively (US Census Bureau 2010). During the same 10 year period the State of Ohio experienced a population increase of 1.6 percent. Overall, Sandusky County is projected to decline by an estimated five percent between 2010 and 2020 (US Census Bureau 2010).

Table 1-16. Community Populations near the Project Vicinity

	Population		Change	
Governmental Unit	**2000**	**2010**	**2000-2010**	**Percent**
Ballville Township	6,395	5,985	-410	-6.4%
City of Fremont	17,375	16,734	-641	-3.6%
Sandusky County	61,792	60,944	-848	-1.4%
State of Ohio	11,353,140	11,536,504	183,364	1.6%

Source: U.S. Census Bureau, 2010

The median household income for Ballville Township is approximately $20,600 greater than that of the City of Fremont; $11,900 greater than Sandusky County; and $12,600 greater than the State of Ohio (Table 1-17). According to data from the US Census Bureau (2010) and the American Community Survey, the unemployment rate for Sandusky County (6.6 percent) is lower than the state average (8.6 percent).

Table 1-17. Income Characteristics, 2006 - 2010

Subject	Ballville Township	City of Fremont	Sandusky County	State of Ohio
Median Household Income	$60,000	$39,398	$48,056	$47,358
Population In Labor force	3,292	8,379	31,774	5,889,779
Employed	3,130	7,582	29,616	5,877,987
Unemployed	162	797	2,106	508,130
Armed Forces	0	0	52	11,792

Source: US Census Bureau 2010; 2006-2010 American Community Survey

Median household income can help to depict the financial state of a community and poverty levels are used to determine whether or not there is economic hardship or need. In the American Community Survey, poverty is determined through a sample of household or family income, against a series of federal thresholds that take into account age, family size, and the presence of children. Ballville Township had the lowest poverty percentage at 1.8 percent while the City of Fremont was the highest among geographies analyzed (Table 1-18). Sandusky County had lower poverty rates than the state as a whole (7.2 percent to 10.3 percent).

Table 1-18. Percentage of Families Below the Poverty Level, 2006 – 2010

Subject	Ballville Township	City of Fremont	Sandusky County	State of Ohio
Median Household Income	$60,000	$39,398	$48,056	$47,358
Percent of population below poverty	1.8%	14.2%	7.2%	10.3%

Source: US Census Bureau 2010; 2006-2010 American Community Survey

Table 1-19. Employment, by industry

Industry	Ballville Township		City of Fremont		Sandusky County	
	Estimate	%	Estimate	%	Estimate	%
Employed population 16 years and older	3,130	100%	7,582	100%	29,616	100%
Agriculture, forestry, fishing, hunting, and mining	107	3.4%	182	2.4%	740	2.5%
Construction	142	4.5%	525	6.9%	2,056	6.9%
Manufacturing	879	28.1%	2,187	28.8%	8,004	27.0%
Wholesale trade	67	2.1%	91	1.2%	546	1.8%
Retail trade	276	8.8%	748	9.9%	3,095	10.5%
Transportation and warehousing, and utilities	120	3.8%	334	4.4%	1,585	5.4%
Information	0	0	101	1.3%	229	0.8%
Finance and insurance, and real estate and rentals	85	2.7%	295	3.9%	938	3.2%
Professional, scientific, and management, and administrative and waste management services	129	4.1%	438	5.8%	1,409	4.8%
Educational services, health care, social assistance	867	27.8%	1,413	18.6%	6,388	21.5%
Arts, entertainment, and recreation, and accommodation and food service	137	4.4%	742	9.8%	2,422	8.2%
Public administration	128	4.1%	256	3.4%	830	2.8%
Other services	193	6.2%	270	3.6%	1,374	68.0%

1.14.1 Preferred Alternative

The employment impacts estimated to be associated with the Preferred Alternative include full time, part time, and temporary positions. Employment is considered direct or indirect. The

estimated jobs may be short term, 5 years or less, or long term, 6 or more years. Jobs directly associated with dam removal and restoration efforts, short term, will occur at the time of dam removal and jobs associated with maintenance and upkeep, long term, will occur after dam removal. Other job creation associated with recreational fishing and other recreational activities such as canoeing and kayaking is expected to develop over time following dam removal.

During removal, an average of 12.5 jobs, (both direct and indirect) can be supported per $1 million invested in the project (Bowman et al. 2002). This project however, also includes restoration efforts. A report by Restore America's Estuaries indicates that 30 jobs are created for every $1 million spend in aquatic restoration efforts.

Under the Preferred Alternative, tax revenues could be expected to increase slightly due to increased tourism as a result of increased recreational opportunities. Any increase in property values would also contribute to an increase in tax revenues.

Information regarding property values and dam removal is lacking in literature. In addition, property values are difficult to calculate over time and the uncertainty in today's markets makes calculations more challenging. However, several case studies, including one conducted by Trout Unlimited in 2001 indicate that property values had not decreased when examined after 10 years following dam removal. In other instances property may briefly lose value, but then regain its original value with a couple of years of dam removal (Bowman et al. 2002). It can reasonably be expected that the restored riparian area would enhance aesthetic values along the river, therefore increasing property values.

A free-flowing river can create business opportunities as in the case of recreation. Businesses related to rafting, canoeing, and kayaking would be expected to develop as would those associated with recreational fishing. The American Rivers Organization cites the removal of the Grist Mill Dam in Soudabscook Stream in 1998 as giving an economic boost to the local town (Bowman et al. 2002). In addition, opportunities for wildlife viewing, and hiking would also support local business development. Furthermore, jobs related to entertainment, food services and hotels would increase as tourism associated with recreation increases.

Positive aesthetics can be said to be a natural landscape, such as a free flowing river. Without question, removal of the Ballville Dam will make the river narrower, free flowing and will create new riparian areas for plants and wildlife to colonize. Wetlands will also be created as a consequence of dam removal (Section 8-Conceptual Mitigation Report). The idea of these aesthetic changes relating to the Preferred Alternative can be said to fall in the eye of the beholder. Creating 'flowing water' and its associated wetlands as will be the case with the Preferred Alternative, as opposed to the 'still water' currently in place can seem to some as an improvement and to others a degradation.

Under the Preferred Alternative, recreational fishing opportunities will increase. Walleye and white bass support significant spring river fisheries in the Sandusky River, providing about ~196,000 angler hours during March-April fisheries in 2009, while ranging from ~102,000 to

~367,000 hours annually since 1975 (ODNR 2010a). The Sandusky River walleye stock is recognized by fisheries managers as one of several discrete walleye stocks that contribute to inter-jurisdictional fisheries in the U.S. and Canada (Biggrigg 2008).

Lake Erie fishermen angled for 3.6 million hours and made nearly 750,000 angling trips in 2010 (ODNR 2011b). ODNR Division of Wildlife creel surveys (2011) show that in 2006 anglers traveled to Lake Erie from 27 states and one foreign country. The combined economic impact of the region's sport fish is substantial, but the Lake Erie walleye fishery alone is thought to generate over $1 billion in economic activity annually. Sandusky River targeted walleye angling totaled 36,263 hours of effort (ODNR 2011b). In contrast walleye angling effort in the nearby Maumee River accounted for 187,302 hours. Biggrigg (2008) analyzed otolith microchemistry signatures and concluded that the Sandusky River walleye stock comprised only one percent of the recreational catch in Lake Erie while the Maumee River accounted for 42 percent of the recreational catch.

Although current migratory walleye and white bass stocks that spawn in the Sandusky River support a smaller percentage of the fisheries in the river and in Lake Erie, it is thought that increases in their abundance would lead to commensurate economic benefits at local, state, and inter-jurisdictional scales. ODNR research indicates that the Sandusky River walleye stock is constrained by the amount (~8 ha) of spawning habitat below the dam, and that this extant habitat is likely deteriorating from a lack of gravel replenishment. Their research also indicates that approximately 122 ha of suitable spawning habitat exists upstream of the dam, and that, when relocated to that location, walleye can spawn and produce larvae from the upstream habitat (Davies 1994; Plott 2000; Jones et al. 2003; Cheng et al. 2006).

1.14.2 Minimal Degradation Alternative

Repairing the dam and bringing it into compliance with current ODNR safety standards would create jobs in the short term. The number of short term jobs created would depend on the scale of repairs and scheduling. The dam would not be put back into service as a power generator. Only the structure itself would be repaired. It is expected that few if any long term jobs would be created with this Alternative.

The Minimal Degradation Alternative offers little or no change in current tax revenue generation. This alternative would offer no change to the current business atmosphere. Homes and property are selling for less as a result of a weak economy and higher unemployment in the area. The Sandusky area is expected to see a -0.5% change in home prices for the third quarter 2012 through the third quarter 2013 while the Toledo area is expected to see a -3.7% change in home prices for the same period (CNN Money 2013) Ballville and the City of Fremont are geographically located between the two. Current projections for property and home values in this area indicate a slight decrease over time. This Alternative offers no change to this projection.

Repairing the dam and ensuring that it meets current safe dam guidelines will produce little change to the aesthetics of the area. Under this alternative, the dam would stay in place with little or no change to the surrounding landscape.

1.14.3 Non-Degradation Alternative

The Non-Degradation Alternative would allow the existing local and regional economy to continue on the current path. The existing economic structures set in place would continue to be at work and the area would depend on other projects to grow the local economy.

1.15 BLOCK 10I: JOBS AND REVENUE LOST

1.15.1 Preferred Alternative

The following is a general discussion of the potential job and revenue loss associated with the implementation of the preferred design. There are jobs dependent upon the dam being in place. The jobs associated with the upkeep and maintenance of the dam for many years to come will be lost. There is also the overall public perception of dam removal which is not quantifiable, but can be an indicator of how the local economy will respond to dam removal.

Many years of living under current conditions creates a feeling of contentment, security, and well-being for local residents. The reservoir is a central part of the community and is perceived as a natural part of the environment. The dam structure has become a symbol of community pride and identity. Community sentiments about the dam and the river are important factors to consider when deciding whether or not to remove a dam (Klein 1999).

After review from the OHPO, the dam has been found eligible for the National Register of Historic Places. The removal of the dam structure is considered a loss of a cultural and historical resource. State (OHPO) and local historical societies will document the potential historical and cultural significance of the dam and prescribe steps to adequately document and preserve the history of the dam.

There is a potential loss of aesthetic value to the area from the loss of forested floodplain wetlands habitat (See Section 8). It is expected that the recreation and tourism from wildlife viewing and bird watching will decrease in these specific wetland areas. However, the aesthetics and wildlife viewing areas are expected to increase along the free-flowing river and function on a much higher level. The loss of aesthetic value may also occur in the exposed sediment areas upstream of the dam. Although the preferred design proposes to seed and mitigate in areas of exposure, these areas are naturally more susceptible to the establishment of invasive non-native plant species.

Removal of the dam would eliminate the use of motor boats. Jobs and revenue associated with lake style sport fishing will be lost.

Property values along the reservoir may potentially decrease. The idea of "Lake Front" property will no longer exist as an aesthetic quality and a driver of property value. However in cases where the landowner's deed reads to "water's edge", property boundaries (Figure 3-5) will expand and may result in an increase in property value.

Some local businesses like the campground along South River Road may lose business, since it will no longer be a "Lake Front" campground.

1.15.2 Minimal Degradation Alternative

The implementation of the Minimal Degradation Alternative would leave the dam in place but would require rehabilitation of the structure to meet State of Ohio dam safety standards. Ballville Dam is in violation of state dam safety laws; repairs must be made if it is not removed. A prior dam investigation report estimated the cost to bring the dam and sea wall to current dam safety standards at $4.1 million to $5.1 million (ARCADIS 2005). Note that the referenced estimate is several years old, and it is likely that current costs would be higher. The average repair cost ($4.6 million) is used in the Feasibility Study (Stantec 2011b) to compare against other alternatives. The City of Fremont would also be responsible for the costs of operating and maintaining the site and structures for the life of the dam. These costs are undeterminable, but experience indicates expenditures of the magnitude mentioned above every 25 to 30 years. Moreover, a large amount of funds must be spent to repair, maintain, and operate the dam. The City of Fremont would still have financial and safety liabilities associated with the dam ownership. As the dam continues to age, risk for costly repairs and potential failure will increase. Additionally, the local economy would lose 2 million dollars in USFWS grant (WRRSP grant).

It is expected that this alternative would have no effect to fisheries resources in the upstream or downstream reach of the Sandusky River. This alternative may have some short-term negligible adverse effects on fisheries in the impoundment when the dam is being repaired. This alternative would result in major opportunistic loss in migratory fish passage. The Lake Erie fisheries (especially walleye) would continue to suffer from lost riverine production. Implementation of this alternative would result in minor adverse impacts to fishing and negligible impact to the existing recreational usage including non-motorized boating and navigation from the Sandusky River to the Bay.

1.15.3 Non-Degradation Alternative

The Non-Degradation Alternative would allow the existing local and regional economy to continue on the current path. The existing economic structures set in place would continue to be at work and the area would continue to see the existing job and revenue loss.

1.16 BLOCK 10J: ENVIRONMENTAL BENEFITS LOST OR GAINED

Table 1-20. Project Alternatives Environmental Benefits

Environmental Component	Project Alternatives (Lost, Gained or No Change)		
	Preferred	Minimal Degradation	Non-Degradation
Water Quality	Gained	No Change	No Change
Aquatic Life	Gained	No Change	No Change
Wildlife	Gained/Lost	No Change	No Change
T & E	No Change	No Change	No Change
Wetland Acreage	Lost	No Change	No Change
Wetland Function	Gained	No Change	No Change

1.16.1 Preferred Alternative

The Preferred Alternative will restore the sediment transport regime in the Sandusky River by releasing the coarse grained sediments that have been trapped by the dam. Water quality is expected to improve since stagnant water behind the dam will be flushed allowing dissolved oxygen levels to increase. Removing the dam will replenish coarse grained sediments in the downstream reaches of the Sandusky River, thus improving the aquatic habitat. Removing the dam will also flush the sediment built up behind the dam and will reduce the dominance of silt substrate in the area where the impoundment was located. Nutrient concentrations in the river may decrease as well. Wetland acreage will be lost due to the lowering of the water surface elevation behind the dam. However, the realigned riparian zone and wetlands will function to support a natural riverine system. For more details on wetland mitigation see Section 8 of this permit application. Generally speaking the new river system may improve the habitat for some wildlife and may reduce the habitat for others. The project is not expected to impact federally listed threatened or endangered species including the bald eagles on site.

1.16.2 Minimal Degradation Alternative

The City of Fremont seeks to repair the dam and stabilize the seawall with the intention of bringing the Ballville Dam into compliance with current ODNR safety standards. The implementation of the Minimal Degradation alternative is only designed to address issues concerning safety hazards and liabilities. This alternative will have no adverse effect on the site's current sediment moving or wetland pollutant filtering capabilities. Thus water quality is expected to remain the same. The sediment stored behind the dam is considered to be at equilibrium (Stantec, 2011) and repairing the dam will not change these current conditions. Repairing the dam will not affect wetlands or wildlife habitat within the project area. The direct fill impacts to WUS are temporary access structures that will have no long term impacts therefore no compensatory mitigation is proposed for temporary impacts to WUS.

1.16.3 Non-Degradation Alternative

This alternative is defined as the No-build or No Action alternative proposing no changes to the environment.

1.17 BLOCK 10K: MITIGATION TECHNIQUES

1.17.1 Preferred Alternative

A conceptual discussion of the compensatory mitigation plan for direct and indirect impacts to wetlands from implementation of the preferred alternative is included in the Conceptual Mitigation Report (Section 8). The proposed mitigation will be performed on site. An estimated seeding schedule is provided in the construction drawings (Section 7) and a narrative describing planting zone development is provided (Section 8). If needed, during the monitoring process, additional wetland vegetation may be planted to enhance the establishment of wetland plant communities. Also, if needed, additional management techniques may occur in exposed sediment areas to combat the establishment of invasive species such as reed canarygrass (*Phalaris arundinaceae*).

1.17.2 Minimal Degradation Alternative

The direct fill impacts to WUS are temporary with no long term impacts therefore no compensatory mitigation is proposed for temporary impacts to WUS. Following the implementation of the Minimal Degradation Alternative, the fill to the WUS (Table 1-5) will be hauled off site. Areas on the north bank above the OHWM will be cleared to allow for access to the river. These areas will be actively planted with native riparian trees species and work areas will be cleaned up following the implementation of this alternative.

1.17.3 Non-Degradation Alternative

No mitigation techniques are needed for this alternative.

2.0 404 and 10 Permit Application

2.1 PERMIT APPLICATION

U.S. ARMY CORPS OF ENGINEERS

APPLICATION FOR DEPARTMENT OF THE ARMY PERMIT

33 CFR 325. The proponent agency is CECW-CO-R.

OMB APPROVAL NO. 0710-0003
EXPIRES: 28 FEBRUARY 2013

Public reporting for this collection of information is estimated to average 11 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of the collection of information, including suggestions for reducing this burden, to Department of Defense, Washington Headquarters, Executive Services and Communications Directorate, Information Management Division and to the Office of Management and Budget, Paperwork Reduction Project (0710-0003). Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number. Please DO NOT RETURN your form to either of those addresses. Completed applications must be submitted to the District Engineer having jurisdiction over the location of the proposed activity.

PRIVACY ACT STATEMENT

Authorities: Rivers and Harbors Act, Section 10, 33 USC 403; Clean Water Act, Section 404, 33 USC 1344; Marine Protection, Research, and Sanctuaries Act, Section 103, 33 USC 1413; Regulatory Programs of the Corps of Engineers; Final Rule 33 CFR 320-332. Principal Purpose: Information provided on this form will be used in evaluating the application for a permit. Routine Uses: This information may be shared with the Department of Justice and other federal, state, and local government agencies, and the public and may be made available as part of a public notice as required by Federal law. Submission of requested information is voluntary, however, if information is not provided the permit application cannot be evaluated nor can a permit be issued. One set of original drawings or good reproducible copies which show the location and character of the proposed activity must be attached to this application (see sample drawings and/or instructions) and be submitted to the District Engineer having jurisdiction over the location of the proposed activity. An application that is not completed in full will be returned.

(ITEMS 1 THRU 4 TO BE FILLED BY THE CORPS)

1. APPLICATION NO.	2. FIELD OFFICE CODE	3. DATE RECEIVED	4. DATE APPLICATION COMPLETE

(ITEMS BELOW TO BE FILLED BY APPLICANT)

5. APPLICANT'S NAME
First - Jim Middle - Last - Ellis
Company - City of Fremont
E-mail Address - jellis@fremontohio.org

8. AUTHORIZED AGENT'S NAME AND TITLE (agent is not required)
First - Cody Middle - Last - Fleece
Company - Stantec
E-mail Address - Cody.Fleece@stantec.com

6. APPLICANT'S ADDRESS:
Address- 323 South Front Street
City - Fremont State - OH Zip - 43420 Country - USA

9. AGENT'S ADDRESS:
Address- 11687 Lebanon Road
City - Cincinnati State - OH Zip - 45241 Country - USA

7. APPLICANT'S PHONE NOs. w/AREA CODE
a. Residence b. Business 419-334-5900 c. Fax

10. AGENTS PHONE NOs. w/AREA CODE
a. Residence b. Business 513-842-8238 c. Fax 513-842-8250

STATEMENT OF AUTHORIZATION

11. I hereby authorize Cody Fleece to act in my behalf as my agent in the processing of this application and to furnish, upon request, supplemental information in support of this permit application.

SIGNATURE OF APPLICANT 2/19/14 DATE

NAME, LOCATION, AND DESCRIPTION OF PROJECT OR ACTIVITY

12. PROJECT NAME OR TITLE (see instructions)
Ballville Dam Removal and Sandusky River Restoration Project

13. NAME OF WATERBODY, IF KNOWN (if applicable)
Sandusky River, RM 18, HUC8: 04100011

14. PROJECT STREET ADDRESS (if applicable)
Address N/A
City - Fremont State- OH Zip- 43420

15. LOCATION OF PROJECT
Latitude: °N 41.32627 Longitude: °W -83.13584

16. OTHER LOCATION DESCRIPTIONS, IF KNOWN (see instructions)
State Tax Parcel ID Municipality Fremont
Section - 4, 5, 8, 9, 17 Township - 4N Ballville Range - 15E

17. DIRECTIONS TO THE SITE

On 1-75 north bound from Cincinnati, OH travel north 179 miles. Take exit 179 to merge onto US-6 E toward Fremont for 24 miles. Turn sharp right onto Buckland Ave/Creek 132. Then turn left onto County Highway 501/Oakwood Street, drive 0.5 miles and an access road to the river just downstream of Ballville Dam will be on the right.

18. Nature of Activity (Description of project, include all features)

Section 2.2 Block 18: Nature of Activity.

19. Project Purpose (Describe the reason or purpose of the project, see instructions)

Section 2.3 Block 19: Project Purpose

USE BLOCKS 20-23 IF DREDGED AND/OR FILL MATERIAL IS TO BE DISCHARGED

20. Reason(s) for Discharge

In order to notch the dam at the south spillway and draw-down the reservoir , adjacent areas will be filled and graded to support this activity. In-stream temporary structures will be constructed to access the dam for demolition. Demolished concrete dam materials will be temporarily stored into the Sandusky River. Ice Control Structures will be installed to mitigate for ice-jam flooding. Permanent fill and excavation will occur to achieve geomorphic channel stability in the areas surrounding the removed dam. The draw down and channel realignment will expose the seawall. The seawall will be modified and graded to stabilize. Additional bank stability fill and grading and pilot channel construction may occur to support the above ground reservoir intake.

21. Type(s) of Material Being Discharged and the Amount of Each Type in Cubic Yards:

Type Amount in Cubic Yards	Type Amount in Cubic Yards	Type Amount in Cubic Yards

Section 2.4 Block 21: Types of Material

22. Surface Area in Acres of Wetlands or Other Waters Filled (see instructions)

Acres

or

Linear Feet Section 2.5 Block 22: Surface Area in Acres of Wetlands

23. Description of Avoidance, Minimization, and Compensation (see instructions)

Section 2.6 Block 23: Description of Avoidance, Minimization, and Compensation

24. Is Any Portion of the Work Already Complete? ☐ Yes ☒ No IF YES, DESCRIBE THE COMPLETED WORK

25. Addresses of Adjoining Property Owners, Lessees, Etc., Whose Property Adjoins the Waterbody (if more than can be entered here, please attach a supplemental list).

a. Address- Section 2.7 Block 25: Addresses of Adjoining Property Owners

City - State - Zip -

b. Address-

City - State - Zip -

c. Address-

City - State - Zip -

d. Address-

City - State - Zip -

e. Address-

City - State - Zip -

26. List of Other Certificates or Approvals/Denials received from other Federal, State, or Local Agencies for Work Described in This Application.

AGENCY	TYPE APPROVAL*	IDENTIFICATION NUMBER	DATE APPLIED	DATE APPROVED	DATE DENIED
Section 2.8 Block 26					

* Would include but is not restricted to zoning, building, and flood plain permits

27. Application is hereby made for permit or permits to authorize the work described in this application. I certify that this information in this application is complete and accurate. I further certify that I possess the authority to undertake the work described herein or am acting as the duly authorized agent of the applicant.

SIGNATURE OF APPLICANT — DATE 2/19/14 — SIGNATURE OF AGENT — DATE 1/21/2014

The Application must be signed by the person who desires to undertake the proposed activity (applicant) or it may be signed by a duly authorized agent if the statement in block 11 has been filled out and signed.

18 U.S.C. Section 1001 provides that: Whoever, in any manner within the jurisdiction of any department or agency of the United States knowingly and willfully falsifies, conceals, or covers up any trick, scheme, or disguises a material fact or makes any false, fictitious or fraudulent statements or representations or makes or uses any false writing or document knowing same to contain any false, fictitious or fraudulent statements or entry, shall be fined not more than $10,000 or imprisoned not more than five years or both.

2.2 BLOCK 18: NATURE OF ACTIVITY

The City of Fremont proposes to remove the Ballville Dam from the Sandusky River. Since removal of the dam will change the water surface elevation of the river, stabilization activities are proposed. Exposed sediment areas and areas disturbed from construction activities will be seeded and planted with riparian vegetation. Grading activities will occur surrounding the former dam and if needed additional grading may occur near the newly constructed off-stream reservoir intake. Also, if needed, a pilot channel may be constructed to connect the modified river location to the off-stream reservoir intake. The existing seawall will also be modified.

In addition to the removal of Ballville Dam, the City proposes to install an ice control structure (ICS) as a result of historical accounts of winter ice jams.

The proposed project design will be divided into three separate construction phases. The dates for these activities are tentative.

Phase I (September 2014-November 2014)

In the first phase of the project the existing south spillway will be notched to draw-down the reservoir. An access road will be built to access the south abutment for this activity.

Phase II (March 2015-December 2015)

Following draw-down, the exposed area will be seeded with vegetation. An access road and temporary ramp will be constructed on the north bank leading up to the dam. Following this construction the Ice Control Structure (ICS) will be installed. Following the installation of the ICS, the dam will be demolished. After the dam is demolished and concrete and ramp are hauled off site, the channel will be restored surrounding the construction area.

Phase III (Summer 2016)

If needed additional bank stabilization, planting and in stream work will occur. If needed, a pilot channel will be constructed to convey water to the reservoir intake. Following this activity, the seawall will be modified.

2.3 BLOCK 19: PROJECT PURPOSE

The purpose of the proposed project is to remove Ballville Dam from the Sandusky River thereby restoring natural hydrological processes over a 40-mile stretch of the Sandusky River, re-opening fish passage to 22 miles of isolated habitat, restoring flow conditions for fish access to new habitat above the impoundment, improving overall conditions for native fish communities in the Sandusky River system both upstream and downstream of the Ballville Dam, and restoring self-sustaining fish resources.

The Sandusky River is one of Ohio's largest tributaries to Lake Erie, about 210-km in length with a watershed encompassing 3,680 km^2 that drains into the 14,692-hectare, estuarine-like, Sandusky Bay before entering the lake proper. In 1970 approximately 70 miles of the Sandusky River was designated as the state of Ohio's second scenic river. River connectivity is disrupted by a low-head dam near the City of Tiffin, Ohio (64 river km from Sandusky Bay) and by the Ballville Dam (29 river km from Sandusky Bay). Without the Ballville Dam, the Sandusky River would once again be in a free flowing condition between river mile 19—17.

The Ballville dam has altered natural hydrologic and sediment transport functions in the Sandusky River. The supply of such coarse sediments is necessary for the long-term maintenance of downstream spawning habitat, which is important for many native aquatic species utilizing these areas during a series of life stages. The restriction of coarse sediments, while conveying fine sediment downstream, can negatively impact important habitats, including spawning areas, by filling in interstitial spaces. It may significantly improve the habitat for the threated and endangered species threehorn wartyback (*Obliquaria reflexa*) and deertoe (*Truncilla truncata*). Ecologically, the dam represents an impassable barrier to upstream and downstream movements of all aquatic organisms. The expansion of available habitat would benefit many species of migratory fish and mussels species. This would include economically important sportfish such as walleye (*Sander vitreus*) and white bass (*Morone chrysops*) as well as the State-threatened greater redhorse (*Moxostoma valenciennesi*).

Water bodies within the State of Ohio have, by law, designated beneficial uses that are protected by water quality standards. Within the project area, the Sandusky River's Aquatic Life Use Standard is Warm Water Habitat (WWH). The Sandusky River was sampled at five locations between river mile (RM) 5.5 and 18.05 in 2009. The Sandusky River at the Ballville Dam (RM 18.05) was found to be in non-attainment of the WWH designation due to siltation and direct habitat alteration.

The impounded area was used as a source of public water by the City of Fremont from 1959 to 2012. In February 2008, the Ohio Environmental Protection Agency (OEPA) issued a Findings and Orders notification to the City citing numerous Ohio Administrative Code (OAC) Rule violations related to the operation of the Public Water System (PWS) and water quality of the City's PWS. Among the violations were elevated nitrate levels documented from samples taken over a period from June 1999 to June 2007. Within the Findings and Orders, the OEPA ordered the City to prepare plans for construction of an off- stream reservoir that would hold approximately 750 million gallons of raw water to address the nitrate violations. The reservoir which cost in excess of $45 million was completed and became operable in February 2013. It has successfully supplied water utilities to the City of Fremont for over a year now.

Progressive deterioration of Ballville dam and associated sea wall has been noted in successive inspections beginning in 1980, however the last known maintenance performed on the structure occurred in 1969. The ODNR informed the City in 2004 that if a remediation schedule for the dam was not submitted and approved by December 1, 2007 legal enforcement actions could result. In August 2007, the ODNR issued a Notice of Violation (NOV) to the City stating that, as a result of its poor condition, the dam was being operated in violation of the law. In June 2011, the ODNR extended timeframes for bringing the dam into compliance (ODNR 2011b) in recognition that a new PWS reservoir was being completed. This letter noted that extension of the schedule for compliance did not remedy concerns regarding the condition of the dam.

2.4 BLOCK 21: TYPES OF MATERIAL BEING DISCHARGED AND THE AMOUNT OF EACH TYPE IN CUBIC YARDS

The project's construction limits are confined to approximately 28 acres, which includes activities directly surrounding the dam and exposed reservoir sediment planting areas upstream of the dam (Section 7). The construction limits include temporary access roads and staging areas. There may potentially be some additional bank stabilization, planting and in stream work upstream of the dam near the intake and at River Road. An Ice Control Structure (ICS) will be installed in the Sandusky River approximately 200 feet downstream of the Ballville Dam. In addition, activities may include removing the remaining infrastructure of a small low-head dam (Tucker Dam) which is approximately 0.7 mile upstream of Ballville Dam. The Waters of the U.S. (WUS) features directly impacted on this project will occur below the Ordinary High Water Mark (OHWM) of the Sandusky River or in a jurisdictional wetland (Corp, 2011).

In construction of the access ramp for demolition of the Ballville Dam, approximately 5,275 CY (.378 acres) of earthen material (rock and soil) fill will be temporarily placed in Wetland 18 (25 CY; 0.034 acres), Wetland 19 (34 CY; 0.004 acres) and in the Sandusky River (5,216 CY; 0.34 acres) (Figure 6-1).

An estimated 15,000 CY of concrete (demolished dam materials) from the Ballville Dam will be temporarily discharged to the designated disposal areas below the OHWM of the Sandusky River (Figure 6-1).

The channel restoration area surrounding the dam will extend vertically above the south spillway access on the right descending bank to the top of the existing left descending bank, and will extend horizontally toward the upstream bend in the seawall to approximately 560 feet downstream of the dam, dissecting Wetland 19 (Figure 6-1). In construction of this restoration area, approximately 27,774 CY (4.83 acres) of fill consisting of offsite rock and soil materials as well as some concrete rubble from the demolished dam and leftover access ramp will permanently fill portions of WUS (Table 2-1).

Table 2-1. Channel Restoration Limits--Fill to WUS Summary

Water Feature	Fill (Cubic Yards)	Acres of Impact
Sandusky River	25,719	4.34
Wetland 6	20	0.009
Wetland 18	476	0.18
Wetland 19	1,559	0.30
Total	27,774	4.83

The channel restoration area will also consist of 28,478 CY of excavation, 26,428 CY (4.34 acres) of which will occur in the Sandusky River. Wetland 17 which is located above the dam

will also have 250 CY (0.09 acres) of earth material removed. These excavated materials would be hauled off to an upland disposal site chosen by the contractor. The remaining 1,720 CY of excavated materials would be outside of a JWUS feature.

The Ice Control Structure (ICS) will be a row of 15, 6' diameter concrete piers extending approximately 280 feet across the modified river location. The piers extend on average approximately 12 feet above the channel bottom (Appendix E). An estimated 390 CY (0.009) acres) of concrete for ICS will be permanently placed into JWUS features to mitigate for ice-jam flooding. There will be 2 piers (52 CY; 0.001 acres) directly placed into Wetland 18 and 2 piers (52 CY; 0.001 acres) placed into Wetland 6. The remaining 11 piers (286 CY; 0.007 acres) will be placed in the Sandusky River.

If needed, approximately 790 CY (0.09 acres) of soil fill will be placed for bank stabilization upstream of the dam at the intake for the raw water reservoir along approximately 650 linear feet of the Sandusky River near the River Road/Buckland Avenue intersection. There will be approximately 90 CY (0.03 acres) placed in Wetland 15 and 700 CY (0.06 acres) of fill will be placed in Wetland 14. Also, if needed, approximately 80 CY (0.04 acres) of bare earth will be excavated from the Sandusky River to form a pilot channel (~8' wide x ~1.5' depth) allowing flow to reach the reservoir intake (Figure 6-2).

In summary, of the 49,229 CY (5.99 acres) of fill materials (all values are approximations) to be placed in WUS, 28,954 CY (4.93 acres) is permanent and 20,275 CY (1.06 acres) is temporary (Table 2-2). The total amount of excavated earth from the project area (26,758 CY; 4.47 acres) is permanent removal.

Table 2-2. Summary of Fill and Excavation Activities to WUS

Impact Type	Construction	Type of Materials	Place or Remove	Cubic Yards (CY)	Impact Acreage	WUS Features Impacted
*Temporary	Access Ramp	Earthen Materials (rock and soil)	Place	5,275	0.38	Sandusky River, Wetlands 18 & 19
*Temporary	Ballville Dam	Concrete	Place	15,000	0.68	Sandusky River
Permanent	Restoration Area	Earthen Materials (rock and soil)	Place	27,774	4.83	Sandusky River (4.34 acres), Wetlands 6, 18 & 19
Permanent	Ice Control Structure	Concrete Piers	Place	390	0.01	Sandusky River, Wetlands 6 & 18
Permanent	**Bank Stabilization	Earthen Materials (rock and soil)	Place	790	0.09	Wetlands 14 & 15
Permanent	Restoration Area	Present Earth Materials	Remove	26,678	4.43	Sandusky River (4.34 acres), Wetland 17
Permanent	**Pilot Channel	Present Earth Materials	Remove	80	0.04	Sandusky River
*some ramp materials and dam materials will remain to build up restoration area			**Total Fill Placement**	**49,229**		** construction activity will occur if needed
			Total Earth Removal	**26,758**		

The total stream impacts are 4.38 acres and total wetland impacts are 0.67 acres (Table 2-3). The impact acreage totals shown in Table 2-3 are permanent impacts. The impact acreage to the JWUS water features from the temporary fill of the demolished dam and access ramp are not included in the totals but are shown in Table 2-2. Since the restoration area covers the same area (overlapping) as the disposal areas and the access ramp (Figure 6-1) and it is the final grading activity, the restoration area and the ICS acreages were the acreages accounted for in summing the total JWUS impacts surrounding the dam (Table 2-3).

2.5 BLOCK 22: SURFACE AREA IN ACRES OF WETLANDS

Table 2-3. Summary of Impacts to WUS

Water Feature ID	Latitude	Longitude	Flow Regime or Corp's Description	Estimated Amount of Aquatic Resource in Construction Limits (Direct Impacts)	*Estimated Amount of Aquatic Resource Post-Construction (Indirect Impacts)
Sandusky River (below)	41.325948	-83.152014	Perennial Stream (TNW)	577.00 linear feet / 2.09 acres	**0.00 linear feet / 0.00 acres
Sandusky River (above)	41.329533	-83.143789	Perennial Stream (TNW)	589.00 linear feet / 2.29 acres	11,088.00 linear feet / 89.30 acres
Stream 1	41.317268	-83.151890	Perennial Stream (RPW)	0.00 linear feet / 0.00 acres	***0.00 linear feet / 0.00 acres
Stream 2	41.320584	-83.153522	Perennial Stream (RPW)	0.00 linear feet / 0.00 acres	***0.00 linear feet / 0.00 acres
Stream 3	41.325337	-83.134816	Intermittent Stream (Non-RPW)	0.00 linear feet / 0.00 acres	0.00 linear feet / 0.00 acres
Stream 4	41.326886	-83.128919	Intermittent Stream (Non-RPW)	0.00 linear feet / 0.00 acres	0.00 linear feet / 0.00 acres
Wetland 1	41.315585	-83.153461	Emergent/Scrub-Shrub/Forested	0.00 acres	2.49 acres
Wetland 2	41.317931	-83.151265	Emergent/Scrub-Shrub/Forested	0.00 acres	0.04 acres
Wetland 3	41.318948	-83.150801	Emergent/Scrub-Shrub/Forested	0.00 acres	0.19 acres
Wetland 4	41.327691	-83.145824	Emergent/Scrub-Shrub/Forested	0.00 acres	34.11 acres
Wetland 5	41.328498	-83.141831	Emergent/Scrub-Shrub/Forested	0.00 acres	2.47 acres
Wetland 6	41.325590	-83.135311	Emergent/Scrub-Shrub	0.01 acres	0.00 acres
Wetland 7	41.325557	-83.134511	Emergent	0.00 acres	0.00 acres

Water Feature ID	Latitude	Longitude	Flow Regime & Corps Descriptions	Estimated Amount of Aquatic Resource in Construction Limits (Direct Impacts)	*Estimated Amount of Aquatic Resource Post-Construction (Indirect Impacts)
Wetland 8	41.327079	-83.128475	Emergent/Scrub-Shrub/Forested	0.00 acres	0.00 acres
Wetland 9	41.327392	-83.127684	Emergent/Scrub-Shrub/Forested	0.00 acres	0.00 acres
Wetland 10	41.327281	-83.127571	Emergent/Scrub-Shrub/Forested	0.00 acres	0.00 acres
Wetland 11	41.327887	-83.125616	Emergent/Scrub-Shrub	0.00 acres	0.00 acres
Wetland 12	41.327240	-83.128332	Emergent/Scrub-Shrub	0.00 acres	0.00 acres
Wetland 13	41.314761	-83.155426	Emergent/Scrub-Shrub/Forested	0.00 acres	0.18 acres
Wetland 14	41.320804	-83.152944	Emergent/Scrub-Shrub/Forested	0.06 acres	2.30 acres
Wetland 15	41.323744	-83.153455	Emergent/Scrub-Shrub/Forested	0.03 acres	10.89 acres
Wetland 16	41.330170	-83.143294	Emergent/Scrub-Shrub/Forested	0.00 acres	1.23 acres
Wetland 17	41.326710	-83.136471	Emergent	0.09 acres	0.00 acres
Wetland 18	41.326256	-83.135350	Emergent/Scrub-Shrub/Forested	0.18 acres	0.00 acres
Wetland 19	41.326393	-83.134508	Emergent/Scrub-Shrub/Forested	0.30 acres	0.00 acres
Wetland 20	41.328432	-83.125240	Emergent/Scrub-Shrub/Forested	0.00 acres	0.00 acres
* see mitigation report for details on the proposed outcome of the aquatic resource ** the deposition of suspended solids above the dam will potentially be deposited along a 20 mile stretch of the river between Brady's island to Sandusky Bay *** a net increase in linear stream length due to the draw down			**Total Stream Impacts**	**1,166 linear ft. / 4.38 acres**	**11,088 linear ft.**
			Total Wetland Impacts	**0.67 acres**	**53.90 acres**

2.6 BLOCK 23: DESCRIPTION OF AVOIDANCE, MINIMIZATION AND COMPENSATION

2.6.1 General Working Conditions

Scope of work will be limited and focused on restoring the area immediately upstream and in the vicinity of the existing Ballville Dam within the Project Area boundaries (see Block 22). The disturbance limits are shown on the plans. No storage, staging, travel, or construction is allowed outside these limits except with permission of the Engineer and Owner's Representative. Disturbance limits shall be confined to only the areas necessary to effectively complete project activities. Demolition shall be accomplished using mechanical means (e.g. drilling, saw cutting, hoe ramming, crane with wrecking ball, etc.).The project site shall be maintained in a safe and neat condition. Silt fence and other erosion control measures will be installed at the downstream edge staging areas, as well as on access roads to remain in compliance with the NPDES general permit for storm water discharges associated with construction activity. Regular maintenance of erosion controls will be performed by the Contractor. Disturbed areas will be seeded and mulched upon completion of localized project activities. At the end of each construction day, the Contractor shall remove all trash and debris, the pavement areas shall be swept clean of loose materials, and all excavations shall be closed. All trees, whether shown or not shown in the plans, are to be preserved unless approval to remove is given in writing by the Engineer or their removal has been designated on the plan.

2.6.2 Stream Restoration

The drawdown can be accomplished by creating incrementally larger and deeper notches in the spillway(s) in lieu of full impoundment drawdown and dry removal. The sequence of construction and staged removal of the dam will be designed in a manner which trains the river into a preferred alignment which will minimize the release of sediment and the potential for future river instability (see Section 7). Stantec anticipates that as much as 15 to 40 percent of the accumulated sediment volume may be retained with proper sediment management.

During the drawdown phase, stabilization measures will be implemented to reduce the amount of sediment contributed to the river from the newly exposed margins/banks. Stabilization measures may include aggressive seeding and vegetation strategies to supplement the existing seed banks within the sediment to establish a hearty vegetative cover over exposed areas susceptible to erosion (see planting zone locations in Section 8). In some cases, wetland seed mixes will be prescribed to enhance the establishment of floodplain plant communities. Efforts will be made to control invasive plant colonization of exposed areas. During the low-flow months at the end of summer (August through October), the ICS would be installed just downstream of the dam. This action must be performed prior to full dam removal and the seasonally high winter discharges to minimize potential ice jam impacts in the flood control channel. The remainder of dam removal would take place in the fall (October and November), prior to freezing conditions and wet weather. This timing allows for potential high winter flows to flush sediment through the walleye reach and flood control channel prior to the spring spawning runs. The timing is also

beneficial because the majority of the sediment release will occur in winter and early spring months when dissolved oxygen levels are highest and water temperatures are lowest so as to not stress the resident aquatic communities. Remaining dam removal activities, adaptive management and restoration of the river and banks, and removal of the sea wall would occur the following summer during historic low flow periods.

2.6.3 Tucker Dam

The presence of Tucker dam will be confirmed following the initial drawdown. A survey (Section 5.1) was conducted on July 1st, 2013 by ODNR with the purpose to locate remnants of Tucker Dam. The surveyors found no identifiable features suggesting the existence of Tucker Dam (Tyson 2013).

2.6.4 Indiana Bat

The Project Area lies with the range of the federally endangered Indiana bat; however, there are no current records of Indiana bats known from the Project Area. The closest record is approximately 12 miles southeast of the project area in Seneca County. An Indiana bat survey was conducted during June 2010 approximately 6,000 river feet upstream of the Ballville Dam near the raw water intake for the raw water reservoir. A total of three bats representing two species (two little brown bats [*Myotis lucifugus*]; one big brown bat [*Eptesicus fuscus*]) were captured during two nights of netting. No Indiana bats were captured (Stantec 2011). There is approximately 107 acres of deciduous forest within the Project Area. However, not all deciduous forest is suitable for roosting by Indiana bats. Roosting habitat is limited to the riparian zones along the Sandusky River within the Project Area and upstream and downstream. Potential foraging habitat also includes the riparian zones along the Sandusky River and includes the open water as well. This area represents approximately 526 acres. The Indiana bat is known to forage in a mosaic of habitats throughout its range (USFWS 2007).

While foraging habitat was present within the Project Area; large trees with characteristics of providing a maternity roost for Indiana bats were not observed during site visits adjacent to the dam in 2011 and 2012. In another survey of wetland features, biologists observed four potential roosting trees in wetlands upstream of the dam (Wetland 1, Wetland 4, and Wetland 15). None of the potential roosting trees are located in tree clearing areas, and therefore there will be no impact to these trees.

The construction of temporary access for project activities will require the removal of some brush and trees. Areas used for access will be seeded with native riparian vegetation following the project. An existing farm road will be used to access the south spillway. Approximately 0.08 acres of forest habitat will be cleared and graded between the open field and the right abutment wall to notch the south spillway (Figure 6-1). On the north bank an existing foot path will be used as an access road. An estimated 0.38 acres will be cleared of trees and brush to create this temporary access road. The construction of the temporary ramp will require an additional 0.07 tree and brush clearing. Upstream of the dam, if needed, approximately 0.38

acres of vegetation will be cleared to access bank stabilization areas upstream of the dam. (Figure 6-2). The total tree clearing acreage from direct impacts related to construction activities is approximately 0.91 acres. Only trees absolutely needed to be cleared for access will be removed. Seasonal tree clearing will be conducted between October 1 to April 1. Due to the proposed avoidance and minimization measures the construction phase of the Preferred Alternative is not likely to adversely affect Indiana bats (USFWS, 2014).

A more detailed discussion of the secondary impacts to hydrology alteration to forested wetland habitat above the dam is discussed in detail in Section 8-Conceptual Mitigation report. The existing Palustrine Forested (PFO) are expected to remain forest cover since a majority of the tree canopy species are facultative species that can occur in wetland and upland habitat. The species composition of forest canopy species is expected to change overtime to a more upland plant assemblage (sugar maple, white oak, northern red oak, black cherry and shagbark hickory). New exposed areas will be seeded with native riparian vegetation so the forest habitat is expected to increase in size thus a potential to increase valuable Indiana Bat habitat.

2.6.5 Wetlands

Wetlands near disturbance limits that are to be avoided will be fenced off to prevent accidental impact by construction activities. Wetland areas of temporary and permanent disturbance will be re-vegetated and restored where applicable. For more details on wetland mitigation from proposed impacts, a conceptual mitigation plan is included in Section 8 of this permit application.

2.6.6 Mussels

After the notching in the dam and the drawdown of the impoundment begins, native live mussel species located on the exposed bank/margins of the former impoundment will be recovered and relocated to suitable habitat in the Sandusky River upstream of the dam. This activity will be coordinated with the USFWS and ODNR. At a minimum, we recommend the following measures for a rescue and relocation program:

- Incremental notching of the dam will be used as a strategy to limit the spatial extent of the exposed bed such that areas can be effectively covered by rescue crews
- Hydrographic survey data can be used to target drawdown elevations to expose bed features that have potential to support dense assemblages
- Demolition will be phased to allow rescue work to proceed for 2-3 days before additional incrementally lowering of the upstream pool.

2.6.7 Compensatory Mitigation

A conceptual wetland mitigation report is included in Section 8 of this document. An estimated seeding schedule is provided in the construction drawings (Section 7) and a narrative describing planting zone development is provided (Section 8). If needed, during the monitoring process, additional wetland seed planting may occur to enhance the establishment of wetlands. Also, if needed, additional management techniques may occur in exposed sediment areas to combat the establishment of invasive species such as reed canarygrass (*Phalaris arundinaceae*).

2.7 BLOCK 25: ADDRESSES OF ADJOINING PROPERTY OWNERS

Block 25: ADDRESS OF ADJOINING PROPERTY OWNERS, LESSEES, ETC., WHOSE PROPERTY ADJOINS THE WATERBODY
Ballville Dam Removal and Sandusky River Restoration Project
City of Fremont
Ballville Township
Sandusky County, Ohio

Parcel ID	Owner	Address	City	State	Zip
100900002200	First United Church of Christ	1500 Tiffin Road	Fremont	OH	43420
100900002001	O. Eugene & Delores Grabel	0 River Drive	Fremont	OH	43420
100900002003	Michael Properties Limited	0 West Cole Road	Fremont	OH	43420
100900001801	Ohio Power Co	0 CR 158	Fremont	OH	43420
100400003600	City of Fremont	0 River Street	Fremont	OH	43420
100900005201	James A. Laird	1526 Yingling Road	Fremont	OH	43420
100900005203	Richard N. & Susan Marie Kusmer	8 Laird Drive	Fremont	OH	43420
100900005202	R. Bradford & Patricia L. Culbert	16 Laird Drive	Fremont	OH	43420
100900005204	Willie H. & Diane J. Watts	24 Laird Drive	Fremont	OH	43420
100900005205	Alison V. Harrison	32 Laird Drive	Fremont	OH	43420
100900005207	Gary J. Laird	40 Laird Drive	Fremont	OH	43420
100900005206	Charles R. & Michelle K. Ickes	48 Laird Drive	Fremont	OH	43420
100900005200	Scott L. Alexander	0 Laird Drive	Fremont	OH	43420
100900005208	Scott L. Alexander	0 Laird Drive	Fremont	OH	43420
100900005209	Scott L. Alexander	72 Laird Drive	Fremont	OH	43420
100800004100	Scott L. Alexander	72 Laird Drive	Fremont	OH	43420
100800003300	Jack W. Sr. & Roxanna Ferguson	1620 Baker Road	Fremont	OH	43420
100800003100	John E. & Ruth A. Ferguson	1622 Baker Road	Fremont	OH	43420
100800003800	Kathy A. Ferguson	1638 Baker Road	Fremont	OH	43420
100800003500	Richard W. Baker & Barbara A. Davenport	1646 Baker Road	Fremont	OH	43420
100800003600	Raymond J. & Stacy P. Rellinger	1700 Baker Road	Fremont	OH	43420
100800001800	BTMI Investments Ltd LLC	1704 Baker Road	Fremont	OH	43420
100800001600	William G. & Faye A. Mayer	1714 Baker Road	Fremont	OH	43420
100800001300	Juliana T. Wright	1724 Baker Road	Fremont	OH	43420
100800001500	Ronald E. & Ruth L. Davis	1732 Baker Road	Fremont	OH	43420
100800001400	Wayne E. & Jeanine Graham	1740 Baker Road	Fremont	OH	43420
100800001200	David P. May	1744 Baker Road	Fremont	OH	43420
100800001900	Harold B. Fox	1800 Baker Road	Fremont	OH	43420
100800002600	Harold B. Fox	1816 Baker Road	Fremont	OH	43420
100800002900	Cheryl Lynn Oberst	1824 Baker Road	Fremont	OH	43420
100800003000	Terry R. & Robin R. Hade	1828 Baker Road	Fremont	OH	43420
100800002800	Thos. J. Kramer & Donna J. Hartley	1836 Baker Road	Fremont	OH	43420
100800003700	James R. Hufford & Deborah A. Dimascio	1932 Baker Road	Fremont	OH	43420
100800003900	Misty Meadows Inc	2100 Baker Road	Fremont	OH	43420
101700001100	Ballville Twp. Board of Trustees	0 CR 209	Fremont	OH	43420
101700000403	Township of Ballville	0 CR 209	Fremont	OH	43420
101700000100	Mildred Collins, TRT, etc.	2380 CR 132	Fremont	OH	43420

101700002200	Rudolph W. & Jacqueline K. Smith	2346 South River Road	Fremont	OH	43420
101700001600	Mildred Collins, TRT, etc.	2328 South River Road	Fremont	OH	43420
101700001500	Gillmore Farms Inc.	0 South River Road	Fremont	OH	43420
101700001400	Thomas L. & Robin L. Darr	2304 South River Road	Fremont	OH	43420
101700000300	Janice L. Longanbach	0 CR 43	Fremont	OH	43420
100800004300	Richard W. & Ellen M. May	724 CR 43	Fremont	OH	43420
100800004401	Joseph G. Podach	2022 South River Road	Fremont	OH	43420
100800004402	Eric D. & Sherrie A. Walters	1885 River Road	Fremont	OH	43420
100800004600	City of Fremont	0 CR 132	Fremont	OH	43420
100500002101	Yvonne J. & Jonathan E. Bowen	0 Buckland Avenue	Fremont	OH	43420
100500002100	Albert Roehrich	2475 Buckland Avenue	Fremont	OH	43420
100500002200	David L. & Nancy W. Souder	2459 Buckland Avenue	Fremont	OH	43420
100400003900	Sue P. Babione	2447 Buckland Avenue	Fremont	OH	43420
100400003801	Carol G. Dixon	2425 Buckland Avenue	Fremont	OH	43420
100400003800	Thomas D. & Patricia A. Appleby	2401 Buckland Avenue	Fremont	OH	43420
100400003700	Janis J. Balderama	2319 Buckland Avenue	Fremont	OH	43420
100400003701	Nancy J. Stoner	2317 Buckland Avenue	Fremont	OH	43420
100412000100	William W. & Nanci S. Britenburg	2311 Buckland Avenue	Fremont	OH	43420
100412000200	Roger W. Hafford	2303 Buckland Avenue	Fremont	OH	43420
100412000300	Roger W. Hafford	2303 Buckland Avenue	Fremont	OH	43420
100412000400	James R. & Roberta K. Sherck	2215 Buckland Avenue	Fremont	OH	43420
100412000503	James R. & Roberta K. Sherck	2215 Buckland Avenue	Fremont	OH	43420
100400000900	Gene A. & Linda M. Koschinski	2127 Buckland Avenue	Fremont	OH	43420
100400001000	Daniel K. Fry	2113 Buckland Avenue	Fremont	OH	43420
100400001100	Jesse Ernest & Wanda Sue Kelly	2105 Buckland Avenue	Fremont	OH	43420
100400003600	City of Fremont	0 River Street	Fremont	OH	43420
109500010200	City of Fremont	0 Oakwood Street	Fremont	OH	43420
109500010100	City of Fremont	0 River Street	Fremont	OH	43420
100400003600	City of Fremont	0 River Street	Fremont	OH	43420

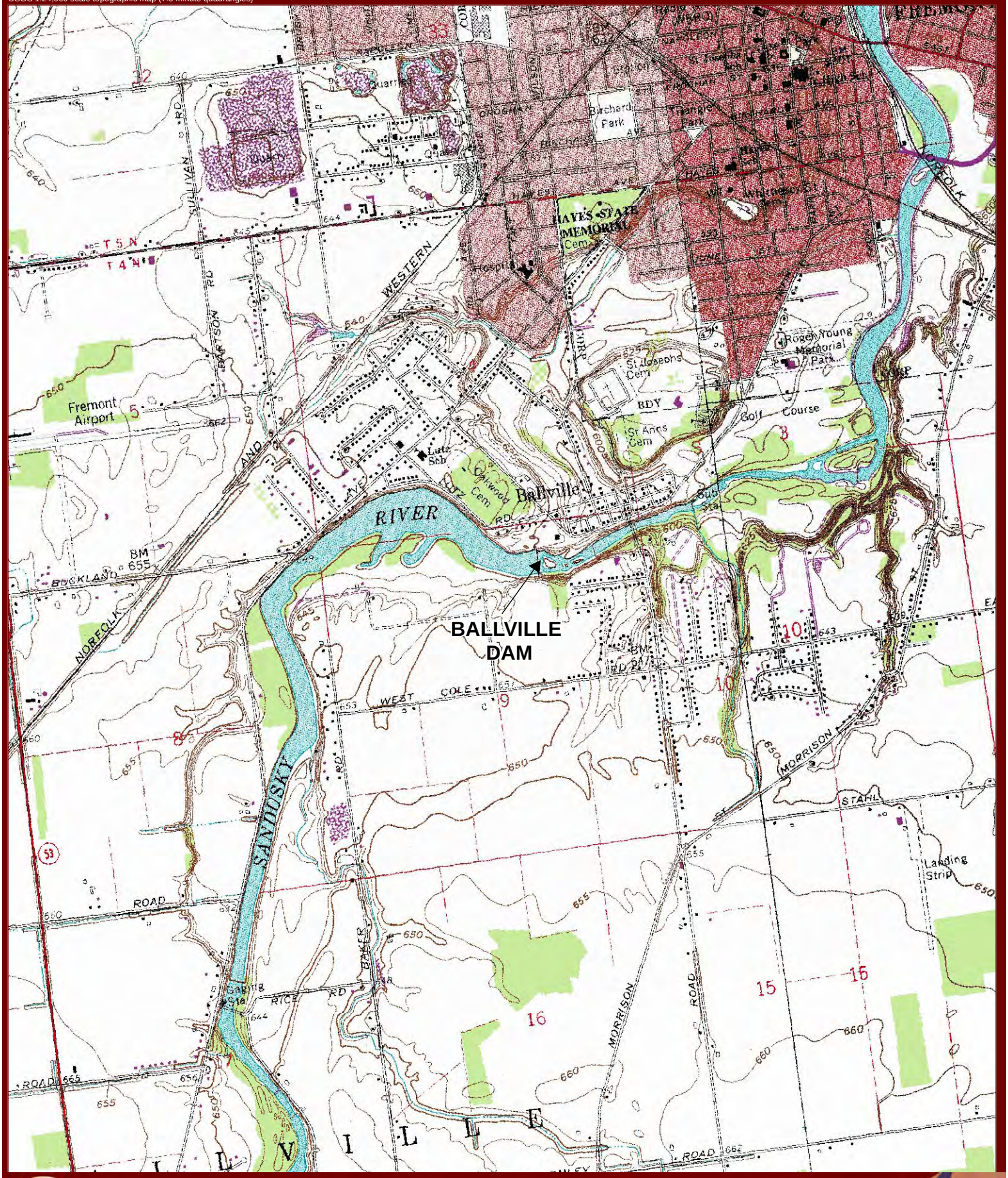
2.8 BLOCK 26: LIST OF OTHER CERTIFICATES OR APPROVALS OR DENIALS RECEIVED FROM OTHER AGENCIES

Table 2-5. List of other Approvals

Issuing Agency	Type of Approval	Identification No	Date of Application	Date of Approval	Date of Denial
Army Corps of Engineers	Individual Section 404 and Section 10 Permit	2011-00046	February 2014	TBD	TBD
Ohio EPA	401 WQC	TBD	January 2014	TBD	TBD
US Fish and Wildlife Service	Section 7	Mussel Survey	February 2, 2012	May 2, 2012	N/A
US Fish and Wildlife Service	Section 7	Eastern Prairie Fringe Orchid Survey Report	August 7, 2013	August 7, 2013	N/A
Ohio Historic Preservation Office	Section 106	TBD	TBD	TBD	TBD
Federal Emergency Management Authority	Floodplain Permit	TBD	TBD	TBD	TBD
Ohio Department of Natural Resources	Scenic River Environmental Review	TBD	TBD	TBD	TBD
US Fish and Wildlife Service (Lead Agency)	Record of Decision -- NEPA	Docket No. FWS-R3-FHC-2013-N266	DEIS Published in Federal Register January 24, 2014	TBD	TBD
Ohio EPA	National Pollutant Discharge Elimination System (NPDES)	TBD	TBD	TBD	TBD

3.0 Project Maps

Fremont West and Fremont East
USGS 1:24,000 scale topographic map (7.5 minute quadrangles)



0 2,000 4,000 Feet

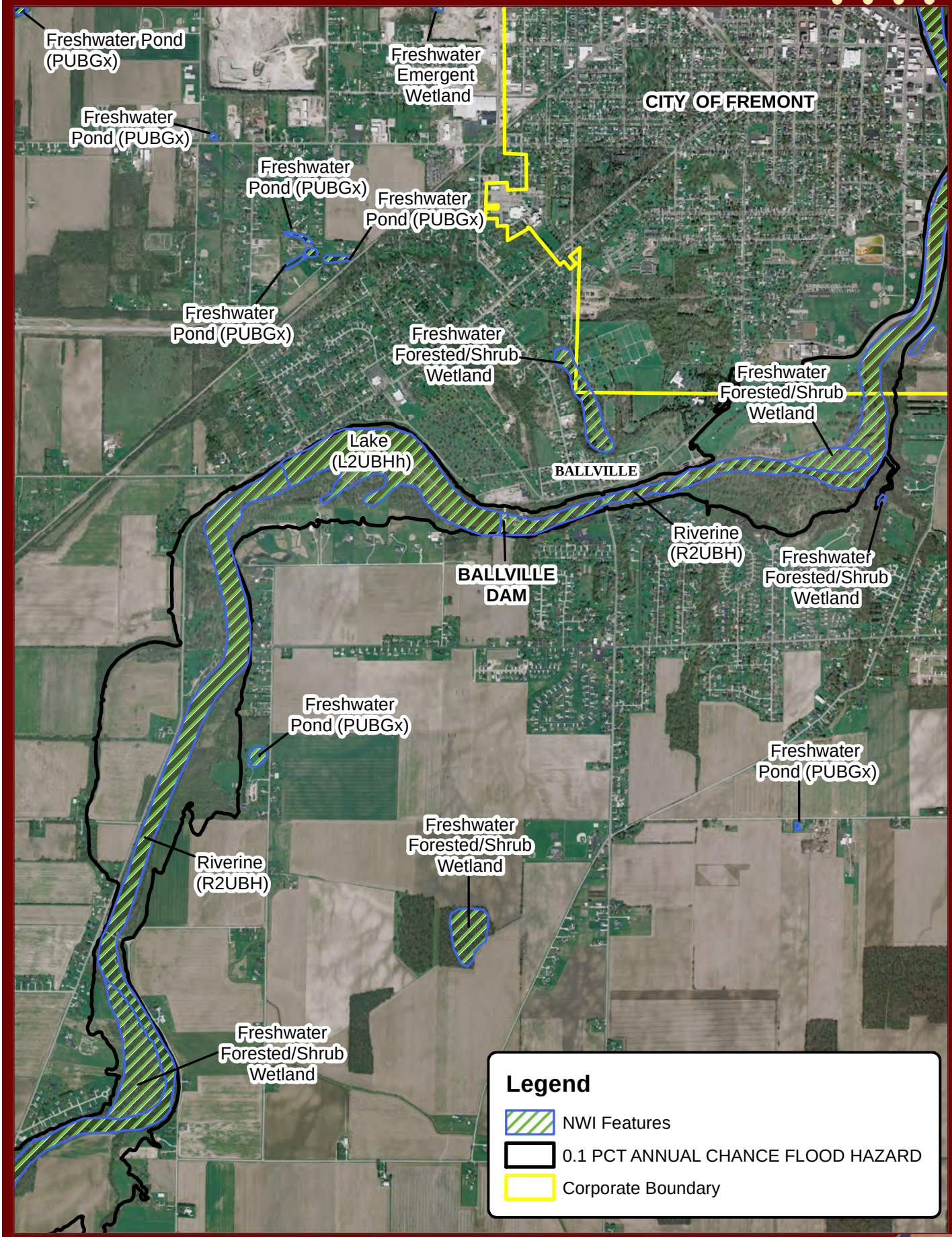
1 inch = 2,000 feet

N

Figure 3-1. Project Location

Sandusky County, Ohio

Stantec
11687 Lebanon Road, Cincinnati, OH 45241 Phone 513.842.8200 Fax 513.842.8250 www.stantec.com



U.S.Fish & Wildlife Service

0 1,000 2,000

Feet

1 in = 2,000 ft

N

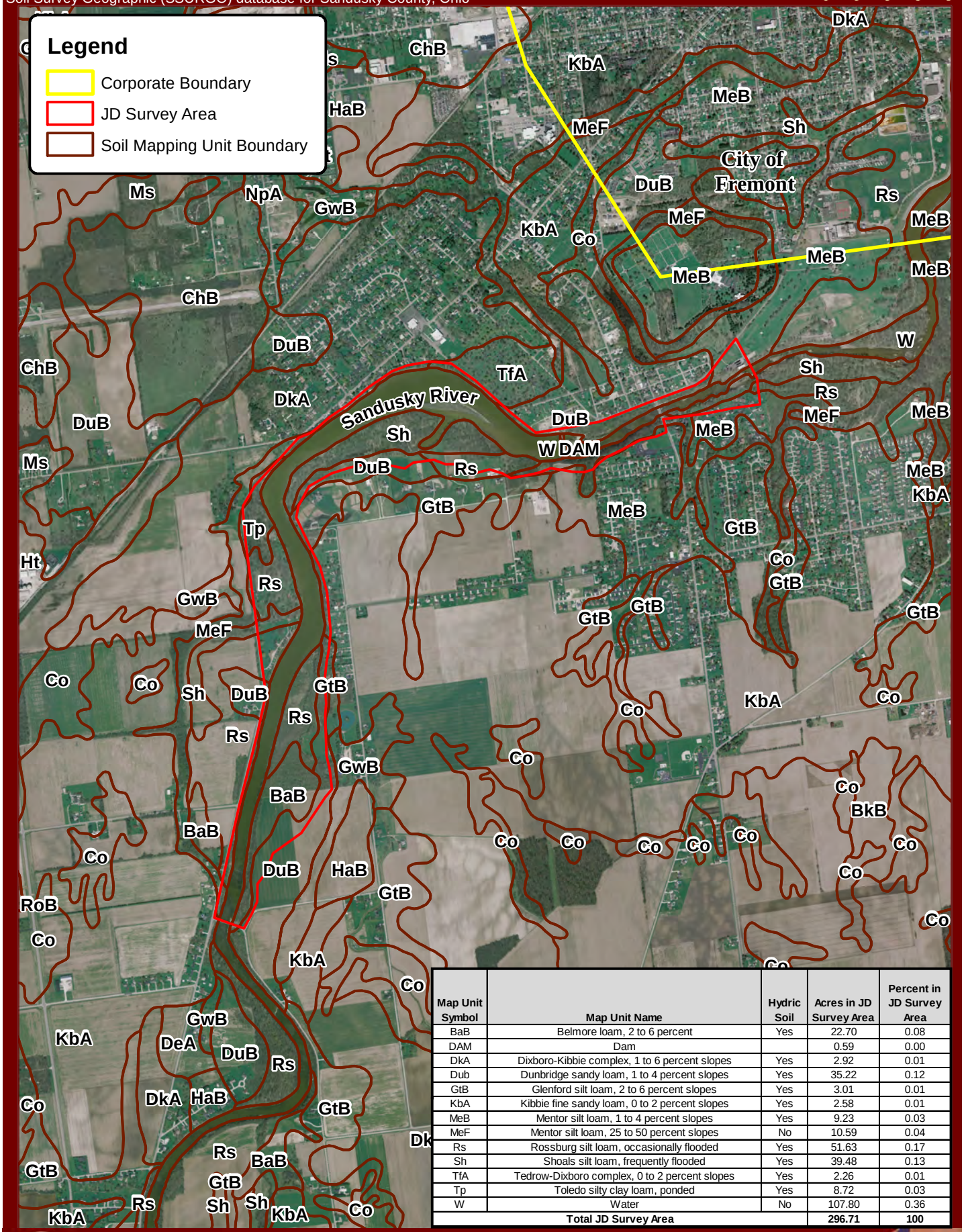
Stantec

11687 Lebanon Road Cincinnati, OH 45241 Phone 513.842.8200 Fax 513.842.8250 www.stantec.com

Figure 3-2. National Wetland Inventory

Ballville Dam Removal and Sandusky River Restoration Project
Fremont, OH

Soil Survey Geographic (SSURGO) database for Sandusky County, Ohio



Map Unit Symbol	Map Unit Name	Hydric Soil	Acres in JD Survey Area	Percent in JD Survey Area
BaB	Belmore loam, 2 to 6 percent	Yes	22.70	0.08
DAM	Dam		0.59	0.00
DkA	Dixboro-Kibbie complex, 1 to 6 percent slopes	Yes	2.92	0.01
Dub	Dunbridge sandy loam, 1 to 4 percent slopes	Yes	35.22	0.12
GtB	Glenford silt loam, 2 to 6 percent slopes	Yes	3.01	0.01
KbA	Kibbie fine sandy loam, 0 to 2 percent slopes	Yes	2.58	0.01
MeB	Mentor silt loam, 1 to 4 percent slopes	Yes	9.23	0.03
MeF	Mentor silt loam, 25 to 50 percent slopes	No	10.59	0.04
Rs	Rossburg silt loam, occasionally flooded	Yes	51.63	0.17
Sh	Shoals silt loam, frequently flooded	Yes	39.48	0.13
TfA	Tedrow-Dixboro complex, 0 to 2 percent slopes	Yes	2.26	0.01
Tp	Toledo silty clay loam, ponded	Yes	8.72	0.03
W	Water	No	107.80	0.36
Total JD Survey Area			**296.71**	**100**

U.S. Department of Agriculture, Natural Resources Conservation Service -- 03/16/2012

0 1,000 2,000 Feet

1 in = 2,000 ft

N

Stantec

11687 Lebanon Road Cincinnati, OH 45241 Phone 513.842.8200 Fax 513.842.8250 www.stantec.com

Figure 3-3 NRCS Soil Mapping Units

Ballville Dam Removal and Sandusky River Restoration Project
Fremont, OH

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The community map repository should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood insurance data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Ohio State Plane North zone 4401 (FIPSZONE 3401). The **horizontal datum** was NAD83. Differences in datum, ellipsoid, projection or state plane zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at (301) 713-3242 or visit its website at http://www.ngs.noaa.gov.

Base Map information shown on this FIRM was derived from the Sandusky County Regional Planning Commission and Sandusky County Tax Map/GIS office at a scale of 1:200 from photography dated 2006 and from USGS digital orthophoto quadrangles at a scale of 1:12,000 dated 1998 or later.

This map reflects more **detailed and up-to-date stream channel configurations** than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables in the Flood Insurance Study report (which contain authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on this map.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

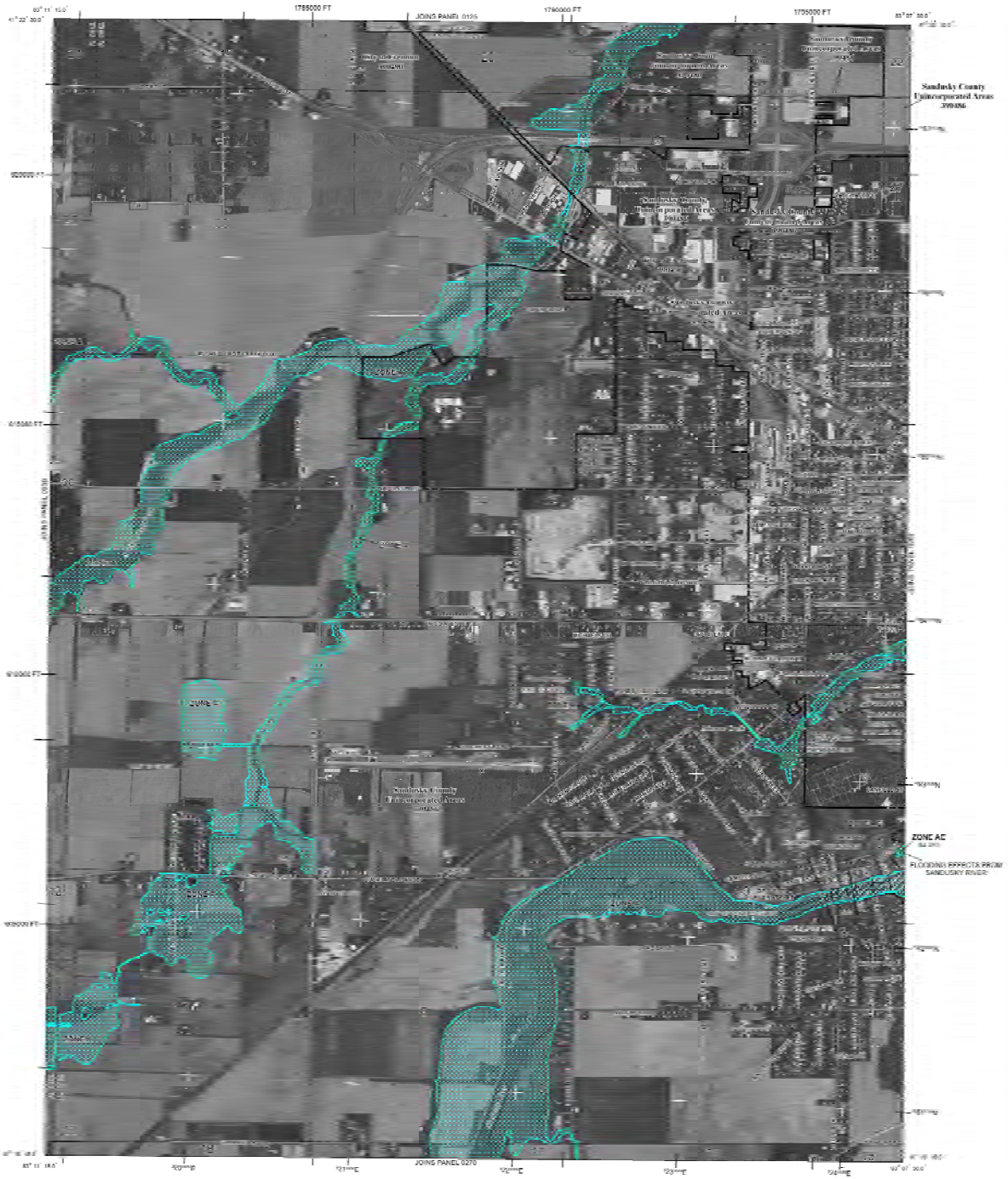
Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

For information on available products associated with this FIRM visit the **Map Service Center (MSC)** website at http://msc.fema.gov. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the MSC website.

If you have **questions about this map**, how to order products, or the National Flood Insurance Program in general, please call the **FEMA Map Information eXchange (FMIX)** at **1-877-FEMA-MAP** (1-877-336-2627) or visit the FEMA website at http://www.fema.gov/business/nfip.

The **profile base lines** depicted on this map represent the hydraulic modeling baselines that match the flood profiles in the FIS report. As a result of improved topographic data, the **profile base line**, in some cases, may deviate significantly from the channel centerline or appear outside the SFHA.

PANEL INDEX



NOT TO SCALE

LEGEND

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard may include Zones A, AE, AH, AO, AR, A99, V and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A — No Base Flood Elevations determined.

ZONE AE — Base Flood Elevations determined.

ZONE AH — Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.

ZONE AO — Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.

ZONE AR — Area of special flood hazard formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.

ZONE A99 — Area to be protected from 1% annual chance flood event by a federal flood protection system under construction; no Base Flood Elevations determined.

ZONE V — Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.

ZONE VE — Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X — Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X — Areas determined to be outside the 0.2% annual chance floodplain.

ZONE D — Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are generally located within or adjacent to Special Flood Hazard Areas.

1% annual chance floodplain boundary

0.2% annual chance floodplain boundary

Floodway boundary

Zone D boundary

CBRS and OPA boundary

Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.

Base Flood Elevation line and value; elevation in feet*

Base Flood Elevation value where uniform within zone; elevation in feet*

*Referenced to the North American Vertical Datum of 1988

(A) — (A) Cross section line

23 — 23 Transect line

97°07'30.0", 41°22'30.0" Geographic coordinates referenced to the North American Datum of 1983 (NAD 83)

4275000 FT Western Ohio Zone (FIPSZONE 3401) Ohio State Plane North Coordinate System

5000000 FT Universal Transverse Mercator grid values, zone 17

7000000 FT Western Ohio Zone (FIPSZONE 3401) Ohio State Plane North Coordinate System

MAP REPOSITORY

Refer to listing of Map Repositories on Map Index

EFFECTIVE DATE OF COUNTYWIDE
FLOOD INSURANCE RATE MAP
APRIL 18, 2011

MAP SCALE 1" = 1000'

FEET
METERS

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

NFIP

PANEL 0260C

FIRM

FLOOD INSURANCE RATE MAP

SANDUSKY COUNTY, OHIO

AND INCORPORATED AREAS

PANEL 260 OF 360

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

Figure 3-4

Notice to User: The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.

MAP NUMBER
39143C0260C

EFFECTIVE DATE
APRIL 18, 2011

Federal Emergency Management Agency

NATIONAL FLOOD INSURANCE PROGRAM

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Ohio State Plane North zone 4676 (FIPSZONE 3401). The **horizontal datum** was NAD83. Differences in datum, spheroid, projection or state plane zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713-3242** or visit its website at http://www.ngs.noaa.gov/.

Base Map information shown on this FIRM was derived from the Sandusky County Regional Planning Commission and Sandusky County Tax Map/GIS office at a scale of 1:200 from photography dated 2006 and from USGS digital orthophoto quadrangles at a scale of 1:12,000 dated 1996 or later.

This map reflects more detailed and up-to-date **stream channel configurations** than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables in the Flood Insurance Study report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on this map.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

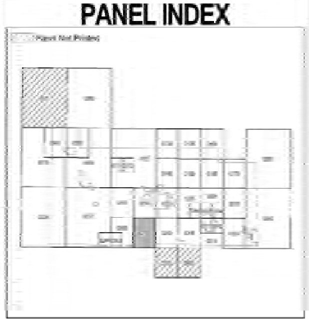
Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

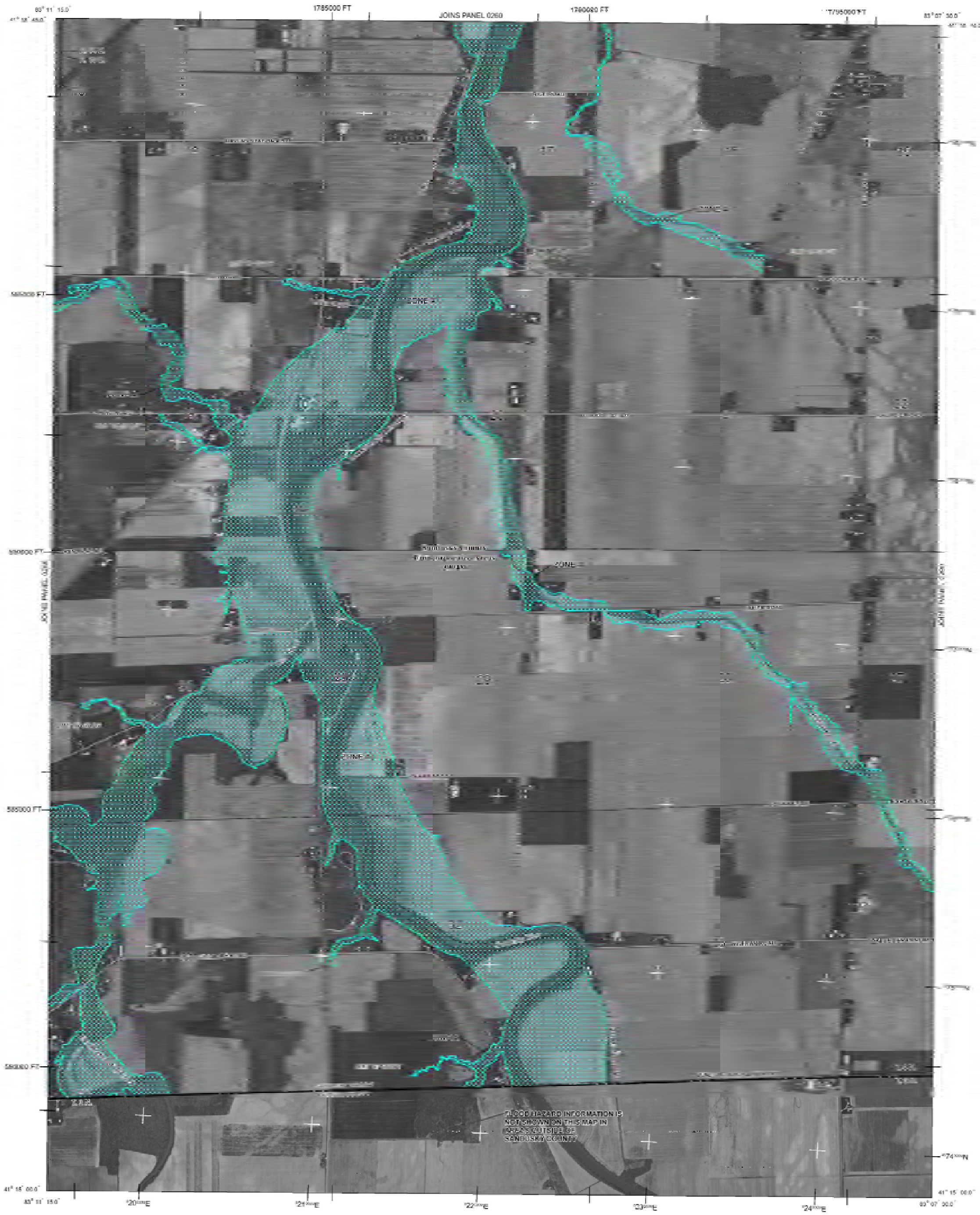
For information on available products associated with this FIRM visit the **Map Service Center (MSC)** website at http://msc.fema.gov. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the MSC website.

If you have **questions about this map**, how to order products, or the National Flood Insurance Program in general, please call the **FEMA Map Information eXchange (FMIX)** at **1-877-FEMA-MAP** (1-877-336-2627) or visit the FEMA website at http://www.fema.gov/business/nfip.

The **profile base lines** depicted on this map represent the hydraulic modeling baselines that match the flood profiles in the FIS report. As a result of improved topographic data, the **profile base line**, in some cases, may deviate significantly from the channel centerline or appear outside the SFHA.

PANEL INDEX





LEGEND

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

FLOODWAY AREAS IN ZONE AE

OTHER FLOOD AREAS

OTHER AREAS

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

MAP SCALE 1" = 1000'

NOT TO SCALE

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0270C

FIRM

FLOOD INSURANCE RATE MAP

SANDUSKY COUNTY, OHIO

AND INCORPORATED AREAS

PANEL 270 OF 360

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

Figure 3-5

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
39143C0270C

EFFECTIVE DATE
APRIL 18, 2011

Federal Emergency Management Agency

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

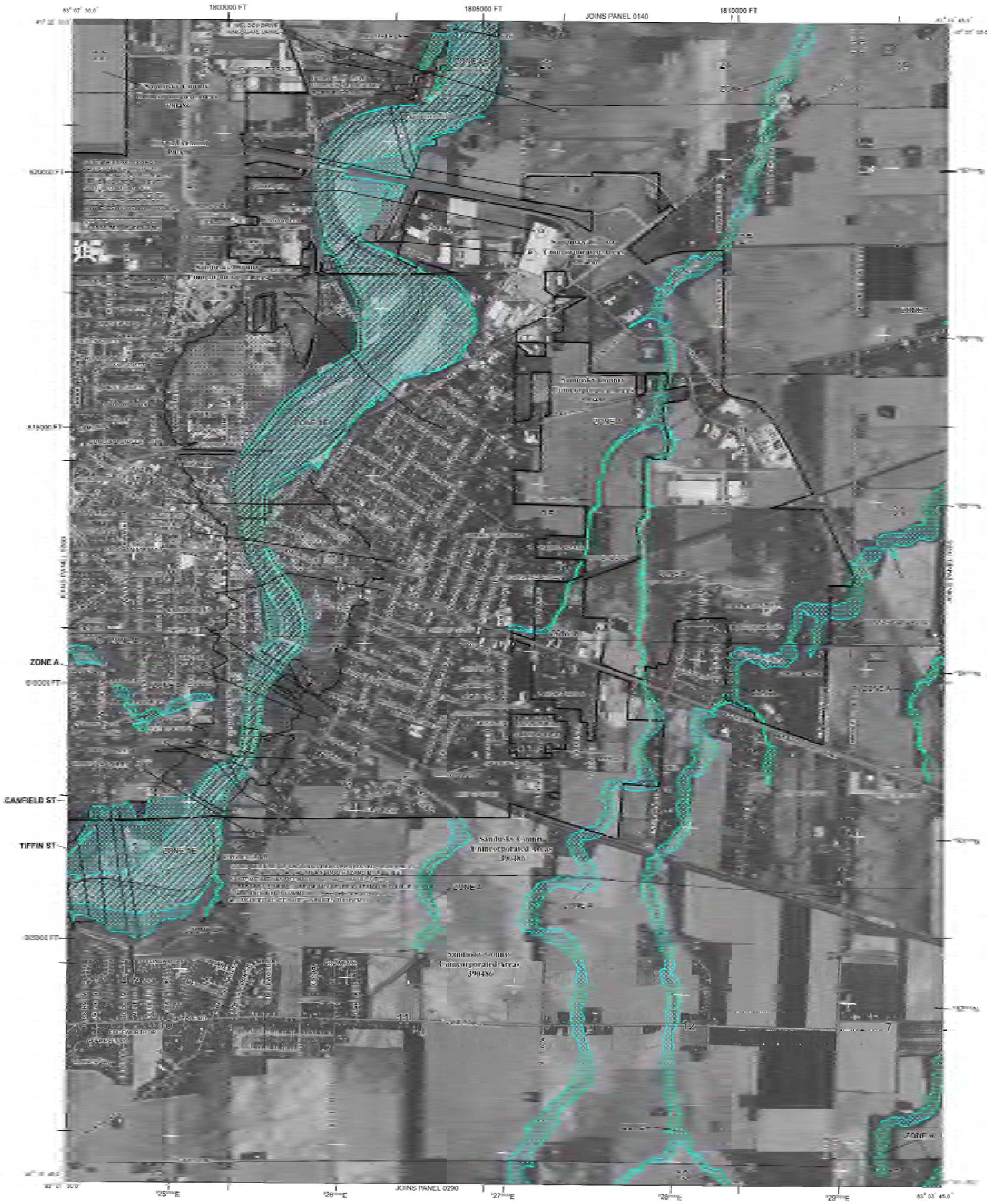
Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Ohio State Plane North zone [illegible]. The **horizontal datum** was NAD 83. Differences in datum, spheroid, projection or state plane zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

[illegible]

PANEL INDEX

Panel Not Printed



LEGEND

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

FLOODWAY AREAS IN ZONE AE

OTHER FLOOD AREAS

OTHER AREAS

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

MAP SCALE 1" = 1000'

PANEL 0280C

FIRM
FLOOD INSURANCE RATE MAP

SANDUSKY COUNTY, OHIO
AND INCORPORATED AREAS

PANEL 280 OF 360

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

Figure 3-6

MAP NUMBER 39143C0280C

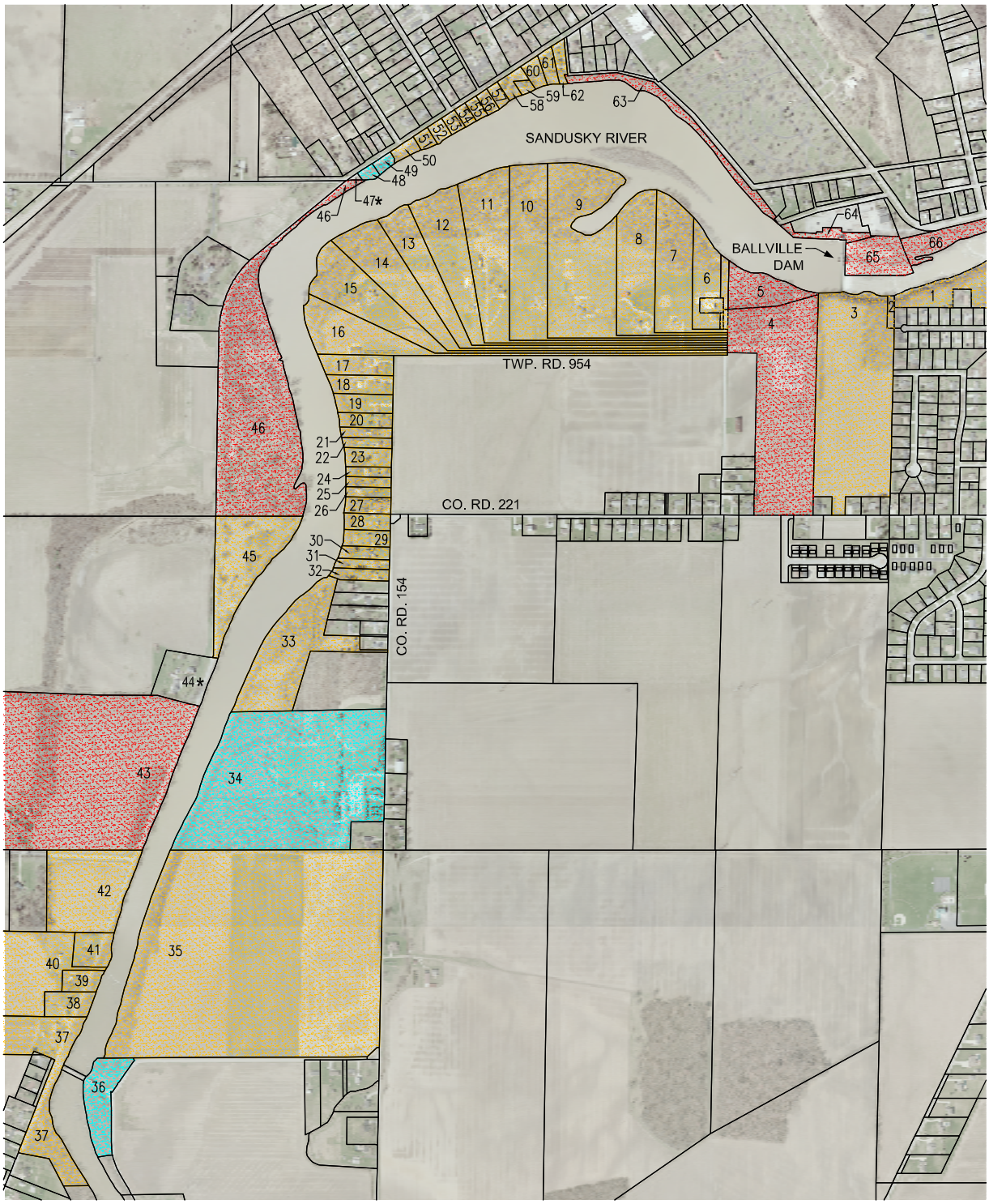
EFFECTIVE DATE APRIL 18, 2011

Federal Emergency Management Agency

NATIONAL FLOOD INSURANCE PROGRAM

NOT TO SCALE

FIGURE: C.1
PROPERTY SUMMARY



LEGEND

- Deed Is Inconclusive As To Property Boundaries
- Deed Reads To Within The River
- Deed Reads To The Water's Edge
- * Property Has No Frontage Along River

N

0 800' 1600'

SCALE IN FEET

September, 2011
175630015

Stantec Consulting Services Inc.
11687 Lebanon Road
Cincinnati, OH
45241-2012
Tel. 513.842.8200
Fax. 513.842.8250
www.stantec.com

Client/Project
City of Fremont
Ballville Dam
Removal

Figure No.
C.1 Figure. 3-7

Title
PROPERTY SUMMARY

NOT TO SCALE

Table: C.1
Deed Summary

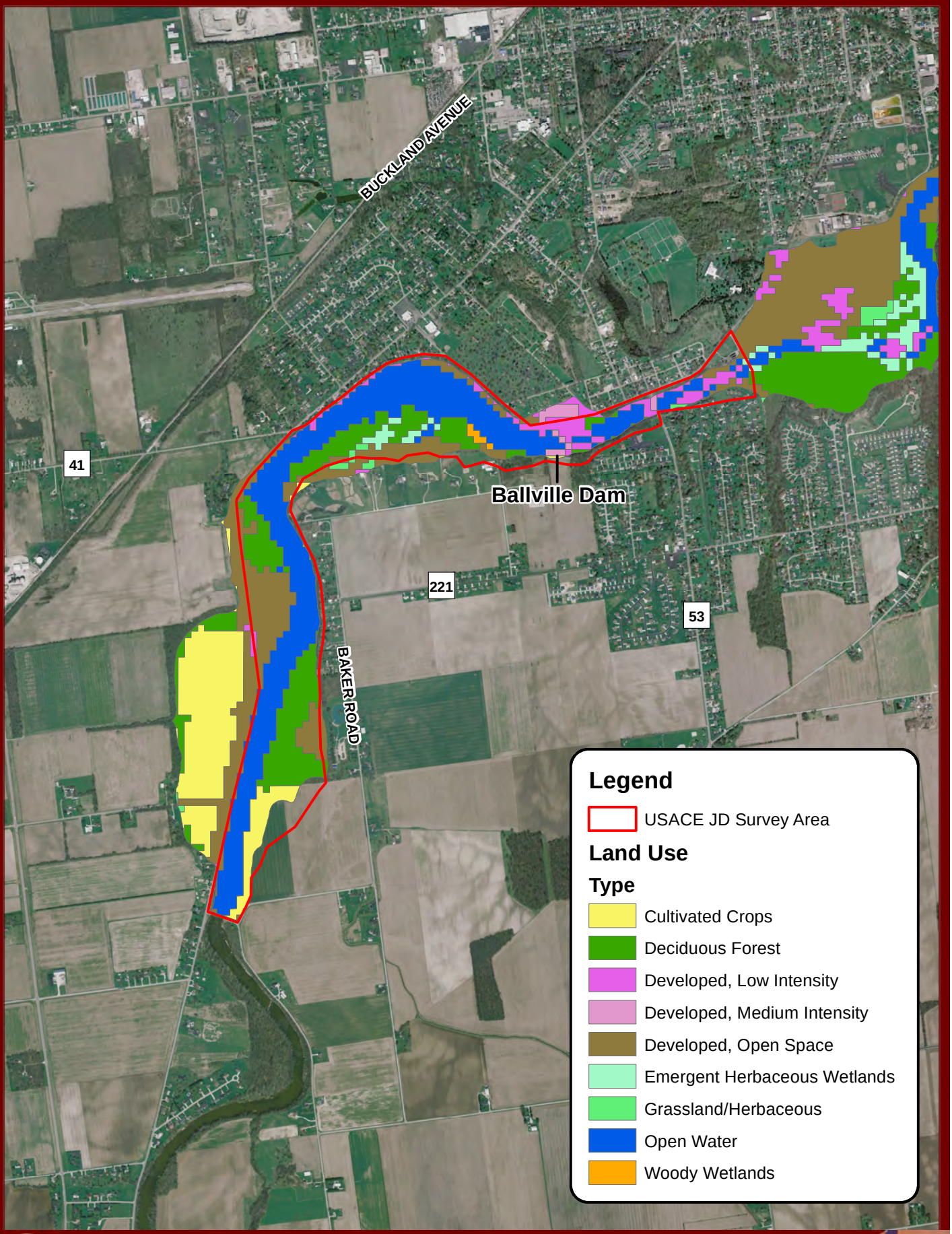
Map #	Parcel #	Owner	Property Address	Subdivision	Property Description
1	100900002200	First United Church of Christ	1500 Tiffin Road	Wayne Fiber	Deed Reads to Waters Edge
2	100900002001	O. Eugene & Delores Grabel	0 River Drive	Wayne Fiber	Deed Reads to Waters Edge
3	100900002003	Michael Properties Limited	0 West Cole Road		Deed Reads to Waters Edge
4	100900001801	Ohio Power Co	0 CR 158		Deed is Inconclusive as to Property Boundaries
5	100400003600	City of Fremont	0 River Street		Deed is Inconclusive as to Property Boundaries
6	100900005201	James A. Laird	1526 Yingling Road		Deed Reads to Waters Edge
7	100900005203	Richard N. & Susan Marie Kusmer	8 Laird Drive	Idylwild Estates	Deed Reads to Waters Edge
8	100900005202	R. Bradford & Patricia L. Culbert	16 Laird Drive	Idylwild Estates	Deed Reads to Waters Edge
9	100900005204	Willie H. & Diane J. Watts	24 Laird Drive	Idylwild Estates	Deed Reads to Waters Edge
10	100900005205	Alison V. Harrison	32 Laird Drive		Deed Reads to Waters Edge
11	100900005207	Gary J. Laird	40 Laird Drive	Idylwild Estates	Deed Reads to Waters Edge
12	100900005206	Charles R. & Michelle K. Ickes	48 Laird Drive	Idylwild Estates	Deed Reads to Waters Edge
13	100900005200	Scott L. Alexander	0 Laird Drive	Idylwild Estates	Deed Reads to Waters Edge
14	100900005208	Scott L. Alexander	0 Laird Drive	Idylwild Estates	Deed Reads to Waters Edge
15	100900005209	Scott L. Alexander	72 Laird Drive	Idylwild Estates	Deed Reads to Waters Edge
16	100800004100	Scott L. Alexander	72 Laird Drive	Idylwild Estates	Deed Reads to Waters Edge
17	100800003300	Jack W. Sr. & Roxanna Ferguson	1620 Baker Road		Deed Reads to Waters Edge
18	100800003100	John E. & Ruth A. Ferguson	1622 Baker Road		Deed Reads to Waters Edge
19	100800003800	Kathy A. Ferguson	1638 Baker Road		Deed Reads to Waters Edge
20	100800003500	Richard W. Baker & Barbara A. Davenport	1646 Baker Road		Deed Reads to Waters Edge
21	100800003600	Raymond J. & Stacy P. Rellinger	1700 Baker Road		Deed Reads to Waters Edge
22	100800001800	BTMI Investments Ltd LLC	1704 Baker Road		Deed Reads to Waters Edge
23	100800001600	William G. & Faye A. Mayer	1714 Baker Road		Deed Reads to Waters Edge
24	100800001300	Juliana T. Wright	1724 Baker Road		Deed Reads to Waters Edge
25	100800001500	Ronald E. & Ruth L. Davis	1732 Baker Road		Deed Reads to Waters Edge
26	100800001400	Wayne E. & Jeanine Graham	1740 Baker Road		Deed Reads to Waters Edge
27	100800001200	David P. May	1744 Baker Road		Deed Reads to Waters Edge
28	100800001900	Harold B. Fox	1800 Baker Road		Deed Reads to Waters Edge
29	100800002600	Harold B. Fox	1816 Baker Road		Deed Reads to Waters Edge
30	100800002900	Cheryl Lynn Oberst	1824 Baker Road		Deed Reads to Waters Edge
31	100800003000	Terry R. & Robin R. Hade	1828 Baker Road		Deed Reads to Waters Edge
32	100800002800	Thos. J. Kramer & Donna J. Hartley	1836 Baker Road		Deed Reads to Waters Edge
33	100800003700	James R. Hufford & Deborah A. Dimascio	1932 Baker Road		Deed Reads to Waters Edge
34	100800003900	Misty Meadows Inc.	2100 Baker Road		Deed Reads Boundary Extends Into River
35	101700001100	Ballville Twp. Board of Trustees	0 CR 209		Deed Reads to Waters Edge
36	101700000403	Township of Ballville	0 CR 209		Deed Reads Boundary Extends Into River
37	101700000100	Mildred Collins, TRT, etc.	2380 CR 132		Deed Reads to Waters Edge
38	101700002200	Rudolph W. & Jacqueline K. Smith	2346 South River Road		Deed Reads to Waters Edge
39	101700001600	Mildred Collins, TRT, etc.	2328 South River Road		Deed Reads to Waters Edge
40	101700001500	Gillmore Farms Inc.	0 South River Road		Deed Reads to Waters Edge
41	101700001400	Thomas L. & Robin L. Darr	2304 South River Road		Deed Reads to Waters Edge
42	101700000300	Janice L. Longanbach	0 CR 43		Deed Reads to Waters Edge
43	100800004300	Richard W. & Ellen M. May	724 CR 43		Deed is Inconclusive as to Property Boundaries
44	100800004401	Joseph G. Podach	2022 South River Road		*Deed Reads as No Water Front Property
45	100800004402	Eric D. & Sherrie A. Walters	1885 River Road		Deed Reads to Waters Edge
46	100800004600	City of Fremont	0 CR 132		Deed is Inconclusive as to Property Boundaries
47	100500002101	Yvonne J. & Jonathan E. Bowen	0 Buckland Avenue		*Deed Reads as No Water Front Property
48	100500002100	Albert Roehrich	2475 Buckland Avenue		Deed Reads Boundary Extends Into River
49	100500002200	David L. & Nancy W. Souder	2459 Buckland Avenue		Deed Reads Boundary Extends Into River
50	100400003900	Sue P. Babione	2447 Buckland Avenue		Deed Reads to Waters Edge
51	100400003801	Carol G. Dixon	2425 Buckland Avenue		Deed Reads to Waters Edge
52	100400003800	Thomas D. & Patricia A. Appleby	2401 Buckland Avenue		Deed Reads to Waters Edge
53	100400003700	Janis J. Balderama	2319 Buckland Avenue	Tucker	Deed Reads to Waters Edge
54	100400003701	Nancy J. Stoner	2317 Buckland Avenue	Tucker	Deed Reads to Waters Edge
55	100412000100	William W. & Nanci S. Britenburg	2311 Buckland Avenue	Tucker	Deed Reads to Waters Edge
56	100412000200	Roger W. Hafford	2303 Buckland Avenue	Tucker	Deed Reads to Waters Edge
57	100412000300	Roger W. Hafford	2303 Buckland Avenue	Tucker	Deed Reads to Waters Edge
58	100412000400	James R. & Roberta K. Sherck	2215 Buckland Avenue	Tucker	Deed Reads to Waters Edge
59	100412000503	James R. & Roberta K. Sherck	2215 Buckland Avenue	Tucker	Deed Reads to Waters Edge
60	100400000900	Gene A. & Linda M. Koschinski	2127 Buckland Avenue	Tucker	Deed Reads to Waters Edge
61	100400001000	Daniel K. Fry	2113 Buckland Avenue	Tucker	Deed Reads to Waters Edge
62	100400001100	Jesse Ernest & Wanda Sue Kelly	2105 Buckland Avenue	Tucker	Deed Reads to Waters Edge
63	100400003600	City of Fremont	0 River Street		Deed is Inconclusive as to Property Boundaries
64	109500010200	City of Fremont	0 Oakwood Street		Deed is Inconclusive as to Property Boundaries
65	109500010100	City of Fremont	0 River Street		Deed is Inconclusive as to Property Boundaries
66	100400003600	City of Fremont	0 River Street		Deed is Inconclusive as to Property Boundaries

September, 2011
175630015

Stantec Consulting Services Inc.
11687 Lebanon Road
Cincinnati, OH
45241-2012
Tel. 513.842.8200
Fax. 513.842.8250

Client/Project
City of Fremont
Ballville Dam Removal
Table No.
C.1
Title
Deed Summary

USGS Land Use Data 2006



0 1,000 2,000 Feet

1 inch = 2,000 feet

N

Figure 3-8. Land Use

Ballville Dam Removal and Sandusky River Restoration Project
Fremont, OH

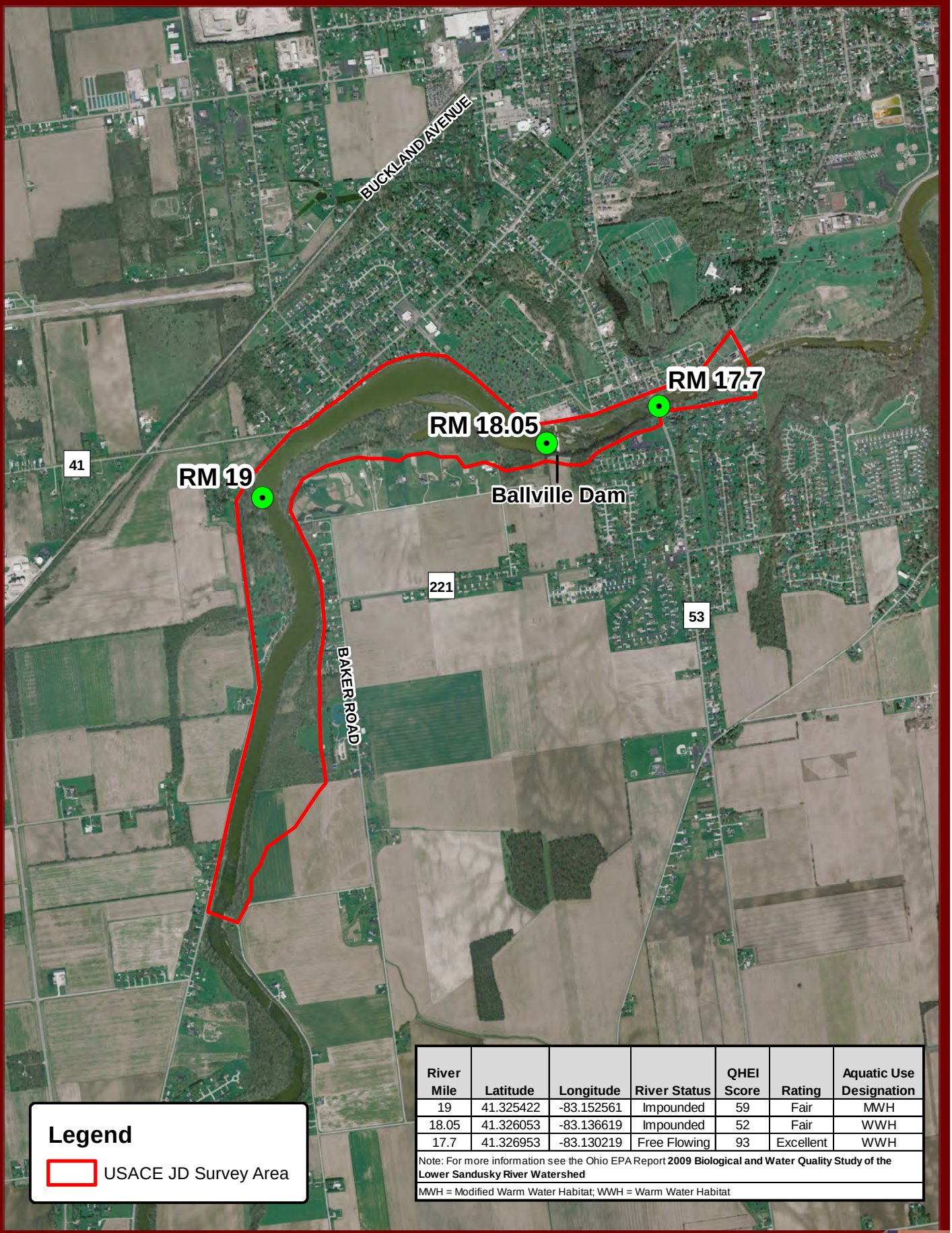
Stantec 11687 Lebanon Road Cincinnati, OH 45241 Phone 513.842.8200 Fax 513.842.8250 www.stantec.com

4.0 STREAMS ANALYSIS

The stream sampling points (QHEI) for the Sandusky River were evaluated in the report Biological and Water Quality Study of the Lower Sandusky River Watershed (OEPA, 2009). Three sampling locations were summarized and presented in Figure 4-1, representing 2 locations in the impoundment and 1 location downstream of the dam. The unnamed tributaries of the Sandusky River surrounding the project area considered JD features by the Corps (Appendix A- JD report) were evaluated by Stantec and are included in the following QHEI and HHEI datasheets and photolog (Section 4.2). Mapping of these unnamed tributaries can be found in Appendix A.

4.1 SANDUSKY RIVER

Qualitative Habitat Evaluation Index (QHEI) sampling was performed by the Ohio Environmental Protection Agency (OEPA) in 2009



River Mile	Latitude	Longitude	River Status	QHEI Score	Rating	Aquatic Use Designation
19	41.325422	-83.152561	Impounded	59	Fair	MWH
18.05	41.326053	-83.136619	Impounded	52	Fair	WWH
17.7	41.326953	-83.130219	Free Flowing	93	Excellent	WWH

Note: For more information see the Ohio EPA Report **2009 Biological and Water Quality Study of the Lower Sandusky River Watershed**

MWH = Modified Warm Water Habitat; WWH = Warm Water Habitat

QHEI Sampling Points present on this figure are approximate locations

0 1,000 2,000 Feet

1 inch = 2,000 feet

N

Figure 4-1. QHEI Sampling Locations

Ballville Dam Removal and Sandusky River Restoration Project
Fremont, OH

Stantec 11687 Lebanon Road Cincinnati, OH 45241 Phone 513.842.8200 Fax 513.842.8250 www.stantec.com

4.2 UNNAMED TRIBUTARIES

Ohio EPA — Qualitative Habitat Evaluation Index and Use Assessment Field Sheet

QHEI Score: 32

Stream & Location: Ballville Dam Stream #1 **RM:** ____ **Date:** 5/22/06

Stream #1 **Scorers Full Name & Affiliation:** Joey Sommonds/Lindsey Conley - Stantec

River Code: - - - **STORET #:** _____ **Lat./Long.:** 41.19138861 83.9153166 (NAD 83 - decimal °) Office verified location ☐

41.317747 -83.151477

1] SUBSTRATE

Check ONLY Two substrate TYPE BOXES; estimate % or note every type present

BEST TYPES	POOL	RIFFLE	OTHER TYPES	POOL	RIFFLE
☐ ☐ BLDR /SLABS [10]			☐ ☐ HARDPAN [4]		
☐ ☐ BOULDER [9]			☐ ☐ DETRITUS [3]	✓	
☐ ☐ COBBLE [8]			☐ ☑ MUCK [2]		
☐ ☑ GRAVEL [7]			☑ ☐ SILT [2]	✓	
☑ ☐ SAND [6]	✓	✓	☐ ☐ ARTIFICIAL [0]		
☐ ☐ BEDROCK [5]			(Score natural substrates; ignore sludge from point-sources)		

NUMBER OF BEST TYPES: ☐ 4 or more [2] ☑ 3 or less [0]

Comments

Check ONE (Or 2 & average)

ORIGIN	QUALITY
☐ LIMESTONE [1]	☑ HEAVY [-2]
☑ TILLS [1]	☐ MODERATE [-1]
☐ WETLANDS [0]	☐ NORMAL [0]
☐ HARDPAN [0]	☐ FREE [1]
☐ SANDSTONE [0]	☑ EXTENSIVE [-2]
☐ RIP/RAP [0]	☐ MODERATE [-1]
☐ LACUSTURINE [0]	☐ NORMAL [0]
☐ SHALE [-1]	☐ NONE [1]
☐ COAL FINES [-2]	

SILT

EMBEDDEDNESS

Substrate: 5 (Maximum 20)

2] INSTREAM COVER

Indicate presence 0 to 3: 0-Absent; 1-Very small amounts or if more common of marginal quality; 2-Moderate amounts, but not of highest quality or in small amounts of highest quality; 3-Highest quality in moderate or greater amounts (e.g., very large boulders in deep or fast water, large diameter log that is stable, well developed rootwad in deep / fast water, or deep, well-defined, functional pools.

0 UNDERCUT BANKS [1]	0 POOLS > 70cm [2]	0 OXBOWS, BACKWATERS [1]
1 OVERHANGING VEGETATION [1]	0 ROOTWADS [1]	0 AQUATIC MACROPHYTES [1]
0 SHALLOWS (IN SLOW WATER) [1]	0 BOULDERS [1]	1 LOGS OR WOODY DEBRIS [1]
0 ROOTMATS [1]		

AMOUNT — Check ONE (Or 2 & average)

- ☐ EXTENSIVE >75% [11]
- ☐ MODERATE 25-75% [7]
- ☑ SPARSE 5-<25% [3]
- ☐ NEARLY ABSENT <5% [1]

Comments

Cover: 5 (Maximum 20)

3] CHANNEL MORPHOLOGY

Check ONE in each category (Or 2 & average)

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY
☐ HIGH [4]	☐ EXCELLENT [7]	☐ NONE [6]	☐ HIGH [3]
☐ MODERATE [3]	☐ GOOD [5]	☐ RECOVERED [4]	☑ MODERATE [2]
☑ LOW [2]	☑ FAIR [3]	☑ RECOVERING [3]	☑ LOW [1]
☐ NONE [1]	☑ POOR [1]	☑ RECENT OR NO RECOVERY [1]	

Comments

Channel: 7 (Maximum 20)

4] BANK EROSION AND RIPARIAN ZONE

Check ONE in each category for EACH BANK (Or 2 per bank & average)

River right looking downstream

EROSION (L R)	RIPARIAN WIDTH (L R)	FLOOD PLAIN QUALITY (L R)	(L R)
☐ ☐ NONE / LITTLE [3]	☐ ☑ WIDE > 50m [4]	☐ ☑ FOREST, SWAMP [3]	☐ ☐ CONSERVATION TILLAGE [1]
☑ ☑ MODERATE [2]	☑ ☐ MODERATE 10-50m [3]	☑ ☐ SHRUB OR OLD FIELD [2]	☐ ☐ URBAN OR INDUSTRIAL [0]
☐ ☐ HEAVY / SEVERE [1]	☐ ☐ NARROW 5-10m [2]	☐ ☐ RESIDENTIAL, PARK, NEW FIELD [1]	☐ ☐ MINING / CONSTRUCTION [0]
	☐ ☐ VERY NARROW < 5m [1]	☐ ☐ FENCED PASTURE [1]	
	☐ ☐ NONE [0]	☐ ☐ OPEN PASTURE, ROWCROP [0]	
	3.5	2.5	

Indicate predominant land use(s) past 100m riparian.

Comments

Riparian: 7 (Maximum 10)

5] POOL / GLIDE AND RIFFLE / RUN QUALITY

MAXIMUM DEPTH (Check ONE (ONLY!))	CHANNEL WIDTH (Check ONE (Or 2 & average))	CURRENT VELOCITY (Check ALL that apply)	
☐ > 1m [6]	☐ POOL WIDTH > RIFFLE WIDTH [2]	☐ TORRENTIAL [-1]	☑ SLOW [1]
☐ 0.7-<1m [4]	☐ POOL WIDTH = RIFFLE WIDTH [1]	☐ VERY FAST [1]	☐ INTERSTITIAL [-1]
☐ 0.4-<0.7m [2]	☑ POOL WIDTH > RIFFLE WIDTH [0]	☐ FAST [1]	☐ INTERMITTENT [-2]
☑ 0.2-<0.4m [1]		☑ MODERATE [1]	☐ EDDIES [1]
☐ < 0.2m [0]		Indicate for reach - pools and riffles.	

Recreation Potential
Primary Contact
Secondary Contact
(circle one and comment on back)

Comments

Pool / Current: 3 (Maximum 12)

Indicate for functional riffles; Best areas must be large enough to support a population of riffle-obligate species: Check ONE (Or 2 & average). ☐ NO RIFFLE [metric=0]

RIFFLE DEPTH	RUN DEPTH	RIFFLE / RUN SUBSTRATE	RIFFLE / RUN EMBEDDEDNESS
☐ BEST AREAS > 10cm [2]	☐ MAXIMUM > 50cm [2]	☐ STABLE (e.g., Cobble, Boulder) [2]	☐ NONE [2]
☑ BEST AREAS 5-10cm [1]	☑ MAXIMUM < 50cm [1]	☐ MOD. STABLE (e.g., Large Gravel) [1]	☐ LOW [1]
☐ BEST AREAS < 5cm [metric=0]		☑ UNSTABLE (e.g., Fine Gravel, Sand) [0]	☑ MODERATE [0]
			☐ EXTENSIVE [-1]

Comments

Riffle / Run: 2 (Maximum 8)

6] GRADIENT

(5 ft/mi) ☑ VERY LOW - LOW [2-4] ☐ MODERATE [6-10] ☐ HIGH - VERY HIGH [10-6]

DRAINAGE AREA (2.67 mi²)

%POOL: 5 %GLIDE: 95 %RUN: 5 %RIFFLE: 5

Gradient: 3 (Maximum 10)

A] SAMPLE REACH
Check ALL that apply

Comment RE: Reach consistency/Is reach typical of steam?, R ition/Observed - Inferred, Other/Sampling observations, Concerns, Access direct etc.

minow species observed
snail species observed photo 1381 , 1382

METHOD
- ☐ BOAT
- ☐ WADE
- ☐ LINE
- ☑ OTHER

STAGE (1st-sample pass- 2nd)
- ☐ HIGH ☐
- ☐ UP ☐
- ☐ NORMAL ☐
- ☑ LOW ☐
- ☐ DRY ☐

DISTANCE
- ☐ 0.5 Km
- ☐ 0.2 Km
- ☐ 0.15 Km
- ☑ 0.12 Km
- ☐ OTHER

_____ meters

CLARITY (1st --sample pass-- 2nd)
- ☐ < 20 cm ☐
- ☐ 20-<40 cm ☐
- ☐ 40-70 cm ☐
- ☐ > 70 cm/ CTB ☐
- ☐ SECCHI DEPTH ☐

1st pass _____ cm
2nd _____ cm

CANOPY
- ☑ > 85%- OPEN
- ☐ 55%-<85%
- ☐ 30%-<55%
- ☐ 10%-<30%
- ☐ <10%- CLOSED

B] AESTHETICS
- ☑ NUISANCE ALGAE
- ☐ INVASIVE MACROPHYTES
- ☐ EXCESS TURBIDITY
- ☐ DISCOLORATION
- ☐ FOAM / SCUM
- ☐ OIL SHEEN
- ☐ TRASH / LITTER
- ☐ NUISANCE ODOR
- ☐ SLUDGE DEPOSITS
- ☐ CSOs/SSOs/OUTFALLS

C] RECREATION AREA DEPTH
POOL: ☐>100ft² ☐>3ft

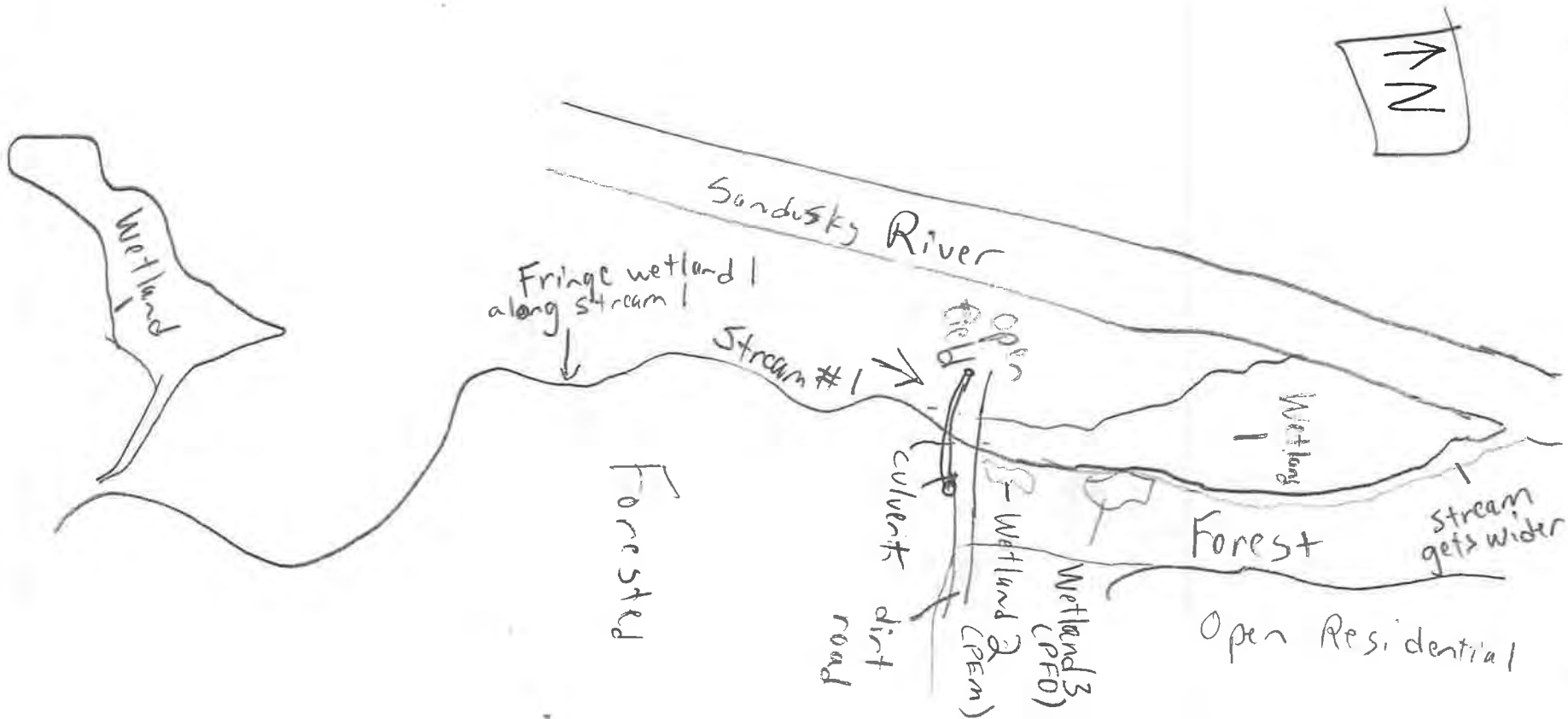
D] MAINTENANCE Circle some & COMMENT
PUBLIC / PRIVATE / BOTH / NA
ACTIVE / HISTORIC / BOTH / NA
YOUNG-SUCCESSION-OLD
SPRAY / SNAG / REMOVED
MODIFIED / DIPPED OUT / NA
LEVEED / ONE SIDED
RELOCATED / CUTOFFS
MOVING-BEDLOAD-STABLE
ARMOURED / SLUMPS
ISLANDS / SCOURED
IMPOUNDED / DESICCATED
FLOOD CONTROL / DRAINAGE

E] ISSUES
WWTP / CSO / NPDES / INDUSTRY
HARDENED / URBAN / DIRT&GRIME
CONTAMINATED / LANDFILL
BMPs-CONSTRUCTION-SEDIMENT
LOGGING / IRRIGATION / COOLING
BANK / EROSION / SURFACE
FALSE BANK / MANURE / LAGOON
WASH H_20 / TILE / H_20 TABLE
ACID / MINE / QUARRY / FLOW
NATURAL / WETLAND / STAGNANT
PARK / GOLF / LAWN / HOME
ATMOSPHERE / DATA PAUCITY

F] MEASUREMENTS
- x̄ width 3 m
- x̄ depth 30 cm
- max. depth 75 cm
- x̄ bankfull width 3 m
- bankfull x̄ depth 30 cm
- W/D ratio
- bankfull max. depth
- floodprone x^2 width
- entrench. ratio

Legacy Tree:

Stream Drawing:



Ohio EPA Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3) : 43

SITE NAME/LOCATION Ballville Dam Stream 2
Stream 2 SITE NUMBER S-2 RIVER BASIN Sandusky DRAINAGE AREA (mi²) 0.080
LENGTH OF STREAM REACH (ft) 200 LAT. 41°19'14.01" LONG 83°9'14.636" RIVER CODE N/A RIVER MILE N/A
DATE 5/26/2002 SCORER JS, LC COMMENTS 7x 2 (depth) Intermittent-Perennial

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions

STREAM CHANNEL ☐ NONE / NATURAL CHANNEL ☐ RECOVERED ☑ RECOVERING ☐ RECENT OR NO RECOVERY

MODIFICATIONS: Stream channelized

1. SUBSTRATE (Estimate percent of every type of substrate present. Check *ONLY* two predominant substrate *TYPE* boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

TYPE		PERCENT	TYPE		PERCENT
☐ ☐	BLDR SLABS **[16 pts]**		☑ ☑	SILT **[3 pt]**	95
☐ ☐	BOULDER (>256 mm) **[16 pts]**		☐ ☐	LEAF PACK/WOODY DEBRIS **[3 pts]**	
☐ ☐	BEDROCK **[16 pt]**		☐ ☐	FINE DETRITUS **[3 pts]**	5
☐ ☐	COBBLE (65-256 mm) **[12 pts]**		☐ ☐	CLAY or HARDPAN **[0 pt]**	
☐ ☐	GRAVEL (2-64 mm) **[9 pts]**		☐ ☐	MUCK **[0 pts]**	
☐ ☐	SAND (<2 mm) **[6 pts]**		☐ ☐	ARTIFICIAL **[3 pts]**	

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock 0 (A) 6 (B) 2

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: **TOTAL NUMBER OF SUBSTRATE TYPES:**

2. Maximum Pool Depth ***(Measure the maximum pool depth within the 61 meter (200 ft)*** evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check *ONLY* one box):

☐ > 30 centimeters **[20 pts]**
☐ > 22.5 - 30 cm **[30 pts]**
☐ > 10 - 22.5 cm **[25 pts]**
☑ > 5 cm - 10 cm **[15 pts]**
☐ < 5 cm **[5 pts]**
☐ NO WATER OR MOIST CHANNEL **[0 pts]**

COMMENTS **MAXIMUM POOL DEPTH (centimeters):** 10

3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) **(Check *ONLY* one box):**

☐ > 4.0 meters (> 13') **[30 pts]**
☐ > 3.0 m - 4.0 m (> 9' 7" - 13') **[25 pts]**
☑ > 1.5 m - 3.0 m (> 9' 7" - 4' 8") **[20 pts]**
☐ > 1.0 m - 1.5 m (> 3' 3" - 4' 8") **[15 pts]**
☐ ≤ 1.0 m (≤ 3' 3") **[5 pts]**

COMMENTS **AVERAGE BANKFULL WIDTH (meters)** 2

HHEI Metric Points

Substrate Max = 40	8
A + B	
Pool Depth Max = 30	15
Bankfull Width Max=30	20

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY ☆NOTE: River Left (L) and Right (R) as looking downstream☆

L	R	RIPARIAN WIDTH (Per Bank)	L	R	FLOODPLAIN QUALITY (Most Predominant per Bank)	L	R	
☑	☐	Wide >10m	☑	☐	Mature Forest, Wetland	☐	☐	Conservation Tillage
☐	☐	Moderate 5-10m	☐	☐	Immature Forest, Shrub or Old Field	☐	☐	Urban or Industrial
☐	☐	Narrow <5m	☐	☑	Residential, Park, New Field	☐	☐	Open Pasture, Row Crop
☐	☑	None	☐	☐	Fenced Pasture	☐	☐	Mining or Construction

COMMENTS

FLOW REGIME *(At Time of Evaluation)* (Check *ONLY* one box):

☑ Stream Flowing
☐ Subsurface flow with isolated pools (Interstitial)
☐ Moist Channel, isolated pools, no flow (Intermittent)
☐ Dry channel, no water (Ephemeral)

COMMENTS

SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check *ONLY* one box):

☑ None
☐ 0.5
☐ 1.0
☐ 1.5
☐ 2.0
☐ 2.5
☐ 3.0
☐ >3

STREAM GRADIENT ESTIMATE

☑ Flat (0.5 ft/100 ft) ☐ Flat to Moderate ☐ Moderate (2 ft/100 ft) ☐ Moderate to Severe ☐ Severe (10 ft/100 ft)

October 24, 2002 Revision

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):

QHEI PERFORMED? - ☐ Yes ☑ No QHEI Score _____ (If Yes, Attach Completed QHEI Form)

DOWNSTREAM DESIGNATED USE(S)

☐ WWH Name: _____ Distance from Evaluated Stream _____

☐ CWH Name: _____ Distance from Evaluated Stream _____

☐ EWH Name: _____ Distance from Evaluated Stream _____

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION

USGS Quadrangle Name: Fremont West NRCS Soil Map Page: _____ NRCS Soil Map Stream Order _____

County: Sandusky Township / City: Ballville ; Fremont, OH

MISCELLANEOUS

Base Flow Conditions? (Y/N): N Date of last precipitation: May 9, 2012 Quantity: 6.10mm

Photograph Information: 1493 , 1494

Elevated Turbidity? (Y/N): Y Canopy (% open): 95%

Were samples collected for water chemistry? (Y/N): N (Note lab sample no. or id. and attach results) Lab Number: _____

Field Measures: Temp (°C) _____ Dissolved Oxygen (mg/l) _____ pH (S.U.) _____ Conductivity (µmhos/cm) _____

Is the sampling reach representative of the stream (Y/N) N If not, please explain: Sample taken at road in channelized section, silt bed

Additional comments/description of pollution impacts: _____

BIOTIC EVALUATION

Performed? (Y/N): N (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)

Fish Observed? (Y/N)____ Voucher? (Y/N)____ Salamanders Observed? (Y/N)____ Voucher? (Y/N)____

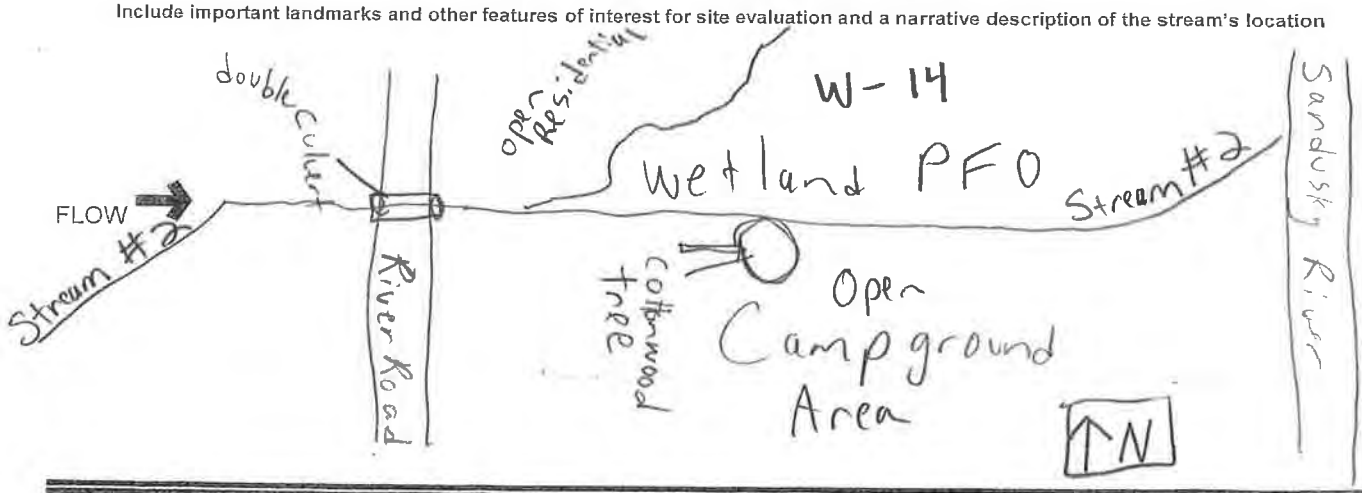
Frogs or Tadpoles Observed? (Y/N) Y Voucher? (Y/N)____ Aquatic Macroinvertebrates Observed? (Y/N)____ Voucher? (Y/N)____

Comments Regarding Biology: Frogs observed

Stream covered by herbaceous vegetation — Phalaris arundinaceae, Justicia americana, polygonum hydropiperoides

DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed):

Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location



Ohio EPA Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3) : 59

SITE NAME/LOCATION Ballville Dam - D.S. of Dam next to Wetland 7
Stream 3 SITE NUMBER S-3 RIVER BASIN Sandusky DRAINAGE AREA (mi²) .027
LENGTH OF STREAM REACH (ft) 200 LAT. 41°19'32.071 LONG. 83°8'4.109 RIVER CODE N/A RIVER MILE N/A
DATE 5/24/2012 SCORER JS, LC COMMENTS 4'x .5' (depth) - Ephemera / Drain

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions

STREAM CHANNEL MODIFICATIONS: ☑ NONE / NATURAL CHANNEL ☐ RECOVERED ☐ RECOVERING ☐ RECENT OR NO RECOVERY

1. SUBSTRATE (Estimate percent of every type of substrate present. Check *ONLY* two predominant substrate *TYPE* boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

TYPE		PERCENT	TYPE		PERCENT
☐ ☑	BLDR SLABS **[16 pts]**		☐ ☐	SILT **[3 pt]**	5
☑ ☐	BOULDER (>256 mm) **[16 pts]**	20	☐ ☐	LEAF PACK/WOODY DEBRIS **[3 pts]**	
☑ ☐	BEDROCK **[16 pt]**	50	☐ ☐	FINE DETRITUS **[3 pts]**	5
☐ ☐	COBBLE (65-256 mm) **[12 pts]**	5	☐ ☐	CLAY or HARDPAN **[0 pt]**	
☐ ☐	GRAVEL (2-64 mm) **[9 pts]**	10	☐ ☐	MUCK **[0 pts]**	
☐ ☐	SAND (<2 mm) **[6 pts]**	5	☐ ☐	ARTIFICIAL **[3 pts]**	

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock 75 (A) 32

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: **TOTAL NUMBER OF SUBSTRATE TYPES:** (B) 7

HHEI Metric Points

Substrate Max = 40 39

A + B

2. Maximum Pool Depth ***(Measure the maximum pool depth within the 61 meter (200 ft)*** evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check *ONLY* one box):

☐ > 30 centimeters **[20 pts]**
☐ > 22.5 - 30 cm **[30 pts]**
☐ > 10 - 22.5 cm **[25 pts]**
☐ > 5 cm - 10 cm **[15 pts]**
☑ < 5 cm **[5 pts]**
☐ NO WATER OR MOIST CHANNEL **[0 pts]**

COMMENTS almost dry channel **MAXIMUM POOL DEPTH (centimeters):** 4

Pool Depth Max = 30 5

3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) **(Check *ONLY* one box):**

☐ > 4.0 meters (> 13') **[30 pts]**
☐ > 3.0 m - 4.0 m (> 9' 7" - 13') **[25 pts]**
☐ > 1.5 m - 3.0 m (> 9' 7" - 4' 8") **[20 pts]**
☑ > 1.0 m - 1.5 m (> 3' 3" - 4' 8") **[15 pts]**
☐ ≤ 1.0 m (≤ 3' 3") **[5 pts]**

COMMENTS **AVERAGE BANKFULL WIDTH (meters)** 1.5

Bankfull Width Max=30 15

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY ☆NOTE: River Left (L) and Right (R) as looking downstream☆

RIPARIAN WIDTH L	R	(Per Bank)	FLOODPLAIN QUALITY L	R	(Most Predominant per Bank)	L	R	
☑	☑	Wide >10m	☐	☐	Mature Forest, Wetland	☐	☐	Conservation Tillage
☐	☐	Moderate 5-10m	☑	☑	Immature Forest, Shrub or Old Field	☐	☐	Urban or Industrial
☐	☐	Narrow <5m	☐	☐	Residential, Park, New Field	☐	☐	Open Pasture, Row Crop
☐	☐	None	☐	☐	Fenced Pasture	☐	☐	Mining or Construction

COMMENTS

FLOW REGIME *(At Time of Evaluation)* (Check *ONLY* one box):

☐ Stream Flowing
☐ Subsurface flow with isolated pools (Interstitial)
☑ Moist Channel, isolated pools, no flow (Intermittent)
☐ Dry channel, no water (Ephemeral)

COMMENTS

SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check *ONLY* one box):

☐ None ☐ 1.0 ☐ 2.0 ☐ 3.0
☑ 0.5 ☐ 1.5 ☐ 2.5 ☐ >3

STREAM GRADIENT ESTIMATE

☐ Flat (0.5 ft/100 ft) ☐ Flat to Moderate ☐ Moderate (2 ft/100 ft) ☑ Moderate to Severe ☐ Severe (10 ft/100 ft)

October 24, 2002 Revision

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):

QHEI PERFORMED? - ☐ Yes ☑ No QHEI Score _____ (If Yes, Attach Completed QHEI Form)

DOWNSTREAM DESIGNATED USE(S)

☐ WWH Name: _____ Distance from Evaluated Stream _____

☐ CWH Name: _____ Distance from Evaluated Stream _____

☐ EWH Name: _____ Distance from Evaluated Stream _____

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION

USGS Quadrangle Name: Fremont West NRCS Soil Map Page: _____ NRCS Soil Map Stream Order _____

County: Sandusky Township / City: Ballville / Fremont, OH

MISCELLANEOUS

Base Flow Conditions? (Y/N): N Date of last precipitation: May 9, 2012 Quantity: 6.10 mm

Photograph Information: 1448 - mouth 1449 US 1450 DS

Elevated Turbidity? (Y/N): N Canopy (% open): 15

Were samples collected for water chemistry? (Y/N): N (Note lab sample no. or id. and attach results) Lab Number: _____

Field Measures: Temp (°C) _____ Dissolved Oxygen (mg/l) _____ pH (S.U.) _____ Conductivity (µmhos/cm) _____

Is the sampling reach representative of the stream (Y/N) Y If not, please explain: _____

Additional comments/description of pollution impacts: _____

BIOTIC EVALUATION

Performed? (Y/N): N (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)

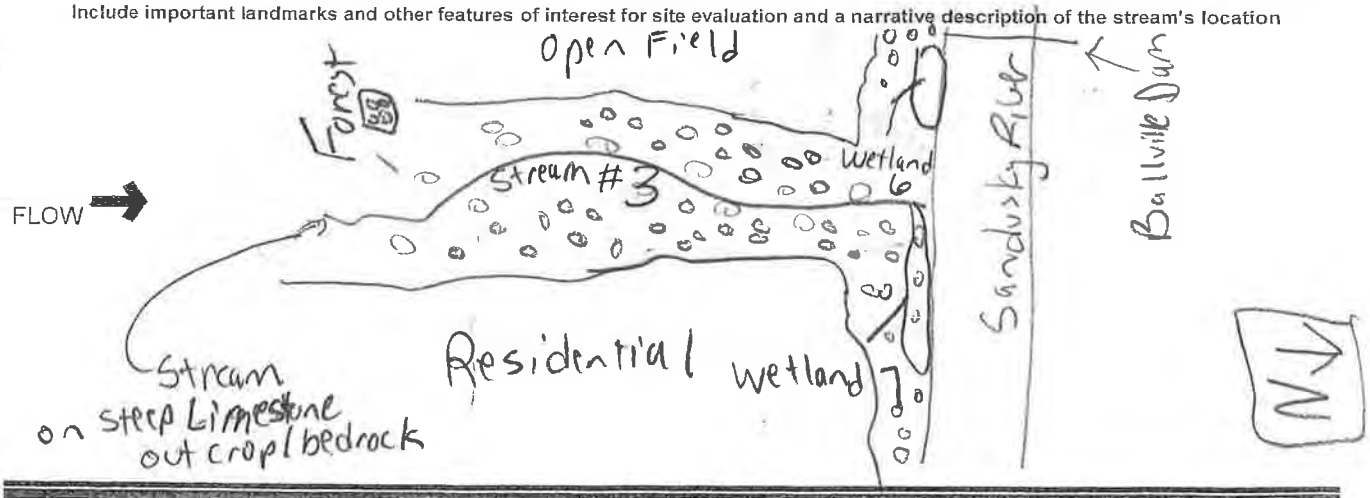
Fish Observed? (Y/N)_____ Voucher? (Y/N)_____ Salamanders Observed? (Y/N)_____ Voucher? (Y/N)_____

Frogs or Tadpoles Observed? (Y/N)_____ Voucher? (Y/N)_____ Aquatic Macroinvertebrates Observed? (Y/N)_____ Voucher? (Y/N)_____

Comments Regarding Biology: _____

DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed):

Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location



4.2.1 Photo Log for Unnamed Tributaries

Stream 1: viewing upstream about 50 ‘ upstream of culvert (5/22/2012)

Stream 1: viewing downstream about 50’ upstream of culvert (5/22/2013)

Stream 1: viewing upstream about 2000’ upstream of culvert (5/22/2012)

Stream 2: viewing upstream from South River Road, stream shows channelization (5/23/2012)

Stream 2: viewing downstream from South River Road, stream shows channelization (5/23/2012)

Stream 3: viewing upstream in HHEI sampling reach(5/24/2012)

Stream 3: viewing downstream in HHEI sampling reach(5/24/2012)

Stream 3: viewing upstream from the Sandusky River bank (5/24/2012)

5.0 Agency Correspondence

5.1 OHIO DEPARTMENT OF NATURAL RESOURCES

DATA REQUEST FORM

OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF WILDLIFE
OHIO BIODIVERSITY DATABASE PROGRAM
2045 MORSE RD., BLDG. G-3
COLUMBUS, OHIO 43229-6693
PHONE: 614-265-6452; FAX: 614-267-3096

INSTRUCTIONS:
Please complete both sides of this form, sign and return it to the address or fax number given above along with: **(1)** a brief letter describing your project, and **(2)** a map detailing the boundaries of your project site. A copy of the pertinent portion of a USGS 7.5 minute topographic map is preferred but other maps are acceptable. Our turnaround time is two weeks, although we can often respond more quickly. If you fax in your request you do not need to mail the original unless otherwise requested.

FEES:
As of June 2010, we have temporarily suspended charging a fee until a review of the data request process has been completed.

WHAT WE PROVIDE: The Biodiversity Database is the most comprehensive source of information on the location of Ohio's rare species and significant natural features. Records for the following will be provided: plants and animals (state and federal listed species), high quality plant communities, geologic features, breeding animal concentrations and unprotected significant natural areas. We also provide locations for managed areas including federal, state, county, local and non-profit sites, as well as state and national scenic rivers. A minimum one mile radius around the project site will automatically be searched. Because the data is sensitive information, it is our policy to provide only the data needed to complete your project.

****

Date: 1-28-2011 Company name: Stantec Consulting Services

Name of person response letter should be addressed to: Mr. ☒ Ms. ☐
T.C. Dinkins

Address: 11687 Lebanon Rd

City/State/Zip: Cincinnati, OH 45241-2012

Phone: (513) 842-8227 Fax: (513) 842-8250

E-mail address: Timothy.Dinkins@Stantec.com

Project Name: Ballville Dam Removal

Project Number: 175630015

Project Site Address: N 41.327008 W-83.134087

Project County: Sandusky Co.

Project City/Township: Fremont, OH

Project site is located on the following USGS 7.5 minute topographic quad(s):

Fremont East

Description of work to be performed at the project site: The Ballville is scheduled to be removed by end of 2012

How do you want your data reported? (Both formats provide exactly the same data. The only difference is in the format of our response. The manual search is most appropriate for small scale projects or for those who do not have GIS capabilities. Please choose only one option.)

Printed list and map (manual search) _____ **OR** GIS shapefile (computer search) X

Additional information you require:

How will the information be used? To determine if any species of special concern have historically been found near project area.

I certify that data supplied by the Ohio Biodiversity Database Program will not be published without crediting the ODNR Division of Wildlife as the source of the material. In addition, I certify that electronic datasets will not be distributed to others without the consent of the Division of Wildlife, Ohio Biodiversity Program.

Signature [signature]

Date: 1-28-2011

DNR 5203
REV 8/2010

Ohio Department of Natural Resources

JOHN R. KASICH, GOVERNOR | DAVID MUSTINE, DIRECTOR

PN: 175630015

Ohio Division of Wildlife
Office of the Chief
2045 Morse Rd., Bldg. G
Columbus, OH 43229-6693
Phone: (614) 265-6300

January 28, 2011

Tim Dinkins
Stantec Consulting Services
11687 Lebanon Rd.
Cincinnati, OH 45241

Dear Mr. Dinkins:

Per your request, I have e-mailed you a set of ArcView shape files with our Biodiversity Database records for the Ballville Dam Removal project ('data'), including a one mile radius, in Fremont, Sandusky County, and on the Fremont West Quad (175630015). The files are projected in NAD83 Ohio State Plane South. The units are feet. This data will not be published or distributed beyond the scope of the project description on the data request form without prior written permission of the Biodiversity Database Program.

Records included may be for rare and endangered plants and animals, geologic features, high quality plant communities and animal assemblages. Fields included are scientific and common names, state and federal statuses, as well as managed area and date of the most recent observation. State and federal statuses are defined as: E = endangered, T = threatened, P = potentially threatened, SC = species of concern, SI = special interest, FE = federal endangered, FT = federal threatened and A=recently added to inventory, status not yet determined.

A layer for state designated scenic rivers ('sr') is included. If this project is located within 1000 feet of a state designated scenic river, the approval of the Director of ODNR may be required in accordance with Ohio Revised Code section 1517.16. Please contact Scenic River Program Manager Bob Gable at 614-265-6814 for further information.

Our inventory program has not completely surveyed Ohio and relies on information supplied by many individuals and organizations. Therefore, a lack of records for any particular area is not a statement that rare species or unique features are absent from that area. Please note that although we inventory all types of plant communities, we only maintain records on the highest quality areas.

Please contact me at 614-265-6818 if I can be of further assistance.

Sincerely,

Debbie Woischke, Ecological Analyst
Ohio Biodiversity Database Program

RECEIVED
FEB 03 2011
STANTEC

From: Kwiatkowski, Tim [Tim.Kwiatkowski@dnr.state.oh.us]
Sent: Monday, January 31, 2011 11:55 AM
To: Fleece, Cody
Subject: RE: Ballville Dam
Attachments: Ballville Dam Comments.doc

Cody,

These are the comments that we will be recommending. They will be compiled with other divisions within the department and should be incorporated into the general notes of the project plan set.

If you have any questions please don't hesitate to call.

Thanks,
Tim
-----Original Message-----
From: Fleece, Cody [mailto:Cody.Fleece@stantec.com]
Sent: Friday, January 28, 2011 2:38 PM
To: Kwiatkowski, Tim
Subject: Ballville Dam

Tim

I left a message at your office a few moments ago and thought I'd follow up with an e-mail. We're trying to scope out the next phase of the Ballville Dam project and I'd like to talk with you to get a sense of what steps will be necessary for coordinating with the Scenic Rivers Program. Please call at your earliest convenience.

Thanks

Cody Fleece
Senior Ecologist
Stantec
11687 Lebanon Road
Cincinnati OH 45241-2012
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175630015

Fleece, Cody

From: Mitch, Brian [Brian.Mitch@dnr.state.oh.us]
Sent: Thursday, February 10, 2011 12:39 PM
To: joe.jellick@epa.state.oh.us
Subject: 11-0003; Ballville Dam Removal, Fremont, Ohio

ODNR COMMENTS TO Joe Jellick, OEPA-DEFA, Lazarus Government Center, 50 West Town Street, Columbus, Ohio 43215.

Project: The City of Fremont is seeking funds from the Water Pollution Control Fund to remove the Ballville Dam.

Location: The Ballville dam is located on the Sandusky River, Sandusky County, Ohio.

The Ohio Department of Natural Resources (ODNR) has completed a review of the above referenced project. These comments were generated by an inter-disciplinary review within the Department. These comments have been prepared under the authority of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.), the National Environmental Policy Act, the Coastal Zone Management Act, Ohio Revised Code and other applicable laws and regulations. These comments are also based on ODNR's experience as the state natural resource management agency and do not supersede or replace the regulatory authority of any local, state or federal agency nor relieve the applicant of the obligation to comply with any local, state or federal laws or regulations.

Fish and Wildlife: The ODNR, Division of Wildlife (DOW) has the following comments.

The project is within the range of the Indiana bat (*Myotis sodalis*), a state and federally endangered species. The following species of trees have relatively high value as potential Indiana bat roost trees: Shagbark hickory (*Carya ovata*), Shellbark hickory (*Carya laciniosa*), Bitternut hickory (*Carya cordiformis),* Black ash (*Fraxinus nigra*), Green ash (*Fraxinus pennsylvanica*), White ash (*Fraxinus americana*), Shingle oak (*Quercus imbricaria*), Northern red oak (*Quercus rubra*), Slippery elm (*Ulmus rubra*), American elm (*Ulmus americana*), Eastern cottonwood (Populus deltoides), Silver maple (*Acer saccharinum*), Sassafras (*Sassafras albidum*), Post oak (*Quercus stellata*), and White oak (*Quercus alba*). Indiana bat habitat consists of suitable trees that include dead and dying trees of the species listed above with exfoliating bark, crevices, or cavities in upland areas or riparian corridors and living trees of the species listed above with exfoliating bark, cavities, or hollow areas formed from broken branches or tops. If suitable trees occur within the project area, these trees must be conserved. If suitable habitat occurs on the project area and trees must be cut, cutting must occur between September 30 and April 1. If suitable trees must be cut during the summer months of April 2 to September 29, a net survey must be conducted in May or June prior to cutting. If no tree removal is proposed, the project is not likely to impact this species.

The project is within the range of the piping plover (*Charadrius melodus*), a state and federally endangered bird species, and the Kirtland's warbler (*Dendroica kirtlandii*), a state and federally endangered species. These species do not nest in the state but only utilize stopover habitat as they migrate through the region. Therefore, the project is not likely to have an impact on these species.

The project is within the range of the rayed bean (*Villosa fabalis*), a state endangered and federal proposed endangered mussel species. Due to the lack of records near the project area for this species, the project is not likely to impact this species.

The project is within the range of the Eastern massasauga (*Sistrurus catenatus*), a state endangered and a federal candidate snake species. Due to the location of the project and the lack of records near the project area for this species, the project is not likely to impact this species.

The project is within the range of the Western banded killifish (*Fundulus diaphanous menona*), a state endangered species. The DOW recommends no in-water work March 15 to June 30 to reduce impacts to aquatic species and their habitat.

The project is within the range of the bobcat (*Lynx rufus*), a state endangered species. Due to the mobility of these species, the project is not likely to have an impact on these species.

The project is within the range of the American bittern (*Botaurus lentiginosus*), a state endangered bird. A statewide survey has not been completed for this species. A lack of records does not indicate the species is absent from the area. Nesting bitterns prefer large undisturbed wetlands that have scattered small pools amongst dense vegetation. They occasionally occupy bogs, large wet meadows, and dense shrubby swamps. If this type of habitat will be impacted, construction must be avoided in this habitat during the species' nesting period of May 1 to July 31. If this type of habitat will not be impacted, the project is not likely to impact this species.

The project is within the range of the king rail (*Rallus elegans*), a state endangered bird. A statewide survey has not been completed for this species. A lack of records does not indicate the species is absent from the area. Therefore, if wetland habitat will be impacted, construction must be avoided during the species' nesting period of May 1 to August 1. If no wetland habitat will be impacted the project is not likely to impact this species.

The project is within the range of the Northern harrier (*Circus cyaneus*), a state endangered bird. This is a common migrant and winter species. Nesters are much rarer, although they occasionally breed in large marshes and grasslands. Harriers often nest in loose colonies. The female builds a nest out of sticks on the ground, often on top of a mound. Harriers hunt over grasslands. A statewide survey has not been completed for this species. A lack of records does not indicate the species is absent from the area. Therefore, if this type of habitat will be impacted, construction must not occur in this habitat during the species' nesting period of May 15 to August 1. If this habitat will not be impacted, the project is not likely to impact this species.

The project is within the range of the trumpeter swan (*Cygnus buccinator*), a state endangered bird. A statewide survey has not been completed for this species. A lack of records does not indicate the species is absent from the area. Trumpeter swans prefer large marshes and lakes ranging in size from 40 to 150 acres. They like shallow wetlands one to three feet deep with a diverse mix of plenty of emergent and submergent vegetation and open water. Therefore, if this type of wetland habitat will be impacted, construction must be avoided in this habitat during the species' nesting period of May 1 to August 1. If this type of wetland habitat will not be impacted, the project is not likely to impact this species.

The Ohio Biodiversity Database (OBD) shows this project is located on the Sandusky State Scenic River. The OBD has one record within the river at this site for a population of the greater redhorse (*Moxostoma valenciennesi*), a state threatened fish species. As indicated above, the DOW recommends no in-water work March 15 to June 30 to reduce impacts to aquatic species. The OBD also has a record approximately one mile upstream for a bald eagle nest (*Haliaeetus leucocephalus*), state threatened, (Portage Livery Nest) and one approximately one mile downstream (Fremont Nest). Due to the location of these records in relation to the project area, the project is not likely to impact the Bald Eagle/.

Boating and Navigation: The ODNR Division of Watercraft, Scenic Rivers Program, has the following comments.

These conditions should be incorporated into the general notes of the project plan set. These conditions should be implemented before earthwork commences and adhered to for the duration of the project.

1. Stream Channel Morphology: Sufficient analysis should be conducted to evaluate current channel morphology, substrate composition, sediment depth etc. within, above and below the existing dam pool. Such information will be critical with regard to evaluating potential impacts of dam removal on downstream hydrology, channel recovery within the impounded area as well as sediment transport downstream. If feasible, a sediment transport load model describing the rivers natural ability to carry sediment and how this will relate to the sediments currently behind the dam should be developed. Potential downstream impacts of released sediment load should also be determined as part of this analysis. Gradually drawing down the reservoir, trapping sediments in screens, and dredging of the reservoir sediments are techniques recommended to reduce the short-term impacts of sediments on downstream habitats. Every attempt should be made to research historical documents to determine the channel morphology that existed within the impounded area prior to dam construction as this may determine methods utilized in dam removal and alternatives for channel recovery/restoration.

2. Depositional Sediments: An exploration plan should be submitted to ODNR showing the location and have a detailed description of the subsurface features (accumulated sediments and other substrates). A sediment chemical analysis (and toxicity bioassays) must be conducted and the samples should be compared with EPA standard reference values for acceptable concentrations. Such data will be extremely important in the recommendations on the dam removal.

3. Existing Structure: All components of the existing structure should be completely removed. Every effort shall be made to keep concrete and other debris out of the river during removal. If any material falls into the water, it should be removed immediately. All debris, excess fill material and material excavated from the river bottom shall be disposed of at an approved

upland site (above 100 year flood elevations). Disposal in wetlands, floodplains or within 1000 feet of the Sandusky State Scenic River is prohibited.

4. Storage of Fuels, Petrochemicals and Equipment: Idle equipment, petrochemicals and toxic/hazardous materials should not be stored in the floodplain or near any drainage ways, ditches or streams that could convey such materials to the Sandusky River or any of its tributaries. Petrochemicals and toxic/hazardous materials should not be discharged into scenic rivers, their floodplains or any tributary drainage ways, ditches or streams. Refueling of equipment should not occur in floodplains or near any tributary drainage ways, ditches or streams. A spill containment and cleanup plan should be generated prior to the start of the project.

5. Work Platforms: If work platforms or coffer dams are necessary, all rip- rap and other stone used should be kept to the minimum amount needed and shall consist of clean rock only (free of any toxic or fine material). All fill material used as rip rap, work platforms or cofferdams shall be a minimum of three inches in diameter and be washed to remove fine particulate matter (clay, silt, sand and soil). Work platforms shall be kept to the absolute minimum size needed to facilitate in-stream work. In-stream work shall be conducted through the use of water diversions not requiring the placement of earthen fill (sheet piling, membrane dams, etc.) wherever possible. Any fill shall be completely removed from the streambed immediately upon completion of in-stream work.

6. In-Stream Work: All in-stream work should be conducted during low flow period (August 1 through October 31). Any disturbed areas in the stream bottom should be returned to natural contours and elevations.

7. Riparian Corridor: All streambank vegetation shall be left undisturbed to the maximum extent possible. Areas where vegetation is removed shall be re-vegetated with native tree species. Any disturbed streambanks should be returned to previously existing contours and elevations. Newly exposed stream banks that result from the removal of the dam should be revegetated with a regionally appropriate mix of native tree species. A general native tree species list will be provided by the Scenic River Manager. Cutting or clearing of any riparian vegetation within 1000 feet of the Sandusky State Scenic River beyond the existing right-of-way/project area shall be prohibited, however vertical trimming is permitted where necessary. Care shall be taken not to girdle or scuff tree trunks or damage any standing trees.

8. Native Plants: A list of native plants that are to be established post-construction along the Sandusky State Scenic River should be provided to the Northwest Ohio Scenic River Manager for review before construction begins.

9. Invasive Species: The use of any non-local equipment within designated Scenic River areas must be thoroughly cleaned and free of sediment to minimize the spread of invasive species.

10. Mussel Survey: A mussel survey and relocation, where appropriate, should be performed within the impounded area, upstream of the impoundment and downstream of the dam prior to the commencement of any work on the project. This will reduce the possibility of any mussel beds being harmed by the removal. An appropriate professional malacologist should be secured to perform the survey and relocation work. Survey and relocation protocols and limits should be based on the recommendations of the professional malacologist hired to perform the work.

11. Threatened and Endangered Species: The Natural Heritage (DOW) database shows records for the state endangered western banded killifish (*Fundulus diaphanus menona*), state threatened river redhorse (*Ictalurus punctatus*) and the state endangered greater redhorse (*Moxostoma valenciennesi*) for the Sandusky River in this region. It is recommended that no in-stream work take place between April 15 to June 30 to reduce impacts to these and other aquatic species and their habitat primarily during the spawning season.

12. Biological Assessment: A biological assessment needs to be conducted to determine the proposed project's effect on these threatened and endangered species or critical habitat, and address concerns that if the removal of the dam will lead to unwanted invasive species.

13. Mitigation: Any mitigation required under Sections 404 and 401 of the Clean Water Act for the Sandusky River should be implemented as protection or restoration projects within the watershed. Preferably directly within the designated scenic river corridor. This will help ensure the long term protection of these sensitive, high quality river systems. Regional Scenic Rivers Program staff may be able to assist with the identification and implementation of local mitigation projects.

14. Notification: Northwest Ohio Scenic Rivers Manager Tim Kwiatkowski, Sandusky State Scenic Rivers, 419-621-1302 or tim.kwiatkowski@dnr.state.oh.us should be invited to a pre-construction meeting with the contractor present and be notified of the project start date one week prior to the commencement of work. Mr. Kwiatkowski should also be contacted one week prior to completion of the project to conduct a final site inspection. The final site inspection should be scheduled while the contractor is present to ensure that final site stabilization has been achieved.

ODNR appreciates the opportunity to provide these comments. Please contact Brian Mitch at (614) 265-6378 if you have questions about these comments or need additional information.

Brian Mitch, Environmental Review Manager
Ohio Department of Natural Resources
Environmental Services Section
2045 Morse Road, Building E-3
Columbus, Ohio 43229-6693
Office: (614) 265-6378
Fax: (614) 262-2197
brian.mitch@dnr.state.oh.us

Cody,

The Scenic Rivers Program, has no objection to the proposed drilling/geotechnical investigation on the Sandusky State Scenic River. No further environmental review will be required for the investigation. However; if the ice structures would be needed, there will be a Departmental Environmental Review. Please give me prior notice to when this work will will be performed.

Thanks,
Tim

Timothy J. Kwiatkowski
Northwest Ohio Scenic Rivers Manager
Scenic Rivers Program
ODNR, Division of Watercraft
952 Lima Avenue
Findlay, Ohio 45840

Phone: (419) 429-8306
Cell: (440) 949-9132
Fax: (419) 422-4875
email: tim.kwiatkowski@dnr.state.oh.us

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-----Original Message-----
From: Fleece, Cody [mailto:Cody.Fleece@stantec.com]
Sent: Friday, January 06, 2012 5:42 PM
To: Kwiatkowski, Tim; brian.p.swartz@lrb01.usace.army.mil
Cc: Brown, Jeff
Subject: FW: Bald Eagle and Geotechnical Drilling Memo for Ballville Dam EIS....

Tim
Brian

This is something we prepared for USFWS to describe the proposed drilling/geotechnical investigation on the Sandusky related to the ice control structures. Please call if you have questions, comments, or concerns.

Cody Fleece
Senior Ecologist
Stantec
11687 Lebanon Road
Cincinnati OH 45241-2012

Ph: (513) 842-8238
Fx: (513) 842-8250
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From: Brown, Jeff
Sent: Friday, January 06, 2012 2:02 PM
To: Brian Elkington (USFWS); Melanie_Cota@fws.gov
Cc: Fleece, Cody
Subject: Bald Eagle and Geotechnical Drilling Memo for Ballville Dam EIS....

Sorry for the delay on this document. I hope it provides you with the information you need to make a determination regarding need for a permit or not. Please feel free to contact me via e-mail or phone if you have any questions.

Thank you,
Jeff

Jeff Brown, M.En.
Senior Environmental Scientist
Stantec
11687 Lebanon Road
Cincinnati OH 45241-2012
Ph: (513) 842-8205
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MEMORANDUM

Division of Wildlife

Lake Erie Fisheries Unit

To: Brian Elkington, USFWS, Deputy Program Supervisor - Fisheries

cc:

From: Jeff Tyson, ODNR, Division of Wildlife, Lake Erie Program Administrator

Date: August 15, 2013

Subject: Ballville Reservoir sidescan sonar survey, 2013

On July 1st, 2013, staff at the Ohio DNR Division of Wildlife's Lake Erie Fisheries Unit conducted a reconnaissance sidescan survey in the Ballville Reservoir of the Sandusky River near Fremont, Ohio. The purpose of this survey was to locate any remnants of the Tucker Dam, a small wooden structure that pre-dates the Ballville Dam.

The survey was conducted aboard a small (12-14') Crestliner aluminum modified v-hull boat with a 15 horsepower 2-stroke Mercury outboard motor. The boat was fitted with a portable sidescan unit consisting of a Lowrance HDS-5 Gen 1 chartplotter/depth sounder with a LSS-1 Structure Scan Imaging Module and transducer, broadband sounder, and internal GPS receiver. The sounder and LSS-1 transducers were mounted on a removable plate that was adapted to fit on the transom of the Crestliner boat. A group 31 deep cycle battery was used to power the HDS-5 and the LSS-1 module.

Data were recorded on a SD card in the HDS-5. Sounder depth was recorded at 200-kHz, while sidescan and downscan data from the LSS-1 transducer were recorded at 800-kHz. Data were collected at 3.2-4.8 km/h [2-3 mph]. The area upstream and downstream of some Tucker Dam reference points provided by the engineering firm Stantec was surveyed. Transects were not established before the survey, but we intended to make multiple passes parallel to shore to cover the width of the reservoir, then make overlapping passes perpendicular to shore to overlay additional data. Sidescan data were collected at a range of 18.3 m (60') per side. At this range, it was determined that five parallel passes would have provided sufficient coverage.

The survey was cut short after 3.75 passes due to encroaching thunderstorms (Figure 1). Despite this, more than 50,000 soundings were recorded (ping speed set to max in HDS-5) in the 298 MB .sl2 file during the survey. The survey encompassed an area of the reservoir that was approximately 700-m x 150-m, and the survey track was 2.5-km long. No underwater features were evident during data collection.

The raw sonar log (.sl2) was viewed in Sonar Viewer 2.1.2 upon return to the office, and an object near the suggested location of the Tucker Dam was identified. The file was then examined using two sidescan imagery software packages. DrDepth was used to view the sidescan imagery, generate bathymetry lines (Figure 2), and export images to Google Earth. The river channel in this reach of the reservoir runs along the northern bank, with bathymetry getting shallower as you head to the southern bank. This is likely a result of siltation along the inside bend of the river channel, and suggests that any remnants of the Tucker Dam will most likely be visible along the northern bank.

SonarTRX was used to view and smooth the sidescan imagery, isolate the area of interest (250-m x 150-m), measure object size, and export the imagery to Google Earth. The object appears to be man-made, and is located at N41.329173 W83.146646 (decimal degrees). This is near the Tucker Dam reference point provided by Stantec directly off of 2317 Buckland Avenue, 15-m from the northern bank of the reservoir, and 1-km upstream of the Ballville Dam. The object is somewhat ‘U’ shaped, approximately 6.5-m long and 1- to 3-m thick (Figure 3). The object clearly rises above the bottom of the reservoir, but its height cannot be measured with the available software.

Despite finding this unidentified object, the only other objects found during this survey were exposed bedrock and debris (sunken logs and car tires). No other feature was identified that suggested the continued existence of the Tucker Dam in this location.

Figure 1. Google Earth image of Ballville Reservoir sidescan survey track (grey line). Tucker Dam reference points and location of unidentified object are indicated.

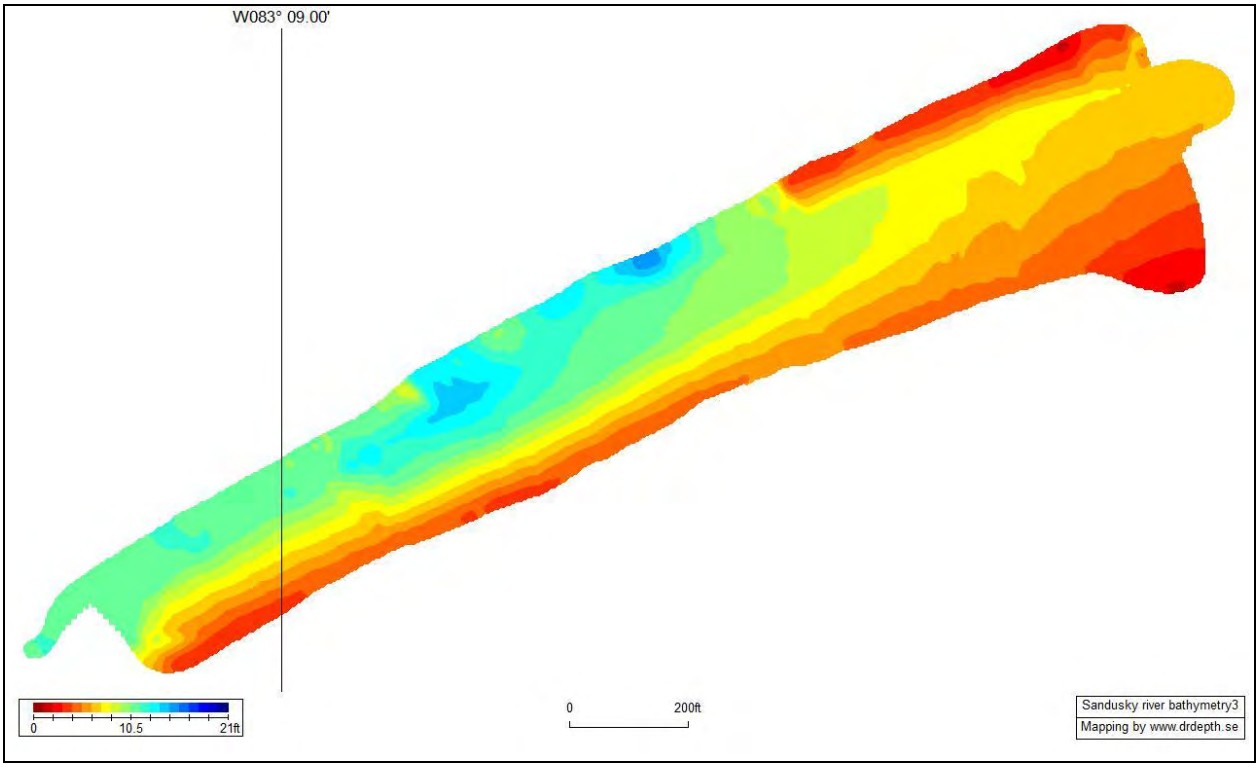

Figure 2. Bathymetry of the surveyed portion of the Ballville Reservoir as generated in DrDepth. Bathymetry indicates that deeper water (blue) is located along the northern bank, with shallower water (red) towards the southern bank.

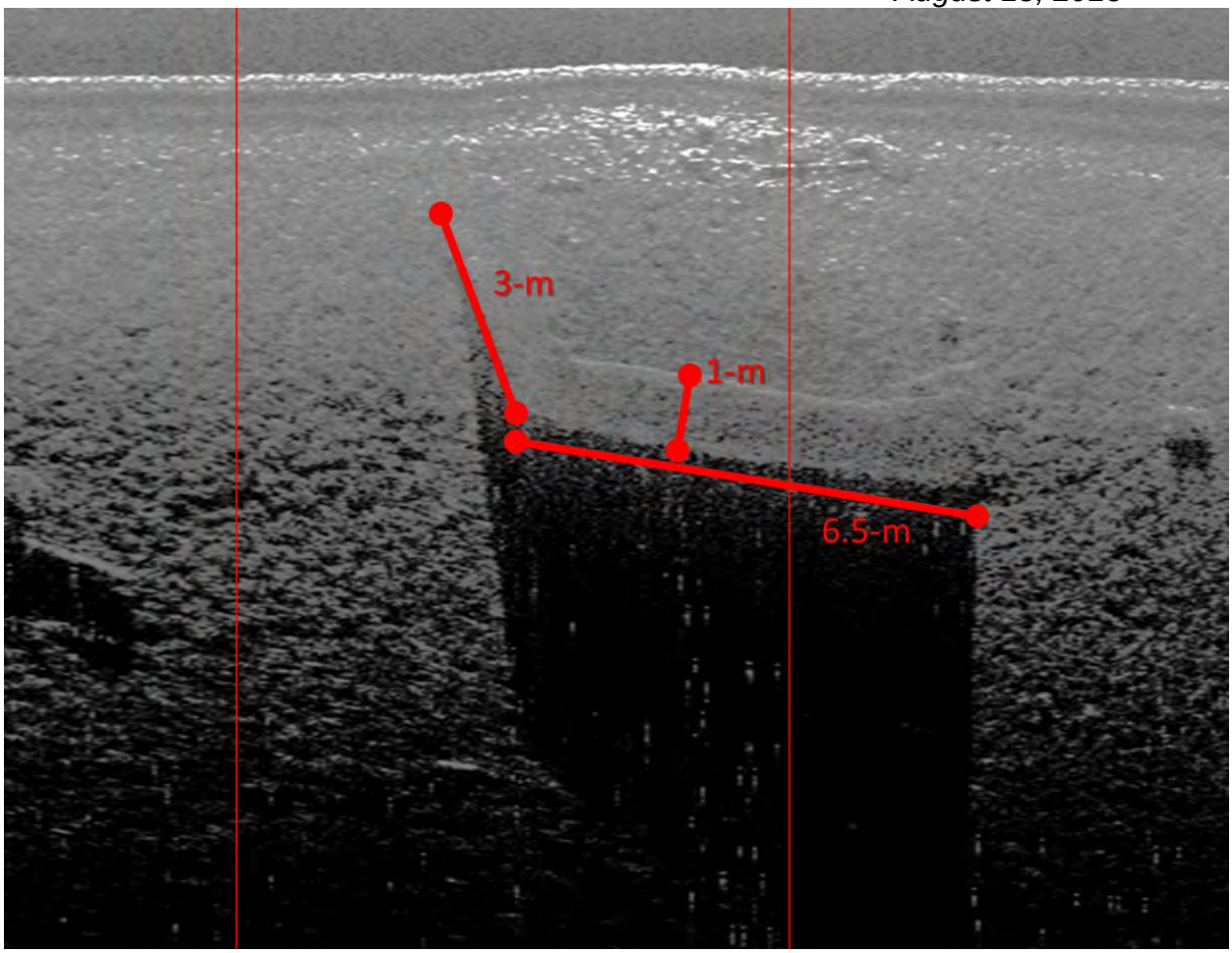

Figure 3. Sidescan imagery of the object at the bottom of the Ballville Reservoir, located near the reported location of the Tucker Dam, Fremont, Ohio.

5.2 U.S. FISH & WILDLIFE SERVICE

Stantec

Stantec Consulting Services Inc.
11687 Lebanon Road
Cincinnati OH 45241-2012
Tel: (513) 842-8200
Fax: (513) 842-8250

February 2, 2011

Melanie Cota
U.S. Fish and Wildlife Service
Ohio Ecological Services Field Office
4625 Morse Road, Suite 104
Columbus, Ohio 43230

Dear Mrs. Cota:

Reference: Ballville Dam Removal – Fremont, OH

Stantec Consulting Services, Inc. (Stantec) is under contract with the City of Fremont to design and remove the Ballville Dam located on the Sandusky River in Sandusky County, Ohio. A feasibility study is currently under way to determine the best way to approach this project. On January 13, 2011 the first of a series of stakeholder meetings was held to identify key issues to be addressed and to identify action items for resolving those issues. Our notes indicate that USFWS identified the following special status species as warranting further attention.

- Indiana Bat
- Freshwater Mussels
- Bald Eagle

The objective of the letter is to coordinate with the U.S. Fish and Wildlife Service regarding the need for studies to determine if federally listed species occur in the project area. In the following paragraphs we also summarized recently acquired information regarding potential occurrence of listed taxa in the study area and have attached relevant reports to this letter. We hope to work closely with the USFWS throughout this project and await your recommendations regarding studies required to adequately address potential impacts to federally listed species.

Indiana bat

Indiana bats are not known to occur in the project area. However, trees with characteristics suitable for summer roosting are present throughout the project area. An Indiana Bat survey was conducted on June 9th and 10th of 2010 in the vicinity of the City of Fremont's new reservoir intake site. Figure 1 shows the survey site located approximately 6000 river feet upstream of the Ballville Dam. Two Little Brown Bats and one Big Brown Bat were captured during the second night of the survey. No federally endangered Indiana Bats were collected, Stantec will make an effort to minimize tree removal and disturbance within project vicinity and will remove trees only during approved work windows.

Bald Eagle

Two bald eagle nests have been observed in the project vicinity, shown in Figure 1. However these nests are outside areas that will be disturbed during the demolition process. We are aware of no other nests at this time. The locality of the nest will be carefully monitored to ensure no disturbance occurs during the course of the project.

Stantec

Reference: Ballville Dam Removal – Fremont, OH , Fremont, Ohio

Freshwater mussels

A freshwater mussel survey was conducted in a 100x100ft area at the inlet of the new reservoir intake by EnviroScience on April 29, 2010. No live or dead mussels were found within the survey reach, shown on Figure 1, however, one live giant floater was found approximately 100ft downstream. The surveyed area had exceedingly poor habitat for freshwater mussels. We are aware of no other recent surveys of mussel fauna in the vicinity of the Ballville Dam

We look forward to working with you on this effort to restore free flowing habitat to the Sandusky River. Please feel free to call with any questions you may have.

Sincerely,

STANTEC CONSULTING SERVICES INC.

Cody Fleece
Senior Ecologist
Tel: (513) 842-8238
Fax: (513) 842-8250
cody.fleece@stantec.com

Attachment: Figure 1

c. Paul Wetzel, U.S. Army Corps of Engineers
Scott Peyton, Stantec Consulting Services
Sam Derr, City of Fremont

United States Department of the Interior

FISH AND WILDLIFE SERVICE

Ecological Services
4625 Morse Road, Suite 104
Columbus, Ohio 43230
(614) 416-8993 / FAX (614) 416-8994

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STANTEC

March 2, 2011

Cody Fleece
Stantec Consulting Services, Inc
11687 Lebanon Road
Cincinnati, OH 45241

TAILS: 31420-2011-TA-0374

RE: Ballville Dam Removal, Sandusky County, OH

Dear Mr. Fleece:

This is in response to your February 2, 2011 letter requesting information from the U.S. Fish and Wildlife Service (Service) regarding the occurrence or possible occurrence of federally listed threatened or endangered species within the vicinity of the proposed project located on the Sandusky River in the City of Fremont, Sandusky County, Ohio. We understand that a feasibility study is currently under way to determine the best approach of this project and that this was discussed in a meeting held on January 13, 2011, in which the Service was in attendance. We understand that the planning of this project has been ongoing for many years and a number of surveys have already been completed within the vicinity of the proposed project.

The U.S. Fish and Wildlife Service recommends that proposed activities minimize water quality impacts and impacts to quality fish and wildlife habitat, such as forests, streams, and wetlands. Riparian zone habitat should be preserved wherever possible. Vegetated areas along streams and rivers stabilize the banks, provide fish and wildlife habitat, filter pollutants and excess nutrients, store excess water during storm events, and minimize sedimentation. Best Management Practices (BMP's) should be utilized to minimize sedimentation and erosion. All disturbed areas should be mulched and revegetated with native woody and herbaceous species. We support and recommend mitigation activities that reduce the likelihood of invasive plant spread and encourage native plant colonization. Prevention of non-native, invasive plant establishment is critical in maintaining high quality habitats.

In general, the U.S. Fish and Wildlife Service supports the concept of removing dams unless the removal could result in significant potential for downstream flood damage. Dams impact ecosystems in a number of ways including altering the natural cycle of flow, transforming the biological and physical characteristics of river channels and floodplains, and fragmenting the continuity of rivers and streams. The physical obstruction of dams impedes or delays the migration of various organisms. Dam removal may contribute to a range of benefits including improved migration for fish and other organisms, restoring natural temperature and flow regimes, improved water quality, return of natural sediment regime and channel form, and an increase in species abundance and diversity. While the Service supports the removal of dams in general, there can be some short term negative impacts associated with the removal process that need to be

assessed. These potential impacts depend on the size of the dam and how long it has been in place as well as the species present in the natural environment. However, with careful planning, negative impacts can potentially be minimized with measures such as removing the dam in stages and the removal of bound sediments prior to the dam removal.

MIGRATORY BIRD COMMENTS: The project area lies within the range of the **bald eagle** (*Haliaeetus leucocephalus*). The bald eagle has been removed from the Federal list of endangered and threatened species due to recovery. This species continues to be afforded protection by the Bald and Golden Eagle Protection Act (BGEPA, 16 U.S.C. 668-668d) and Migratory Bird Treaty Act (MBTA, 16 U.S.C. 703-712). There is a known bald eagle nest within 1 mile southwest of the dam and another nest approximately 1 mile northeast of the dam. We recommend that you contact the Ohio Department of Natural Resources, Division of Wildlife, (419) 898-0960, for the location(s) of the eagle nest(s) in the county. If any active nests are located within ½ mile of the project site, we recommend that work at the site be restricted from mid-January through July to allow pre-nesting activities, incubation, and raising of the young.

ENDANGERED SPECIES COMMENTS: The proposed project lies within the range of the **Indiana bat** (*Myotis sodalis*), a federally listed endangered species. Since first listed as endangered in 1967, their population has declined by nearly 60%. Several factors have contributed to the decline of the Indiana bat, including the loss and degradation of suitable hibernacula, human disturbance during hibernation, pesticides, and the loss and degradation of forested habitat, particularly stands of large, mature trees. Fragmentation of forest habitat may also contribute to declines. During winter, Indiana bats hibernate in caves and abandoned mines. Summer habitat requirements for the species are not well defined but the following are considered important:

(1) dead or live trees and snags with peeling or exfoliating bark, split tree trunk and/or branches, or cavities, which may be used as maternity roost areas;
(2) live trees (such as shagbark hickory and oaks) which have exfoliating bark;
(3) stream corridors, riparian areas, and upland woodlots which provide forage sites.

Should the proposed site contain trees or associated habitats exhibiting any of the characteristics listed above, we recommend that the habitat and surrounding trees be saved wherever possible. We understand an Indiana bat survey was conducted on June 9 and 10, 2010 within the vicinity of the reservoir intake, located southwest of the dam. We understand that 2 little brown bats and 1 big brown bat were captured during the survey. According to your report, no Indiana bats were captured during this survey. Please note that mist net surveys are only valid for 2 years. If tree clearing is proposed outside of the area that was surveyed or the mist net survey timeframe has expired, we recommend an assessment of Indiana bat habitat within areas proposed to be cleared. If the trees must be cut, further coordination with this office is requested to determine if surveys are warranted. Any survey should be designed and conducted in coordination with the Endangered Species Coordinator for this office. Surveyors must have a valid Federal permit.

The proposed project lies within the range of the **rayed bean** (*Villosa fabalis*), a freshwater mussel that is currently proposed for listing as federally endangered. The rayed bean is generally known from smaller, headwater creeks, but records exist in larger rivers. They are usually found in or near shoal or riffle areas, and in the shallow, wave-washed areas of lakes. Substrates typically include gravel and sand, and they are often associated with, and buried under the roots of, vegetation, including water willow (*Justicia americana*) and water milfoil (*Myriophyllum* sp.). We understand a mussel survey was conducted on April 29, 2010 in a 100x100 area at the inlet of the new reservoir intake. We understand that no live or dead mussels were found within the

survey reach but that a giant floater was found approximately 100 feet downstream. The Service has no other records for surveys in this area. Due to the potential for this project to impact freshwater mussels, including the rayed bean, we recommend that a survey be conducted to determine if this species occurs within the impact zone of the proposed dam removal. The impact zone or action area is defined as all areas that may be affected directly or indirectly by the action and not merely the immediate area involved in the action. It encompasses the geographic extent of environmental changes (i.e., the physical, chemical and biotic effects) that will result directly and indirectly from the action. This action area should be determined prior to initiating the mussel survey. The survey should be designed and conducted in coordination with the Endangered Species Coordinator for this office. Please note that mussel surveys may only be performed between May 1 and October 31 when the water temperature is at or above 60°F. In addition, the survey should only be performed by a qualified, permitted surveyor (list enclosed).

The proposed project lies within the range of the federally listed endangered **piping plover** (*Charadrius melodus*) and **Kirtland's warbler** (*Dendroica kirtlandii*), the **eastern prairie fringed orchid** (*Platanthera leucophaea*), a federally listed threatened species, and the **eastern massasauga** (*Sistrurus catenatus catenatus*), a Federal Candidate species. Due to the location of the project and on-site habitat, no impacts are anticipated for these species.

These comments have been prepared under the authority of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.), the Endangered Species Act of 1973 (ESA), as amended, and are consistent with the intent of the National Environmental Policy Act of 1969 and the U. S. Fish and Wildlife Service's Mitigation Policy. This letter provides technical assistance only and does not serve as a completed ESA section 7 consultation document.

If you have questions, or if we may be of further assistance in this matter, please contact Melanie Cota at extension 15 in this office or by email at Melanie_Cota@fws.gov or visit our website at http://www.fws.gov/midwest/Ohio.

Sincerely,

Mary Knapp

Mary Knapp, Ph.D.
Field Supervisor

cc: ODNR, DOW, SCEA Unit, Columbus, OH

United States Department of the Interior

FISH AND WILDLIFE SERVICE

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February 25, 2011

USFWS permittees for Federally-Listed Mussel Surveys in Ohio*

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July 18, 2011
File: 175630015L01

Ms. Angela Boyer
Fish and Wildlife Biologist
U.S. Fish & Wildlife Service
4625 Morse Road, Suite 104
Columbus, Ohio 43230

Reference: Proposed Study Plan for Mussel Surveys in Support of the Ballville Dam Removal Project Sandusky River, Fremont, Ohio

Dear Ms. Boyer:

This correspondence was prepared to present a draft study plan for conducting freshwater mussel surveys in the Sandusky River in the vicinity of the Ballville Dam. The Ohio Department of Natural Resources and the City of Fremont would like to complete these surveys in late August of 2011 and would appreciate comment on our proposal at your earliest convenience.

BACKGROUND

The Ohio Department of Natural Resources (ODNR), together with the City of Fremont, seeks to remove the Ballville Dam from the Sandusky River (Attachment 1). The dam, located approximately 2.4 km southwest of Fremont, was initially built in 1911 for hydro-electricity production, but was destroyed by a flood in 1913. Rebuilt soon after, the dam was converted to steam production; hydroelectric generation was discontinued in 1946 and the dam was sold to the City in 1959. The Ballville Reservoir serves as the primary drinking water supply for Fremont. All of the water retaining structures in the Ballville Dam were built of concrete and are founded on bedrock; the dam is ~10 m high and spans ~122 m across the Sandusky River. Based on soundings performed in 1985, the reservoir extends approximately 3.4 km upstream of the dam. The reservoir area at normal pool level is approximately 9.7ha with a water storage capacity of 303,300 m^3.

This proposed dam removal is feasible for the city because an alternate water supply, a new 2.8-million kiloliter reservoir, is being constructed adjacent to the river upstream of the dam and is expected to be operational by summer 2011. The new water supply will address serious issues of poor water quality (high in nitrates) and insufficient water quantity, especially during seasonal low flow periods. Removal will also alleviate serious issues related to the deterioration of the dam and the sea wall, which require immediate attention for flood control protection (ODNR 1998). Additionally the Ballville Dam serves as a major barrier to aquatic life on the Sandusky River and the removal of the dam would restore the free flowing river and should restore the habitat and water quality of this impounded length of the lower Sandusky River (Biological and Water Quality Study of the Sandusky Bay Tributaries, 2009). The Sandusky River supports a commercial and recreational walleye fishery that could exceed $100 million annually. The removal of Ballville Dam would double the length of river available to the walleye migration and increase the spawning habitat 15 fold, and therefore could boost the economic output from the Ohio fishery. Overall, the Ballville Dam has become an ecological, health, and safety issue and is more than 20 years older than the normal life expectancy for a dam. The removal of the dam will have immediate and long lasting economical and ecological impacts.

Reference: Proposed Study Plan for Mussel Surveys in Support of the Ballville Dam Removal Project, Sandusky River, Fremont, Ohio

Project Design

Stantec Consulting Services, Inc. (Stantec) recently began the engineering design phase for removal of the Ballville Dam on the Sandusky River within the City of Fremont, Ohio. One of the principal challenges of the project is management of stored sediment. Evans and Gottgens (2007) estimated that approximately 1,300,000 m^3 of sediments are stored in the reservoir basin. Revised estimates based on new information suggest that the stored volume is closer to 460,000 m^3. Stantec is currently preparing a feasibility study that will examine various removal alternatives (e.g., complete and immediate removal vs. phased and prolonged removal) and their impact on sediment transport competence and capacity in the lower channel. Results of this study will be made available to USFWS, ODNR, and the public at large.

Aquatic Habitat in the Project Area

The dam is located on exposed bedrock that extends downstream to approximately river mile 17.4 (Attachment 1). Photographs of habitat conditions at the photo points are presented in Attachment 2. Few spent valves were observed in this reach and those that were observed consisted of *Pyganodon grandis* and *Utterbackia imbecillis*. These valves likely originated from upstream of the dam rather than from within the reach. Suitable substrates for mussels first appear as the channel emerges from the confined valley below river mile 17.4. The U.S. Army Corps of Engineers flood control project begins at approximately river mile 16.7. Substrates change dramatically at this point from cobble/gravel dominant immediately upstream to primarily sand/silt/small gravel dominant. Coarser more stable substrates appear again upstream of the Hayes Avenue Bridge. Casual observation of spent valves below the dam included *Lampsilis cardium*, *Lasmigona complanata*, *Truncilla truncata*, *Potamilus alatus*, and *Quadrula quadrula*.

Substrates in the impounded reach immediately upstream of the dam are primarily loosely consolidated silt and clay. Near the terminus of the backwatered area, substrates coarsen and are comprised of rubble and cobble. Another bedrock outcrop is present from well upstream of the Tiffin Road Bridge to the transitional area described above (Attachment 1).

Potential Impact to Listed Mussels

The Ohio State University Bivalve database indicates that valves for *Epioblasma torulosa rangiana* (proposed federally endangered), *Villosa fabalis* (proposed federally endangered), *Ligumia recta* (state threatened), *Ptychobranchus fasciolaris* (state species of concern), *Pleurobema sintoxia* (state species of concern), *Lampsilis fasciola* (state species of concern), and *Cyclonaias tuberculata* (state species of concern) have been found in proximity to the proposed project. However, most of these records were found prior to 1976, but have been found as recently as 1995. Furthermore, most of the historical records are from no closer than approximately 20 miles upstream of the project area. EnviroScience (2010) conducted a limited study of the impounded area in the reservoir in support of efforts to construct the drinking water intake. No live or dead mussels were found within the survey area, however, one live giant floater was found approximately 30 meters downstream. The surveyed area was characterized as having exceedingly poor habitat for freshwater mussels.

If listed mussels are present within the construction footprint, they could be directly affected by crushing from heavy equipment or demolition debris. If listed mussels are present downstream of the dam they may be impacted indirectly by the transport and deposition of fine sediment currently stored behind the impoundment. Mussels upstream of the impounded area should not be affected by headward channel incision due to the presence of erosion resistant bedrock outcrops.

Reference: Proposed Study Plan for Mussel Surveys in Support of the Ballville Dam Removal Project, Sandusky River, Fremont, Ohio

Regulatory Requirements

The ODNR and the City of Fremont will use the engineering studies and other supporting information to seek authorization to remove the Ballville Dam under Section 404 of the Clean Water Act. The U.S. Army Corps of Engineers is required to coordinate with the U.S. Fish and Wildlife Service and ODNR on potential impacts to special status species that may occur as a result of the proposed project. On February 2, 2011, Stantec sent a letter requesting dialogue with the U.S. Fish and Wildlife Service regarding the need for studies to determine if federally listed species occur in the project area. In the response letter dated March 2, 2011 (Attachment 3), the U.S. Fish and Wildlife Service recommended that, based on the potential for the project to impact freshwater mussels including the rayed bean (*Villosa fabalis*), field surveys be conducted to determine if federally listed mussel species occurred within the impact zone of proposed dam removal. Correspondence from ODNR (Attachment 4) expressed many of the same concerns about state-listed species.

PROPOSED STUDY PLAN

Objectives

The objective of this study plan is to:

- Determine the presence or probable absence of federal and state-listed freshwater mussels in the project area,

Presence-Absence Surveys

Mussel surveys will be performed using Stantec's Federal Permit TE38821A-0 (Attachment 5) and Ohio Division of Wildlife Wild Animal Permit 14-174 (Attachment 6). We propose to conduct qualitative and quantitative surveys within the construction foot print including access areas and work areas downstream of the dam. For the purposes of this proposal we assumed that an area extending approximately 100 meters downstream of the proposed project would be sufficient. We also propose to conduct qualitative surveys in high quality habitats between the dam and the State Street Bridge (Attachment 1).

Qualitative surveys will consist of timed searches for live mussels by using viewing buckets and/or tactile searches. Surveying efforts will begin at the downstream end of the site and progress upstream against the current to prevent unnecessary reductions in visibility resulting from disturbance of the sediments. Surveyors will remove live mussels from the substrate and place them in mesh bags to be held temporarily until data can be recorded on species identity and shell dimensions. Gender and reproductive status will also be recorded if possible. Spent valves encountered during the survey will be identified to species and representative spent valves will be retained and added to the collection at the Cincinnati Museum of Natural History.

Surveyors will also establish quantitative sample plots in high density mussel habitats within the construction footprint. This will be accomplished by establishing survey lines parallel to the streambank and excavating substrates from within 0.25 meter^2 quadrats placed on the stream bed to define the sampling area. Up to 15 cm of substrate will be removed from each quadrat and will be sieved through a coarse screen. The number of quadrats to be sampled will depend on the mussels densities encountered in the field and the amount of potentially suitable habitat present at the sample site.

SCUBA divers will survey two transects between points P 7 and P 8 (Attachment 1). Transects will be established perpendicular to the stream channel and spaced out at 50 meter intervals. The survey will be conducted using a weighted stainless steel chain, spaced in 10 meter increments with a search area of one meter to either side of the transect. All live mussels, fresh dead, and weathered mussels found within a 10

meter section of transect will be placed in a mesh bag and taken to stream bank for identification and data entry. All live mussels will be identified and returned to the stream substrate in the section of transect where it was found. No live mussels will be retained.

CONCLUSION

Thank you for your assistance on this matter. If you have questions about the materials provided or the proposed approach, please contact me at the numbers provided below.

Sincerely,

STANTEC CONSULTING SERVICES INC.

Cody Fleece
Senior Ecologist
Tel: (513) 842-8238
Fax: (513) 842-8250
cody.fleece@stantec.com

Attachment:

c. Melanie Cota, U.S. Fish & Wildlife Service
Brian Mitch, Ohio Department of Natural Resources
Becky Jenkins, Ohio Department of Natural Resources
Tim Kwiatowski, Ohio Department of Natural Resources
Brian Schwartz, U.S. Army Corps Engineers
Steve Malone, Ohio Environmental Protection Agency
Sam Derr, City of Fremont
Scott Peyton, Stantec Consulting

Reference: Proposed Study Plan for Mussel Surveys in Support of the Ballville Dam Removal Project, Sandusky River, Fremont, Ohio

From:	Angela_Boyer@fws.gov
Sent:	Tuesday, July 19, 2011 10:32 AM
To:	Fleece, Cody
Cc:	Melanie_Cota@fws.gov
Subject:	Re: Mussel Survey Study Plan for Ballville Dam Removal Project

Dear Mr. Fleece,

This is in response to your July 18, 2011 request for an amendment to your Federal Fish and Wildlife Permit No. TE38821A-0 to conduct a 2011 survey for federally listed freshwater mussels in the Sandusky River. The survey site is located in the vicinity of the Ballville Dam Removal Project in Freemont, Sandusky County, Ohio.

The Service has reviewed your proposal for the mussel survey. The U.S. Fish and Wildlife Service, Columbus, Ohio Field Office has no objection to the survey as proposed. This notification serves as written concurrence that Stantec is authorized to proceed with the mussel survey as described in your request. Upon completion of the survey, we request that you submit an electronic copy of the survey results to this office for review. Please include the latitude and longitude coordinates for the survey site in the report. If any federally listed mussels, rayed bean (*Villosa fabalis*), and/or snuffbox (*Epioblasma triquetra*) are found during the survey, please notify this office within 48 hours. Please carry a copy of this site specific authorization and your Federal permit while conducting the survey. If you have questions, or if we may be of further assistance in this matter, please contact me.

Sincerely,
Angela Boyer
Endangered Species Coordinator for Ohio
U.S. Fish and Wildlife Service
4625 Morse Road, Suite 104
Columbus, OH 43230
(614) 416-8993, ext. 22
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January 27, 2012
File: 175630015

Melanie Cota
U.S. Fish and Wildlife Service
4625 Morse Rd.
Columbus, Oh 43230

Dear Ms. Cota:

Reference: Ballville Dam Removal Project – Ice Control Structure, Sandusky River, Fremont, Ohio

The City of Fremont, Ohio is considering the design and construction of an ice control structure across the Sandusky River upstream of the Ballville Dam, at River Mile 19. The ice control structure would consist of a row of large-diameter drilled shafts extending from the west to east banks of the river. The drilled shafts would be designed to catch and contain large pieces of ice that would otherwise drift downstream, accumulate in ice jams, and potentially cause flooding and impact infrastructure such as downstream bridge piers.

Stantec will perform a geotechnical exploration of the site consisting of 4 borings with one of the borings as close as possible to the west bank, one as close as possible to the east bank, and the other two evenly spaced across the river channel. These borings will be drilled from a floating plant consisting of sections of barges transported to the site and placed and assembled in the water by a crane. The drill rig will be placed onto the floating plant by the crane. Approximately 30 feet of rock coring will be performed in each boring. The borings will be approximately 3.25 inches in diameter.

Concerns have been raised regarding the potential impacts of this drilling on listed mussels, and a thorough search was conducted for information regarding the substrate composition and potential for mussel habitat in the vicinity of the proposed drilling site. The objective of this letter is to present the information that is readily available on substrate composition in the area near the proposed drilling for the ice control structure, and gain agency opinion on the potential for impacts to listed mussels.

The Sandusky River thalweg is approximately 10 feet deep in the vicinity of the proposed ice control. A review of readily available sediment data suggest that sediments are probably dominated by silt, clay, and other organic matter (EnviroScience 2010). An annotated bibliography on this topic is presented in Attachment A along with a map illustrating presumed survey areas.

Two species of federally listed mussels could occur within the project area, Rayed bean (*Villosa fabalis*) and northern riffleshell (*Epioblasma torulosa rangiana*). Rayed bean is usually found in or near shoal or riffle areas, in gravel and sand; additionally, this species is often found among vegetation (water willow (*Justicia americana*) and water milfoil (*Myriopyllum* spp.)) in and near riffles and shoals (USFWS 2010). Based on these observations, it is unlikely that rayed bean mussels will be located at depths of 10 feet. Similarly, the

northern riffleshell is primarily known from shallow water (a few inches to six feet deep) (Parmalee and Bogan, 1998).

Based on our review of the available information we offer the following observations:

- The total substrate surface area to be impacted by drilling is small (~0.5 ft^2).
- A substantial proportion of the bed material appears to be silt/clay.
- The habitat type in the proposed drilling location is pool-like and the species of interest are generally found in shallow water habitats.

Thank you for attention on this important matter. Please contact me if you have questions, comments or concerns regarding the information presented.

Respectfully,

Cody Fleece
cody.fleece@stantec.com
(513) 842-8238

STANTEC CONSULTING SERVICES INC.

Attachments: Annotated Bibliography and Map

c. Brian Swartz

Annotated Bibliography

EnviroScience. 2010. Freshwater Mussel Survey / Translocation for the City Above-Ground Reservoir Intake on the Sandusky River, Sandusky County, OH. Final Report.

> EnviroScience, Inc. (2010) was contracted to conduct mussel surveys and possible translocations for the intake of a new above-ground reservoir along the Sandusky River in Fremont, Ohio. A 100x100 ft survey area, as well as 2 spot dives, were searched using SCUBA gear. Substrates recorded during this survey were 80% decaying vegetation close to shore (25-30 ft), and 20% vegetation debris in the riverward center. According to EnviroScience (2010), "bottom mud was anaerobic and foul smelling. The entire survey area, including both spot dives, was exceedingly poor habitat for freshwater mussels." The entire survey encountered only one mussel, a giant floater (*Pyganadon grandis*) that was found at the downstream spot dive (approximately 100 ft downstream of the larger sampling area). This study concluded that it is highly unlikely that unionid mussels would be negatively impacted by the construction work in this area. The ice structure is planned for just upstream of this sampled location.

Evans, JE, NS Levine, SJ Roberts, JF Gottgens, and DM Newman, 2002. Assessment Using GIS and Sediment Routing of the Proposed Removal of the Ballville Dam, Sandusky River, Ohio. Journal of the American Water Resources Association, Vol. 38, No. 6.

> Evans et al. (2002) assessed the proposed removal of the Ballville Dam using 14 sediment vibracores. These cores were collected in 1993 and 1997 – the vibracorer penetrated through all sediments until hitting bedrock. The sediment properties of the cores were assessed, and the core taken at the upstream end of the reservoir (taken approximately 1/3 mile downstream of the planned location of the ice structure) was 20% gravel, 20% sand, and 60% silt.

Yoder, C. O. and R. A. Beaumier. 1986. The Occurrence and Distribution of River Redhorse, *Moxostoma carinatum* and Greater Redhorse, *Moxostoma valenciennesi* in the Sandusky River, Ohio. Ohio Journal of Science 86(1):18-21.

> Yoder and Beaumier (1986) conducted an electrofishing survey at 10 locations on the Sandusky River between Tiffin and Fremont, OH; qualitative observations of substrate were made at each sampling location. At River kilometer 30.6 (RM 19), substrate characteristics of the Sandusky River are 35% boulder, 25% rubble, 10% gravel, and 30% muck.

Davies, D. H. 1994. Unpublished Project Proposal. Development of Management Recommendations for Sandusky River Walleye. Ohio Division of Wildlife, Lake Erie Research Station, Sandusky, OH.

Granata, T. C. 2008. Bathymetric Assessment for the Water Intake of the Fremont Reservoir, Sandusky River, Ohio. Final Report by Granata Ecological Engineering, LLC. 19 pp.

Mackey, S. Ohio Geological Survey, 1634 Sycamore Line, Sandusky, OH 44870, U.S.A., unpublished data.

Other sources have also reported on the Sandusky River substrates near the Ballville Dam, but these sources are more general; the methods used to define the substrate composition is unclear, and/or the location of the sampling is indistinct. Granata (2008) reports that at approximately River Mile 19 (where the ice structure is planned) riverbed sediments are "mostly fine, cohesive material of silt-clay, however outcrops of limestone bedrock occurred along the northeastern bank of the reach." Scudder Mackey, with the Ohio Geological Survey, created GIS maps of substrates showing that the impoundment is dominated by silt/clay over bedrock. Mackey was also cited in Davis (1994) for a preliminary sediment deposition estimate for the reservoir that reported the substrates were 20% sand/gravel, 65% silt, and 15% clay.

Parmalee, P. W. and A. E. Bogan. 1998. The Freshwater Mussels of Tennessee. The University of Tennessee Press, Knoxville. 328 pp.

(USWFS) United States Fish and Wildlife Service. 2010. Endangered and threatened wildlife and plants: listing the rayed bean and snuffbox as endangered. Federal Register 75(211):67552-67583.

United States Department of the Interior

FISH AND WILDLIFE SERVICE

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May 2, 2012

Cody Fleece
Stantec Consulting Services, Inc
11687 Lebanon Road
Cincinnati, OH 45241

TAILS: 03E15000-2012-TA-0752

Re: Ballville Dam Removal Project, Sandusky County, OH

Dear Mr. Fleece:

This is in response to your February 2, 2012 mussel report for the proposed Ballville Dam removal project located on the Sandusky River within the City of Fremont, Sandusky County, Ohio. In a March 2, 2011 letter, the U.S. Fish and Wildlife Service (Service) requested a mussel survey be conducted within the vicinity of the proposed project due to the potential for the rayed bean (*Villosa fabalis*) to occur, a mussel that was previously proposed for listing and is now listed as a federally endangered species. This letter also serves as follow up on the potential occurrence of other federally listed and protected species in the vicinity of the project where additional information may be needed to determine possible impacts. The Service is currently conducting an Environmental Impact Statement (EIS) on the proposed removal of the Ballville Dam and various alternatives to fulfill National Environmental Policy Act (NEPA) requirements.

The Service recommends that proposed developments avoid and minimize water quality impacts and impacts to high quality fish and wildlife habitat, such as forests, streams, and wetlands. Riparian zone habitat should be preserved wherever possible. Vegetated areas along stream and river banks stabilize the banks, provide fish and wildlife habitat, filter pollutants and excess nutrients from the water, store excess water during storm events, and minimize sedimentation. Best construction techniques should be used to minimize erosion, in particular, on slopes. Additionally, natural buffers around streams and wetlands should be preserved to enhance beneficial functions. If streams or wetlands will be impacted, the Buffalo Corps of Engineers should be contacted for possible need of a Section 404 permit. We support and recommend mitigation activities that reduce the likelihood of invasive plant spread and encourage native plant colonization. Prevention of non-native, invasive plant establishment is critical in maintaining high quality habitats. All disturbed areas in the project vicinity should be mulched and revegetated with native riparian species (please see recommended list). For maximum benefits on water quality and bank stabilization, riparian areas should not be mowed. Please note the Ohio Department of Natural Resources (ODNR) has an in-water work restriction for the Sandusky River from March 15-June 30 to protect spawning fish. In addition, the Sandusky River has been designated as a State Scenic River in Ohio and we recommend coordination with the Ohio Department of Natural Resources Scenic Rivers Program on project developments.

BALD EAGLE COMMENTS: The project lies within the range of the **bald eagle** (*Haliaeetus leucocephalus*). Bald eagles are protected under the Migratory Bird Treaty Act (16 U.S.C. 703-712; MBTA), and are afforded additional legal protection under the Bald and Golden Eagle Protection Act (16 U.S.C. 668-668d, BGEPA). BGEPA is the primary federal law protecting bald eagles and prohibits, among other things, the killing and disturbance of eagles. "Disturb" is defined by regulation (50 CFR 22.3) as, "to agitate or bother a bald or golden eagle to a degree that causes...injury to an eagle, a decrease in productivity, or nest abandonment." The Service recently issued a final rule that authorizes issuance of eagle take permits, where the take to be authorized is associated with otherwise lawful activities. Further information on eagle take permits and assessing your project's potential effect on bald eagles can be found at: http://www.fws.gov/midwest/MidwestBird/EaglePermits/index.html.

Eagle nest(s) exist within 1 mile southwest of the dam and another nest approximately 1 mile northeast of the Ballville dam.

In order to avoid take of bald eagles, we recommend that no tree clearing occur within 660 feet of the nest or within the woodlot supporting the nest tree. Further we request that work within 660 feet of the nest or within the direct line-of-site of the nest be restricted from mid-January through July. This will prevent disturbance of the eagles from the egg-laying period until the young fledge, which encompasses their most vulnerable times. We ask that you consult with this office before construction begins to confirm that the eagles have left the nest. Once this has been confirmed, construction may begin.

If these recommendations cannot be implemented and take of bald eagles is likely, based on the best information available, a bald eagle take permit for this project will be necessary.

ENDANGERED SPECIES COMMENTS: The proposed project lies within the range of the **Indiana bat** (*Myotis sodalis*), a Federally-listed endangered species. Since first listed as endangered in 1967, their population has declined by nearly 60%. Several factors have contributed to the decline of the Indiana bat, including the loss and degradation of suitable hibernacula, human disturbance during hibernation, pesticides, and the loss and degradation of forested habitat, particularly stands of large, mature trees. Fragmentation of forest habitat may also contribute to declines. During winter, Indiana bats hibernate in caves and abandoned mines. Summer habitat requirements for the species are not well defined but the following are considered important:

(1) dead or live trees and snags with peeling or exfoliating bark, split tree trunk and/or branches, or cavities, which may be used as maternity roost areas;
(2) live trees (such as shagbark hickory and oaks) which have exfoliating bark;
(3) stream corridors, riparian areas, and upland woodlots which provide forage sites.

We understand there is some potential for aspects of this project to necessitate some clearing of trees and field visits indicate some potential roost trees within the vicinity of the Ballville Dam. Should the proposed site contain trees or associated habitats exhibiting any of the characteristics listed above, we recommend that the habitat and surrounding trees be saved wherever possible. If the trees must be cut, further coordination with this office is requested to determine if surveys are warranted. In order for the Service to evaluate potential impacts to the Indiana bat, the Applicant must submit additional information. We recommend including the following information:

1. A map of the site with all forested areas indicated, and a general description of the habitat, including acreage, dominant species composition, age, density of understory, and canopy cover, and representative photos of these areas.
2. A map identifying the location of any exposed bedrock that supports caves, crevices, fissures, or sinkholes, or abandoned mines of any kind, and representative photos of these areas.
3. A map indicating the location of suitable roost trees (dead or live trees with peeling bark, cracks, or crevices), and describe species, condition (live or dead), size (dbh), and canopy cover. In particular, potential maternity roost trees should be located and quantified. Potential maternity roosts are typically large diameter trees with peeling bark that receive solar exposure for at least half the day. Please include representative photos of these trees.
4. A map indicating the location of any wetlands, streams, ponds, and cleared paths or trails.
5. A description and quantification of any forested parcels and potential roost trees onsite that will be preserved.
6. A description of any other forested properties within the vicinity of the project that are protected in perpetuity (ex. parks, conservation easements, etc.).
7. A description of the connectivity of forested areas onsite and other adjacent forested parcels.
8. A list of avoidance and minimization measures to protect the bat and its habitat (such as preservation of suitable habitat, seasonal tree clearing, etc.).
9. Using the information above as justification, please include your determination of whether or not the project is likely to adversely affect the Indiana bat.

Based on this information, the Service will evaluate potential impacts to the Indiana bat from the proposed project. Depending on the extent of impacts to suitable Indiana bat habitat, we may recommend mist net or emergence surveys to determine bat usage of the project area. These surveys must be designed and conducted in coordination with this office, and *may only be completed between May 15 and August 15*. In lieu of first providing the above information for Service evaluation, the Applicant may elect to forgo a habitat evaluation and conduct a mist net survey on the property. If this option is selected, the Applicant should contact this office immediately for a list of permitted Indiana bat surveyors, and to ensure that the appropriate survey protocol is implemented. Furthermore, if the habitat evaluation and/or mist net surveys do not provide sufficient information to document a "not likely to adversely affect" determination, formal consultation under section 7 of the Endangered Species Act of 1973, as amended, will be necessary.

The proposed project lies within the range of the **rayed bean**, a federally listed endangered species. The rayed bean is generally known from smaller, headwater creeks, but records exist in larger rivers. They are usually found in or near shoal or riffle areas, and in the shallow, wave-washed areas of lakes. Substrates typically include gravel and sand, and they are often associated with, and buried under the roots of, vegetation, including water willow (*Justicia americana*) and water milfoil (*Myriophyllum* sp.). The Service requested a mussel survey for this species in a March 2, 2011 letter. The objective to the survey was to determine presence or probable absence of the rayed bean and the survey proposal was approved by the Service. According to your report, a mussel survey was conducted by Stantec on September 1 and 2, 2011. It appears that sites D-5 and D-1 were of the best quality substrates and where the most mussels were observed but that overall the substrates within the transects were predominantly cobble and sand. We understand a total of 81 live mussels representing 12 species were encountered during the survey with one additional species added in the form of a weathered valve. According to your information, no federally listed mussels were found during the survey however, one live state threatened (threehorn wartyback, *obliquaria reflexa*and) twenty-three live state species of concern (deertoe, *truncilla truncate)* were observed. The Service recommends Stantec work with the ODNR, Division of Wildlife to relocate any state listed mussels within the limits of the project

area prior to any in-water construction taking place to avoid any direct/indirect impacts to these species. Best Management Practices (BMP's) should be utilized to minimize sedimentation and erosion and reduce any direct or indirect impacts of the project on mussel species. All work should be performed between periods of low flow and riparian zone habitat should be preserved wherever possible. Due to the negative results of the mussel survey, it is unlikely the rayed bean would be impacted by the proposed project.

These comments have been prepared under the authority of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.), the Endangered Species Act of 1973 (ESA), as amended, and are consistent with the intent of the National Environmental Policy Act of 1969 and the U. S. Fish and Wildlife Service's Mitigation Policy. This letter provides technical assistance only and does not serve as a completed ESA section 7 consultation document.

If you have questions, or if we may be of further assistance in this matter, please contact Melanie Cota at extension 15 in this office or by email at Melanie_Cota@fws.gov or visit our website at http://www.fws.gov/midwest/Reynoldsburg/.

Sincerely,

Mary Knapp

Mary Knapp, Ph.D.
Field Supervisor

cc: ODNR, DOW, SCEA Unit, Columbus, OH
Brian Elkington, USFWS Fisheries, Bloomington, MN
Joseph Krawczyk, USACE, Buffalo District, Regulatory Branch, Buffalo, NY
Rodger Knight, ODNR, Sandusky Fisheries Research Station, Sandusky, OH
Tim Kwiatkowski, ODNR, Scenic Rivers, Findlay, OH
Steve Malone, OEPA, Columbus, OH

From: Seymour, Megan [mailto:megan_seymour@fws.gov]
Sent: Wednesday, February 06, 2013 3:59 PM
To: Brown, Jeff; Fleece, Cody; Brian Elkington
Subject: Eastern Prairie Fringed Orchid surveys at Ballville Dam

Jeff and Cody,

The Project Area lies within the range of the federally threatened eastern prairie fringed orchid. This tall, showy orchid is found in wet prairies, sedge meadows, and moist road-side ditches. There are no current records of eastern prairie fringed orchid within the Project Area, however known populations occur in Riley Township, Sandusky County, located just east of the Project Area. Suitable habitat for this species may exist within the 63.37 acres of wetland found upstream of the Ballville Dam.

If wetland areas provide suitable habitat and will be impacted by the proposed project, we recommend that surveys to detect the presence or probable absence of this species be conducted during the period of time when the orchids are in bloom. Surveys should be completed either the 3rd or 4th week in June. Regardless of weather, the orchids should be blooming during this timeframe. Surveys should be conducted by a qualified botanist that can identify orchids in the field. Orchids may first be observed at several local locations including Pickerel Creek State Wildlife Area (there is a large sign near parking lot indicating where the orchids are, although last year we did not observe any in this field), and nearby on Coonrod and Erlin Roads, Riley Twp. (orchids grow along the roadside ditches and there are usually good numbers here). We recommend the survey include walked transects approximately 5 m apart through all areas of suitable habitat. Service biologists may be able to assist you during the surveys; if you are interested in having our assistance please let us know and we can notify you when we will be surveying this county.

Please let me know if you have any questions.
Sincerely,
Megan

--
Megan Seymour

Wildlife Biologist
U.S. Fish and Wildlife Service, 4925 Morse Rd., Suite 104, Columbus, OH 43230
(614) 416-8993 ext 16, (614) 416-8994 fax

Eastern Prairie Fringed Orchid
(*Platanthera leucophaea*)
Survey Report

Ballville Dam Removal Project,
Located on the Sandusky River, south of Fremont, Ohio

Conducted by: Jenny Finfera and Megan Seymour of the U.S. Fish and Wildlife Service Ecological Services Office and Bill Leopold, Joey Seamands, and Michael de Villiers of Stantec.

Report Submitted by Jenny Finfera and Megan Seymour.
Map and vegetation list provided by Stantec.

August 7, 2013

The **Eastern prairie fringed orchid** (*Platanthera leucophaea*) is a federally listed threatened species. This tall, showy orchid is found in wet prairies, sedge meadows, and moist road-side ditches, and has been assigned a "Facultative Wet" wetland indicator status according to the National Wetland Plant List for the Midwest Region (Lichvar 2013). The first collection (1819) of this species was in Arkansas Territory, now Choctaw County, Oklahoma; however, it has not been observed in Oklahoma since that time (USFWS 1999). The eastern prairie fringed orchid (EPFO) was once widespread across the upper Midwest, with disjunct populations in Virginia, New Jersey, and Maine. Its range has declined by more than 70% from original county records (USFWS 1999). Illinois had the largest and most extensive pre-settlement EPFO populations and has suffered the most drastic decline of any state in the species' historical range (USFWS 1999). Recent surveys indicate that rangewide; most populations continue to contain fewer than 50 plants and are not considered highly viable (USFWS 2010). Often, remaining habitats are just fragments of former prairie areas and they may lack the natural processes to maintain the habitat as prairie or the native pollinators required for pollination to be successful.

When EPFO was listed, it was only found in four counties in northern Ohio, but populations have now been located in a total of six counties: Clark, Lucas, Holmes, Ottawa, Sandusky, and Wayne. Many of Ohio's EPFO populations are within state wildlife areas or the Ottawa National Wildlife Refuge. In Ohio, EPFO is found in mesic prairies near Wooster, sedge meadow prairies near Dayton, and lake plain prairies near Lake Erie. This orchid is usually found in a grassy habitat with little to no woody encroachment and requires full sun for maximum growth and flowering (USFWS 1999). A mycorrhizal symbiotic relationship allows seeds to germinate and become established. Ohio currently has 11 active sites; however, only three of the 11 sites are considered highly viable (USFWS 2010).

Threats to the species include: habitat loss, habitat degradation, impacts to water quantity (increasing or decreasing), impacts to water quality, low population size, low natural pollination, self-pollination, low population trend, fluctuating annual population trends, small habitat size, late-successional vegetation stages, collecting, mowing, and no, low, or inappropriate management.

Some threats can be avoided, minimized, or mitigated. These include stressors such as wetland fill, sedimentation/siltation, soil compaction, increased pollutant load (road salt, oil), woody encroachment, shade, pesticide use, introduction and establishment of invasive species, water removal, increased water discharge to orchid sites, herbicide drift, self-pollination, mowing while vegetative, loss of propagules, crushing, late spring season burns, off road vehicular traffic, and herbivory by deer (eat blooms before seed set).

For projects that have the potential to impact suitable habitat, the Service recommends that surveys for this species be conducted when the orchids are in bloom (late June through early July).

The removal of the Ballville dam has the potential to impact suitable habitat for this species by altering the hydrology of the wetlands associated with the Sandusky River. If the water table were to be lowered too much, the orchids may not have the water they need to grow. In addition, changes in hydrology often can create conditions favorable to invasive species and can result in

significant competition for native species. For EPFO the most significant threat is the succession of habitat to woody species. A high water table can limit tree growthup and help to maintain orchid habitat.

The EPFO survey area included jurisdictional wetland features upstream of Ballville Dam subject to hydrology alteration (Figure 2--Indirectly Impacted Wetland Areas). The survey date was selected based on past information on when the plant has been in flower. EPFO is easiest to detect when the showy, white blossoms are in bloom.

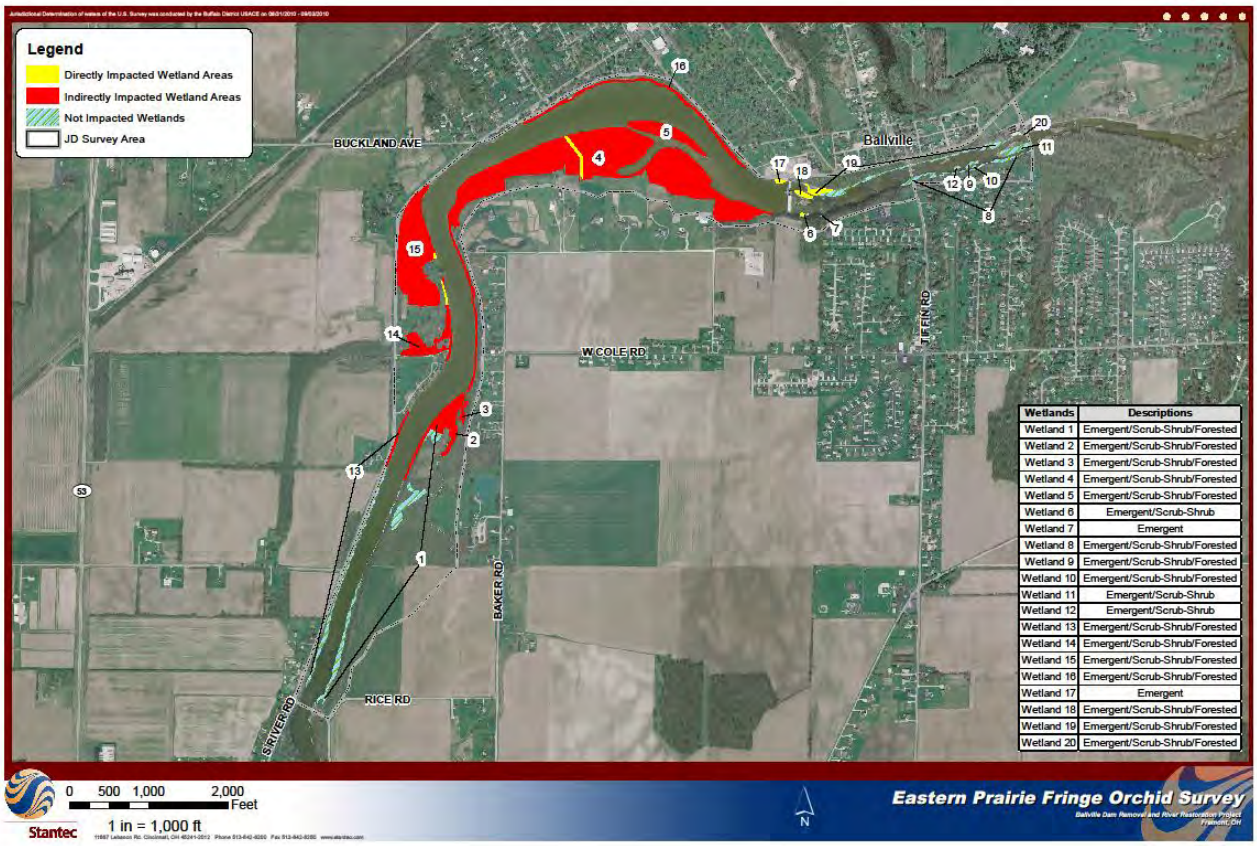
On June 2013 we visited a known EPFO site at the Pickerel Creek Wildlife Area to observe orchids and confirm that they were blooming. Over a dozen orchids were identified. The plants were significantly shorter this year. Most were not yet at the peak of bloom, however the plants were visible and they provided a fresh search image for the survey (Figure 1).

Figure 1. Eastern Prairie Fringe Orchid observed at Pickerel Creek Wildlife Area on June 20, 2013.

We then traveled to the Ballville Dam project site. We surveyed wetlands 1, 2, 3, 4, 14, and 15 (Figure 2). We then conducted a survey along the shore for wetlands 5, and 16. Wetland 4 was quite forested and we tried to concentrate on the areas with openings. No orchids were observed within any of the project area.

Overall habitat for the orchids at all the sites visited was marginal to poor due to the extensive forest cover in most areas, and the invasive cover of *Phalaris arunduncaeae* (reed canarygrass) in open areas.

Based on the survey results and the habitat present within the area to be impacted, it is unlikely that EPFO would occur within the project area, and no effect on this species is anticipated.



Wetlands	Descriptions
Wetland 1	Emergent/Scrub-Shrub/Forested
Wetland 2	Emergent/Scrub-Shrub/Forested
Wetland 3	Emergent/Scrub-Shrub/Forested
Wetland 4	Emergent/Scrub-Shrub/Forested
Wetland 5	Emergent/Scrub-Shrub/Forested
Wetland 6	Emergent/Scrub-Shrub
Wetland 7	Emergent
Wetland 8	Emergent/Scrub-Shrub/Forested
Wetland 9	Emergent/Scrub-Shrub/Forested
Wetland 10	Emergent/Scrub-Shrub/Forested
Wetland 11	Emergent/Scrub-Shrub
Wetland 12	Emergent/Scrub-Shrub
Wetland 13	Emergent/Scrub-Shrub/Forested
Wetland 14	Emergent/Scrub-Shrub/Forested
Wetland 15	Emergent/Scrub-Shrub/Forested
Wetland 16	Emergent/Scrub-Shrub/Forested
Wetland 17	Emergent
Wetland 18	Emergent/Scrub-Shrub/Forested
Wetland 19	Emergent/Scrub-Shrub/Forested
Wetland 20	Emergent/Scrub-Shrub/Forested

Figure 2. Wetlands in the vicinity of Ballville Dam.

Literature Cited

Lichvar, R. W. 2013. National Wetland Plant List : 2013 wetland ratings. Phytoneuron 2013, 49:1-241.

U.S. Fish and Wildlife Service (USFWS). 1999. Eastern Prairie Fringed Orchid (*Platanthera leucophaea*) Recovery Plan. Fort Snelling, Minnesota. 32p.

U.S. Fish and Wildlife Service (USFWS). 2010. Eastern Prairie Fringed Orchid (*Platanthera leucophaea*) 5-year review. Fort Snelling, Minnesota. 62p.

Plants observed within wetlands of the project site during 2013:

Scientific Name*	Common Name
Acalypha virginica	Virginia threeseed mercury
Acer negundo	boxelder
Acer rubrum	red maple
Acer saccharinum	silver maple
Ailanthus altissima	tree-of-heaven
Alisma triviale	northern water plantain
Alliaria petiolata	garlic mustard
Allium canadense	meadow garlic
Ambrosia artemisifolia	annual ragweed
Ambrosia trifida	great ragweed
Anemone canadensis	Canadian anenome
Apocynum cannabinum	Indianhemp
Arctium minus	lesser burdock
Arisaema dracontium	green dragon
Asclepias incarnata	swamp milkweed
Asclepias spp	milkweed
Asclepias syriaca	common milkweed
Betula nigra	river birch
Bidens frondosa	devil's beggartick
Boehmeria cylindrica	smallspike false nettle
Carex crinita	fringed sedge
Carex frankii	Frank's sedge
Carex grayi	Gray's Sedge
Carex lasiocarpa	awlfruit sedge
Carex planispicata	flat-spiked sedge
Carex scoparia	broom sedge
Carex spp	sedge
Carex stipata	woollyfruit sedge
Catalpa speciosa	northern catalpa
Cephalanthus occidentalis	common buttonbush
Cercis canadensis	eastern redbud
Chamaecrista fasciculata	partridge pea
Cicuta maculata	spotted water hemlock
Convolvulus arvensis	field bindweed
Cornus drummondi	roughleaf dogwood
Crataegus spp	hawthorn
Cryptotaenia canadensis	Canadian honewort
Cuscuta americana	American dodder
Elymus riparius	riverbank wildrye
Elymus virginicus	Virginia wildrye
Equisetum hyemale	scouringrush horsetail
Eragrostis spp	lovegrass
Fraxinus pensylvanica	green ash
Geranium maculatum	spotted geranium

Plants observed within wetlands of the project site during 2013:

Scientific Name*	Common Name
Gerardia spp	foxglove
Geum canadense	white avens
Geum laciniatum	rough avens
Glechoma hederacea	ground ivy
Gleditsia triacanthos	honeylocust
Helenium autumnale	common sneezeweed
Heracleum maximum	common cowparsnip
Humulus lupulus	common hop
Hydrophyllum canadense	bluntleaf waterleaf
Impatiens capensis	jewelweed
Iris pseudacorus	paleyellow iris
Iris versicolor	harlequin blueflag
Juglans nigra	black walnut
Justicia americana	American water-willow
Laportea canadensis	Canadian woodnettle
Leersia oryzoides	rice cutgrass
Leersia virginica	whitegrass
Lonicera maackii	Amur honesuckle
Ludwigia alternifolia	seedbox
Lycopus americanus	American water horehound
Lysimachia ciliata	fringed loosestrife
Lysimachia nummularia	creeping jenny
Menispermum canadense	common moonseed
Mimulus ringens	Allegheny monkeyflower
Morus rubra	red mulberry
Osmorhiza longistylis	longstyle sweetroot
Oxalis stricta	common yellow oxalis
Parthenocissus quinquefolia	Virginia creeper
Pastinaca sativa	wild parsnip
Paulownia tomentosa	princesstree
Penstemon canescens	eastern gray beardtongue
Penthorum sedoides	ditch stonecrop
Phalaris arundinacea	reed canarygrass
Phlox glaberrima	smooth phlox
Phragmites australis	common reed
Phyla lanceolata	lanceleaf fogfruit
Pilea pumila	Canadian clearweed
Plantago lanceolota	narrowleaf plantain
Plantago major	common plantain
Platanus occidentalis	American sycamore
Poa pratensis	Kentucky bluegrass
Polygonum hydropiperoides	swamp smartweed
Polygonum pensylvanicum	Pennsylvania smartweed
Polygonum persicaria	spotted ladysthumb

Plants observed within wetlands of the project site during 2013:

Scientific Name*	Common Name
Polygonum spp	smartweed
Polygonum virginianum	jumpseed
Polymnia canadensis	whiteflower leafcup
Populus deltoides	eastern cottonwood
Populus grandidentata	bigtooth aspen
Potentilla simplex	common cinquefoil
Quercus palustris	pin oak
Ranunculus hispidus	bristly buttercup
Ranunculus septentrionalis	swamp buttecup
Ranunculus spp	buttercup
Rosa multiflora	multiflora rose
Rosa spp	rose
Rubus allegheniesis	Allegheny blackberry
Rubus idaeus	raspberry
Rudbeckia lacianata	cutleaf coneflower
Rumex altissimus	pale dock
Rumex crispus	curly dock
Rumex verticillatus	swamp dock
Sagittaria latifolia	broadleaf arrowhead
Salix interior	sandbar willow
Salix nigra	black willow
Saururus cernuus	lizard's tail
Scutellaria lateriflora	blue skullcap
Senecio spp.	ragwort
Smilax rotundifolia	roundleaf greenbriar
Solidago Canadensis	Canada goldenrod
Solidago graminifolia	flat-top goldentop
Solidago juncea	early goldenrod
Solidago spp	goldenrod
Solidago uliginosa	bog goldenrod
Spartina pectinata	prairie cordgrass
Symphyotrichum lateriflorum	calico aster
Toxicodendron radicans	eastern poison ivy
Ulmus Americana	American elm
Urtica dioica	stinging nettle
Verbena hastata	swamp verbena
Verbesina alternifolia	wingstem
Veronia spp	ironweed
Viburnum acerfolium	maple leaf viburnum
Viola spp	violet
Vitis riparia	riverbank grape

**USDA plant database nomenclature*

5.3 OHIO HISTORICAL PRESERVATION OFFICE

State of Ohio Environmental Protection Agency

STREET ADDRESS:
Lazarus Government Center
50 W. Town St., Suite 700
Columbus, Ohio 43215

TELE: (614) 644-3020 FAX: (614) 644-3184
www.epa.state.oh.us

MAILING ADDRESS:
P.O. Box 1049
Columbus, OH 43216-1049

October 4, 2010

Mark Epstein, Department Head
Ohio Historic Preservation Office
Resource Protection and Review
1982 Velma Avenue
Columbus, Ohio 43211-2497

RECEIVED
OCT 12 2010
By

RE: City of Fremont
Ballville Dam Removal Project
WPCLF Loan WR390371-0003
NHP Act Section 106 Review Project Summary Form

Dear Mr. Epstein:

The City of Fremont in Sandusky County has requested funding through the Ohio EPA Water Pollution Control Loan Fund program for deconstruction of the Ballville dam.

Enclosed for your review are a NHP Act Section 106 Review Project Summary Form and supporting maps and photographs.

Please provide recommendations in a letter to the City of Freemont (contact in the Project Summary Form) on how to proceed to evaluate:

1) The dam and the property on which it is located; and
2) Cultural resources which may be impacted by its removal.

You can contact me if you need additional information by phone (614-644-3667), fax (614-644-3687), or e-mail (*joe.jellick@epa.state.oh.us*).

Sincerely,

Joseph R. Jellick
Environmental Planning Section
Division of Environmental and Financial Assistance

c: Sam Derr, City of Fremont

OHIO HISTORIC PRESERVATION OFFICE:

RESOURCE PROTECTION & REVIEW

Section 106 Review- Project Summary Form

City of Fremont, Ballville Dam Removal Project

Ohio EPA Division of Environmental and Financial Assistance

WPCLF Loan WS390371-0006

October 4, 2010

SECTION I. GENERAL PROJECT INFORMATION

All contact information must include the name, address, phone number and e-mailof the person listed. This information is (check one):

☒ A NEW PROJECT SUBMITTAL

☐ ADDITIONAL INFORMATION RELATING TO PREVIOUSLY SUBMITTED PROJECT. PLEASE PROVIDE THE OHPO/RPR SERIAL NUMBER ON OHPO LETTER REFERENCING THE PREVIOUSLY SUBMITTED PROJECT:

a. **Project Name** (if applicable):
City of Fremont, Ballville Dam Removal Project

b. **Project Address** or vicinity: Approx 0.5 mile SW of Fremont municipal limts

c. **City/Township:** Fremont/BallvilleTwp **County:** Sandusky

d. **Federal Agency and Contact Person:**
Ohio EPA for USEPA

e. **Type of Federal Assistance.** List all known federal sources of federal funding, approvals, and permits to avoid repeated reviews:
Ohio EPA Water Pollution Control Loan Fund (WPCLF) Program

f. **State Agency and Contact Person** (if applicable):
Ohio EPA, Division of Environmental and Financial Assistance (DEFA)
Joseph R. Jellick 614-644-3667 joe.jellick@epa.state.oh.us
Ohio EPA-DEFA, P.O.B. 1049, Columbus, Ohio 43216-1049

g. **Type of State Assistance:**
Water Resources Restoration Program Grant No. WR 390371-0006

h. **Is this project being submitted solely under Ohio Revised Code 149.53?** Answering yes means you are sure no federal funding/ permits/ approvals will be used for any of your project, and that you are seeking comments under ORC 149.53.
☐ YES ☒ NO

i. **Consultant and/or Applicant Contact Person** (if applicable):
Sam Derr, Safety Service Director
City of Fremont, 323 S Front St, Fremont, Ohio 43420-3065
Phone: 419-334-2687

j. **Consultant and/or Applicant Project Reference Number** (if applicable): NA

k. **Public Involvement**- Describe how public has been/will be informed about project and potential to affect historic properties. Summarize how they will have an opportunity to provide comments:
The dam removal is part of Fremont's upland reservoir project. There have been presentations and discussions concerning the project in Fremont City Council meetings which are open to the public and videotaped for online access. Drinking Water Advisories, negotiations with OEPA and funding of the project have been well covered by several area newspapers including the Fremont News-Messenger and the Toledo Blade.

l. **Please list other consulting parties that you have contacted/will contact about this project,** such as Indian Tribes, Certified Local Governments, local officials, property owners, or preservation groups. (See 36 CFR 800.2 for more information about involving other consulting parties). Also summarize how they will have an opportunity to provide comments:

SECTION II. PROJECT DESCRIPTION AND AREA OF POTENTIAL EFFECTS (APE)

Provide a basic description of your project, its site and geographical information. You will also describe your project's APE.

Exact project site location must be submitted on a USGS 7.5-minute topographic Quadrangle map for all projects (map sections, photocopies, and online versions of USGS maps acceptable).

a. **USGS Quad Map Name:** Fremont West

b. **Township/City/Village Name:**
SW of City of Fremont in Ball Twp
DOES THIS PROJECT INVOLVE ANY GROUND-DISTURBING ACTIVITY? (Check one)
☒ YES ☐ NO **(If yes, you must complete II.c through II.f. If no, proceed directly to Section II.g.)**

c. General description of width, length and depth of **proposed ground disturbing activity**:
Ballville dam is a concrete structure approximately 400 feet long and 35 feet high, oriented N-S across the Sandusky River. The dam and a small area on each bank will be disturbed during deconstruction. Property (former Ohio State Power Company (OSPC) equipment yard) adjacent to the N end of the dam is gravel covered. It is used by an electric utility company to store materials. It will probably be used as an equipment parking and maintenance area.

d. Narrative description of **previous land use** and past ground disturbances, if known:
The land use in the area prior to the existing land uses was river bed and flood plain. The dam (built in 1911) was used by OSPC to generate hydroelectric power until 1946. Fremont bought the facility in 1959 for use as its water supply. None of the generating equipment remains.

e. Narrative description of **current land use** and conditions:
Current use of the dam is as an impoundment for water supply.

f. Does the landowner know of any **archaeological resources** found on the property? ☐ YES ☒ NO
If yes, please describe:
The City is not aware of any archaeological resources on the property.

g. Provide a **local map** indicating the location of the project site; road names must be included and legible. Map must show the exact location of the project site relative to nearby intersections and geographical features:
See the attached topographic Location Map and photos of the dam.

h. Provide a **detailed written description** of the project. The information provided must support your analysis of effects to historic properties, not other types of project impacts (do not simply include copies of environmental documents or other types of specialized project reports:
The impoundment formed by Ballville dam is the source of Fremont's drinking water. Its capacity has been greatly reduced by sediment accumulation. The City has been under Findings & Orders from Ohio EPA since 2/15/08 to construct an upland raw water reservoir to store water from the Sandusky River when nitrate levels are low. The Ohio Department of Natural Resources (ODNR) is also involved with the reservoir project because it will allow removal of the dam to restore the Sandusky River to natural flow conditions.

i. On the same local map and/or USGS Quad Map, you must clearly **show the project APE**. It should be clearly distinguished from other features shown on the map.
The location of the dam is shown on the attached topographic map.

j. Provide a **written description of the APE**, including a discussion of potential for direct and indirect effects from the project, the steps taken to identify the APE, and the justification for the boundaries chosen.
The APE of direct effect will be the footprint of the dam and small areas adjacent to each end to allow for construction equipment operation and parking.

SECTION III. IDENTIFICATION OF HISTORIC PROPERTIES

Describe whether there are historic properties within APE. Use information from your Field Survey and Background Research to make this determination. See Section III.e for reporting options. Refer to Directions or contact OHPO if you are unsure about how to identify historic properties for your project.

a. Background Research- Describe the steps taken to determine whether or not any previously identified historic properties are located in the APE. Please describe the level of effort made to carry out this step (i.e. OHPO literature review, OHPO Record Search Service, local research methods, use of archival data or county histories). Also provide a background statement that summarizes the local history.
Fremont is located at a crossing of the lower rapids of the Sandusky River and the intersection of the Sandusky-Scioto River Trail and the Lake Trail. Fort Stephensen was set up at the trading post there in 1812. The first substantial growth in the Fremont area occurred in the 1830s. The communities of Croghansville and Lower

Sandusky (established respectively in 1816 and 1817) merged in 1849 to form the City of Fremont. Sandusky County was established by Act in 1820. Most of the county has been cleared and drained for farming.

For the current review, the OHPO Online Mapping System was used to review a 0.5 mile radius around the dam. The review of the OHPO data base included the Ohio Archaeological Inventory (OAI) and Historic Inventory (OHI) records, a check for previous cultural survey reports, National Register Eligibility Determinations and NRHP listed sites. (See attached OHPO GIS map.)

b. Field Survey- Using one of the formats described in item III.e., provide basic information for all buildings/structures/sites **50 years of age or older** that you found to be located in your project **APE**. Include OHI or OAI numbers (if assigned) and property addresses or vicinity information.
The area of the proposed project was photographed on 9/22/2010. There is one property (SAN0027510) listed on the OHI in the review area at 0.4 mile NE of the dam.

There are residential buildings more than 50 years old at about 400 feet N of the dam. The water intake screening building at Ballville Dam does not appear to be more than 50 years old and the attached photo shows no notable architectural features.

There are five archaeological finds recorded in the OAI within the 0.5 mile radius of the dam. Oakwood Cemetery is about 500 feet NW the dam.

c. Eligibility Evaluation- Describe current condition, previous disturbances/alterations, and history of any buildings/structures/sites within the APE. Use information in your Field Survey and Background Research to decide if any buildings/structures/sites in APE are eligible or already listed in the National Register. If you found a building/structure/site is in a listed or eligible historic district, include the name of district.

d. Based on the conclusions you reached in **Section III.c**, please choose one finding. There are:
- ☐ Historic Properties Present in the APE
- ☐ No Historic Properties Present in the APE

e. To complete Section III, you must provide information about buildings/structures/sites that are described in III.a through III.d using one or more of following reporting options and attach it to this Summary Form.
- ☐ **Summary of discussions and/or consultation with OHPO** about this project that demonstrates how the Agency Official and OHPO have agreed that no Field Survey was necessary (e.g. extreme ground disturbance or other circumstances). Attach emails/correspondence to document agreement. Show how you considered the project's potential to affect archaeological and historic resources.
- ☐ **A table** that includes the minimum information listed in the **Section 106 Historic Documentation Table**, equivalent to information on an inventory form. The information must be mailed with Project Summary Form. Please label forms and CDs with date of submission and project name, as in Section I. a.
- ☐ New **OHI** or **OAI** inventory forms may be prepared using the **OHI.pdf form**, **Internet IForm**, or typed archival quality inventory forms. When buildings/structures/sites have previously been entered into state inventory, you may simply list reference numbers. Describe the current condition of each resource and your assessment of eligibility for the National Register. Update information on completed inventory forms on Continuation Sheets. Assessment of the current condition and eligibility of previously surveyed properties can be in an attachment to Project Summary Form.
- ☐ **A historic or archaeological survey report** prepared by qualified consultant should meet the Secretary of Interior's Guidelines for Identification and OHPO Archaeological Guidelines. New, or updates of previous inventory forms may be included with your survey.

SECTION IV. SUPPORTING DOCUMENTATION

All photos must be keyed to a local map. OHPO does not visit project sites. Present enough documentation to show existing conditions at project site and details ofbuildings/structures/sites.

a. Provide photos of the entire project site.
Captioned photos of the project area and copies of photos from a Dam Safety Inspection Report (2003) by ODNR, Division of Water are attached.

b. Provide current photos of all buildings/structures/sites described in Section III. (Photographs taken to/from historic properties from/towards your project site may also be submitted to support determination of effect in Section V.
See attached photos of the project area.

c. Project plans, specifications, site drawings and any other media presentation that conveys detailed information about your project and its potential to affect historic properties.
d. Provide copies or summaries of any comments provided by consulting parties or the public.

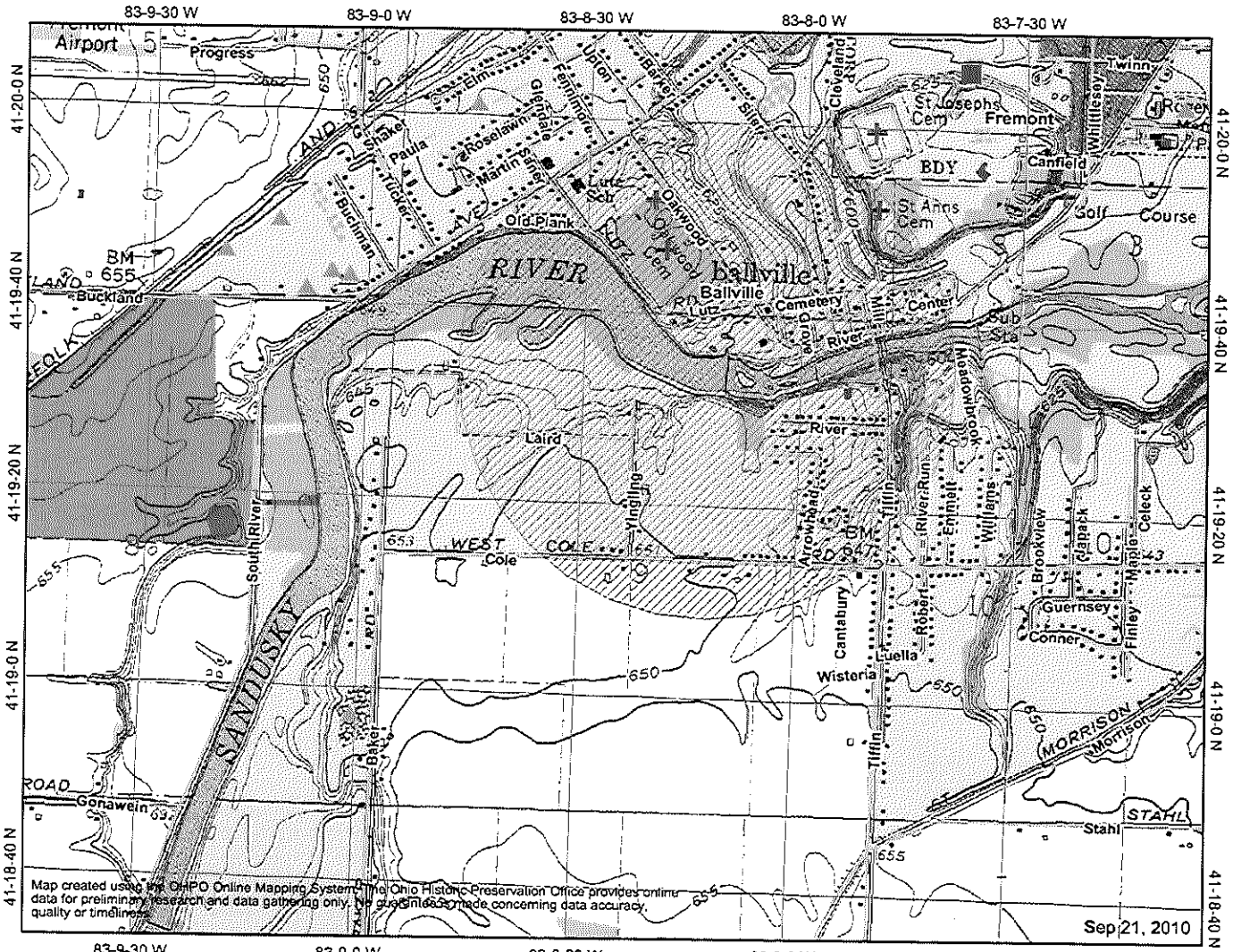
SECTION V. DETERMINATION OF EFFECT

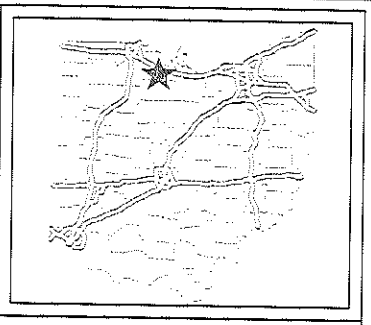
a. **For challenging projects, you may provide information in Sections I through IV and STOP HERE** to ask OHPO to offer comments or recommendations about how to proceed.
☒ **Request preliminary comments from OHPO about this project.**
Please provide recommendations to the City of Freemont (contact in the Project Summary Form) on how to proceed to evaluate:
1) The dam and the property on which it is located; and
2) Cultural resources which may be impacted by its removal.

b. If you believe you have enough information to conclude Section 106 process, you may be ready to make a determination of effect and ask OHPO for concurrence, after considering public comments:
☐ No **historic** properties will be affected based on [36 CFR § 800.4(d)(1)]. Please explain how you made this determination:
☐ No Adverse Effect [36 CFR § 800.5(b)] on **historic** properties. Please explain why the criteria of adverse effect, 36 CFR Part 800.5(a)(1), were found not to be applicable for your project:
☐ Adverse Effect [36 CFR § 800.5(d)(2)] on **historic** properties. Please explain why the criteria of adverse effect, [36 CFR Part 800.5(a)(1)], were found to be applicable to your project. You may also include an explanation of how these adverse effects might be avoided, reduced or mitigated:

Ohio Historic Preservation Office

Internet Mapping Framework





Legend

- NR Determinations of Eligibility
- National Road
- Highways
- Roads
- National Register Listings
- Archaeological Sites
- Historic Structures
- OGS Cemeteries
- Phase 1
- Phase 2
- Phase 3
- National Register Boundaries
- Cities
- Wayne National Forest
- Counties

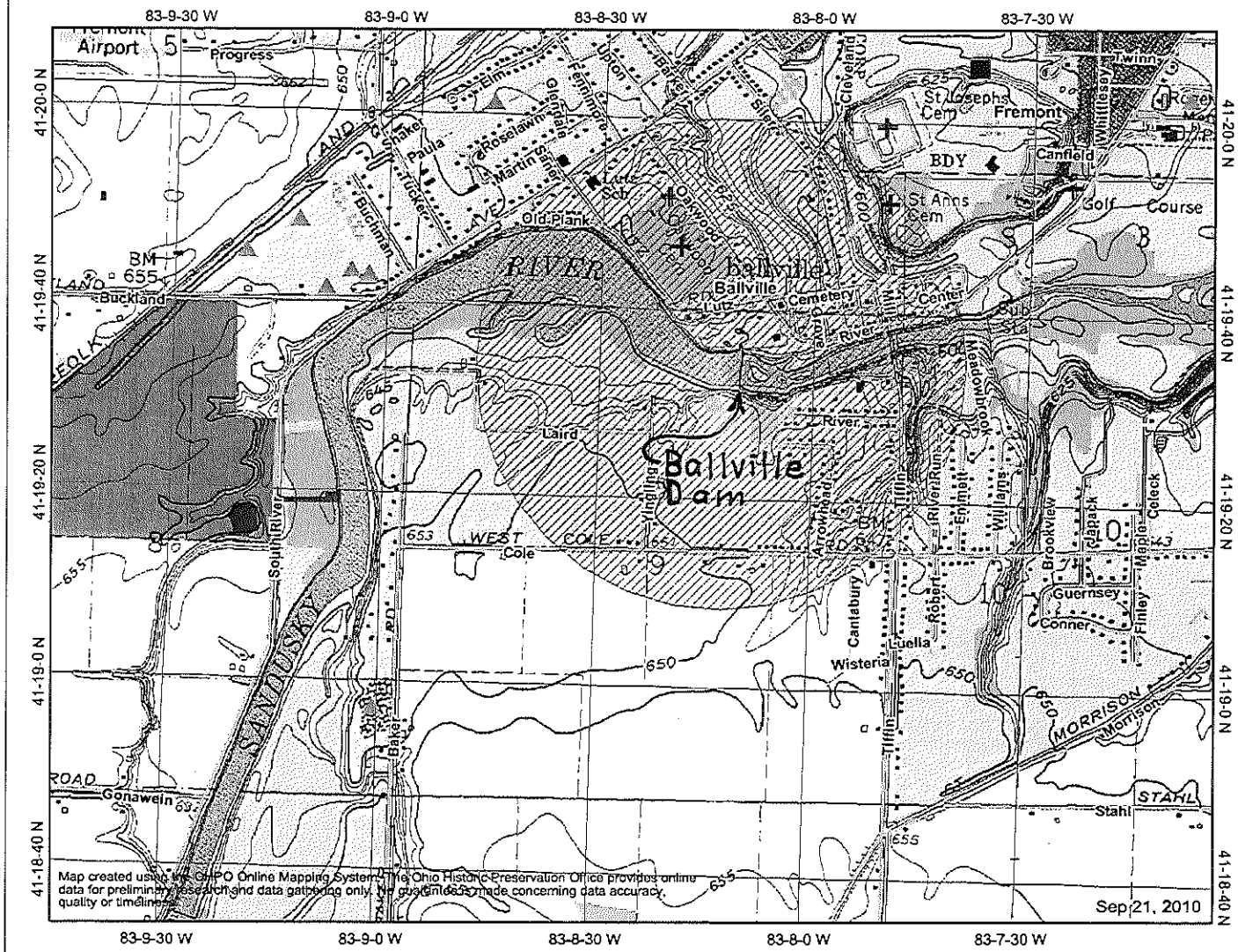
Scale: 1:20,424

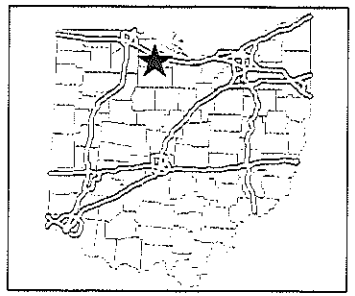
Map center: 320871, 4576588 (UTM 17N)

This map is a user generated static output from an Internet mapping site and is for general reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable. THIS MAP IS NOT TO BE USED FOR NAVIGATION.

Ohio Historic Preservation Office

Internet Mapping Framework





Legend

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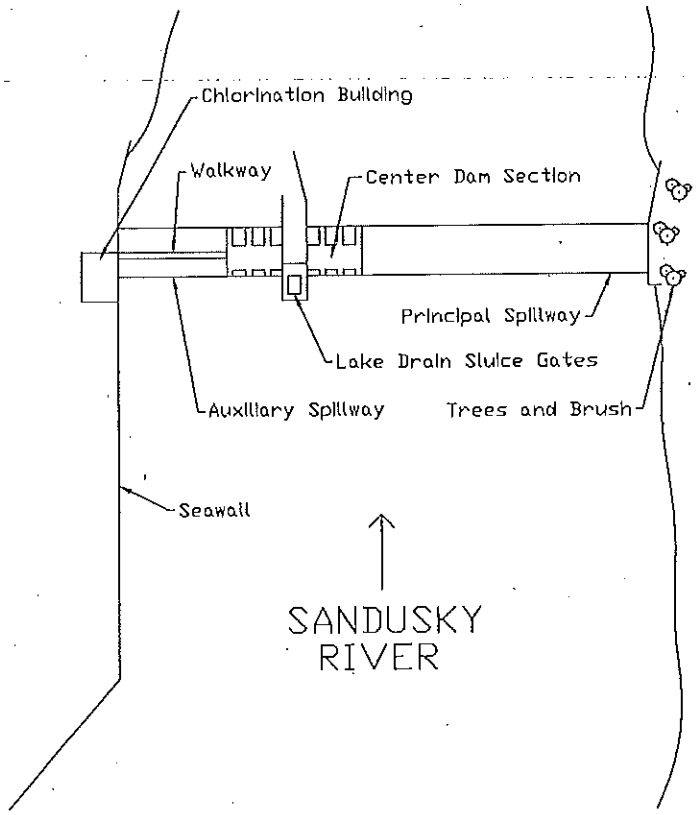
City of Fremont
Ballville Dam Removal Project
Ohio EPA WPCLF Loan WR390371-0003
October 2010



Designed by:	NA	File No.	1231-003
Drawn by:	MEM	Scale	NTS
Checked by:	KRB	Date	December 10, 2003
Approved by:	NA	Revised	NA

1 / 1

Ballville Dam
Sandusky County

OHIO DEPARTMENT OF NATURAL RESOURCES
Division of Water
Dam Safety Engineering Program

City of Fremont - Ballville Dam Removal Project Extension Project, WR390371-0003

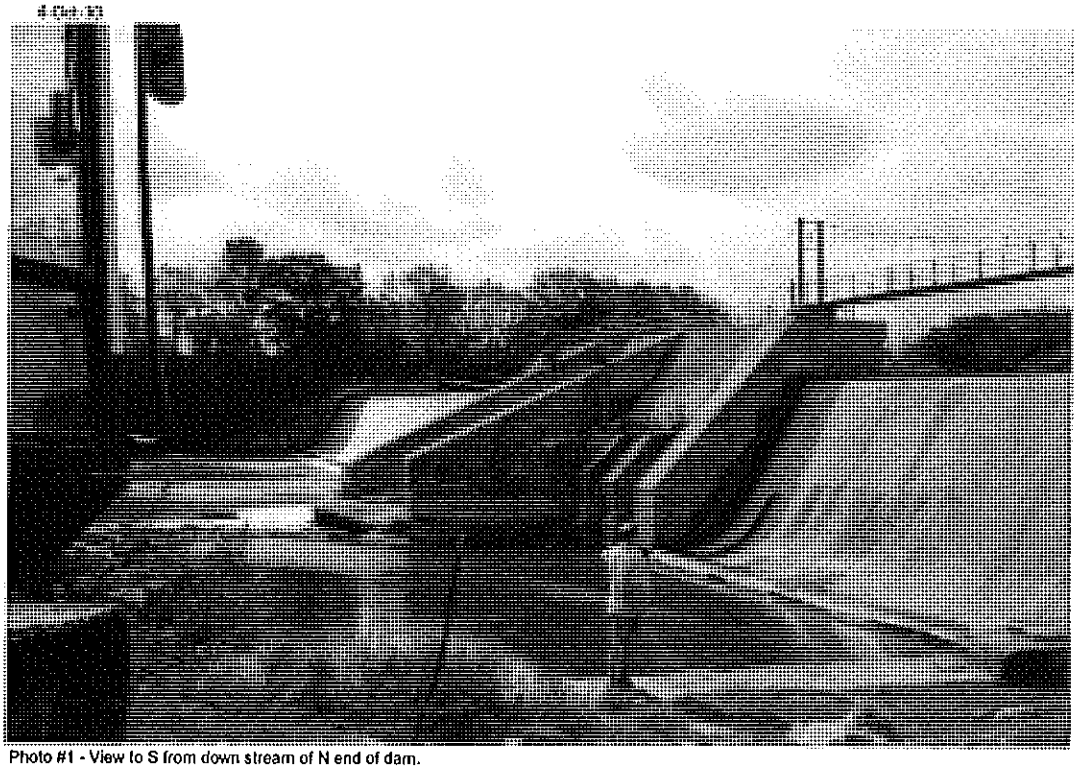
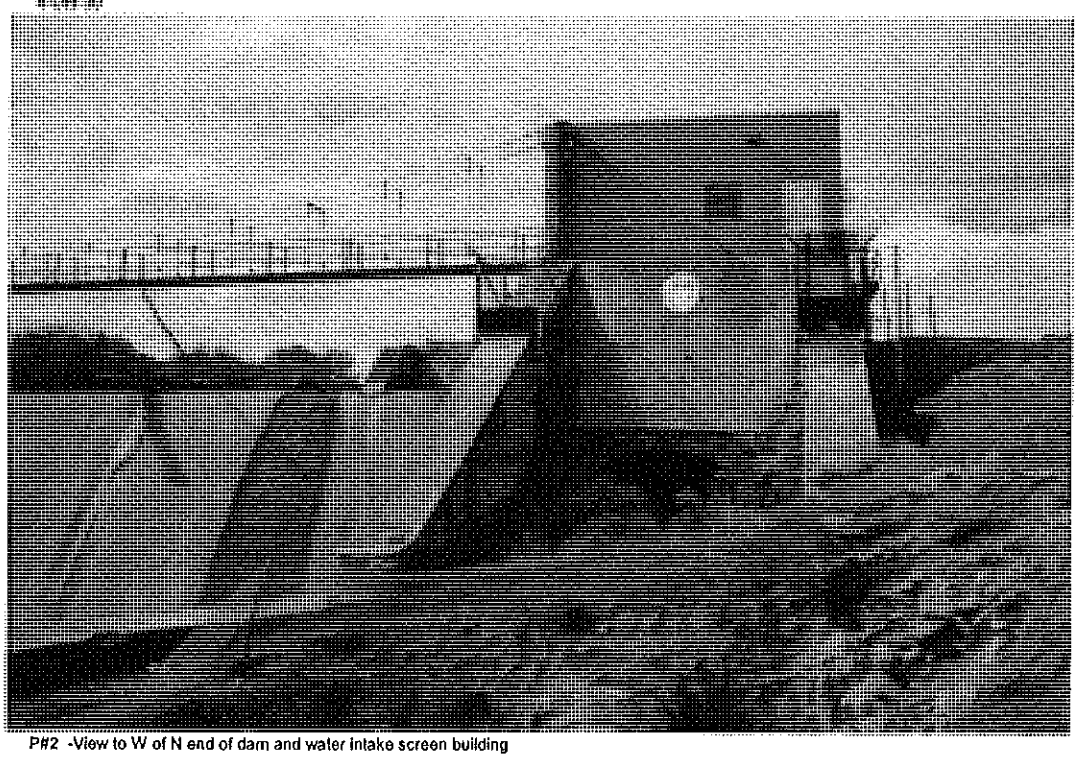


Photo #1 - View to S from down stream of N end of dam.

City of Fremont - Ballville Dam Removal Project Extension Project, WR390371-0003



P#2 -View to W of N end of dam and water intake screen building

City of Fremont - Ballville Dam Removal Project Extension Project, WR390371-0003
4-Oct-10

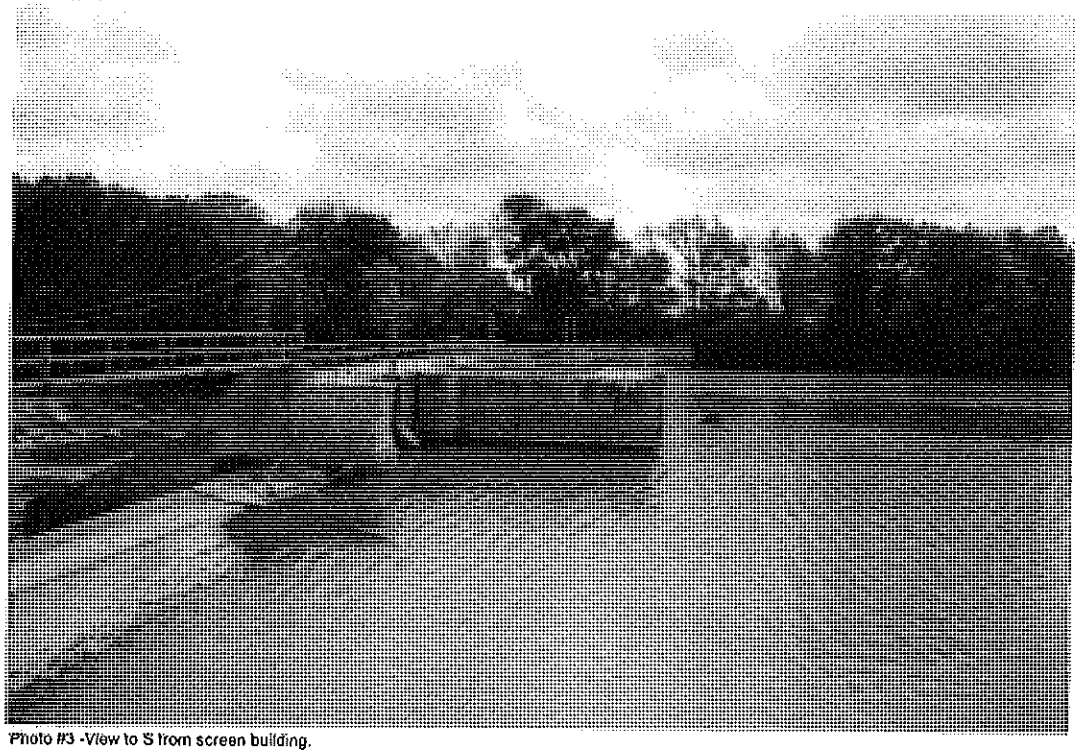


Photo #3 -View to S from screen building.

City of Fremont - Ballville Dam Removal Project Extension Project, WR390371-0003
4-Oct-10

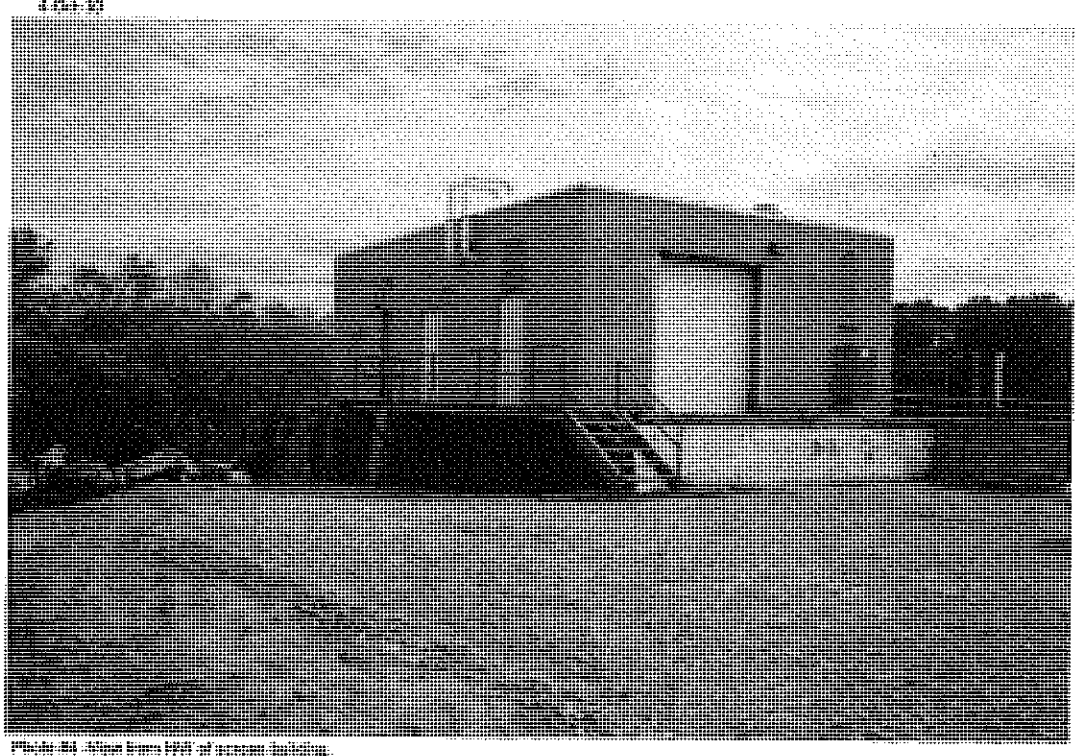


Photo #4 -View from NW of screen building.

City of Fremont - Ballville Dam Removal Project Extension Project, WR390371-0003
4-Oct-10

Photo #4 - View to NW from power building at W end of dam.

City of Fremont - Ballville Dam Removal Project Extension Project, WR390371-0003
[illegible]

Photo #5 - View to NE from power building at W end of dam.