

WATER RESOURCE RESTORATION SPONSOR PROGRAM (WRRSP)  
PROPOSED PROJECT



AURORA BRANCH CHAGRIN RIVER  
PROTECTION AND RESTORATION PLAN

City of Aurora

**July 9, 2012**

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# AURORA BRANCH CHAGRIN RIVER RESTORATION

## PROTECTION AND RESTORATION PLAN

### I. PLAN SUMMARY

The **Aurora Branch Chagrin River Restoration Project** involves acquisition by the City of Aurora of 194.3-acres of the the existing Aurora Golf Club, an 18-hole golf course located within the City limits and restoration of streams on the property. The site lies in Portage County and within the Upper Aurora Branch of the Chagrin River Watershed.

The project includes preservation of over 8,000 linear feet of the Aurora Branch of the Chagrin River and over 9,000 linear feet of headwater streams, removal of one dam, and restoration of 3,600 linear feet of the Aurora Branch of the Chagrin River and 691 linear feet of headwater stream. In addition, 13 acres of wetlands will be preserved including 6 acres of potential Category 3 wetlands. Finally this project will restore nearly 33 acres of existing mowed and manicured golf course to a forest riparian corridor and floodplain. This project will implement one of the action items included in the Chagrin River Watershed Action Plan (2006, revised, 2010, "WAP"). The plan lists restoration of the river through the Aurora Country Club as an action item and specifically calls for removal of the golf course infrastructure and restoration of the riparian corridor.

The project will protect the adjacent Aurora Audubon Sanctuary, a 165-acre preserve that was the first bird sanctuary established in the State of Ohio. This property, which harbors state-listed species, is designated as a State Nature Preserve and managed in partnership with ODNR. The subject property will provide significant buffer for the preserve as well as expanded habitat along the river. In addition the Aurora Branch of the Chagrin River is a designated State Scenic River just downstream of the project site. Restoration of the Aurora Branch and the riparian corridor may allow for expansion of this scenic river designation upstream of State Route 82.

## **II. DESCRIPTION OF WATER RESOURCES TO BE PROTECTED**

### **A. Identification and Location of Water Resources**

#### **1. HUC 11 Identification Number**

The HUC 11 Identification Number for the watershed in which the Property is located is:

04110003-020

Upper Aurora Branch of Chagrin River – Aurora Branch upstream of McFarland Creek

#### **2. Location Map and Project Area within Ohio**

The site is located in the City of Aurora and is adjacent to the Aurora Audubon Sanctuary. An overview of the site is shown in Appendix A.

#### **3. High Quality Topographic Maps Detailing the Project Area**

Please see Appendix A for an overview of the site and a high quality topographic map.

### **B. Overview of Water Resources**

#### **1. Provide Descriptive Information for the HUC 14 Unit and Waterbody Segment**

The section of the Aurora Branch of the Chagrin River that flows through the property is in partial or non attainment of WWH. Ohio EPA's 305(b) and 303(d) report identifies causes in this segment as mercury, unionized ammonia, chlorine, organic enrichment, thermal modifications, flow alteration, noxious aquatic plants, and other habitat modifications. Sources are identified as major industrial point sources, package plants, highway/road/bridge/sewer line construction, drainage/filling of wetlands due to development, natural, upstream impoundments, and onsite wastewater systems (HSTS). Ohio EPA's Study, "Biological and Water Quality Study of the Chagrin River and Selected Tributaries 2003-04" sampling noted that 42% of sites in the Aurora Branch were impaired which was a slight improvement compared to 60% during a 1995 survey. Page 86 of this report states "Most of the problems facing the Chagrin basin are found within the hydrologic unit comprising the watershed upstream from and including the Aurora Branch. Channelization of the Chagrin River headwaters, organic enrichment of the Aurora Branch, and toxicity from algal blooms in Sunny Lake are the main problems."

Since the 2003-2004 sampling, the City of Aurora has completed several projects to improve water quality in the Aurora Branch, including preservation of the Spring Hill Wetlands Property (2010 WRRSP), Harmon Homestead Restoration Project (2011 award of 319 Project, construction slated for summer 2012), implementation of recommendations from the Save Sunny Lake report, including work on Sunny Lake and

sewer connections to the Sunny Lake boathouse. These activities and this proposed acquisition and restoration will move the Aurora Branch to full attainment of its WWH status. While the sinuosity of the river through the site is fairly good, several sections have been channelized and entrenched. The stream also suffers from flow impairments due to conversion of the natural forested floodplains to fairways and related course infrastructure, including ponds, bridges, and tile drainage. The golf operation also threatens the Category 2-3 wetlands by introducing nutrient-rich run-off and sediments to these resources.

## **2. Identify assigned Beneficial Uses, Anti-degradation Categories Referring to Ohio Water Quality Standards**

This section of the Aurora Branch of the Chagrin River is designated as Warm Water Habitat by the Ohio EPA. The 2007 Ohio EPA TMDL report indicates that this section of stream is in Non-Attainment of its official use designation. Channelization and organic enrichment are two factors cited as impacts to the Aurora Branch of the Chagrin River.

The following water resources will benefit from the protection and restoration efforts outlined in this document (Note: restoration numbers may change slightly based on development of final restoration plan) :

- 8,300 linear feet of the Aurora Branch of the Chagrin River will be protected.
- 9,000 linear feet of headwater tributaries will be protected.
- A dam on one headwater stream will be removed.
- 3,600 linear feet of the Aurora Branch of the Chagrin River will be restored.
- 691 linear feet of headwater stream will be restored.
- 33-acres of mowed riparian area (golf lawn) will be restored.
- 13-acres of wetlands including 6-acres of CAT2/3 wetlands will be protected.

The restoration of the Aurora Branch of the Chagrin River is specifically listed as an action item in the Chagrin River Watershed Action Plan (2006, revised, 2010, "WAP").

## **3. Identify Current Status of the Water Resources Relative to Meeting Designated Aquatic Life Uses**

A 2010 wetland survey of the Property by Davey Resource Group categorized 2 of the 15 wetlands on site as possible Category 3 wetlands, based on their ORAM scores, ranging from 61.5 to 62.5. Please see Appendix D for the ORAM surveys and a map of the wetlands surveyed. Table 1 summarizes available wetlands data for the project area.

The Aurora Branch of the Chagrin River is the dominant aquatic feature of the site. Portions of this stream that flow through the property have an intact riparian corridor

and aquatic habitat is good. Ohio EPA rates aquatic habitat in these stretches with a QHEI scores of 66-77 which generally are reflective of good aquatic habitat (Appendix E). However, several sections of the Aurora Branch within the subject property have been severely impacted and modified in order to facilitate use of the property as a golf course. Approximately 3,600 linear feet of the Aurora Branch have been cleared of all riparian vegetation, over widened, and/or channelized. A QHEI form was completed and is representative of all areas within the subject property where riparian removal has taken place (Appendix F). Habitat values in these areas are very low (QHEI of 40) and are characterized by embedded substrates dominated by silt and detritus, lack of instream cover and undercut banks, lack of well developed riffles, and rip-wrapped and channelized banks. Table 1 summarizes numerical water resources and criteria.

Table 1. Aquatic Resources for the Aurora Branch Chagrin River Restoration Project

<u>Wetland</u>	<u>Acreage</u>	<u>Type</u>	<u>ORAM Score</u>	<u>ORAM Classification</u>
Wetland A	3.8	Woods/shrub	62.5	CAT 2-3
Wetland B	1.94	Woods/shrub	61.5	CAT 2-3
Wetland C	0.41	Not Available – Not eligible for CAT 3 investigation		
Wetland D	1.40	Not Available – Not eligible for CAT 3 investigation		
Wetland E	1.41	Not Available – Not eligible for CAT 3 investigation		
Wetland F	0.25	Not Available – Not eligible for CAT 3 investigation		
Wetland G	0.50	Not Available – Not eligible for CAT 3 investigation		
Wetland H	0.52	Not Available – Not eligible for CAT 3 investigation		
Wetland I	0.56	Not Available – Not eligible for CAT 3 investigation		
Wetland J	1.43	Not Available – Not eligible for CAT 3 investigation		
Wetland K	0.30	Not Available – Not eligible for CAT 3 investigation		
Wetland L	0.19	Not Available – Not eligible for CAT 3 investigation		
Wetland M	0.16	Not Available – Not eligible for CAT 3 investigation		
Wetland N	0.001	Not Available – Not eligible for CAT 3 investigation		
Wetland O	0.49	Not Available – Not eligible for CAT 3 investigation		
Total Wetlands Acreage = 13.36				
<u>Stream</u>	<u>Linear Feet</u>	<u>QHEI Score</u>	<u>Attainment Status</u>	<u>Notes</u>
Aurora Branch Chagrin River (natural areas)	4,800	66-77	Attainment (part)	Depressed Biological Communities
Aurora Branch Chagrin River (impacted areas)	3,500	40	Non- Attainment	Depressed Habitat and Biology
Total Aurora Branch				
Headwater Trib #1	816			
Headwater Trib #2	858			
Headwater Trib #3	4419			
Headwater Trib #4	404			
Headwater Trib #5	3013			
Total Headwater 9,510				

## C. Biological Features of the Water Resource

### 1. Rare, threatened, or endangered plant and animal species

The Cleveland Museum of Natural History conducted a review and inventory of the property. Their taxa list is presented in Appendix B of this document. No rare, threatened, or endangered species were found during their investigation. The Ohio Department of Natural Resources was contacted for records from the Natural Heritage Database. No records of listed species were found for the subject property. However, there are several records of species from nearby Aurora Sanctuary State Nature Preserve. It is possible that these species may colonize the subject site as the area is restored and returned to a natural setting.

Rare Species Noted from Aurora Sanctuary:

- Wolfiella (*Wolffiella gladiata*) – State Potentially Threatened
- Pale Sedge (*Carex pallescens*) – State Potentially Threatened
- Floating Pondweed (*Potamogeton natans*) – State Potentially Threatened
- Fringed Gentian (*Gentianopsis crinite*) – State Potentially Threatened

Although most of the species noted for the subject property are not designated as rare or endangered, they represent a diverse assemblage of plant and animal life that will only increase and improve once restoration of the property is complete.

The Ohio Environmental Protection Agency was contacted for a list of fish species from the subject property. Their data is presented in Appendix E. While none of the fish are listed as rare or endangered, they represent a fair assemblage of mostly native fish species.

### 2. Invasive, non-native species and their potential impacts

Invasives noted during surveys performed by the Cleveland Museum of Natural History are listed below. Although the list is extensive, most of these species are at a manageable level and are most predominant at the forest edges. Recent logging activities have probably increased the abundance of these species in recent years.



## Invasive Species Noted

Bugleweed	<i>Ajuga</i>	<i>Reptans</i>
Garlic Mustard	<i>Alliaria</i>	<i>Petiolata</i>
Mugwort	<i>Artemesia</i>	<i>Vulgaris</i>
Barberry, Japanese	<i>Berberis</i>	<i>Thunbergii</i>
Canada Thistle	<i>Cirsium</i>	<i>Arvense</i>
Crown Vetch	<i>Coronilla</i>	<i>Varia</i>
Queen Anne's Lace	<i>Daucus</i>	<i>Carota</i>
Teasel, Common	<i>Dipsacus</i>	<i>Fullonum</i>
Olive, Autumn	<i>Elaeagnus</i>	<i>Umbellata</i>
Hairy Willow-Herb	<i>Epilobium</i>	<i>Hirsutum</i>
Herb Robert	<i>Geranium</i>	<i>Robertianum</i>
Privet, Common	<i>Ligustrum</i>	<i>Vulgare</i>
Honeysuckle, Japanese	<i>Lonicera</i>	<i>Japonica</i>
Moneywort	<i>Lysimachia</i>	<i>Nummularia</i>
Purple Loosestrife	<i>Lythrum</i>	<i>Salicaria</i>
Reed Grass	<i>Phragmites</i>	<i>Australis</i>
Buckthorn, Glossy	<i>Rhamnus</i>	<i>Frangula</i>
Multiflora Rose	<i>Rosa</i>	<i>Multiflora</i>
Bouncing Bet	<i>Saponaria</i>	<i>Officinalis</i>
Cattail, Narrow-leaved	<i>Typha</i>	<i>Angustifolia</i>
Periwinkle (Myrtle)	<i>Vinca</i>	<i>Minor</i>

Appendix J includes additional information for the most significant invasive species noted on the subject property. Also included are BMP's for control and eradication.

### 3. Current habitat quality of the resource in question

The most obvious habitat feature on the subject property is the Aurora Branch of the Chagrin River. The subject property includes over 8,300 linear feet of the Aurora Branch. This section of stream is designated Warmwater Habitat (WWH) by the Ohio EPA but is in non-attainment of this use designation (Ohio EPA, 2007). Reasons cited for impairment include channelization, loss of riparian habitats, organic enrichment, and impacts from upstream Sunny Lake (Ohio EPA, 2007). Since the TMDL report was issued, the City of Aurora has made many improvements to the water quality of the Aurora Branch including preservation of the Spring Hill Wetlands property (2010 WRRSP), Harmon Homestead Restoration Project (2011 award of 319 Project, construction planned for 2013), implementation of recommendations from Save Sunny Lake report, including sewer connections to Sunny Lake Boat House. These activities, along with the currently proposed acquisition and restoration plan, will move this section of the Aurora Branch toward full attainment of WWH criteria.

In addition to the Aurora Branch of the Chagrin River, there are 9,000 linear feet of headwater streams. Several other historic headwater habitats have been modified, culverted, and/or impounded to facilitate recreational use of the area. These habitats

will be restored as part of this restoration project by crushing drain tiles, day-lighting culverted streams, and removing impoundments on headwater streams.

Davey Resource (Appendix D) surveyed a total of 15 wetlands in 2010 totaling 13-acres. Two of the higher quality wetlands were deemed suitable for potential Category 3 consideration. Wetlands A is a complex of lowland woods and scrub/shrub wetlands within the floodplain of the Aurora Branch. Wetland A scored a 62.5 on the ORAM form which places it between a Category 2 and 3. Generally, when a wetland falls between a scoring category, the Ohio EPA will consider it the higher quality. Wetlands B is similar to Wetlands A and contains a mixture of trees and shrubs along the river. This wetlands scored an ORAM value of 61.5 which again places it between Category 2 and 3 ranking.

#### **4. Other important/unique environmental features or resources**

**Water Quality Benefits:** The wetlands on the property will be preserved in perpetuity and provide valuable aquatic habitat and water quality benefits (groundwater recharge, filtering water pollution) for downstream communities. The restoration of the riparian zone as indicated on the conceptual plan in Appendix A and Appendix G will greatly improve water quality of the resource.

**Flora and Fauna:** Data from a botanical and wildlife survey is presented in Appendix B and illustrates a diverse assemblage of plant and animal life. Plant and wildlife diversity at the site will greatly increase once the property is acquired and recreational golfing activities cease. Restoration of the Aurora Branch will increase fish diversity (as noted in Appendix E) and will reduce or eliminate the abundance of non-native common carp. The restoration of the riparian area will also increase wildlife diversity of both resident and migratory species.

**Regional Planning Implementation:** Acquisition and restoration of the Aurora Branch of the Chagrin River as it flows through the Aurora Country Club is identified as a priority in the Chagrin River Watershed Action Plan (Chagrin River Watershed Partners, 2006). Once implemented, this project will fully implement this important action item. The protection of this property is also noted in the Chagrin River Balanced Growth Initiative and City of Aurora Masterplan.

**Recreational Benefits:** The long term protection of the property compliments passive recreational use. Golfing and turf management will be discontinued and the site will be managed for passive recreational use including pedestrian and non-motor vehicular access.

**Historical Water Quality Designations:** Today, the Aurora Branch of the Chagrin River is a designated Warmwater Habitat. However, this was not always the case. Prior to 1987, the Aurora Branch was designated a Coldwater Habitat (CWH) by the Ohio EPA (Chagrin River Watershed Partners, 2006). In 1987 Ohio EPA sampling indicated a clear

transition to a WWH community with biological scores nearing Exceptional Warmwater Habitat (EWH). However, siltation and impacts to fish communities were noted in 1991 but the Aurora Branch was still in full attainment of WWH until 2003 when fish communities showed signs of stress and IBI scores dropped significantly. Suburban development and wastewater impacts were cited as possible causes of impairment.

### **III. DESCRIPTION OF SURROUNDING LAND USE**

#### **A. Land Cover Description**

##### **1. Identify Percentages of Different Categories of Land Use Within the HUC 11 and Project Area**

The Property is located within HUC 04110003-020 HUC. Land cover within this unit consists of cultivated land (17%), Deciduous forest (46%), Developed (35%), Water (1%). Appendix K includes additional watershed statistics.

Within the subject property, the land is a mix of wetlands, wooded areas, golf course greens, and developed areas.

##### **2. Identify Currently Protected Lands within the HUC 11 and Project Area**

Appendix A includes a map showing the project site in relation to currently protected lands. The project site is immediately adjacent to the Aurora Sanctuary State Nature Preserve. In addition, the site is close to the Tinkers Creek State Park and State Nature Preserve as well as Liberty Park in nearby Summit County.

##### **3. Discuss the Status and Trends of Land Use, and How These May Affect Water Quality and Aquatic Habitat in the Future**

The Property is located in the City Aurora. Like much of Northeast Ohio, the region has experienced considerable growth over the past few decades which has resulted in impacts to aquatic resources. A significant factor influencing the area is the continued dispersal of people and jobs from Cuyahoga County and other built communities into the undeveloped areas of the Chagrin River watershed (Chagrin River Partners, 2006). The City of Cleveland achieved its maximum population in 1950 while Cuyahoga County and the entire Northeast Ohio region peaked in 1970. Since this time, more than 300,000 people have left Cuyahoga County, many of them dispersing into previously undeveloped areas in Northeast Ohio. Additional watershed statistics are presented in Appendix K.

While much of the property is in a natural state, the majority of the riparian area of the Aurora Branch within the subject area has been largely cleared of trees and developed into a golf course fairway. Continuation of this existing landuse is a threat to water quality. The restoration of this area has been identified as an action item by Chagrin River Watershed Partners in their Watershed Action Plan (2006). Even more threatening

would be the development of the property for residential or commercial use which would prevent the restoration of the Aurora Branch through this area.

There are three existing gas and/or oil wells on the property (Appendix A) existing under a single lease. All three wells were installed in 1981 and have come to the end of their production life. The acquisition of this property includes acquiring all of the underground mineral rights, subject to the lease and only for the duration of the existing leases. Upon expiration of the lease, all minerals are vested in the control of the City of Aurora who will not grant any additional extraction rights.

Oil and gas production logs on file at ODNR indicate no oil produced in the last 3 years and very little gas. ODNR production logs for the three wells are attached in Appendix H. The City of Aurora will work with the Lessee to plug the wells as soon as they become non-producing per Ohio Revised Code. TPL and Aurora have worked in cooperation with the Lessee on other existing wells, as it is the same operator as the wells on the Spring Hill Wetlands 2010 WRRSP project, immediately adjacent to this property.

This approach, coupled with existing state law and regulations, is sufficient to protect the water resources on this site from threats associated with oil and gas production (Appendix I).

#### **IV. KEY ISSUES RELATED TO SUPPORT OF AQUATIC LIFE USES**

##### **A. Making reference to QHEI, HHEI, or ORAM, provide a narrative description of past habitat modifications or other problems relating to habitat either threatening or preventing attainment of aquatic life use, or for wetlands, attainment of category 3.**

Davey Resource Group surveyed the Property in June 2010. Numerous wetlands were identified for the property. Two of these wetlands scored ORAM values of 62.5 and 61.5 which places them in the range of Category 2-3. Davey notes that recent logging activities have impacted these (and other wetlands) resources. Once acquired, logging operations will cease and these areas will likely improve in quality.

The Aurora Branch generally supports good aquatic habitat. Appendix E of this document includes a breakdown of QHEI values from the general area. Ohio EPA has sampled the Aurora Branch at State Route 82 and obtained a value of 77 which would indicate possible attainment of Warmwater or even Exceptional Warmwater Habitat. Despite relatively good habitat, the biological communities are depressed and the Aurora Branch of the Chagrin River is not in full attainment of WWH designation. The fish communities (Appendix E) for the area are particularly depressed and dominated by pollution tolerant species. While overall habitat is good, there have been clear habitat modifications within the existing golf course that have lowered the biological integrity of this aquatic resource. A QHEI form was completed for impacted regions of the Aurora Branch within the golf course and is

presented in Appendix F. This QHEI value (40) is representative of reaches that flow through existing golf course fairways and is illustrative of very poor habitat. The following modifications have taken place that have lowered QHEI values and associated aquatic wildlife:

1. All trees and vegetation from the riparian zone have been removed. This modification lowers Metric 4 of the QHEI.
2. Removal of riparian vegetation has caused the stream to widen and slow. This in turn lowers QHEI values in Metric 5.
3. In many areas, bank erosion has been stabilized by channelization and addition of rip-wrap. This practice lowers water quality and influences QHEI Metric 3.
4. The slowing of water within the fairway regions causes fine sediments to drop out and accumulate which embeds the stream bottom and lowers QHEI Metric 1.

**B. Describe the origins of impairment or threats, including both point and nonpoint sources, relating these to what is known about the current status and trends of the water resource in question.**

The section of the Aurora Branch of the Chagrin River that flows through the property is in partial or non attainment of WWH. Ohio EPA's 305(b) and 303(d) report identifies causes in this segment as mercury, unionized ammonia, chlorine, organic enrichment, thermal modifications, flow alteration, noxious aquatic plants, and other habitat modifications. Sources are identified as major industrial point sources, package plants, highway/road/bridge/sewer line construction, drainage/filling of wetlands due to development, natural, upstream impoundments, and onsite wastewater systems (HSTS). Ohio EPA's Study, "Biological and Water Quality Study of the Chagrin River and Selected Tributaries 2003-04" sampling noted that 42% of sites in the Aurora Branch were impaired which was a slight improvement compared to 60% during 1995 survey. Page 86 of this report states "Most of the problems facing the Chagrin basin are found within the hydrologic unit comprising the watershed upstream from and including the Aurora Branch. Channelization of the Chagrin River headwaters, organic enrichment of the Aurora Branch, and toxicity from algal blooms in Sunny Lake are the main problems."

One of the most clear and obvious sources of impairment is the use of the existing property as a golf course. As previously described, the existing facility has channelized large portions of the Aurora Branch, denuded the riparian zone of trees and all natural vegetation, allowed the channel to widen and waters to slow, and tiled/draind riparian wetlands. In addition, the maintenance of a monoculture of non-native grasses within the fairways requires large applications of herbicides, pesticides, and fertilizers that directly run off into the Aurora

Branch. Once the property has been acquired, these practices will cease and will result in an immediate improvement to water quality.

**C. Identify and describe the history of previous water quality improvement efforts in the watershed.**

In 1996, the Chagrin River Watershed Partners formed in response to concerns about overall water quality in the Chagrin basin. Today, the partnership is a collaboration of 37 member communities working together to preserve, protect, and restore water quality in the Chagrin River drainage. In 2009, the Partnership spearheaded the completion of a Watershed Action Plan (WAP). One of the action items identified in this plan is the restoration of the Aurora Branch through the Aurora Country Club.

In recent years the City of Aurora has completed several projects to improve water quality in the Aurora Branch, including preservation of the Spring Hill Wetlands Property (2010 WRRSP), Harmon Homestead Restoration Project (2011 award of 319 Project, construction slated for summer 2012), implementation of recommendations from the Save Sunny Lake report, including work on Sunny Lake and sewer connections to the Sunny Lake boathouse. These activities (coupled with the proposed acquisition and restoration detailed in this document) will restore the Aurora Branch to full attainment of its WWH status.

There are a host of agencies and organizations that are active within the Chagrin River watershed to preserve existing high quality resources and restore those areas that have been degraded by past land use activities. Prominent among these groups are the following:

City of Aurora	Ohio Department of Natural Resources
Trust for Public Land	Cleveland Museum of Natural History
Chagrin River Watershed Partners, Inc.	Soil and Water Conservation Districts
The Holden Arboreteum	Geauga Park District
Audubon Society	Lake Metroparks
Western Reserve Land Conservancy	Cleveland Metroparks
Portage Park District	Ohio EPA

**D. Identify and describe current efforts that are occurring in the watershed which will help meet water quality standards, especially aquatic life designated uses or, in the case of wetlands, category 3. If an Ohio EPA-approved TMDL or WAP exists for the area, relate the current efforts to the implementation recommendations of the report.**

There are a number of efforts occurring in the watershed that are aimed at improving water quality. Below is a summary of efforts from the greater Chagrin River Watershed. <sup>1</sup>

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<sup>1</sup> Adapted from Orchard Hills Preserve WRRSP Protection & Restoration Plan (Geauga Park District, 2009).

1. The Chagrin River Watershed Partners, inc: CRWP's mission is to strive to preserve and enhance the scenic and environmental quality of the ecosystem of the Chagrin River and its watershed in a manner that assures a sustainable future for people, plants and animals. Formed in 1996 by 16 cities, villages, townships, counties, and park districts, CRWP is now an established organization with 37 member communities representing 99% of the watershed. CRWP provides technical assistance to members and develops cost effective solutions to minimize new, and address current water quality and quantity problems.
  2. Chagrin River Watershed Action Plan (2006): In 1998, the Chagrin River Watershed Partners, Inc. (CRWP) received a small grant from the Ohio Environmental Protection Agency (Ohio EPA) through the Section 319 with matching funds from CRWP members to develop the Chagrin River Watershed Action Plan. This watershed action plan, which was endorsed by the OEPA and the ODNR in December 2006, identifies and prioritizes properties (Critical Protection Parcels) that will help maintain and improve water quality within the Chagrin River Watershed if they are preserved.
  3. Chagrin River TMDL Report (OEPA 2007): Ohio EPA approved the Chagrin River TMDL in 2007. The Report highlights riparian corridor and wetlands protection as a critical step to address the sources and causes of impairment in the watershed. Specifically, the report addresses headwater streams and indicates that were Class III-PHWH streams are identified, all efforts should be made to ensure that their biological and hydraulic functions are protected and maintained.
  4. Chagrin River Balanced Growth Plan (2009): The growth plan helps to achieve the goals and objectives of the Lake Erie Balanced Growth Program, The Lake Erie Protection and Restoration Plan, the Chagrin River Watershed Action Plan, and promotes the conservation and development goals of chagrin communities. The plan details the process CRWP completed for the introduction of balanced growth concepts, collaboration as a watershed planning partnership, development of local determined Priority Conservation Areas (PCA's) and Priority Development Areas (PDA's), and possible tools for implementation of PCA's and PDA's at the local level. The Aurora Country Club was noted as a Priority Conservation Area in this plan.
  5. Ohio Comprehensive Wildlife Conservation Strategy (2007): One goal of this plan is the protection of Ohio's wetlands and riparian habitats. With many acres of these state important resources held in private ownership, the status of this critical habitat varies. Nevertheless, protecting these habitats is critical to managing the biotic communities of Ohio's streams and wetlands. Specific goals of the plan include
    - a. Protecting and restoring natural flow regimes including floodplains, wetlands and stormwater areas.
    - b. Protecting and restoring forested riparian corridors, floodplains, and wetlands through conservation easements, acquisition, and landowner programs and incentives.
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6. Other Watershed Efforts:

- a. **Section 208 of the Clean Water Act:** Section 208 requires states to identify regional water quality planning areas for the preparation, maintenance and implementation of water quality management plans. These Section 208 plans contain information used to address both municipal wastewater treatment issues and nonpoint source pollution management and control. Information from all Section 208 plans produced in the state are combined to form the state Water Quality Management (WQM) plan. Development and publication of this plan is a requirement of Section 303 of the Clean Water Act. To facilitate the creation of the state WQM, the Governor of Ohio identified six urban areas of Ohio for regional water pollution control planning. Areawide Councils of Governments were then designated as the lead planning agencies for developing what became known as 208 plans. The six regional water quality planning areas cover 25 counties.
- b. **Ohio EPA Total Daily Maximum Loads Program:**<sup>2</sup> The Total Maximum Daily Load (TMDL) program, established under Section 303(d) of the Clean Water Act (33 U.S.C. 1313), focuses on identifying and restoring polluted rivers, streams, lakes and other surface waterbodies. A TMDL report is a written, quantitative assessment of the water quality problems in a waterbody and the contributing sources of pollution. It specifies the amount a pollutant needs to be reduced to meet water quality standards, allocates pollutant load reductions, and provides the basis for taking actions needed to restore a waterbody.
- c. **National Pollutant Discharge Elimination System (NPDES):**<sup>3</sup> Through the Clean Water Act, the permit program controls water pollution by regulating point sources that discharge pollutants into waters of the United States.
- d. **Ohio EPA Combined Sewer Overflow (CSO) Control Program:**<sup>4</sup> US EPA established a Combined Sewer Overflow Control Policy in April 1994 as a national framework for control of CSOs through the National Pollutant Discharge Elimination System (NPDES) permitting program. Ohio EPA no longer permits the installation of combined sewers and is working with 86 communities to address the 1,306 known CSOs. Ohio EPA continues to implement CSO controls through provisions included in NPDES permits and using orders and consent agreements when appropriate. The NPDES permits for Ohio CSO communities require the implementation of nine minimum control measures. Requirements to develop and implement Long Term Control Plans (LTCPs) are also included where appropriate.
- e. **Ohio EPA Source Water Assessment and Protection Program:**<sup>5</sup> The source water protection program helps public water suppliers protect drinking water sources, such as streams and underground aquifers, from contamination. It addresses the 5,600 public water systems in Ohio, but not private residential water systems.

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<sup>2</sup> Ohio EPA Total Maximum Daily Load Program. <http://www.epa.state.oh.us/dsw/tmdl/index.html>

<sup>3</sup> National Pollutant Discharge Elimination System. <http://cfpub.epa.gov/npdes/>

<sup>4</sup> Ohio EPA Division of Surface Water Combined Sewer Overflow Program. <http://www.epa.state.oh.us/dsw/cso/csoindex.aspx>

<sup>5</sup> Ohio EPA Source Water Assessment and Protection Program. <http://www.epa.state.oh.us/ddagw/pdu/swap.html>



- f. **NRCS Wetlands Preserve Program:**<sup>6</sup> The program offers landowners the opportunity to protect, restore, and enhance wetlands on their property. The NRCS goal is to achieve the greatest wetland functions and values, along with optimum wildlife habitat, on every acre enrolled in the program. This program offers landowners an opportunity to establish long-term conservation and wildlife practices and protection.
- g. **Ohio EPA Water Resource Restoration Sponsorship Program (WRRSP):**<sup>7</sup> The program addresses the loss of ecological function and biological diversity that is threatening the health of Ohio's water resources and will fund both preservation and restoration of aquatic habitat to accomplish this goal. The Aurora Branch Chagrin River Restoration project will provide complete protection and compliments previous land protection efforts in the area. The area will add significant habitat to the protected land within the Chagrin River watershed.
- h. **Ohio Department of Agriculture – Clean Ohio Agricultural Easement Protection Program:**<sup>8</sup> This program provides funding to assist landowners and communities in preserving Ohio's farmland and ensuring that the scenic views and heritage of Ohio's countryside are maintained for future generations. The Clean Ohio program helps family farms transition to the next generation and protects the economic foundation of Ohio's largest industry.

**E. Develop a problem/issue statement regarding habitat integrity, related to attainment or maintenance of aquatic life uses or wetland category 3, which takes into account A-D above and surrounding land uses as covered in III above.**

Long-term, permanent protection of the Property is necessary to protect the water resources and important ecological communities found on site. Protection will directly implement the Chagrin River *TMDL*, by permanently preserving wetlands, and floodplains, and riparian corridors as well as implement an action item of the Chagrin River Watershed Action Plan by restoring portions of the Aurora Branch that flow through the Aurora Country Club. This project will help implement *Ohio's Lake Erie Protection and Restoration Plan* and *Ohio's State Wildlife Action Plan* by preserving and protecting open space, sensitive lands, and wetlands. The protection of this property is also noted in the Chagrin River Balanced Growth Initiative and City of Aurora Masterplan.

If this property is not acquired and restoration measures not taken, the following scenarios are likely, both of which will perpetuate and exacerbate water quality problems within the Aurora Branch and greater Chagrin River basin:

Scenario #1 – It has been announced by the site owner that golf course operations will cease. The property will revert to fallow, unkempt state, while it is placed on the real estate market for its value under current residential zoning and commercial zoning.

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<sup>6</sup> NRCS Wetlands Reserve Program. <http://www.nrcs.usda.gov/Programs/wrp/>

<sup>7</sup> Ohio EPA WRRSP. <http://www.epa.state.oh.us/defa/09wrrsp.html>

<sup>8</sup> ODA Farmland Preservation. [http://www.agri.ohio.gov/divs/farmland/farm\\_aepp.aspx](http://www.agri.ohio.gov/divs/farmland/farm_aepp.aspx)

Existing channelization and erosion will continue, with potential to increase. Commercial logging can be pursued to extract value from the property while fallow and unused.

Scenario #2 – The site will be sold to a developer for residential or commercial development. The City of Aurora is a desirable community for residential development and the golf course is a prime location for housing. Residential development of the area will have all of the negative aspects of Scenario #1 (above) and will also likely result in additional deforestation. In May of 2011, the owners of the subject property secured a commercial rezoning of a portion of the property and are currently making plans for the closure of the golf course clubhouse area for redevelopment. The current owners purchased this property with the full intention to shut it down for a large scale redevelopment.

Both of these possible scenarios will perpetuate current water quality impacts and prevent full attainment of WWH criteria within this reach of the Aurora Branch.

## **V. RESTORATION AND PROTECTION OBJECTIVES**

### **A. Describe the habitat restoration/protection objectives for the WRRSP project**

The primary objectives of this project are two-fold:

Preservation: This project will permanently protect 194.3-acres of riparian lands, 8,300 linear feet of the Aurora Branch of the Chagrin River, and 9,000 linear feet of headwater tributaries. In addition, this project will protect 13-acres of wetlands (including 6-acres of CAT 2-3 wetlands). Additional upland forest buffers will also be protected.

Restoration: This project will restore 33-acres of existing golf course fairway to forested floodplain, restore two areas to native meadow habitat, restore 361-linear feet of headwater tributary, remove one dam, and restore floodplain connectivity to over 3,600-linear feet of the Aurora Branch. Preliminary concept plans are illustrated in Appendix A and in more detail in Appendix G.

Once acquired The City of Aurora will become the primary land steward responsible for preservation efforts. Chagrin River Watershed Partners will become the lead agency for restoration activities and will assist with on-site stormwater management. A conceptual restoration plan has been prepared and is presented in Appendix G of this document.

#### **1. Indicate whether the restoration/protection objective regarding habitat integrity is consistent with the findings of the Ohio EPA-approved TMDL.**

The objectives of this project are consistent with the recommendations of the Chagrin River Watershed TMDL (Ohio EPA, 2007). The report highlights the following items that will all be addressed and implemented as part of the Aurora Branch Chagrin River Restoration project:

Riparian Corridor and Wetlands Protection: This project will protect thousands of linear feet of the Aurora Branch, 13-acres of existing wetlands, and several hundred feet of existing headwater tributaries.

Reduction in Pollutant Loading: Once acquired, pollutant loading associated with golf-course maintenance will cease.

Dam Removal: Dams are cited as a source of thermal pollution and chemical degradation. This project will remove one dam and restore it to headwater habitat.

Riparian Forests: Riparian forest preservation is cited as the single greatest item in preserving existing water quality. This project will both preserve existing riparian forests AND restore riparian forests in degraded areas.

**VI. ALTERNATIVES TO ACHIEVE RESTORATION AND PROTECTION OBJECTIVES**

**A. Develop alternatives to meet identified habitat needs that will achieve the stated restoration/protection objective.**

**1. For projects involving land acquisition, a comparison of fee simple land acquisition versus conservation easements.**

The following Table summarizes two potential alternatives for protecting the subject Property.

Analysis of Alternative Strategies for <u>Protection</u> of the Aurora Branch Chagrin River Restoration Project		
	Alternative 1	Alternative 2
Description	Property restricted with a conservation easement	Acquisition of the entire property
<b>Benefits</b>	<ul style="list-style-type: none"> <li>• Land use is restricted</li> <li>• Increased level of resource protection</li> <li>• Preserves the natural resources of the property</li> <li>• Cost Effective means of preserving land which is often cheaper than purchasing the fee title to a property</li> </ul>	<ul style="list-style-type: none"> <li>• Land use is restricted</li> <li>• Increased level of resource protection and management</li> <li>• Entire Property under ownership of entity that wishes to see the natural resources protected</li> <li>• Entire property restricted under OEPA's Environmental Covenant which is very similar to the benefits of a conservation easement</li> <li>• Restoration of streams and floodplains which will move Aurora Branch toward full attainment of WWH criteria</li> </ul>
<b>Drawbacks</b>	<ul style="list-style-type: none"> <li>• Only allows for the acquisition of certain rights instead of all rights to the property</li> <li>• Conservation easement pertains only to that portion of land an owner wishes to see restricted</li> <li>• Owner will not consider this option.</li> </ul>	<ul style="list-style-type: none"> <li>• None</li> </ul>
<b>Responsible Parties</b>	There is no third party currently identified to hold a conservation easement	City of Aurora and Chagrin River Watershed Partners, Inc.
<b>Recommended in TMDL?</b>	Yes	Yes

**2. For projects involving habitat restoration and protection, different feasible alternative methods of restoring habitat should be considered.**

A concept plan for restoration activities has been prepared by Chagrin River Watershed Partners, Inc. (Appendix G). Once the property has been acquired, CRWP will take a lead role in restoration activities while the City of Aurora will be responsible for preservation, management, and stewardship of the site.

Preliminary restoration alternatives have been identified and are detailed in Appendix G. Actions under consideration include the following (Note that restoration numbers may change slightly based on preparation of final restoration plan):

1. Convert 33-acres of golf course turf to floodplain forest, meadow, and riparian corridor.
2. Restore 691 linear feet of headwater stream by removing or breaking tiles and daylighting a buried stream and removing a single dam.
3. Restore 3,600 linear feet of the Aurora Branch through a combination of instream habitat enhancement, reconnection to floodplain, and reforestation of riparian corridor.

**3. For projects involving protection of existing high quality habitat, different management methods for protection should be considered.**

The property will be managed as a high-quality natural resource area, consistent with the terms of the Environmental Covenant. Restoration of impacted areas is planned and illustrated on the map in Appendix A and discussed in more detail in the conceptual plan presented in Appendix G. Land uses will be limited to passive outdoor recreational uses (walking, nature study, wildlife watching, etc.) as defined below and illustrated on the map in Appendix A:

The focus of the Aurora Branch Chagrin River Restoration project is preservation of existing high quality water resources and the restoration of the Aurora Branch of the Chagrin River. Limited public access will be allowed when such use and access does not conflict with the goals of preservation and restoration of wetlands and aquatic resources. Presently, the following uses are planned for the property:

Trail Head Area

A destination point will be developed near the northwest corner of the property in an area that has already been impacted by the existing golf course and that is well removed from the Chagrin River, riparian areas, and/or wetlands. A 40-car gravel parking lot will be developed in this area. A rain garden and/or bio swale will be constructed to intercept parking lot runoff. Also included here will be an informational kiosk, trail entrance, open-air pavilion, and small sledding area.

### Managed Meadow

Three areas have been designated as meadow habitats. These areas are illustrated on the map in Appendix A and will increase overall habitat diversity of the site. These areas are currently mowed lawns/fairways and will be allowed to revert to more natural meadow habitats through guided management. Invasive species will be prevented from overtaking these areas and a mowing regimen will be implemented around the breeding season for ground nesting grassland bird species.

### Successional Area

The majority of the existing golf course fairways (outside of the riparian zone) will be left fallow and allowed to proceed through guided succession; natural succession will be aided by controlling invasive plant species.

### Wetlands

There are a number of existing high quality wetlands on the subject property. Two of these wetlands are classified as CAT 3 by Ohio EPA ORAM methodology. These wetlands will be managed through guided succession; they will be allowed to proceed through natural succession with the aid of invasive species control. Once acquired, the application of fertilizers and herbicides to the existing fairways will cease and improve the integrity of these water resources.

### Conservation Woods

The dominant vegetative community of the subject property is a mixed mesophytic woods. This area has been extensively and recently logged and has clearly degraded the habitat quality of this resource. Once acquired, all logging activities will cease and the area will be guided toward a native mature forest by controlling invasive species and preventing an overabundance of grape vines from reaching the canopy in the canopy gaps created by logging.

### Park and Resource Management Area

The City of Aurora will maintain existing buildings currently used by the golf course operations and maintenance staff. Included in this area are three buildings and a greenhouse. These structures (and associated parking areas) will be maintained within the current development footprint (less than 2-acres) and may be used by Aurora Parks Department for management, maintenance, and stewardship of the site.

### Pedestrian Trails

The City of Aurora will maintain select portions of the existing golf cart path for use as pedestrian and non-motorized vehicle trails. Other portions of the trail will be removed to facilitate the stream and riparian restoration of the Aurora Branch of the Chagrin River. The existing path is approximately 6-feet wide and composed of asphalt. A mowed berm (approximately 4 feet wide) will be maintained on either side of the existing path for a total footprint of 14-feet. The City will maintain the existing trail surface until a time that the asphalt degrades to a point where repairs are no longer

possible. At this time, the asphalt will be removed and the trail will be reconstructed (within the existing footprint) with crushed stone. There are numerous bridges that cross the Aurora Branch of the Chagrin River. Seven of these bridges will be removed to facilitate the stream and riparian restoration of the Aurora Branch. Four of the remaining bridges will be maintained to facilitate trail crossings. With few exceptions, there will be no trail construction outside of the existing cart path footprint. Two exceptions will be made in order to move the trail away from the Aurora Branch and out of the proposed restored riparian area. The locations of these new trail segments are shown on the map in Appendix A.

#### Miscellaneous Structures

Two additional existing structures will be maintained in their current foot print and for their current use. A composting toilet building is located toward the eastern end of the site. This structure will be maintained in its current location. In addition, a small open-air pavilion is also located near the eastern section of the project area and will also be maintained as a picnic area and rest stop for hikers and park users.

A third structure is a small building that is used as a rest area. This building will be retained and used as a small information and interpretive center.

The Chagrin River Watershed Partners will be responsible for implementation of the restoration activities detailed in Appendix A. These actions will include:

- Restoration of mainstem of Aurora Branch Chagrin River
- Restoration of headwater habitats
- Restoration and replanting of riparian floodplain forests

The City of Aurora will be responsible long-term stewardship and for implementing all management activities which would primarily include:

- Ensuring the terms of OEPA Environmental Covenant are enforced
- Wildlife management
- Monitoring for invasive species and control as necessary
- Guided succession of former fairways
- Management of designated meadow habitats
- Stream and wetlands quality monitoring

Management priorities will be dependent upon the availability of funding. Appendix J includes a list of the most significant invasive species found on the subject site and best methods for control and eradication of these species. Fortunately invasive species do not pose a significant immediate threat to either diversity of the Property or to water quality. Long term management costs will not be funded by WRRSP funds.

### Utility Lines

There are existing sewer lines that run through the property as shown on the map in Appendix A of this document. The City of Aurora will make all efforts to ensure that the maintenance of these existing lines does not interfere with the preservation and restoration objectives of this project.

### Gas and Oil Wells

There are three existing gas and/or oil wells on the property (Appendix A) existing under a single lease. All three wells were installed in 1981 and have come to the end of their production life. The acquisition of this property includes acquiring all of the underground mineral rights, subject to the lease and only for the duration of the existing leases. Upon expiration of the lease, all mineral are vested in the control of the City of Aurora who will not grant any additional extraction rights.

Oil and gas production logs on file at ODNR indicate no oil produced in the last 3 years and very little gas. ODNR production logs for the three wells are attached in Appendix H. The City of Aurora will work with the Lessee to plug the wells as soon as they become non-producing per Ohio Revised Code. TPL and Aurora have worked in cooperation with the Lessee on other existing wells, as it is the same operator as the wells on the Spring Hill Wetlands 2010 WRRSP project, immediately adjacent to this property.

This approach, coupled with existing state law and regulations is sufficient to protect the water resources on this site from threats associated with oil and gas production (Appendix I).

**4. For projects involving potential acquisition of a number of properties within a defined corridor area, identify alternative acquisition/protection strategies.**

Not applicable.



**5. Develop preliminary cost estimates for all identified alternatives.**

As previously described, acquisition of the property is the only feasible option for both protection and restoration measures. Cost estimates for both are provided below:

	<b>Requested WRRSP Amount</b>	<b>Total Project Implementation Cost</b>
<b>Stream/Riparian Protection</b>	\$ 3,500,000	\$ 3,500,000
<b>Wetlands Protection</b>	\$400,000	\$400,000
<b>Dam or Levee Removal or Modification</b>	\$96,250	\$96,250
<b>In-Stream Habitat Restoration</b>	\$57,250	\$57,250
<b>Streambank Restoration</b>	\$438,250	\$438,250
<b>Natural Channel Design</b>	\$183,250	\$183,250
<b>Wetlands Restoration</b>		
<b>Oth</b> Due diligence, boundary marking, signage, plan	\$75,000	\$85,000
<b>Totals</b>	\$4,750,000	\$4,760,000

**6. Identify, for all alternatives, the different parties that would be responsible for their implementation.**

The City of Aurora will be responsible for the oversight of all management activities on the Property. The City of Aurora is a leader among municipalities in its protection of key natural resources. The City maintains a progressive parks department overseeing 1,200-acres of property. These include the 366-acre Aurora Wetlands Preserve, 600-acre Sunny Lake Park, 135-acre Harmon Farm Preserve, 143-acre Spring Hill Preserve, and 44-acre Moebius Nature Preserve.

Chagrin River Watershed Partners will be contracted to oversee restoration activities planned for the site. CRWP is a non-profit technical organization founded by the cities, villages, townships, counties, and park districts of the Chagrin River watershed (including the City of Aurora). CRWP provides land use assistance to 37-member communities and also assists with land protection and restoration projects that will improve or maintain the habitat integrity of the watershed.

Partnering in the acquisition process is the Trust for Public Land. TPL has 38 years of experience in assisting public agencies to acquire land for conservation and public park use. Since 1972, it has closed more than 4,150 land transactions. The City and TPL’s Ohio staff have worked together previously on the Aurora Wetlands acquisition and the Spring Hill Wetlands acquisition.

**7. Identify whether or not alternatives are included in the Ohio EPA-approved TMDL recommended measures for implementation.**

The objectives of this project are consistent with the recommendations of the Chagrin River Watershed TMDL (Ohio EPA, 2007). The report highlights the following items that will all be addressed and implemented as part of the Aurora Branch Chagrin River Restoration project:

Riparian Corridor and Wetlands Protection: This project will protect thousands of linear feet of the Aurora Branch, 15-acres of existing wetlands, and several hundred feet of existing headwater tributaries.

Reduction in Pollutant Loading: Once acquired, pollutant loading associated with golf-course maintenance will cease.

Dam Removal: Dams are cited as a source of thermal pollution and chemical degradation. This project will remove one dam and restore it to headwater habitat.

Riparian Forests: Riparian forests are cited as the single greatest item in preserving existing water quality. This project will both preserve existing riparian forests AND restore riparian forests in degraded areas.

**VII. SELECTED ALTERNATIVE AND BASIS FOR SELECTION**

**A. Select the alternative that best achieves the objective at a reasonable cost.**

The objectives of this project are two-fold:

1. Protect existing high quality natural areas and aquatic resources.
2. Restore portions of the property that have impacted water resources.

The only feasible option to achieve these goals is Alternative 2 – Purchase and restoration of the subject property. The owner of this property has indicated an unwillingness to consider a conservation easement and specifically purchased this property for commercial development.

**B. Identify whether or not the selected alternative is included in the Ohio EPA-approved TMDL's recommended measures for implementation.**

*Page 106 of the Chagrin River TMDL states that effective restoration strategies would include habitat improvements and reductions in pollutant loads combined with additional stream protection through land purchase, easements, and riparian setbacks.*

All aspects of Alternative 2 are consistent and supported by the TMDL.

## VIII. IMPLEMENTATION PLAN FOR SELECTED ALTERNATIVE

### A. For all projects, the implementation plan should address the following items.

#### 1. Identify the parties responsible for implementing the project.

- a) **Sponsor:** Northeast Ohio Regional Sewer District (NEORS)
- b) **Owner of the property:** City of Aurora
- c) **Entity responsible for the restoration of the property:** Chagrin River Watershed Partners, Inc.
- d) **Entity responsible for the perpetual management of the property:** The City of Aurora. The Ohio EPA will also hold an environmental covenant over the property.

#### 2. Qualifications of the parties responsible for restoration work and perpetual management of the property.

The City of Aurora will be responsible for the oversight of all management activities on the Property. The City of Aurora is a leader among municipalities in its protection of key natural resources. The City maintains a progressive parks department overseeing 1,200-acres of property. These include the 366-acre Aurora Wetlands Preserve, 600-acre Sunny Lake Park, 135-acre Harmon Farm Preserve, 95-acre Chesnes Preserve, and 44-acre Moebius Nature Preserve.

Chagrin River Watershed Partners will be contracted to oversee restoration activities planned for the site. CRWP is a non-profit technical organization founded by the cities, villages, townships, counties, and park districts of the Chagrin River watershed (including the City of Aurora). CRWP provides land use assistance to 37-member communities and also assists member communities with land protection and restoration projects that will improve or maintain the habitat integrity of the watershed.

Partnering in the acquisition process is the Trust for Public Land. TPL has 38 years of experience in assisting public agencies to acquire land for conservation and public park use. Since 1972, it has closed more than 4,150 land transactions. The City and TPL's Ohio staff have worked together previously on the Aurora Wetlands acquisition and the Spring Hill Wetlands acquisition.

#### 3. Identify the agreements that will be put in place between the different responsible parties.

A WRRSP **Sponsorship Agreement** between NEORS ("Sponsor") and The City of Aurora ("Implementer") has been sent to NEORS to be signed.

An **Environmental Covenant** will be placed on the entire property. The covenant will be between the City of Aurora and the Ohio Environmental Protection Agency.

A **Contract** will be developed between the City of Aurora and the Chagrin River Watershed Partners who will take the lead role on restoration activities. A design and construction project will be developed with a firm for professional design services and construction of restoration activities.

**4. Provide a detailed description of the tasks to be performed to complete the project.**

*Tasks Performed to Permanently Protect and Restore the Property*

- Submit approvable restoration/protection plan – September, 2012
- Submit draft environmental covenant – September, 2012
- Submit complete land acquisition appraisals – September, 2012
- Submit 4 original executed environmental covenants – November, 2012
- Construction loan – December 2012
- Close on acquisition – April, 2013
- Record Covenant – April, 2013
- Submit detailed restoration plans – February, 2013
- Initiate restoration construction – May 2013
- Complete sponsoring municipal WWTS project – TBD
- Expected achievement of project goals – April, 2013
- Submit first annual report – January 2014

*Tasks Involved in Management of the Property*

The Property will be managed as a natural area with access limited to passive park uses (e.g. monitoring, research, education and management purposes, and passive recreational uses such as wildlife watching, photography, hiking, nature study).

The City of Aurora (in partnership with Chagrin River Watershed Partners) will be responsible for implementing all management activities.

Resource Management Priorities are as follows:

- Restore 3,600 linear feet of channelized Aurora Branch Chagrin River
- Restore 33-acres of existing golf course turf to forest floodplain
- Remove 1 dam
- Restore 691 linear feet of headwater habitat
- Restore 3 meadow habitat
- Allow guided succession of 39.2-acres of existing fairway
- Cease logging and allow guided succession of 93.8 acres of woods.
- Monitor and treat invasive species as necessary
- Implement wildlife management actions as necessary

Limited public access will be allowed when such use and access does not conflict with the goals of preservation and restoration of wetlands and aquatic resources. Presently, the following uses are planned for the property:

#### Trail Head Area

A destination point will be developed near the northwest corner of the property in an area that has already been impacted by the existing golf course and that is well removed from the Chagrin River, riparian areas, and/or wetlands. A 40-car gravel parking lot will be developed in this area. A rain garden and/or bio swale will be constructed to intercept parking lot runoff. Also included here will be an informational kiosk, trail entrance, open-air pavilion, and small sledding area.

#### Managed Meadow

Three areas have been designated as meadow habitats. These areas are illustrated on the map in Appendix A and will increase overall habitat diversity of the site. These areas are currently mowed lawns/fairways and will be allowed to revert to more natural meadow habitats through guided management. Invasive species will be prevented from overtaking these areas and a mowing regimen will be implemented around the breeding season for ground nesting grassland bird species.

#### Park and Resource Management Area

The City of Aurora will maintain existing buildings currently used by the golf course operations and maintenance staff. Included in this area are three buildings and a greenhouse. These structures (and associated parking areas) will be maintained within the current development footprint (less than 2-acres) and may be used by Aurora Parks Department for management, maintenance, and stewardship of the site.

#### Pedestrian Trails

The City of Aurora will maintain select portions of the existing golf cart path for use as pedestrian and non-motorized vehicle trails. Other portions of the trail will be removed to facilitate the stream and riparian restoration of the Aurora Branch of the Chagrin River. The existing path is approximately 6-feet wide and composed of asphalt. A mowed berm (approximately 4 feet wide) will be maintained on either side of the existing path for a total footprint of 14-feet. The City will maintain the existing trail surface until a time that the asphalt degrades to a point where repairs are no longer possible. At this time, the asphalt will be removed and the trail will be reconstructed (within the existing footprint) with crushed stone. There are numerous bridges that cross the Aurora Branch of the Chagrin River. Seven of these bridges will be removed to facilitate the stream and riparian restoration of the Aurora Branch. Four of the remaining bridges will be maintained to facilitate trail crossings. With few exceptions, there will be no trail construction outside of the existing cart path footprint. Two exceptions will be made in order to move the trail away from the Aurora Branch and out of the proposed restored riparian area. The locations of these new trail segments are shown on the map in Appendix A.

Miscellaneous Structures

Two additional existing structures will be maintained in their current foot print and for their current use. A composting toilet building is located toward the eastern end of the site. This structure will be maintained in its current location. In addition, a small open-air pavilion is also located near the eastern section of the project area and will also be maintained as a picnic area and rest stop for hikers and park users.

A third structure is a small building that is used as a rest area. This building will be retained and used as a small information and interpretive center.

**5. A detailed, line item budget for the project must be provided.**

	<b>Requested WRRSP Amount</b>	<b>Total Project Implementation Cost</b>
<b>Stream/Riparian Protection</b>	\$ 3,500,000	\$ 3,500,000
<b>Wetlands Protection</b>	\$400,000	\$400,000
<b>Dam or Levee Removal or Modification</b>	\$96,250	\$96,250
<b>In-Stream Habitat Restoration</b>	\$57,250	\$57,250
<b>Streambank Restoration</b>	\$438,250	\$438,250
<b>Natural Channel Design</b>	\$183,250	\$183,250
<b>Wetlands Restoration</b>		
<b>Oth</b> Due diligence, boundary marking, signage, plan	\$75,000	\$85,000
<b>Totals</b>	\$4,750,000	\$4,760,000

**6. A schedule for completion of the identified tasks.**

The WRRSP project is expected to be completed within 2 years. The time line for each task involved in the protection of the Property is presented above (#4).

**7. A plan for perpetual management of the property. This plan should identify:**

**a) Party responsible for property management and their qualifications**

The City of Aurora will be responsible for the oversight of all management activities on the Property. The City of Aurora is a leader among municipalities in its protection of key natural resources. The City maintains a progressive parks department overseeing 1,200-acres of property. These include the 366-acre Aurora Wetlands Preserve, 600-acre Sunny Lake Park, 135-acre Harmon Farm Preserve, 143-acre Spring Hill Preserve, and 44-acre Moebius Nature Preserve. The City of Aurora plans to use existing buildings on the property as headquarters for Park staff.

Chagrin River Watershed Partners will be contracted to oversee restoration activities planned for the site. CRWP is a non-profit technical organization founded by the cities, villages, townships, counties, and park districts of the Chagrin River watershed (including the City of Aurora). CRWP provides land use assistance to 37-member communities and also assists member communities with land protection and restoration projects that will improve or maintain the habitat integrity of the watershed.

**b) Standards and management techniques that will be used to manage the properties**

The City of Aurora maintains a progressive Parks Department that is charged with the preservation of cultural, historic, and environmental resources. The City will follow good conservation practices and will enforce all protection measures listed in the Environmental Covenant.

**c) How the property management will be funded**

Portions of this WRRSP project will fund both acquisition and restoration. Once restoration has been completed, it will be managed in perpetuity by the City of Aurora with local City funds.

**8. A plan for monitoring the property**

The City of Aurora will enter into an environmental covenant with the Ohio EPA as a requirement of the WRRSP funding program. Annual monitoring reports will be submitted to the Ohio EPA for review and approval. The Ohio EPA will have the authority to enter the property at any time to ensure that the terms of the Environmental Covenant are being enforced.

**a) The amount of acreage finally protected, including acreages of the various habitat types**

A total 194.3 acres of land will be protected as part of this plan. The project includes preservation of over 8,000 linear feet of the Aurora Branch of the Chagrin River and over 9,000 linear feet of headwater streams, removal of one dam, and restoration of 3,600 linear feet of the Aurora Branch of the Chagrin River and 691 linear feet of headwater stream. In addition, 13 acres of wetlands will be preserved including 6-acres of potential Category 3 wetlands. Finally this project will restore nearly 33 acres of existing mowed and manicured golf course to a forest riparian corridor and floodplain.

**b) For wetlands, the ORAM score for the restored or protected habitats**

An ORAM study was performed by Davey Resource Group during 2010 (Appendix D). Logging activities were cited as a major source of impairment to wetlands on the subject property. Over time, it is expected that ORAM values for all existing and restored wetlands will improve to CAT 2 and/or CAT 3 status.

**c) The aquatic life use of the restored or protected water resources**

Sections of the Aurora Branch of the Chagrin River within the subject property have an intact riparian zone and support good to excellent habitat. Ohio EPA studies have shown that unimpacted habitat reaches of the Aurora Branch score QHEI values greater than 70 (Appendix E). However, significant reaches of the Aurora Branch have been decimated by the existing use of the area as a golf course. Restoration actions planned for the Aurora Branch will improve QHEI values in the following manner:

1. Riparian restoration of existing fairways will improve Metric 4 of the QHEI
2. Instream habit improvements will increase Metrics 2 and 5 of the QHEI
3. Removal of rip-wrap will increase Metric 3 of the QHEI

There are a number of smaller tributaries that will be restored via dam removal and daylighting of culverts. As these resources are not currently in existence, it is not possible to compare pre/post restoration values. However, elements of the QHEI and/or HHEI will be used in the planning and design process to develop a high quality habitat for fish, amphibians, and other aquatic wildlife.

**B. For projects involving either fee simple acquisition or acquisition of a conservation easement for properties defined at the time of plan preparation, an appraisal of the property must be provided by a certified appraiser.**

- 1. For a fee simple land acquisition, the appraiser should identify the fair market value of the property, based on an analysis of the property and sales of comparable properties in the local area.**

An appraisal will be submitted to Ohio EPA.

- 2. For easement acquisition, the appraisal should identify the fair market value of the property rights.**

Not applicable.

- 3. For all properties, a title search of the property should be assembled and provided, along with an attorney's opinion identifying all encumbrances on the title and the effect of the encumbrances on the property restrictions to be applied, as applicable, through either an environmental covenant or conservation easement.**

The title and a title opinion will be provided to OEPA.

**C. For projects involving acquisition of a number of potential properties within a defined corridor (termed corridor projects), the following items should be addressed in lieu of B above.**

Not applicable.



**D. For projects involving restoration, where restoration plans can only be completed after land acquisition is completed.**

A conceptual restoration plan is presented in Appendix G. A final restoration plan will be completed after land acquisition.

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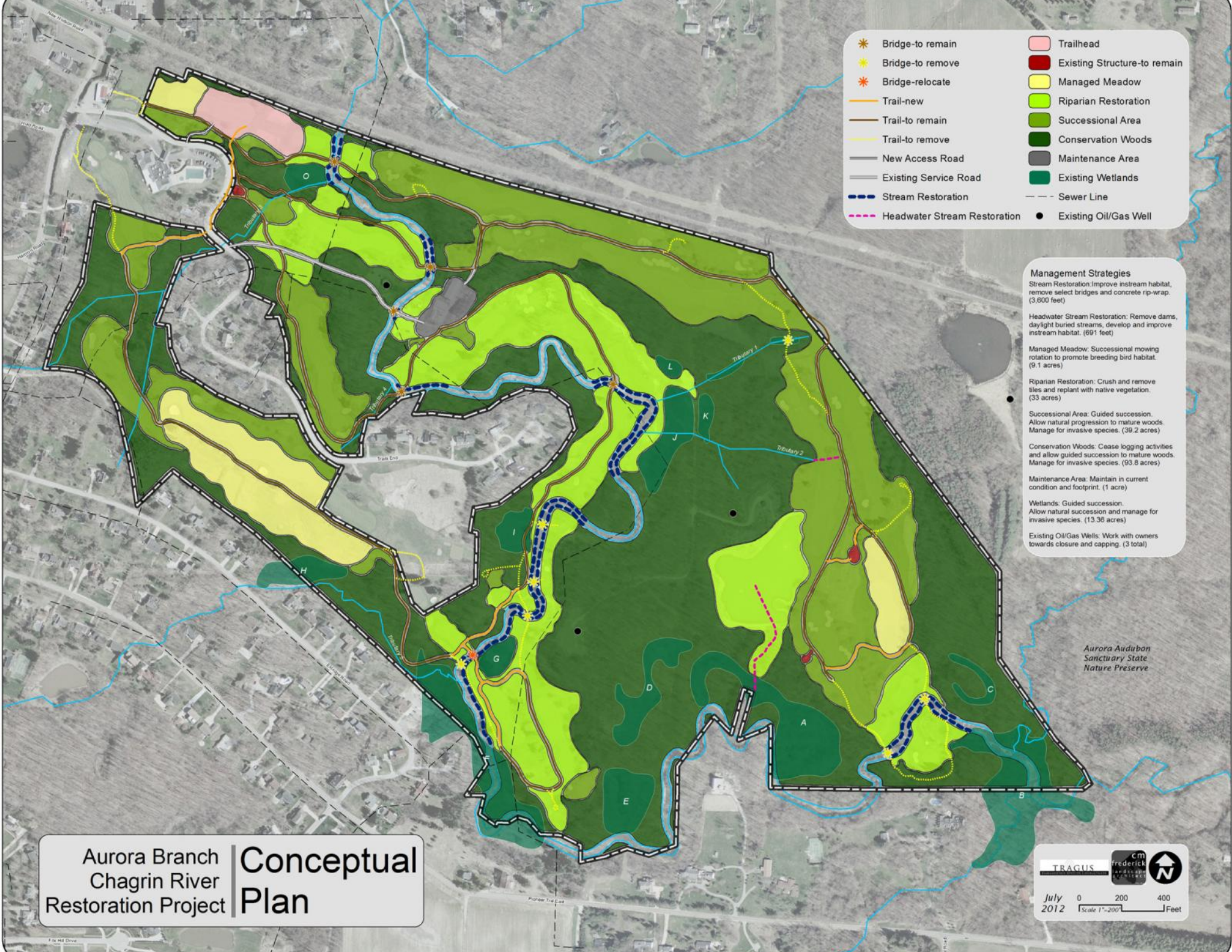
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***Appendix A.***

***Map of Existing Conditions and Proposed Restoration Actions.  
Also included is Surrounding Landuse and Topography.***





- ✱ Bridge-to remain
- ✱ Bridge-to remove
- ✱ Bridge-relocate
- Trail-new
- Trail-to remain
- Trail-to remove
- New Access Road
- Existing Service Road
- - - Stream Restoration
- - - Headwater Stream Restoration
- Trailhead
- Existing Structure-to remain
- Managed Meadow
- Riparian Restoration
- Successional Area
- Conservation Woods
- Maintenance Area
- Existing Wetlands
- Sewer Line
- Existing Oil/Gas Well

**Management Strategies**

**Stream Restoration:** Improve instream habitat, remove select bridges and concrete rip-wrap. (3,600 feet)

**Headwater Stream Restoration:** Remove dams, daylight buried streams, develop and improve instream habitat. (691 feet)

**Managed Meadow:** Successional mowing rotation to promote breeding bird habitat. (9.1 acres)

**Riparian Restoration:** Crush and remove tiles and replant with native vegetation. (33 acres)

**Successional Area:** Guided succession. Allow natural progression to mature woods. Manage for invasive species. (39.2 acres)

**Conservation Woods:** Cease logging activities and allow guided succession to mature woods. Manage for invasive species. (93.8 acres)

**Maintenance Area:** Maintain in current condition and footprint. (1 acre)

**Wetlands:** Guided succession. Allow natural succession and manage for invasive species. (13.36 acres)

**Existing Oil/Gas Wells:** Work with owners towards closure and capping. (3 total)

Aurora Branch  
Chagrin River  
Restoration Project

# Conceptual Plan

TRAGUS cm Frederick CONSULTANTS

July 2012

0 200 400 Feet

Scale 1"=200'

North Arrow