City of Golden Valley
7800 Golden Valley Road • Golden Valley, MN 55427

FEASIBILITY Report

October 7, 2014

Honeywell Pond Enhancement/Improvement Project

City of Golden Valley
Hennepin County, Minnesota

WSB Project No. 1473-31

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FEASIBILITY REPORT

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For:

City of Golden Valley and Bassett Creek Watershed District

October 7, 2014

Prepared By:

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CERTIFICATION

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly licensed Professional Engineer under the laws of the State of Minnesota.

Peter R. Willenbring, P.E. Reg. No. 15998

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1 Summary, Conclusions and Recommendations

1.1 Summary

The Honeywell Pond Enhancement/Improvement Project (HPE/IP) consists of a number of projects that will directly address the need to provide treatment for runoff in addition to the BMPs that will be constructed for the Douglas Drive project scheduled for construction in 2016. If selected, the HPE/IP will be able to expand and enhance the treatment of storm water flowing into and through the area from the upstream watershed prior to its discharge to Bassett Creek, and provide habitat enhancements.

The three Honeywell Pond Enhancement/Improvement Project options include:

Option 1:
- Expanding the size and depth of the Honeywell pond.
- Diverting low flows into the pond from the arch trunk storm line running south on Douglas Drive.
- Creating a habitat/buffer area around the perimeter of the pond.

Option 2:
- Build and connect a force main to the irrigation system at the Sandburg Learning Center ball fields.
- Build and connect a stub off of the force main to the Sandburg Learning Center ball fields for Honeywell's use if they so desire.
- Build and connect a force main to the Douglas Drive Infiltration System.

Option 3:
- Combination of options 1 and 2

The options provide water resource and environmental benefits to the area that include reduced pollutant loads, discharge rates and volume of water directed to Bassett Creek. **Table 1.1** below shows a summary of the options and their individual cost/benefits.

Table 1.1 - Summary Breakdown of Options						
	Estimated Capital Cost	Estimated 30 Year Cost	Estimated lbs Phosphorous Removed per Year	Cost/lb Removed Over 30 Yrs	Estimated Flood Elevation Reduction	Estimated Change in Peak Discharge Rate
Option 1 - Expand Pond, Construct Low Flow System, and Construct Buffer	$880,000	$1,444,914	15.3	$3,148	None	No Change
Option 2 - Construct Lift Station, Force Main To Sandburg Learning Center Ball Fields with Stub for Honeywell, and Force Main to South Infiltration System	$322,000	$639,854	13.5-27	$800 - 1,600	None	No Change
Option 3 - Expand Pond, Construct Low Flow System, and Construct Buffer Construct Lift Station, Force Main To Sandburg Learning Center Ball Fields with Stub for Honeywell, and Force Main to South Infiltration System	$1,202,000	$2,084,768	28.8-42.3	$1,650 - 2,450	None	No Change
Option 2 - If Honeywell does not irrigate	$322,000	$639,854	7.8-15.6	$1400-2,750	None	No Change

The Bassett Creek Watershed Management Commission (BCWMC) P8 model was updated to determine the amount of phosphorous removal capacity of Honeywell pond. The amount entering the pond is 0.17 ppm while the amount leaving the existing pond was found to be 0.14 ppm. In this report, 0.16 ppm was used as the starting value when determining how much phosphorus a specific BMP would be able to remove.

For option 2 the amount of phosphorous removed depends on the amount of water treated by the system. This can be calculated simply by taking the concentration of phosphorus pumped from the pond, estimated to be 0.16 ppm from the P8 model, and converting it to pounds phosphorus removed per year based on the estimated volume of water treated per year.

Option 2 growing season was assumed to be for 120 days out of the year. This is due to the winter months and dry periods thought the year when pumping is not an option.

Indirect costs over each option include, but are not limited to, research and data collection, design, permitting, meetings, and city fees.

1.2 Conclusions and Recommendations

Based on the information contained within this feasibility report along with input from the City of Golden Valley, it is recommended that the improvement option 1 be given the highest priority at the estimated capital cost of $843,000. If funding is still available, option 2 (build a lift station and force main to connect to the irrigation system on the Sandburg Leaning Center ball fields) is recommended as the first alternative to be constructed. This estimated capital cost is $317,000.

Option 1 is recommended as the highest property option based on several reasons. Frist is that in order for option 2 to be feasible there needs to be an adequate amount of dead pool storage to maintain a supply of water to be pumped. The existing pond provides about 1.05 acre-feet of storage that can be used for pumping compared to 3.37 acre-feet with the expanded pond. The second reason is that there is no guarantee that Honeywell will use the pond for irrigation. If Honeywell does not irrigate the amount of phosphorus removed in option two drops from 13.5-27 to 7.8-15.6 pounds per year and the price per pound phosphorus removed per 30 year period increases from $800-1,600 to $1,400-2,450.

The only BMP that is needed for the Douglas Dive project is the underground infiltration system to the south of Honeywell pond on the west side of Douglas Drive. This infiltration system will be designed to meet the water quality needs for the Douglas Drive project. If option 2 is selected, the water treated will be extra to the treatment needed for the Douglas Drive project. The Douglas Drive project will create 1.7 acres of new impervious area and has a 0.58 acre area to use for underground infiltration. The soils in this area are sand and silty sands. Using an infiltration rate of 0.45 inches per hour, based on Minnesota Stormwater Manual guidance, the proposed BMP can infiltrate the required water quality volume in approximately 8 hours. The standard requires infiltration within 48 hours. The BMP size exceeds the NPDES Construction General Permit and BCWMC requirement.

Therefore the options outlined in this feasibility report are additional, standalone options from the Douglas Drive project.

The sections below explain in more detail the individual enhancement/improvement options, their benefits, impacts, costs, and cost/benefits, permits that may be needed, the estimated project schedule, and reasons as to why this project may qualify for funding from the Bassett Creek Watershed Management Commission.

2 INTRODUCTION

The City of Golden Valley is planning to rebuild and expand Douglas Drive. This construction project will increase the existing impervious area by approximately 1.7 acres and reconstruct approximately 14 acres of existing impervious surface. Runoff from this impervious surface currently receives minimal treatment prior to it discharging into Bassett Creek.

Furthermore, in this area, during intense rainfall events, the City of Golden Valley has identified flooding problems in residential areas west of the Honeywell pond which direct runoff to a storm sewer tributary to this pond. The City and Watershed have also noted:

- the need to treat currently untreated stormwater runoff from this watershed prior to discharging to Bassett Creek,
- enhance the level of treatment currently provided,
- reduce projected high water levels in upstream areas,
- and enhance the water quality and habitat values within and around Honeywell pond.

This Honeywell Pond Enhancement/Improvement Project feasibility report outlines options available to provide storm water treatment for water diverted from Douglas Drive as well as additional water quality treatment for the surrounding area. The options identified have varying potentials to enhance the ability of the pond to perform a wide range of functions and values that include:

- Retain stormwater runoff and reduce the volume of water conveyed downstream to Bassett Creek.
- Retain stormwater runoff with the intention of reducing the flow rate of water downstream to Bassett Creek
- Reduce pollutant loads downstream to Bassett Creek.
- Store and pump stormwater to the Sandburg Learning Center baseball fields to the north for irrigation and or infiltration purposes.
- Store and pump stormwater as an alternative source of water for irrigation or other needs at the Honeywell site.
- Capture and treat low flows of untreated runoff currently bypassing the basin and being directed untreated to Bassett Creek via the trunk storm line on Douglas Drive.
- Enhance the habitat and aesthetics of the pond as well as provide environmental education.

This feasibility report provides additional information on the options, cost and benefit, and provides recommendations on the most cost effective feasible options for implementation should this project be ordered.

3 BACKGROUND

3.1 Existing Conditions

The Honeywell Pond is located on the south side of Honeywell's property in Golden Valley, between St. Croix Avenue North and Hampshire Place, on the west side of Douglas Drive North. The outlet is located on the south side of the pond and discharges south along the Canadian Pacific Railroad into Bassett Creek. There is one 54-inch Reinforced Concrete Pipe (RCP) inlet on the west side of the pond that receives runoff from much of the west side of the Honeywell property and some of the area in the neighborhoods to the west. There are also two more inlets on the north side of the pond (24-inch RCP on west side and 30-inch RCP on the east side) that receive water from much of the east side of the Honeywell property. A map of the pond, existing contours, and storm sewers can be seen in **Figure 1**.

3.1.1 Pond Characteristics

At its normal water level (NWL) of 876.4 feet, the surface area of the pond is about 1.5 acres and the average pond depth is approximately 3 feet deep. The existing dead pool storage volume is approximately 3.7 acre-feet. The current high water level (HWL) of the pond is 884.2 feet, which corresponds to the pond capable of providing live pool storage of approximately 20.4 acre-feet of water. The ponding area consists of a Type 4 (Deep Marsh) wetland. The north and east boundary of this wetland was delineated and approved in November 2011. Runoff from the surrounding watershed and the storm sewers are routed through the pond and discharge south to Bassett Creek through a 42-inch storm pipe. A map of the pond can be seen in **Figure 1**.

3.1.2 Drainage Area

The indirect drainage area of the Honeywell Pond receives runoff from many ponds northwest of the Honeywell pond including the Decola Ponds. This area is approximately 620 acres consisting of land in the cities of Golden Valley, Crystal, and New Hope. A map of the indirect drainage area can be seen in ***Appendix B***.

The direct drainage is approximately 105 acres and consists of much of the runoff from the Honeywell property including any water that discharges out to the pond located on the northeast part of the Honeywell property. The direct drainage area also consists of runoff from several of the homes on Duluth Street and much of the SEA School property at Duluth Street and Kelly Drive. A map of this area can be seen in **Figure 2**.

3.1.3 Soils

The Natural Resource Conservation Service (NRCS) soil survey was used to approximate the soil types of the area of the pond and the surrounding area. The soils in the upland areas of the watershed tributary to the pond appear to be mostly in Hydrologic Soil Group B. A map of the NRCS soil survey can be seen in **Figure 2**.

3.1.4 Vegetation

Vegetation within the basin is limited, likely due to the average depth of 2.5 – 3 feet and an often fluctuating depth during storm events. Vegetation is present along the shoreline, and consists of Canadian goldenrod (Solidago canadensis), Kentucky bluegrass (Poa pratensis), sandbar willow (Salix exigua), and eastern cottonwood (Populus deltoids). The herbaceous vegetation present provides little wildlife habitat or shoreline protection.

3.1.5 Pollutant Removal

The BCWMC P8 model for the area indicates that the Honeywell Pond currently has a total inflow of 210.3 pounds of Total Phosphorus (TP) per year. The pond's total outflow of TP is 174.0 pounds per year. This gives the existing pond a TP load reduction of 36.3 pounds, which corresponds to a 17.3% removal. One of the reasons this removal percentage is lower than might be expected, is much of the indirect drainage is pretreated in upstream ponds prior to it being routing through the Honeywell Pond and the existing storage volume is small compared to its large drainage area.

4 POTENTIAL IMPROVEMENTS

4.1 OPTION 1: Expand Pond, Construct Low Flow Diversions from Douglas Drive, and Construct Habitat Buffer

Based on discussions with Honeywell representatives, additional land may be available to allow the pond to be expanded from 1.5 acres to 2.4 acres (***Figure 3***). Expanding the pond increases the flood storage and the dead storage as follows:

- Flood storage volume increases from 22.0 ac-ft to 25.8 ac-ft (HWL of 884.2)
- Dead storage volume increases from 3.7 ac-ft to 12.6 ac-ft (average depth increases from 3 to 6-feet)

A 48-inch low flow diversion is proposed from Douglas Drive. The diversion was sized to maximize the volume to the Honeywell pond from low flow events while maintaining the existing pond HWL and discharge rate.

The buffer area around the pond will be planted with native plants and vegetation to provide habitat. The pond will also contain a 10 to 1 aquatic bench to improve the habitat and safety of the pond. An undulating edge along the shoreline will help in creating a more natural habitat for wildlife.

4.1.1 Benefits

BCWMC developed a watershed-wide P8 model that was utilized for evaluating the benefits of the proposed project. The P8 model was run for the following scenarios:

- Existing conditions (as a comparison point)
- Pond expansion
- Pond expansion and 48 inch low flow diversion

The results are summarized below.

- Existing TP removal = 36.3 lb/yr (17.3% removal)
- Pond Expansion TP removal = 48.1 lb/yr (22.9% removal)
- Pond Expansion and Low Flow diversion TP removal = 51.6 lb/yr (23.4% removal)

The proposed pond expansion and low flow diversion remove an additional 15.3 lb/yr of TP over the existing pond. Additionally, low flow from approximately 60 acres that directly discharged to Bassett Creek with no treatment is diverted to the Honeywell pond. A total of 26% of the runoff, or 1.55 ac-ft, is diverted to the Honeywell pond for the 1-year, 2.49” rainfall event.

The buffer area will improve the shoreline of the existing pond and create additional wildlife habitat onsite. A more natural, undulating pond edge with shallow wildlife bench will allow vegetation to become established. A wetland mix appropriate for the depth of the wildlife bench, along with live plugs, will be used to establish vegetation. This will provide area wildlife (e.g., ducks, geese) with both nesting and feeding opportunities. In addition, the vegetation will also provide shoreline protection from wave action and erosion during storm events.

4.1.2 Impacts

Increasing the pond surface area and or pond depth will change the functions and values of the pond/wetland area. Several permits may be needed. See Section 5 for more information. Also, a significant number of trees and upland vegetation will need to be removed.

Potential impacts will occur to the existing wetland, including filling along the eastern edge of the pond area and expanding the western edge. Consultation with regulatory agencies and permit approvals will be required due to the wetland alternations. Any filling of the eastern edge will be due to the Douglas Drive project and associated permits will be handled though that project. Any expansions on the west side will be part of the Honeywell project and any associated permits will be handled though this project. Permits required for this project are outlined in Section 5. In addition, monitoring and maintenance of the vegetative community will be necessary to ensure establishment of native plants.

4.1.3 Estimated Cost

It is estimated that the cost of expanding the pond, constructing the low flow diversion system and the buffer strip be $880,000. **Table 4.1** below shows the price breakdown

Table 4.1 - Estimated Cost for the Pond Construction, Low Flow Diversion System, and Habitat Buffer

Description	Units	Quantity	Unit Price	Total Price
MOBILIZATION	LUMP SUM	1	$28,000	$28,000
CLEARING	ACRE	3	$9,000	$23,400
GRUBBING	ACRE	3	$9,000	$23,400
DEWATERING	LUMP SUM	1	$20,000	$20,000
COMMON EXCAVATION**	CU YD	10,340	$12	$124,080
MUCK EXCAVATION	CU YD	8,200	$30	$246,000
LOW FLOW DIVERSION SYSTEM	LUMP SUM	1	$50,000	$50,000
HABITAT BUFFER	LUMP SUM	1	$50,000	$50,000

EROSION CONTROL BLANKETS CATEGORY 3	SQ YD	7,900	$1.50	$11,850
SEEDING	ACRE	2	$5,000	$8,500
			Sub-Total	$585,230
			25% Contingency	$147,000
			25% Indirect Costs*	$147,000
			Total	$880,000

* Indirect Costs include; engineering, legal administrative, and construction inspection fees.

** Cost assumes non-contaminated soils

4.1.4 Cost Benefit Analysis (Total Phosphorous)

The Price/Pound/Year of TP removed for the pond construction is approximated to be $3147.96. **Table 4.2** below shows the price breakdown.

Table 4.2 - Price/Pound/Year TP Removed for the Pond Expansion, Low Flow System and Habitat Buffer	
Inflation Rate (i)	3.00%
Life Span	30
Capital Cost	$880,000.00
Annualized Cost	$44,896.95
Annualized Cost Over 30 Year Period	$1,346,908.45
Estimated Maintenance Cost 2014	$2,000.00
Total Cost of Maintenance for 30 Year Period	$98,005.36
Total Cost (Over 30 Years)	$1,444,913.80
lb/yr of TP Removed	15.3
Price/Pound/Year TP Removed	$3,147.96

4.2 OPTION 2: Construct a Lift Station and Force Main to Sandburg Learning Center Ball Fields along with a Stub for Honeywell to Tap is desired, and Force Main to South Infiltration System.

Option 2 consists of utilizing the pond as an alternate source of irrigation water and maximizing the use of the proposed infiltration system. Calculations and assumptions made in this section are based on pumping rates, not pond storage, and given as a range. This is due to the uncertainty of volume of water that will be in the pond at a given time since this will be weather dependent. However, assuming the pond expansion is chosen and the pond is allowed to be pumped down 1.5 feet, the volume of water available to pump is 3.37 acer-feet.

If both Honeywell and the Sandburg Leaning Center Fields are irrigated with 1 inch of water per week for 26 weeks and the south infiltration system is utilized 120 days out of the year the three systems will need approximately 80 acre-feet of water a year. According to the Stormwater Harvesting and Reuse Model created by Emmons & Olivier Resources Inc. a dry year (2009) would produce 227 acre-feet of runoff and an average year (2011) would produce 266 acre-feet of runoff for a 620 acre watershed assuming 35% impervious area. Based on both of these calculations the pond would only need 35% for a dry year and 30% for an average year of the annual during the pumping season to maintain a "healthy" pumping rate.

If both fields are irrigated 6 hours a day, 3 days a week, the pond has enough dead shortage to irrigate both fields for two weeks and infiltrate the whole volume of the infiltration system twice without needing rain to refill the pond.

Irrigation of the Sandburg Learning Center Baseball Fields could be accomplished with a valve that would draw from the pond in times of high water levels or from the City source in times of normal/low pond water levels. The approximate irrigation area of the ball fields is 14 acres. It is estimated that 13.25-26.52 acre-feet of water will be able to be irrigated over the 14 acre area each year. The pumping time will most likely be late night and early morning to avoid disturbance with athletic use. The irrigable area is shown on **Figure 4**.

A stub will be installed along the force main to the Sandburg Learning Center ball fields for Honeywell to tap into, if they desire, for irrigating their property as well. The approximate irrigation area on Honeywell property is 14.5 acres. It is estimated that 13.25-26.52 acre-feet of water will be able to be irrigated over the 14.5 acre area each year. This area can be seen in **Figure 5**.

If this option is chosen, the system will need to be in compliance with the City of Golden Valley's plumbing code reviewers. Signs will also need to be posed indicating stormwater is being used to irrigate the fields.

With the reconstruction of Douglas Drive an underground infiltration system is being constructed as well to satisfy the water quality needs for the project. The exact size and location of the system are still unknown. However for the purposes of this report, it was assumed that the infiltration area of this system will be 8,500 square feet. An infiltration rate of 0.4 inches per hour was used to analyze the phosphorus removal for this system.

Currently this infiltration system will only function after rain events. However, if water were to be pumped from the Honeywell Pond the infiltration system could be utilized during periods with little rain. This would also depend on whether there is enough volume of water in the Honeywell Pond to pump out and still maintain a healthy pond level. An approximate location and size of this system can be seen in **Figure 6**.

4.2.1 Benefits

The benefits of using the pond water as an alternative irrigation source and to pump to the proposed infiltration system include:

- Reduce the amount of city water used for irrigation purposes.
    - The system can switch between city and pond water as the irrigation source depending on the volume of water in the pond.
- Reducing the levels of phosphorus – both dissolved and particulate
- Reduce the volume of water the pond would need to store.
- The ability to infiltrate water during periods without rain.
- Help to regulate the water level of the Honeywell Pond.
- Reduce pollutant loads from the Honeywell Pond

4.2.2 Impacts

- Routine maintenance will need to be performed on this system.
- The water may contain bacteria and chloride.
- Shortening the life span of the infiltration system.
- Increasing the frequency in which the infiltration system will need maintenance.

4.2.3 Estimated Cost

The estimated cost for Option 2 reflects the cost for the high pressure lift station and force main at the site. The cost for the irrigation system construction on the site is not included in this cost estimate. The cost break down of the system can be seen in **Table 4.3** below.

Table 4.3 - Estimated Cost for the Lift Station, Force Main to Sandburg Learning Center, Force Main to Infiltration System to South, and Stub off Force Main for Honeywell

Description	Units	Quantity	Unit Price	Total Price
LIFT STATION**	LUMP SUM	1	$130,000	$130,000
4" FORCE MAIN TO SANDBURG LEARNING CENTER	LIN FT	2400	$35	$84,000
STUB OFF FORCE MAIN TO SANDBURG LEARNING CENTER FOR HONEYWELL	EACH	1	$1,000	$1,000
4" FORCE MAIN TO SOUTH INFILTRATION SYSTEM	LIN FT	1100	$35	$38,500
			Sub-Total	$214,000
			25% Contingency	$54,000
			25% Indirect Costs*	$54,000

Total	$322,000

* Indirect Costs include; engineering, legal administrative, and construction inspection fees.
**The lift station cost includes the cost for a 300 micron screen for filtration

4.2.4 Cost Benefit Analysis (Total Phosphorus)

The TP reduction for the improvements included in Option 2 is listed below:

- Sandburg System = 5.77 - 11.54 lb/yr TP
- Honeywell system = 5.77 - 11.54 lb/yr TP
- Douglas Drive Infiltration System = 2.04 - 4.08 lb/yr TP
- All three combined = 13.5 – 27 lb/yr TP

The two irrigation systems have comparable removals due to the similarly sized irrigable areas. The removal estimates do not take into account the drawdown of the pond that would occur and additional dead storage this provides. Additionally, the removal estimates will vary greatly depending on rainfall and assume average annual conditions. Theses total phosphors removal estimates assume the pomp will be able to run 1/3 of the assumed 180 day pumping season for the low estimate and 2/3 for the high estimate.

The estimated cost per pound per year of TP removed by Option 2 is $800-1,600. This cost assumes that Honeywell will connect their irrigation system to the force main and use water from the pond supplement their existing irrigation system. **Table 4.4** below shows the price breakdown.

Table 4.4 - Price/Pound/Year TP Removed for the Lift Station, Force Main to Sandburg Learning Center, Force Main to Infiltration System to South, and Stub for Honeywell	
Inflation Rate (i)	3.00%
Life Span	30
Capital Cost	$322,000.00
Annualized Cost of Pond Construction	$16,428.20
Annualized Cost Over 30 Year Period	$492,846.05
Estimated Maintenance Cost 2014	$3,000.00
Total Cost of Maintenance for 30 Year Period (Maintenance is needed every year)	$147,008.03
Total Cost (Over 30 Years)	$639,854.08
lb/yr of TP Removed	13.5-27
Price/Pound/Year TP Removed	$800 - 1,600

4.3 OPTION 3: Combine Options 1 and 2

Option 3 simply consists of combining options 1 and 2. The benefits and impacts are consistent with what is described in the previous sections. The estimated cost for option 3 is $1,222,000.

The estimated total phosphorus removal for option 3 is 28.8 - 42.3 lb/yr, which equalities to $1,650 – 2,450 per pound phosphorous removed over a 30 year period.

5 PERMITS

The proposed project may require:

1. Clean Water Act Section 404 permit from the USCAE, and Section 401 certification from the Minnesota Pollution Control Agency (MPCA)
2. Compliance with the Minnesota Wetland Conservation Act
3. Minnesota Pollution Control Agency National Pollution Discharge Elimination (NPDES) System Construction Stormwater Permit
4. Bassett Creek Watershed Management Commission Development Permit
5. City of Golden Valley Stormwater Permit
6. City of Golden Valley ROW Permit
7. DNR Water Appropriation Permit

The Minnesota Pollution Control Agency guidance document for managing dredged materials will need to be fallowed depending on the conditions of the pond soils.

Permits 1-6 may be needed for option 1. Permits 1-7 may be needed for option 2. Details of each permit are listed below.

Section 404 Permit
The USACE regulates the placement of fill into wetlands, if the wetlands are hydraulically connected to a Waters of the United States, under Section 404 of the Clean Water Act (CWA). In addition, the USACE may regulate all proposed wetland alterations if any wetland fill is proposed. The MPCA may be involved in any wetland mitigation requirements as part of the CWA Section 401 water quality certification process for the 404 Permit. USACE staff anticipates that the review timeline to review and approve a Section 404 General Permit (< 0.50 acre of impact) could require 120 days to complete. Review and approval of a Letter of Permission (0.50 – 5 acres of impact) would require more than 120 days.

Minnesota Wetland Conservation Act
The Wetland Conservation Act (WCA) regulates the filling and draining of wetlands and excavation within Type 3, 4, and 5 wetlands. In addition, the WCA may regulate all types of wetland alteration if any wetland fill is proposed. The WCA is administered by local government units (LGU), which include cities, counties, watershed management organizations, soil and water conservation districts, and townships. The City of Golden Valley is the LGU for the proposed project. The Minnesota Board of Water and Soil Resources (BWSR) oversee the administration of the WCA statewide. Wetland Conservation Act approvals can require up to 60 days to complete.

NPDES Construction Stormwater Permit
The Minnesota Pollution Control Agency (MPCA) regulates the discharge of stormwater off construction sites. A NPDES Construction Stormwater Permit is required for any construction activity that disturbs one acre or more of soil. Permit coverage begins seven days following the submittal of a complete application.

Bassett Creek Watershed Management Commission Development Permit
The Bassett Creek Watershed Management Commission regulates development/redevelopment within their watershed which involves the alteration of floodplain, water resources, land use, or utilities. Development Permit approvals require at least 21 days for review and approval.

DNR Water Appropriation Permit
DNR Water Appropriation Permits are needed if users area withdrawing more than 10,000 gallons of water per day or 1 million gallons per year. Minnesota Statues allow local units of government 30 days to review permit applications and submit comments to the DNR waters.

Local Permits
The City of Golden Valley requires permits for grading work within their jurisdiction. Their requirements should be reviewed in the context of each site's work.

6 PROJECT SCHEDULE

The schedule for this project is as follows:

- Feasibility completed in fall 2014
- Final design completed in 2015
- Construction completed in 2016/2017

7 SUITABILITY OF PROJECT FOR FUNDING AS PART OF BASSETT CREEK CAPITAL IMPROVEMENT PROGRAM

It is understood that the Bassett Creek Watershed Management Commission (BCWMC) will consider including projects in their Capital Improvement Program (CIP) that meet one or more of their "gatekeeper" criteria. The Honeywell Pond Enhancement/Improvement Project meets all four of the "gatekeeper" criteria which area listed below:

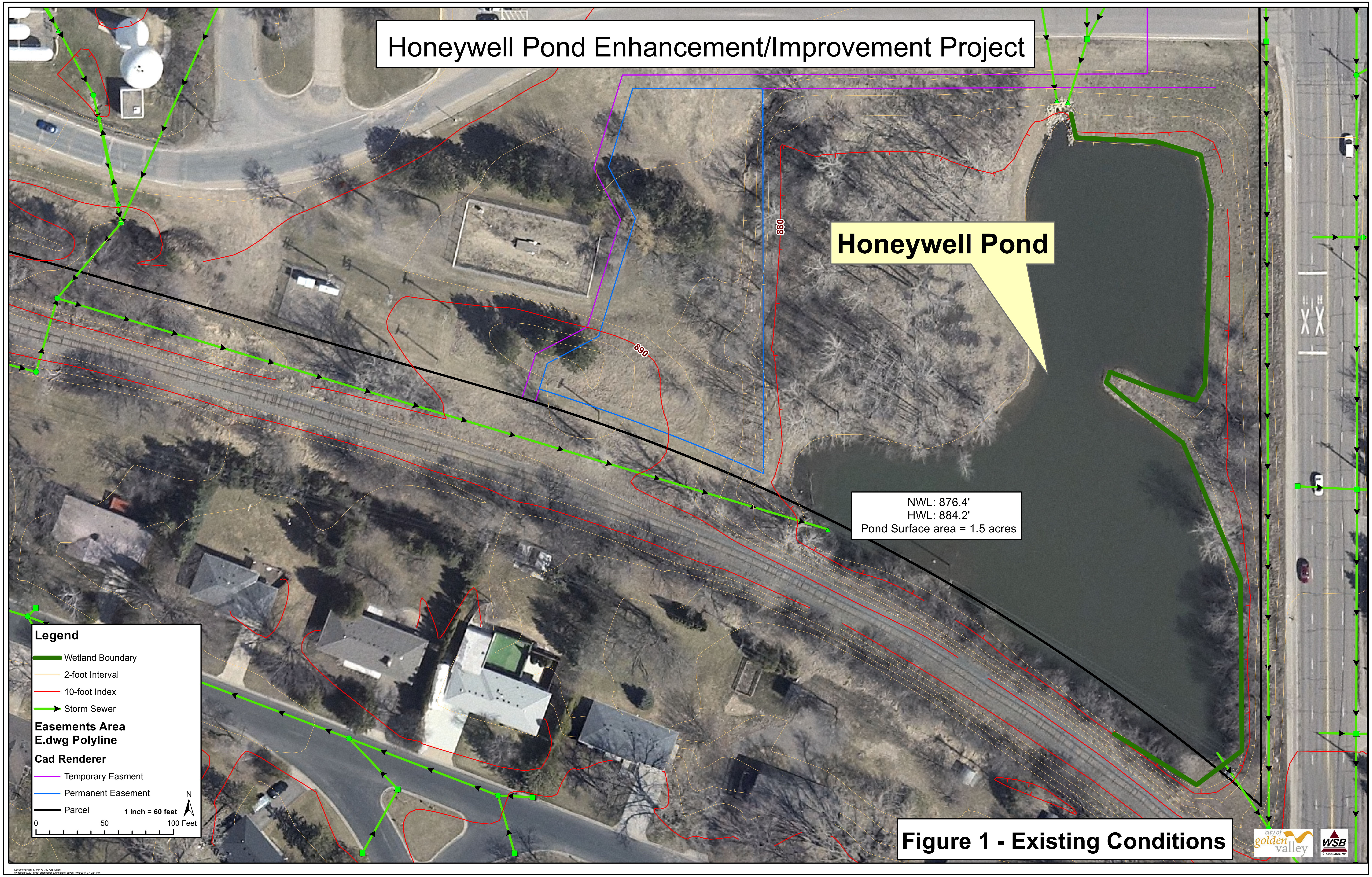
- *Project improves water quality in a priority waterbody.*
  - The Honeywell Pond will improve the water quality of Bassett Creek.

- *Project addresses flooding concern.*
  - By expanding the pond, the HPE/IP will help to address flooding in the area by producing additional flood storage.

The BCWMC will use the following additional criteria to aid in the prioritization of projects:

- *Project protects or restores previous Commission investments in infrastructure.*
  - The System will direct runoff with improved quality to Bassett Creek, which has been the focus of a wide range of improvements by the Commission. This project will clearly protect past Commission investments in infrastructure.
- *Project improves water quality in a priority waterbody.*
  - The Honeywell Pond will improve the water quality of Bassett Creek.
- *Project addresses intercommunity drainage issues.*
  - The HPE/IP's drainage area includes runoff from Golden Valley, Crystal, and New Hope. Selected locations with this drainage area are subject to flooding. This project is projected to slightly reduce flood elevations in this area.
  - Significant sedimentation and corresponding sediment deltas have been created within the City of Minneapolis, as a result of upstream suspended solids loading to the Creek. This project has the ability to reduce the sediment loading to the creek from this watershed.
- *Project addresses flooding concern.*
  - By expanding the pond, the HPE/IP provides additional flood storage and reduces the peak discharge rate to Bassett Creek.
- *Project addresses erosion and sedimentation issues.*
  - The HPE/IP will reduce downstream total suspended solids loads.
- *Project will address multiple Commission goals (e.g., water quality, runoff volume, wildlife habitat, aesthetics, recreation, etc.)*
  - The HEP/IP will improve water quality, runoff volume, wildlife habitat, and aesthetics. See Section 4 for more details.
- *Subwatershed draining to project includes more than one community.*
  - The HPE/IP assists in managing runoff from subwatersheds within the communities of Golden Valley, Crystal, and New Hope.

Appendix A
Figures


Honeywell Pond Enhancement/Improvement Project
Honeywell Pond
880
890
NWL: 876.4'
HWL: 884.2'
Pond Surface area = 1.5 acres
Legend
Wetland Boundary
2-foot Interval
10-foot Index
Storm Sewer
Easements Area
E.dwg Polyline
Cad Renderer
Temporary Easment
Permanent Easement
Parcel
1 inch = 60 feet
N
0
50
100 Feet
Figure 1 - Existing Conditions
city of golden valley
WSB

Honeywell Pond Enhancement/Improvement Project

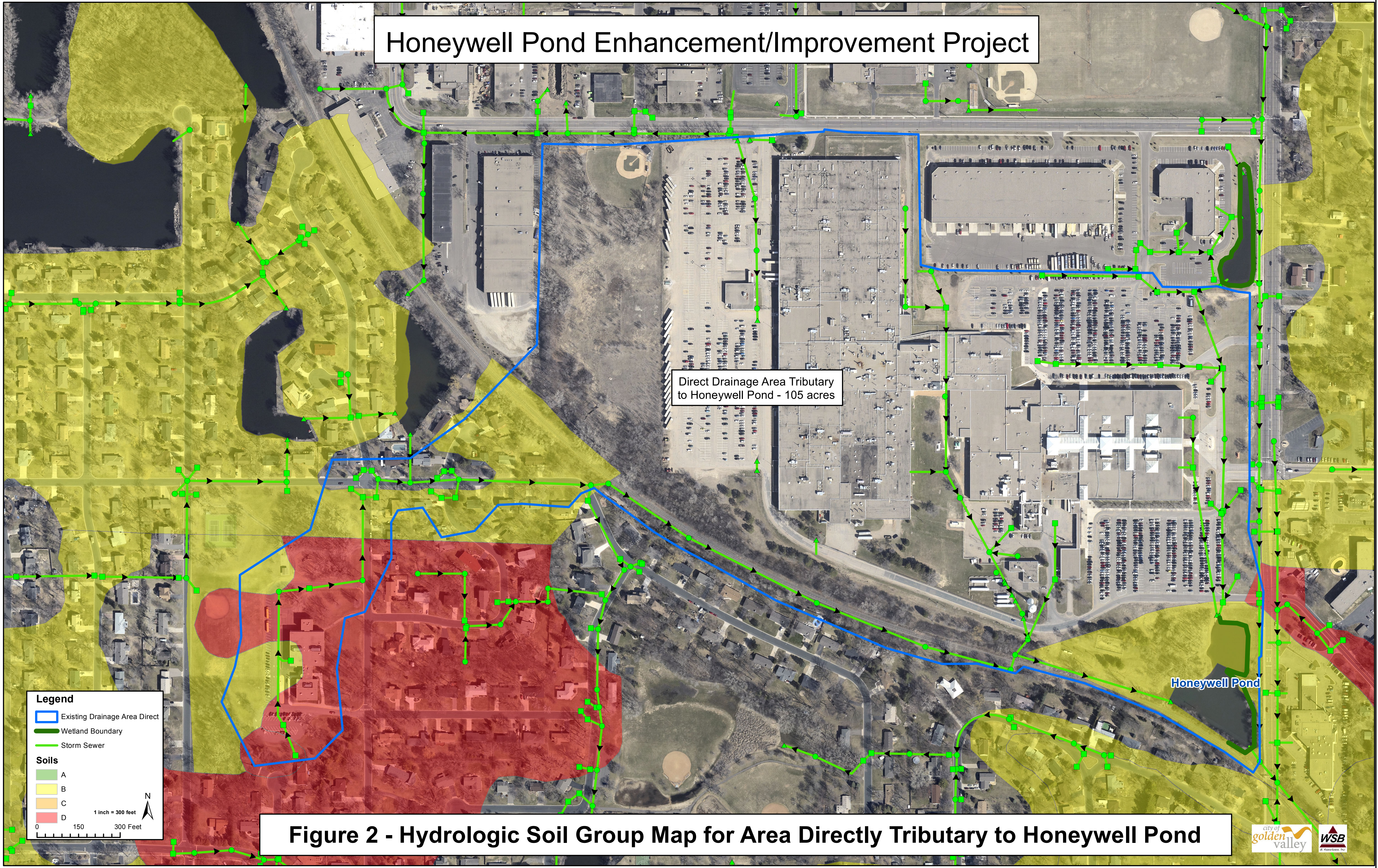


Figure 2 - Hydrologic Soil Group Map for Area Directly Tributary to Honeywell Pond

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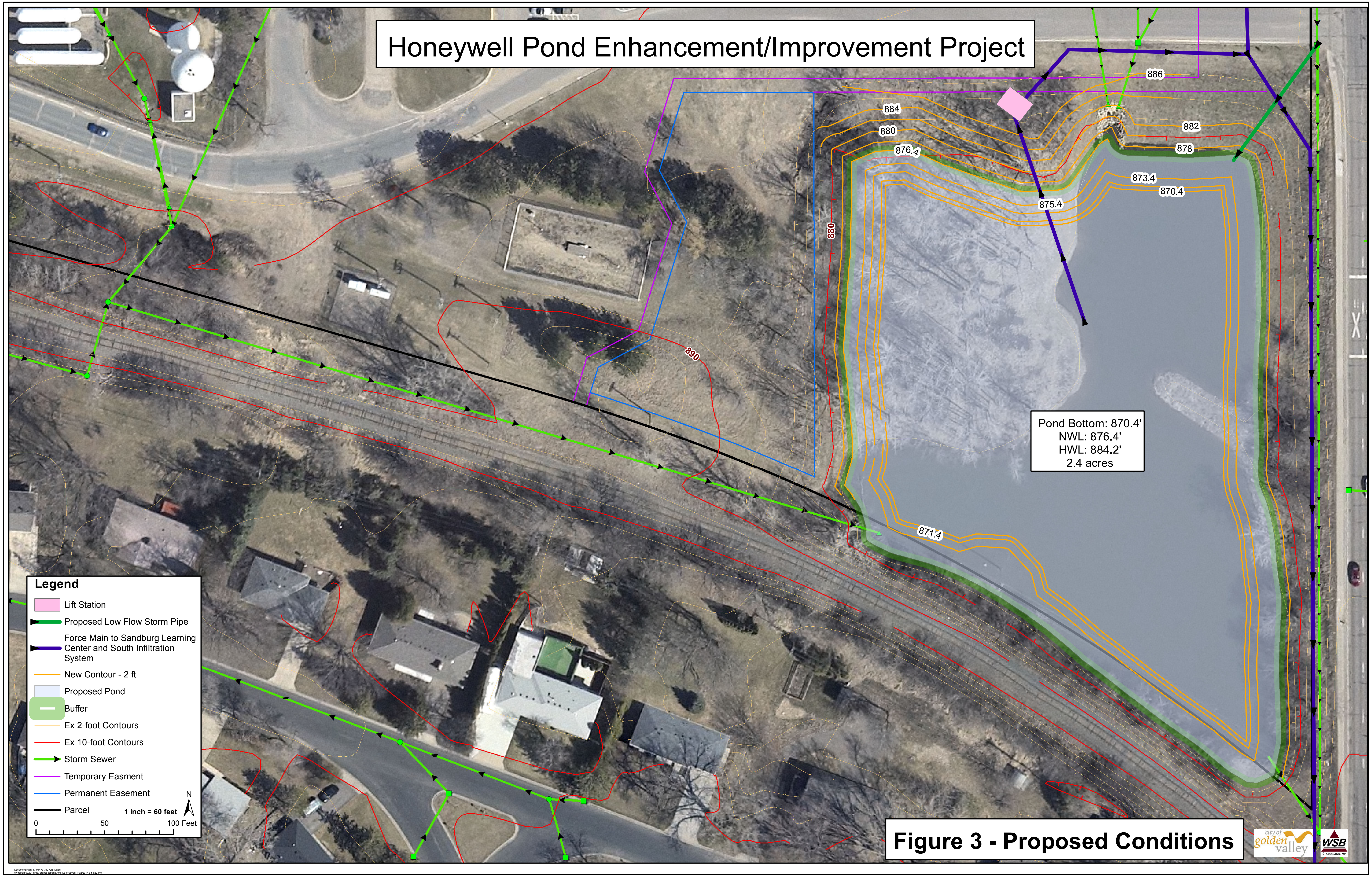


Figure 3 - Proposed Conditions

Honeywell Pond Enhancement/Improvement Project

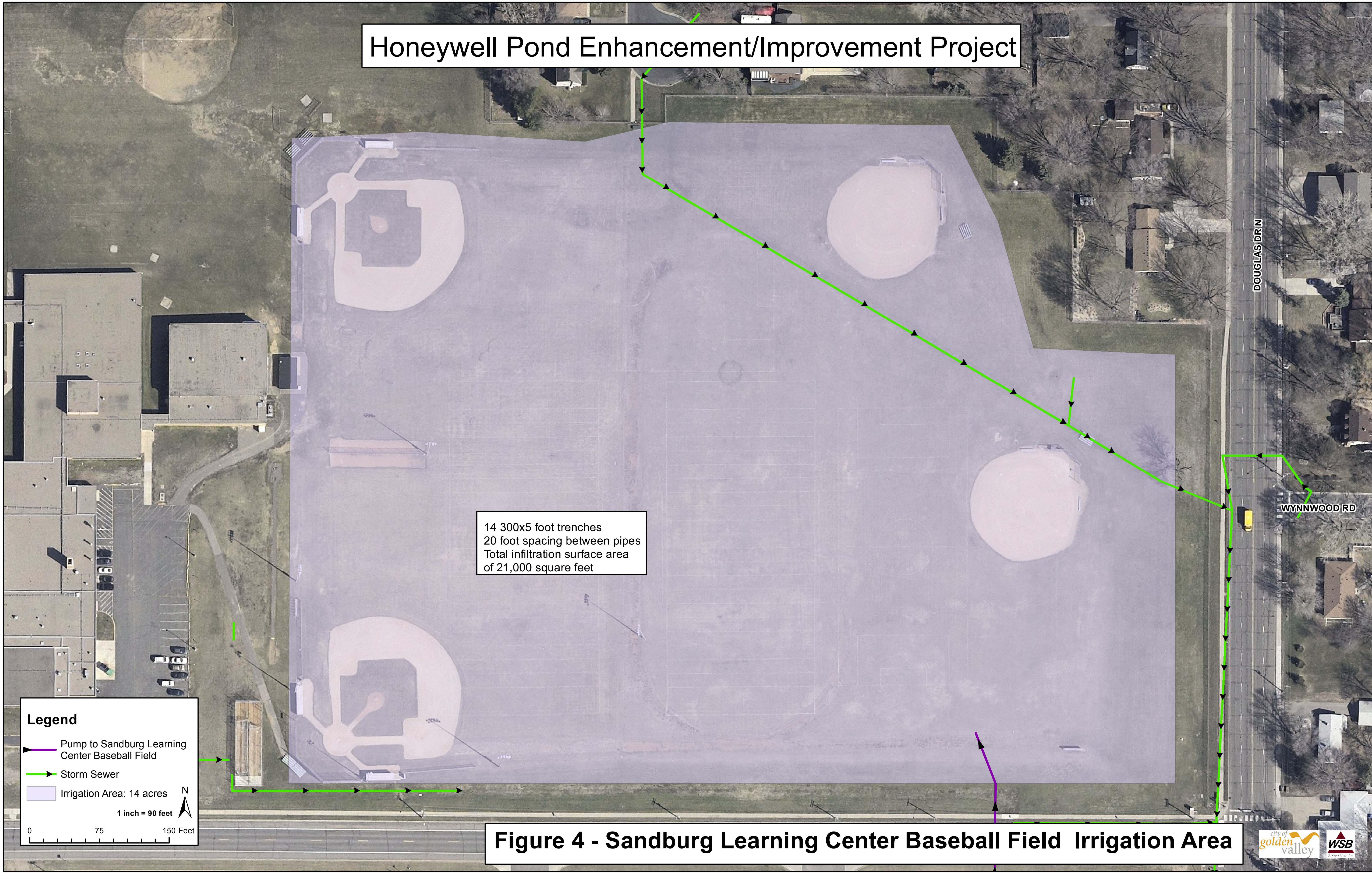


Figure 4 - Sandburg Learning Center Baseball Field Irrigation Area

Honeywell Pond Enhancement/Improvement Project

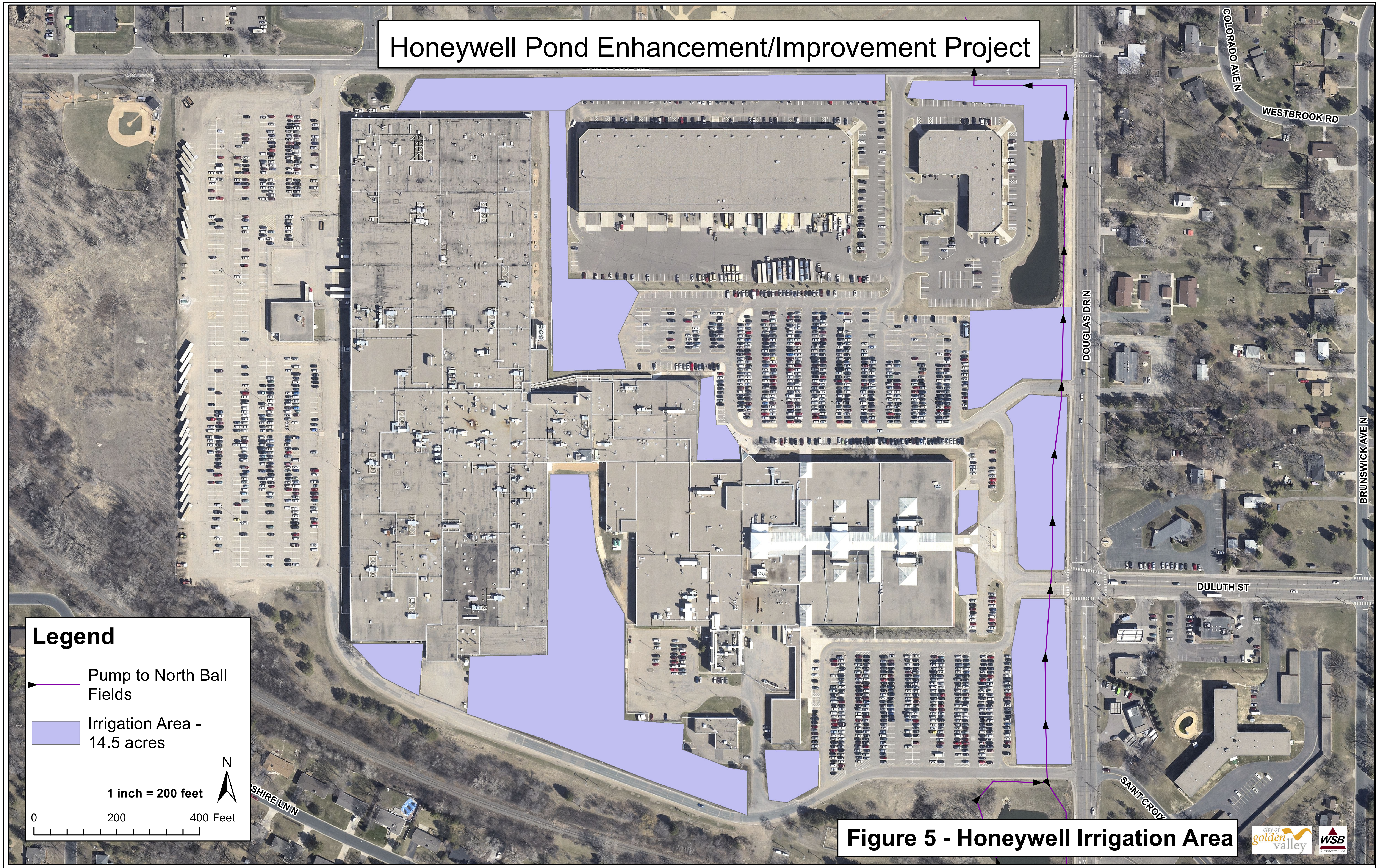


Figure 5 - Honeywell Irrigation Area

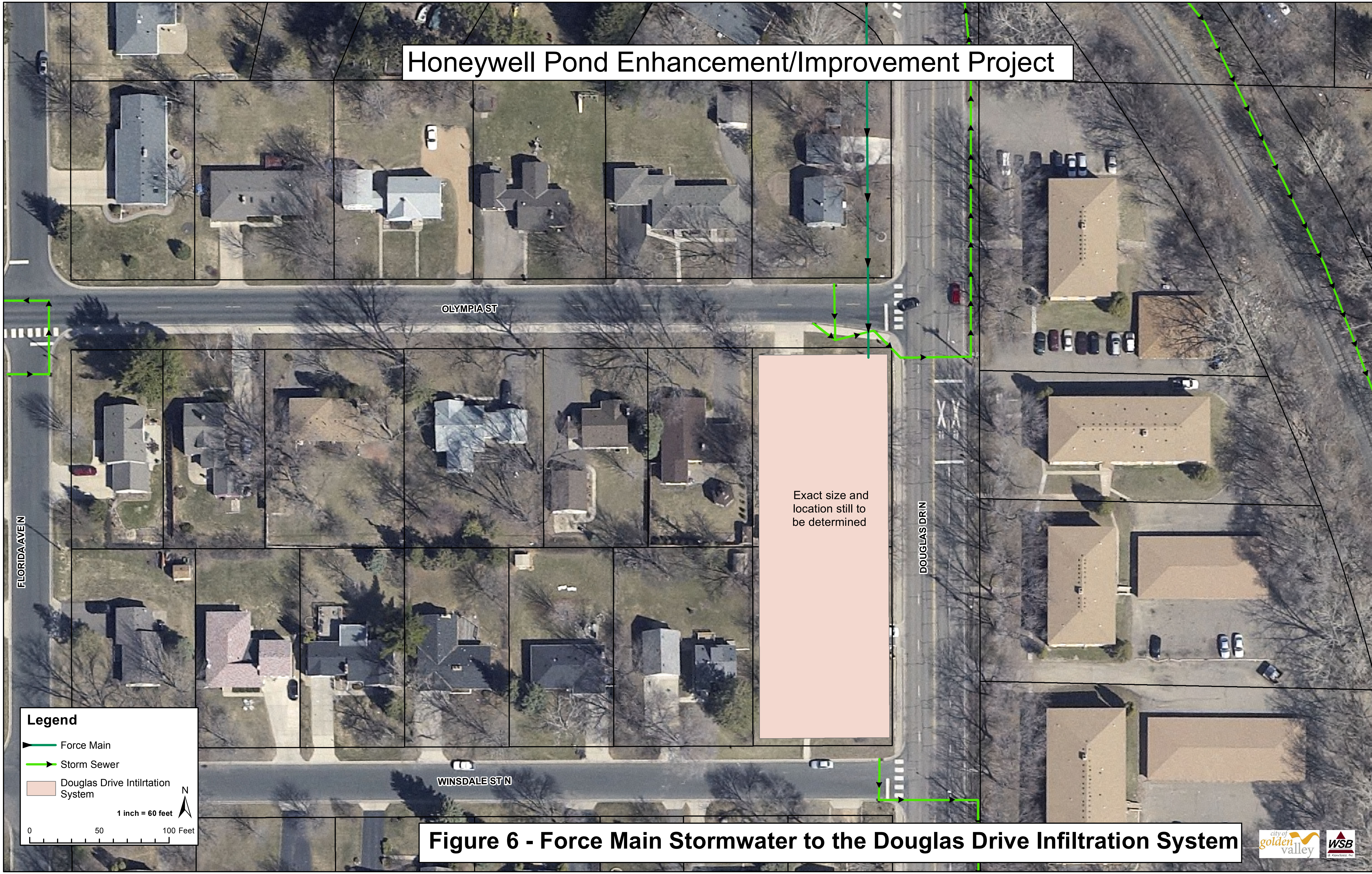
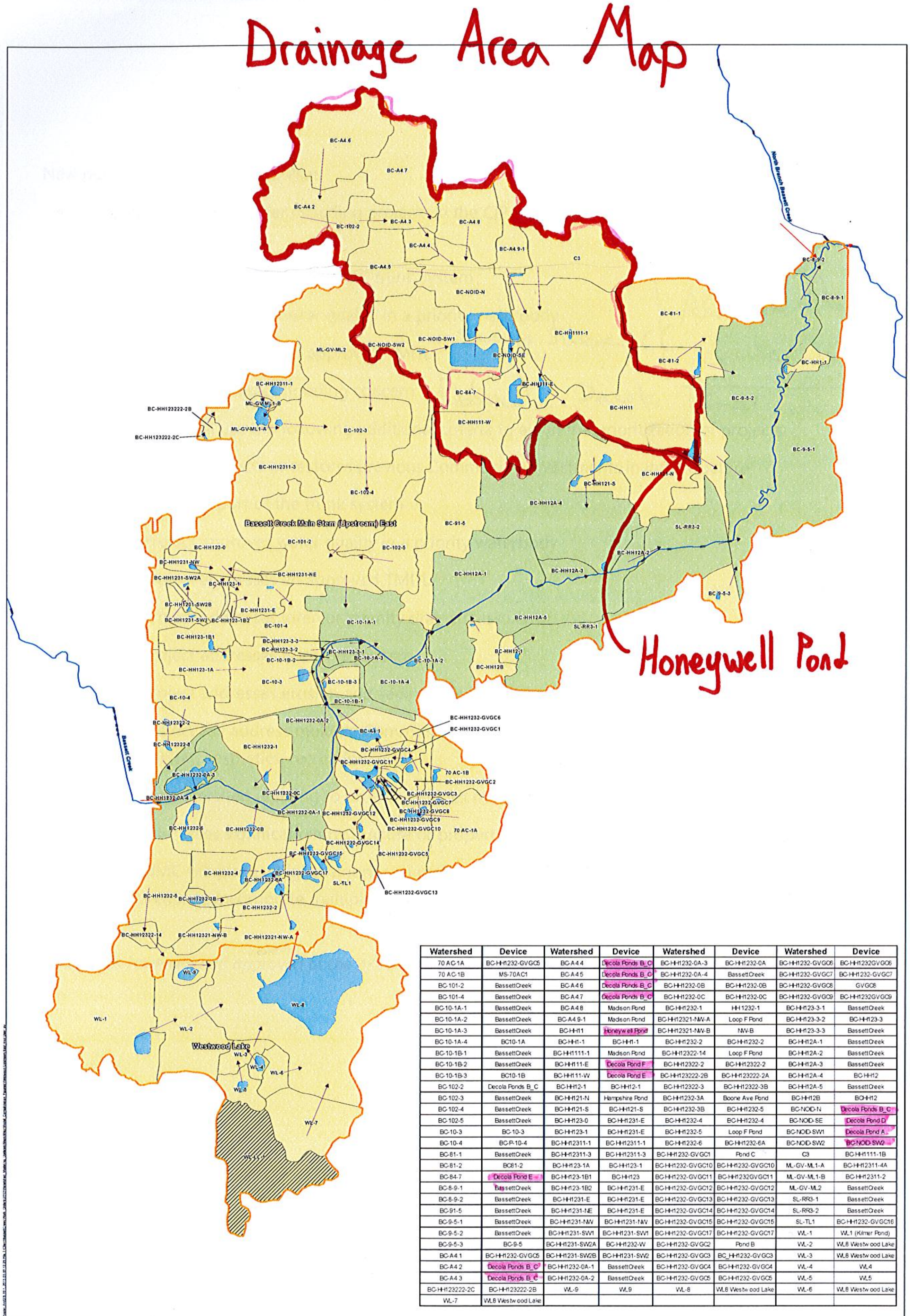


Figure 6 - Force Main Stormwater to the Douglas Drive Infiltration System

Appendix B
Drainage Area Map



Watershed	Device	Watershed	Device	Watershed	Device	Watershed	Device
70 AC-1A	BC-HH1232-GVGC5	BC-A4.4	Decola Ponds B_C	BC-HH1232-0A-3	BC-HH1232-0A	BC-HH1232-GVGC6	BC-HH1232GVGC6
70 AC-1B	MS-70AC1	BC-A4.5	Decola Ponds B_C	BC-HH1232-0A-4	BassettCreek	BC-HH1232-GVGC7	BC-HH1232-GVGC7
BC-101-2	BassettCreek	BC-A4.6	Decola Ponds B_C	BC-HH1232-0B	BC-HH1232-0B	BC-HH1232-GVGC8	GVGC8
BC-101-4	BassettCreek	BC-A4.7	Decola Ponds B_C	BC-HH1232-0C	BC-HH1232-0C	BC-HH1232-GVGC9	BC-HH1232GVGC9
BC-10-1A-1	BassettCreek	BC-A4.8	Madison Pond	BC-HH1232-1	HH 1232-1	BC-HH123-3-1	BassettCreek
BC-10-1A-2	BassettCreek	BC-A4.9-1	Madison Pond	BC-HH12321-NW-A	Loop F Pond	BC-HH123-3-2	BC-HH123-3
BC-10-1A-3	BassettCreek	BC-HH11	Honeywell Pond	BC-HH12321-NW-B	NW-B	BC-HH123-3-3	BassettCreek
BC-10-1A-4	BC10-1A	BC-HH1-1	BC-HH1-1	BC-HH1232-2	BC-HH1232-2	BC-HH12A-1	BassettCreek
BC-10-1B-1	BassettCreek	BC-HH1111-1	Madison Pond	BC-HH12322-14	Loop F Pond	BC-HH12A-2	BassettCreek
BC-10-1B-2	BassettCreek	BC-HH111-E	Decola Pond F	BC-HH12322-2	BC-HH12322-2	BC-HH12A-3	BassettCreek
BC-10-1B-3	BC10-1B	BC-HH111-W	Decola Pond E	BC-HH123222-2B	BC-HH123222-2A	BC-HH12A-4	BC-HH12
BC-102-2	Decola Ponds B_C	BC-HH12-1	BC-HH12-1	BC-HH12322-3	BC-HH12322-3B	BC-HH12A-5	BassettCreek
BC-102-3	BassettCreek	BC-HH121-N	Hampshire Pond	BC-HH1232-3A	Boone Ave Pond	BC-HH12B	BC-HH12
BC-102-4	BassettCreek	BC-HH121-S	BC-HH121-S	BC-HH1232-3B	BC-HH1232-5	BC-NOID-N	Decola Ponds B_C
BC-102-5	BassettCreek	BC-HH123-0	BC-HH1231-E	BC-HH1232-4	BC-HH1232-4	BC-NOID-SE	Decola Pond D
BC-10-3	BC-10-3	BC-HH123-1	BC-HH1231-E	BC-HH1232-5	Loop F Pond	BC-NOID-SW1	Decola Pond A
BC-10-4	BC-P-10-4	BC-HH12311-1	BC-HH12311-1	BC-HH1232-6	BC-HH1232-6A	BC-NOID-SW2	BC-NOID-SW2
BC-81-1	BassettCreek	BC-HH12311-3	BC-HH12311-3	BC-HH1232-GVGC1	Pond C	C3	BC-HH1111-1B
BC-81-2	BC81-2	BC-HH123-1A	BC-HH123-1	BC-HH1232-GVGC10	BC-HH1232-GVGC10	ML-GV-ML1-A	BC-HH12311-4A
BC-84-7	Decola Pond E	BC-HH123-1B1	BC-HH123	BC-HH1232-GVGC11	BC-HH1232GVGC11	ML-GV-ML1-B	BC-HH12311-2
BC-8-9-1	BassettCreek	BC-HH123-1B2	BC-HH1231-E	BC-HH1232-GVGC12	BC-HH1232-GVGC12	ML-GV-ML2	BassettCreek
BC-8-9-2	BassettCreek	BC-HH1231-E	BC-HH1231-E	BC-HH1232-GVGC13	BC-HH1232-GVGC13	SL-RR3-1	BassettCreek
BC-91-5	BassettCreek	BC-HH1231-NE	BC-HH1231-E	BC-HH1232-GVGC14	BC-HH1232-GVGC14	SL-RR3-2	BassettCreek
BC-9-5-1	BassettCreek	BC-HH1231-NW	BC-HH1231-NW	BC-HH1232-GVGC15	BC-HH1232-GVGC15	SL-TL1	BC-HH1232-GVGC16
BC-9-5-2	BassettCreek	BC-HH1231-SW1	BC-HH1231-SW1	BC-HH1232-GVGC17	BC-HH1232-GVGC17	WL-1	WL1 (Kilmer Pond)
BC-9-5-3	BC-9-5	BC-HH1231-SW2A	BC-HH1232-W	BC-HH1232-GVGC2	Pond B	WL-2	WL8 Westwood Lake
BC-A4.1	BC-HH1232-GVGC5	BC-HH1231-SW2B	BC-HH1231-SW2	BC-HH1232-GVGC3	BC_HH1232-GVGC3	WL-3	WL8 Westwood Lake
BC-A4.2	Decola Ponds B_C	BC-HH1232-0A-1	BassettCreek	BC-HH1232-GVGC4	BC-HH1232-GVGC4	WL-4	WL4
BC-A4.3	Decola Ponds B_C	BC-HH1232-0A-2	BassettCreek	BC-HH1232-GVGC5	BC-HH1232-GVGC5	WL-5	WL5
BC-HH123222-2C	BC-HH123222-2B	WL-9	WL9	WL-8	WL8 Westwood Lake	WL-6	WL8 Westwood Lake
WL-7	WL8 Westwood Lake						

- Watershed
- Landlocked Watershed
- Watershed Intersected by Stream
- Ponds

N

Feet

0 750 1,500 2,250 3,000

WESTWOOD-UPSTREAM EAST
Water Modeling Updates
Bassett Creek Watershed Management Commission