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2015 Public Stormwater Detention Basin Study

Final Report

January 25, 2016

Prepared By

CITY OF ANKENY
2015 PUBLIC STORMWATER DETENTION BASIN STUDY

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ACKNOWLEDGEMENTS

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EXECUTIVE SUMMARY

As with most municipalities, the City of Ankeny, Iowa is responsible for operating and managing stormwater detention basins to protect lakes, rivers, and streams under the Clean Water Act. These basins manage runoff and control flooding, regulate the flow of water through the stormwater system, and may improve water quality. Ankeny's stormwater detention basins also serve recreational, ecological, and aesthetic needs. Understanding the type, function, condition, and goals for each basin is needed to effectively manage these important City resources.

This 2015 Public Stormwater Detention Basin Study entailed inventory and assessment of 38 City stormwater detention basins. This involved preliminary assessment of their watersheds, the development of a condition rating and basin classification system, the development of goals for each basin type, and development of specific recommendations to address issues and enhance the multiple functions of the basins. Opinions of probable cost were provided for the most needed capital improvements. The consulting team also examined the efficacy of fountains and diffusers in the stormwater basins.

With a few exceptions, the City of Ankeny's stormwater detention basins are functioning as designed. The consulting team recommends improvement projects at several specific basins. The Tradition Basins warrant a more detailed analysis to identify the changes necessary to address water flows from the large watershed which exceeds the capacity of these basins. Minor safety issues were identified at a few basins, and the function of several basins would be improved by replacing outlet structures. The only location needing dredging is the forebay of Vintage Park Basin. Signature Basin's eroding south shoreline also should be stabilized. In general, there appears to be a significant need to widen the buffers around most basins, which can improve water quality, and to convert high-maintenance turf in parks with basins to low-maintenance native landscapes.

The stormwater detention basin classification system developed for this project will allow the City to more efficiently operate and manage its stormwater detention basins. By implementing this report's recommendations, the City will address engineering, ecological, and minor safety issues and enhance the multiple benefits offered by Ankeny's valuable stormwater detention basins.

1 INTRODUCTION

1.1 Study Setting

The City of Ankeny in Polk County, Iowa, lies along Interstate 35 and U.S. Highway 69, about 10 miles north of downtown Des Moines, in the approximate center of the state. The City encompasses 29.14 square miles, and has a population of over 54,000 residents. Ankeny is a growing, predominantly suburban community.

Ankeny is located at the southern edge of the Des Moines Lobe, formed in the last glacial episode 12,000 years ago. The glacier created a "prairie pothole" landscape, gently rolling with depressions formed in glacial end moraines. Before European settlement, tallgrass prairie covered the uplands, and the depressions held wet prairies, marshes, and sloughs. Nearly all the wetlands were drained for agriculture and development. The City's soils are predominantly the Canisteo-Clarion-Nicollet association, with the Hayden-Storden-Lester association in the west part of the City (USDA/NRCS 2000).

1.2 Purpose & Need

At the beginning of this study, the City of Ankeny owned and managed 38 stormwater detention basins. These stormwater basins manage the runoff of rain and snowmelt through the City. They are designed to control flooding, regulate the flow of water through the stormwater system, and may improve water quality. The most important reason stormwater basins exist is to help the City meet its legal obligation to manage stormwater quantity and water quality as mandated by the Clean Water Act. Stormwater detention basins allow the City to release its stormwater runoff into "waters of the United States", such as the Des Moines River, Fourmile Creek, and Saylor Creek.

Over the years, the City and its residents have viewed the stormwater basins as recreational, ecological, and aesthetic amenities, and a perception has developed that basins are considered "features" in local neighborhoods. For basins in City parks, it is normal to think of them as a feature of the park even though their main purpose is to regulate and clean stormwater runoff. In other locations, recreational use and aesthetic benefits result from having a stormwater basin, but the City is not obligated to provide recreation or focus on aesthetics. Stormwater basins also have ecological benefits, such as providing habitat for fish, birds, butterflies, other insects and pollinators, and a variety of plant species.

The City's stormwater basins also present challenges. Some basins may not function at the engineering standards to which they were designed. Others may have poor water quality. Still others may need maintenance or improvement of outlets and other structures, and a few present minor safety concerns. If the stormwater basins are intended to be a part of a healthy ecosystem, they may not serve that purpose under existing maintenance practices.

Simply put, the purpose of this study is to understand and summarize the conditions of Ankeny's stormwater basins and to recommend capital improvements and/or changes in their management so that they will better serve the needs of the City and its residents.

1.3 Study Goals

This project is primarily an urban stormwater management endeavor. Nevertheless, given the maturity and recreational significance of Ankeny's stormwater basins, many of them now seem like natural resources in the public eye. Some are much more than detention basins; they are unique assets that differentiate Ankeny from other communities in central Iowa.

Working with City staff, the consulting team developed the following goals for the stormwater basin study.

1. Compile and review existing information on the stormwater basins.
2. Complete a desktop and field inventory and assessment of the stormwater basins for engineering, ecological, safety, and aesthetic conditions.
3. Develop an assessment and inspection form with a condition rating system, and apply the system to each basin in order to rank basins according to their level of service in engineering, ecological, and other functions.
4. Conduct an informal poll of anglers about fish species they observed in the 2014 and 2015 seasons.
5. Develop a basin classification system based on the characteristics of the City's stormwater basins.
6. Analyze data from the inventory and assessment and develop recommendations to improve, rehabilitate, maintain, and manage the engineering, ecological, and aesthetic condition of basins and adjacent lands in order to upgrade the conditions of deficient basins to a satisfactory level.
7. Identify priority capital improvement projects and provide planning-level opinions of probable cost for use in planning, budgeting, and implementation of priority projects.
8. Prepare draft and final reports and make a presentation to the City Council.

1.4 Methods

The consulting team, with assistance from City staff, completed several tasks to understand and summarize the conditions of the 38 stormwater basins and to develop recommendations. The tasks included information review, field assessment of engineering conditions, field assessment of ecological conditions, development of a condition rating form, development of a stormwater basin classification system, and evaluation of each basin's condition with recommendations for improvement or maintenance, if applicable.

1.4.1 Existing Information Review

Several studies and data were provided by the City. AES refined the watershed boundaries and impervious surface data provided by the City. The information included:

- Plan drawings, drainage study reports, and other design documents for each stormwater basin, where available
- Geographic Information System (GIS) data, including
    - City boundary
    - Landowner parcel boundaries
    - Stormwater basin outlines
    - Storm sewer infrastructure (inlets, outlets, etc.)
    - Impervious surfaces (roads, drives, sidewalks, rooftops, etc.), modified by AES
    - Watershed boundaries, modified by HR Green and AES
    - LiDAR topographic data
    - Aerial photography

The information used included (continued from previous page):

- City records of fountains, diffusers, and chemical treatments
- City fish stocking records

Watershed boundaries were modified to better define water flow paths between stormwater basins. The impervious surface shapefile was modified to account for new major developments in the stormwater basin watersheds.

The Basin Characterization and Inspection Forms were partially filled out before entering the field. Field maps and photography also were used to document and summarize existing conditions during field assessments. Much of the desktop data also was recorded on the inspection forms to provide a single source for important information related to a basin's design criteria, condition, classification, and watershed condition.

1.4.2 Engineering Assessment

In June and July 2015, HR Green Professional Engineer, Chad Mason, walked the perimeter of all 38 basins and inspected all inlet and outlet structures to determine any problems with their physical condition and to assess whether the structures were functioning properly. Simultaneously, an HR Green staff technician in a kayak took readings on the depth and water clarity of all basins. Depth was measured with a kayak-mounted sonar transducer. To ensure accuracy, depth readings were periodically verified with a measuring tape. At least four depth readings were taken per acre of basin area, and depth readings were evenly spaced throughout the basin. Average depth was calculated as the simple mean of depth readings. Each basin's maximum depth was obtained by using the kayak and recording the maximum depth observed on the sonar. Water clarity was measured as visibility (in feet) using a standard Secchi disk that was lowered into the water until it could no longer be seen, then raised slowly until it was visible. The average of the two readings was taken as the depth of visibility for the basin.

1.4.3 Ecological Assessment

On July 14 and 15, 2015, Applied Ecological Services (AES) Senior Ecologist, Douglas Mensing, conducted a field assessment of the 38 study basins. AES characterized vegetation around each basin by visually estimating how much ground each major vegetation type covered. The assessment area around basins was from the shoreline to 30 feet upslope, an area that was roughly ring-shaped. The fractions of ground covered by forest/woodland, shrubland, natural grassland, and maintained turf equaled 100 percent. Plant diversity was assessed by totaling the number of plant species observed. The cover of cattail—an invasive, non-native variety—was also visually estimated in the ring around each pond. The average width of the natural buffer that was not turf and mowed was estimated by viewing the width of this vegetation at the basin shoreline. Undesirable vegetation of noxious weeds, invasive plants, and non-native species was also visually estimated in the natural buffer zone in terms of percent cover over the ground. In the aquatic or open water zone, the percent cover of floating and suspended algae and submerged plants were each visually estimated for the entire basin. Bank stability was estimated by viewing the entire perimeter of each basin and recording the percent of the shoreline that appeared to be unstable or actively eroding. Wildlife diversity was assessed by

observing and counting the species groups observed (e.g., birds, butterflies, dragonflies) and estimating the numbers of individual organisms.

The fishing resource at each basin was assessed by reviewing recent City stocking records, conducting an informal angler survey, and making field observations. HR Green sought input from members of the Ankeny-based Central Iowa Fly Fishers (CIFF) to assess the current state of fishing in the basins. CIFF is a local chapter of the nationwide Federation of Fly Fishers, and its members include many avid and astute users of the public stormwater basins in Ankeny. Detailed responses were received from several members, providing information for nearly 20 basins in Ankeny. CIFF members were queried about the fish species caught, their observations on algae growth and water quality, and the overall quality of the fisheries. Their responses were crucial in helping the consulting team complete the "Fish Reported" and "Fishing Resource" portions of the basin characterization and evaluation forms.

1.4.4 Data Compilation & Analysis

Desktop and field data for each basin were entered into a Microsoft Excel-based Basin Characterization and Inspection Form, with one tab for each basin (Appendix A). These data were used to evaluate the conditions at each basin and to develop the basin classification system. A basin classification identifies similar basins in order to compare the condition of basins to the goals for a type of basin and make decisions about actions that should be taken to improve or maintain a basin. This electronic form was designed so the City can use it in future inspections.

To develop the basin classification, a matrix was created with each basin on the vertical (y) axis and several key characteristics or criteria across the horizontal (x) axis (Appendix B). Characteristics in the matrix were:

Basin Identifiers *– These uniquely identify each basin.*

- Sort Order – This attribute was assigned last, after data review and basin classification were complete.
- Basin Classification – The final City classification type of each basin.
- Basin ID – City alphanumeric identification code for each basin.
- Basin Name – City name for each basin.

Classification Factors *–These are the main basin characteristics used for basin classification.*

- Intentional Public Access – Yes/No value assigned based on basin setting, intended use, and discussion with City staff. City parkland and public trails indicate intentional public access is being provided. Discussion with City staff resulted in the inclusion or exclusion of some basins from intentional public access.
- Basin Size (acres) – Calculated from City-provided basin shapefile.
- Maximum Depth (feet) – Measured by HR Green in field.

Other Characteristics *– These other basin characteristics further describe each basin.*

- Watershed Area (acres) – The size of the contributing watershed draining to each basin.
- Watershed Impervious (percent cover) – A GIS-estimated percentage of hardened cover (roof, road, etc.) within each basin watershed.
- Watershed to Basin Ratio – The ratio of watershed size to basin size.
- Natural Buffer Width (feet) – An estimated average of the existing natural buffer around a basin.

Condition Criteria *– Three key condition criteria related to basin types that can be used to make recommendations for improving basins.*

- Algae Cover (percent of water surface) – The percentage of the basin water surface covered with floating and suspended algae.
- Secchi Transparency (feet) – The depth at which a black and white-marked disc can be seen in the water column. This indicates the water clarity in the basin.
- Fishery – The categorical quality of the basin as a fishing resource (good, fair or poor) based on the informal angler survey and other information.

To develop the classification system, data in the matrix were sorted in a variety of ways and examined to determine if some basins had similar ranges of conditions. This process revealed that the size of basins appeared to be a way to group basins into types, and that those types seemed to have other characteristics that were similar within a type and different between types. The presence of nearby trails, docks, or similar features suggests the intention of public access; this was another characteristic that differentiated basin types. By examining these types of basin characteristics, the consulting team, in collaboration with City staff, arrived at a reasonable separation of basins into types. Basin size, maximum depth, and intentional public access were the main features distinguishing basin types. The characteristics of the different basin types are described below.

Dividing lines between good, fair and poor condition for different characteristics (called thresholds), such as water clarity and algae growth, were developed by examining the range of conditions in the basins, comparing the conditions to information in published and unpublished scientific studies, and employing the professional judgment of the consulting team and City staff. Thresholds also reflected the reality of the condition of open water in central Iowa. The resulting thresholds for conditions will enable City staff to determine what should be improved or maintained at each basin, according to the goals for each basin type. For example, all large basins are intended to have a fair to good fishery. If a large basin does not have a good fishery, as determined by field observations, then a goal for that basin should be to improve its fishery. This guidance is presented for each basin in Appendix C.

2 EXISTING CONDITIONS ASSESSMENT RESULTS

2.1 General Overview of Ankeny's Stormwater Detention Basins

This section is a brief summary of the consulting team's overall opinion of Ankeny's 38 stormwater basins. With a few exceptions, the City of Ankeny's stormwater basins are functioning as designed, with very little loss of capacity since their initial construction. The current basin depths are nearly equal to the original depths in all but a few instances. This suggests that little sediment has accumulated in the basins, or the basin was excavated deeper than design depths during construction, and dredging is not needed. The infrastructure of basins is generally in good to excellent condition, with few deficiencies in safety or functionality. Exceptions are discussed in Section 3.6 of this report.

Even though the stormwater basins serve their intended stormwater detention function, they generally provide only moderate to low levels of service in the areas of water quality treatment, ecological health, and aesthetics. Many of the stormwater basins have poor water clarity and experience unsightly algae blooms. The common practice of mowing to the water's edge attracts a large goose population, which has a negative effect on water quality. Shoreline mowing also provides little, if any, filtering of water to protect water quality, and supports little habitat for native plants and wildlife, including pollinators and birds. A detailed description of findings from the basin inventory and assessment follows.

2.2 Basin Inventory & Assessment

The combined desktop analysis and field observations of AES and HR Green are summarized in the completed Basin Characterization and Inspection Forms (Appendix A). Condition ratings were assigned for each basin at the end of each form. Condition ratings for each basin are summarized in Appendix D.

The 38 stormwater basins represent a variety of designs, sizes, depths, geometries, and settings. Appendix C presents a data sheet for each basin that summarizes each basin's characteristics and goals. The outlet structures at Vintage Park Basin and Promenade Park Basin warrant individual discussion as follows.

Vintage Park Basin and Promenade Park Basin Outlet Structures

During HR Green's initial field review, cracked concrete was observed in the outlet structure of Vintage Park Basin. A structural engineer from HR Green conducted a follow-up inspection of the structure and a review of recorded engineering drawings to evaluate these cracks. It was determined that these cracks do not pose a serious threat to the integrity of the structure or to public safety.

The consulting team recommends the City consider fencing the outlet structures at both the Vintage Park and Promenade Park Basins to prohibit unauthorized entry to the weir edges of the structures. Currently, the structures are easily accessible from the adjacent grounds. A fall into these structures would likely result in serious injury or fatality, especially in periods when significant water flow is passing over the weir (see photo).

2.3 Watershed Characteristics

The function and condition of stormwater basins can be better understood by identifying whether the basin is located in the upper, middle, or lower part of its watershed; how much cropland and impervious surface exists in the watershed; and establishing the basin's relationship to other basins and surface waters. These characteristics are presented in the Basin Characterization and Inspection Forms (Appendix A) and discussed below.

The City stormwater basins lie within five watersheds of Hydrologic Unit Code (HUC)-12, the smallest HUC unit (Figure 1). The characteristics of these watersheds and the stormwater basins of each are discussed below. Basins are listed within their watershed from those in the upper to those in the lower watersheds.

2.3.1 Upper Fourmile Creek Watershed

Six of Ankeny's stormwater basins lie within the Upper Fourmile Creek watershed in the northern portion of the City (Figure 2). Ordered generally from upstream to downstream, these basins are:

- Otter Creek Basin (NE-01)
- Renaissance Basin (NE-02)
- Reinhart West Basin (NW-03)
- Reinhart East Basin (NW-02)
- Georgetown South Basin (NW-05)
- Georgetown North Basin (NW-04)

These basins are located in the lower portion of this watershed. The Upper Fourmile Creek watershed is characterized by gently rolling land dominated by row crop agriculture.

2.3.2 Middle Fourmile Creek Watershed

Six of Ankeny's stormwater basins lie within the Middle Fourmile Creek watershed in the eastern portion of the City (Figure 3). Ordered generally from upstream to downstream, these basins are:

- Hawkeye Park Basin (NW-11)
- Deer Creek Basin (NE-03)
- Hillside Park East Basin (SE-01)
- Hillside Park West Basin (SE-02)
- Springwood South Basin (SE-04)
- Springwood North Basin (SE-03)

These basins are located in the upper and middle portions of this watershed. The Middle Fourmile Creek watershed is characterized by rolling land, with suburban development dominant in the west (centered around downtown Ankeny), and row crop agriculture dominant in the east.

2.3.3 Rock Creek – Des Moines River Watershed

Nine of Ankeny's stormwater basins lie within the Rock Creek-Des Moines River watershed in the northwestern portion of the City (Figure 4). Ordered generally from upstream to downstream, these basins are:

- Rock Creek Elementary Basin (NW-01)
- Signature Basin (NW-16)
- Prairie Ridge Complex North Basin (NW-08)
- Prairie Lakes North Basin (NW-06)
- Prairie Lakes South Basin (NW-07)
- Prairie Ridge Complex South Basin (NW-09)
- Horizon Park Basin (NW-10)
- Camden Woods West Basin (SW-13)
- Camden Woods East Basin (SW-12)

These basins are located in the central portion of this watershed. The Rock Creek-Des Moines River watershed is characterized by gently rolling land in the northern half (dominated by row crop agriculture); the central portion of the watershed transitions to more suburban development (where the Ankeny stormwater basins exist). The watershed then drops in elevation through wooded and natural land covers to the floodplain of the Des Moines River, which contains both developed and agricultural lands.

2.3.4 Murphy Branch – Des Moines River Watershed

Four of Ankeny's stormwater basins lie within the Murphy Branch-Des Moines River watershed in the western portion of the City (Figure 5). Ordered generally from upstream to downstream, these basins are:

- Watercrest Park Wetlands (NW-15)
- Cherry Glen East Basin (NW-12)
- Cherry Glen South Basin (NW-14)
- Cherry Glen North Basin (NW-13)

These basins are located in the headwaters of this watershed. Where the Ankeny stormwater basins are, the Murphy Branch-Des Moines River watershed is characterized by a relatively small area of gently rolling land with suburban development, which drops in elevation through more wooded and natural land cover to Saylorville Lake.

2.3.5 Saylor Creek – Des Moines River Watershed

Thirteen of Ankeny's stormwater basins lie within the Saylor Creek-Des Moines River watershed in the southwestern portion of the City (Figure 6). Ordered generally from upstream to downstream, these basins are:

- Art Center Basin (SW-11)
- Vintage Park Basin (SW-10)
- Promenade Park Basin (SW-07)
- Cascade Falls Basin (SW-09)
- Chautauqua Park Wetlands (SW-08, consisting of 3 adjacent sub-basins)
- Hy-Vee South Basin (SW-06)
- Tradition North Basin (SW-03)
- Tradition South Basin (SW-04)
- Prairie Trail Wetland (SW-01a)
- Prairie Trail North Detention Basin (SW-01b)
- Prairie Trail South Detention Basin (SW-01c)
- Sawgrass Park Basin (SW-05)
- Wildflower Basin (SW-02)

These basins are located in the headwaters of this watershed. The Saylor Creek-Des Moines River watershed is characterized by gently rolling land in the northern portion and dominated by suburban development where the Ankeny stormwater basins exist. The watershed then drops in elevation through wooded and natural land cover to the floodplain of the Des Moines River, which supports both developed and agricultural lands.

3 DISCUSSION & RECOMMENDATIONS

3.1 Basin Classification Descriptions, Goals, and Management Approach

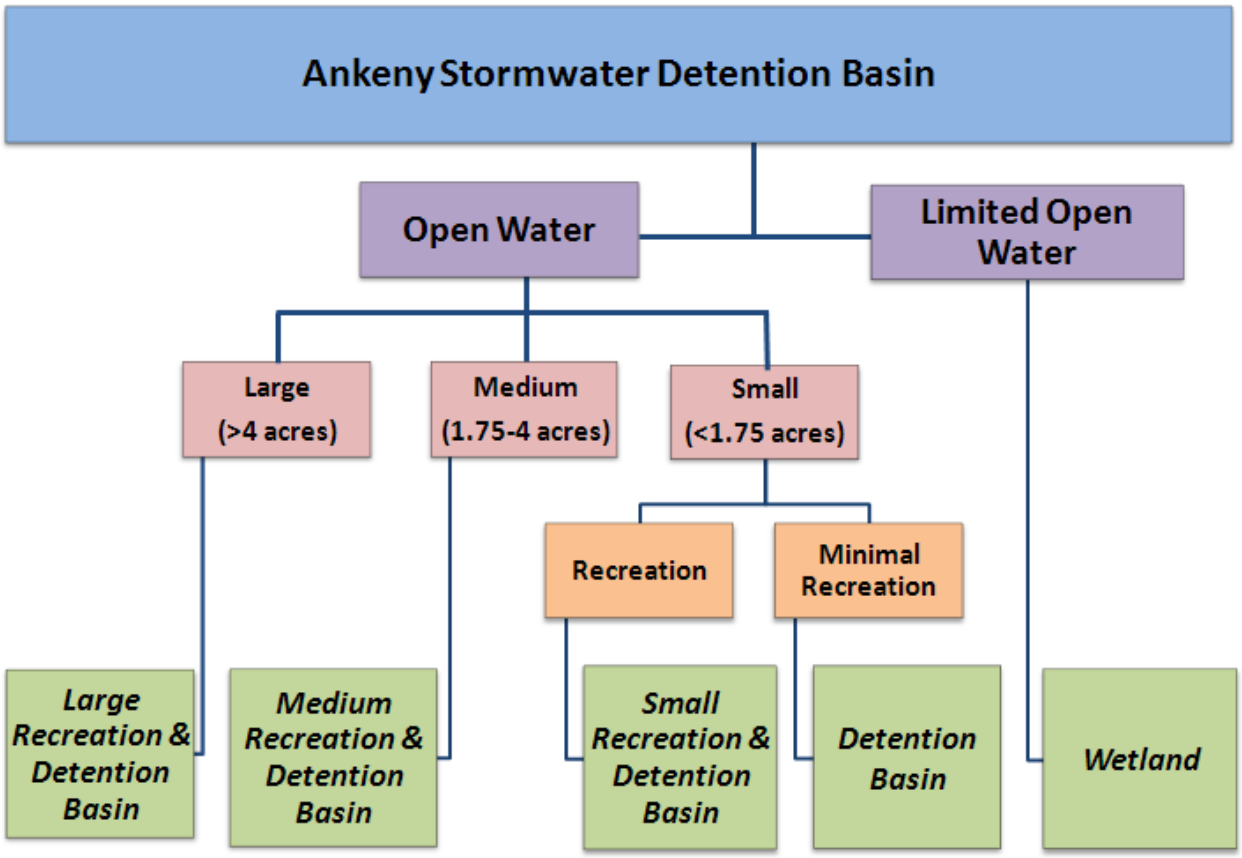
As described in Methods above (Section 1.4.4), a basin classification and criteria matrix was developed to classify and organize the 38 stormwater basins into different types (Appendix B). Basic physical characteristics of size and depth were important considerations in classifying basins. Three of the basins were conspicuously drier, shallower, and more vegetated than the others and were classified as wetlands. Of the open water basins, size appeared to correlate moderately well with maximum depth, with larger basins being deeper than smaller basins. Intentional recreational use and public access was an important factor as well. All of the larger basins and most of the remaining have some direct or nearby public access, such as a trail. Stormwater basins with the sole function of providing detention are classified as detention basins. They do not have water quality or algae growth standards, are not intended to support a fishery, do not have intentional public access, and are often on small parcels of land or are difficult to access due to the type of surrounding development. Detention basins are generally small and shallow and do not readily support a fishery. One exception is Camden Woods East, which is deeper than other detention basins but only 0.6 acres in size, which is a small basin for fish. Many other basin characteristics, including algae growth and water clarity, did not correlate well with other criteria and did not contribute to the classification of basin types.

The consulting team and City staff developed the following five (5) classification types:

- Large Recreation and Detention Basin
- Medium Recreation and Detention Basin
- Small Recreation and Detention Basin
- Detention Basin
- Wetland

The key separating characteristics of the five basin types can be visualized in the flowchart below. The flowchart can be used to assign each basin to a classification type. There is some overlap in depths among the basin types, but in general each type is distinct and basins match the characteristics of the type to which they are assigned (see Appendix C).

Ankeny Stormwater Detention Basin Classification Types



For each basin type, a general description, goals, and management approaches are described on the following pages.

3.1.1 Large Recreation & Detention Basin

Basins

- Promenade Park Basin
- Vintage Park Basin
- Prairie Ridge Complex North Basin
- Prairie Ridge Complex South Basin

Description

Size: Large (>4 acres)
Depth: Moderate (≥13 feet)
Access: Good intentional public access
Fishing: Generally fair

Goals

Engineering: Fully functional for detention of runoff, as designed.
Recreation: Good intentional public access with fair fishing potential; designed for heavy public use.
Aesthetics & Ecology: Very little algae growth (<5% water surface algae-covered); fair visibility (visible to ≥2 feet depth); shoreline treatment: at designated access locations 0-0.5 foot unmowed buffer (turf or natural); everywhere else outside active recreation areas, establish natural buffer or unmowed turf from water's edge to definable feature (e.g., trail, ballfield, picnic area, road, topographic break), or out to a minimum of 15 feet if no definable feature exists.

Management Approach

Mowing/Burning: Access locations <5 inch vegetation height all times; buffer burn every 2-4 years; or hay annually; or combination which maintains leaf litter depth of <2 inches.
Invasive Plant Control: Control all invasive plants listed as high priority from natural resources standpoint; control state-listed noxious weeds as necessary; control sandbar willow.
Natural Buffer: Option 1) Let existing vegetation grow, unless there are invasive plants or excessive weeds. Where natural buffer exists, allow native herbaceous vegetation to fully develop; Option 2) Where turf or disturbed ground exists, plant natural buffer of native vegetation.
Algae Treatment: Treat as needed to maintain good condition, <5% surface cover of algae over any three year period.
Post-Construction Design Features: Decide based on individual basins using known or new information about efficacy of existing and proposed design features (e.g., diffuser).
Fishery: Maintain bluegill and other fish which are able to reproduce naturally; maintain future largemouth bass population by posting that anglers must immediately release all bass ≥12 inches.

3.1.2 Medium Recreation & Detention Basin

Basins

- Cherry Glen East Basin
- Prairie Lakes North Basin
- Springwood South Basin
- Prairie Lakes South Basin
- Hawkeye Park Basin
- Cherry Glen South Basin
- Signature Basin
- Cherry Glen North Basin
- Art Center Basin
- Sawgrass Park Basin
- Georgetown North Basin

Description

Size: Medium (1.75-4 acres)
Depth: Moderate to deep (10-23 feet)
Access: Good intentional public access
Fishing: Generally good

Goals

Engineering: Fully functional for detention of runoff, as designed.
Recreation: Good intentional public access with good fishing potential; designed for moderate to heavy public use.
Aesthetics & Ecology: Little algae growth (<25% of water surface algae-covered); fair visibility (visible to ≥2 feet depth); shoreline treatment: at designated access locations, 0-0.5-foot unmowed buffer (turf or natural); elsewhere a minimum of 10-foot wide natural buffer, or from water's edge to logical topographic break, trail, or other notable feature.

Management Approach

Mowing/Burning: Access locations <5 inch vegetation height all times; buffer burn every 2-4 years; or hay annually; or combination which maintains leaf litter depth of <2 inches.
Invasive Plant Control: Control all invasive plants listed as high priority from natural resources standpoint; control state-listed noxious weeds as necessary; control sandbar willow.
Natural Buffer: Option 1) Let existing vegetation grow, unless there are invasive plants or excessive weeds. Where natural buffer exists, allow native herbaceous vegetation to fully develop; Option 2) Where turf or disturbed ground exists, plant natural buffer of native vegetation.
Algae Treatment: Treat as needed to maintain fair condition, 5-25% surface cover of algae over any three year period.
Post-Construction Design Features: Decide on basis of individual basins using known or new information about efficacy of existing and proposed design features (e.g., diffuser).
Fishery: Maintain bluegill and other fish which are able to reproduce naturally; maintain future largemouth bass population by posting that anglers must immediately release all bass ≥12 inches.

3.1.3 Small Recreation & Detention Basin

Basins

- Springwood North Basin
- Hillside Park West Basin
- Hillside Park East Basin
- Horizon Park Basin
- Georgetown South Basin
- Renaissance Basin
- Rock Creek Elementary Basin
- Otter Creek Basin

Description

Size: Small (<1.75 acres)
Depth: Moderate (9-16 feet)
Access: Good intentional public access
Fishing: Generally fair

Goals

Engineering: Fully functional for detention of runoff, as designed.
Recreation: Good intentional public access with fair fishing potential; designed for light to moderate public use.
Aesthetics & Ecology: Little algae growth (<25% of water surface algae-covered); fair visibility (visible to ≥2 feet depth); shoreline treatment: at designated access locations, 0-0.5-foot unmowed buffer (turf or natural); elsewhere a minimum of 10-foot wide natural buffer, or from water's edge to logical topographic break, trail, or other notable feature.

Management Approach

Mowing/Burning: Access locations <5 inch vegetation height all times; buffer burn every 2-4 years; or hay annually; or combination which maintains leaf litter depth of <2 inches.
Invasive Plant Control: Control all invasive plants listed as high priority from natural resources standpoint; control state-listed noxious weeds as necessary; control sandbar willow.
Natural Buffer: Option 1) Let existing vegetation grow, unless there are invasive plants or excessive weeds. Where natural buffer exists, allow native herbaceous vegetation to fully develop; Option 2) Where turf or disturbed ground exists, plant natural buffer of native vegetation.
Algae Treatment: Treat as needed to maintain fair condition, 5-25% surface cover of algae over any three year period.
Post-Construction Design Features: Decide on basis of individual basins using known or new information about efficacy of existing and proposed design features (e.g., diffuser).
Fishery: Maintain bluegill and other fish which are able to reproduce naturally; maintain future largemouth bass population by posting that anglers must immediately release all bass ≥12 inches.

3.1.4 Detention Basin

Basins

- Cascade Falls Basin
- Tradition North Basin
- Tradition South Basin
- Hy-Vee South Basin
- Wildflower Basin
- Deer Creek Basin
- Reinhart East Basin
- Reinhart West Basin
- Camden Woods East Basin
- Prairie Trail South Detention Basin
- Camden Woods West Basin
- Prairie Trail North Detention Basin

Description

Size: Small (<1.75 acres)
Depth: Shallow to moderate (6-13 feet; one exception at 18 feet)
Access: Minimal intentional public access
Fishing: Minimal fishing opportunity

Goals

Engineering: Fully functional for detention of runoff, as designed.
Recreation: Minimal intentional public access and minimal fishing potential; designed for minimal public use.
Aesthetics & Ecology: No algae treatment; no visibility goal; shoreline treatment: at least 5 feet of unmowed buffer (turf or natural), or from water's edge to logical topographic break, trail, property line (with mowed strip), mowed areas, or other notable feature.

Management Approach

Mowing/Burning: Buffer burn every 2-4 years; or hay annually; or combination which maintains leaf litter depth of <2 inches.
Invasive Plant Control: Control all invasive plants listed as high priority from natural resources standpoint; control state-listed noxious weeds as necessary; control sandbar willow.
Natural Buffer: Option 1) Let existing vegetation grow, unless there are invasive plants or excessive weeds. Where natural buffer exists, allow native herbaceous vegetation to fully develop; Option 2) Where turf or disturbed ground exists, plant natural buffer of native vegetation.
Algae Treatment: None.
Post-Construction Design Features: Decide on basis of individual basins using known or new information about efficacy of existing and proposed design features (e.g., diffuser).
Fishery: None.

3.1.5 Wetland

Basins

- Chautauqua Park Wetlands
- Watercrest Park Wetlands
- Prairie Trail Wetland

Description

Size: Varies
Depth: Minimal standing water(<1 foot); nearly entirely vegetated
Access: Minimal intentional public access
Fishing: No fishing opportunity

Goals

Engineering: Fully functional for detention of runoff, as designed.
Recreation: Minimal intentional public access and no fishing potential; designed for little public use.
Aesthetics & Ecology: No algae treatment; no visibility goal; shoreline treatment: at least 5 feet of unmowed buffer (turf or natural), or from wetland edge to logical topographic break, trail, or other notable feature.

Management Approach

Mowing/Burning: Burn entire wetland and buffer every 2-4 years to maintain leaf litter depth of <2 inches.
Invasive Plant Control: Control all invasive plants listed as high priority from natural resources standpoint; control state-listed noxious weeds as necessary; control sandbar willow.
Natural Buffer: Option 1) Let existing vegetation grow, unless there are invasive plants or excessive weeds. Where natural buffer exists, allow native herbaceous vegetation to fully develop; Option 2) Where turf or disturbed ground exists, plant natural buffer of native vegetation.
Algae Treatment: None.
Post-Construction Design Features: None.
Fishery: None.

3.2 Design for Multiple Benefits and Reduced Maintenance

The greatest return on investment will be gained if capital improvement projects are designed with equal attention to ecology, engineering, and landscape architecture. By considering all these perspectives, projects will achieve multiple positive outcomes including: a) improvements for users of the site, b) better runoff management, c) enhanced aesthetics, and d) better wildlife habitat. Installing or widening natural buffers and expanding native landscaping around stormwater basins are easy and affordable ways to increase these benefits and reduce the higher long-term costs of maintaining weed-free, mowed turf.

3.2.1 Natural Buffers

Properly designed and maintained natural buffers provide a broad range of ecological and landscape benefits for upland, wetland, and aquatic ecosystems. Natural buffers consist of perennial vegetation, preferably a diversity of wild-type native species. The wider the natural buffer, the greater the benefits provided. Ankeny's stormwater basins would benefit from natural buffers in the following ways.

1. *Reduced Maintenance*. Native, perennial buffers would not be mowed regularly, in contrast to turf grass shorelines. The wet prairie and wet meadow vegetation of these shorelines can be economically managed by occasional prescribed burns (approximately every 2-4 years). The water's edge and upslope turf areas provide effective "burn breaks" that greatly facilitate and speed up the burning of shoreline buffers. If desired, weed trimmers can be used to cut tall vegetation in limited areas. Shoreline plants provide important habitat, food, and shelter for birds and other animals, as well as overwintering habitat for native pollinators.

2. *Improved Water Quality.* Vegetated buffers are a common and cost-effective method for filtering and infiltrating runoff, thereby reducing runoff volume and improving water quality. Suspended sediments, along with adhered chemical pollutants such as phosphorus, can be captured by dense perennial vegetation and soil, preventing pollutants from entering a basin. Goose droppings, which are abundant at many of Ankeny's basins, contain a significant amount of phosphorus, which stimulates the growth of algae and aquatic vegetation within the basins. Dense, moderately-tall perennial vegetation discourages geese from using shorelines. The buffers also trap, filter, and absorb phosphorus from the breakdown of goose droppings.
3. *Improved Wildlife Habitat*. Despite Ankeny's suburban character and predominantly manicured landscapes, its stormwater basins offer rare but important habitat for a diverse assemblage of wildlife. Small mammals, birds, insects, turtles, frogs, and fish depend on the habitat created at the interface of vegetation and water.

3.2.2 Native Landscaping

In addition to natural buffers around stormwater basins, conversion of turf areas elsewhere to native landscapes would provide many of the same benefits as natural buffers, but the benefits go further.

Many municipalities and homeowners recognize the benefits that accompany native landscaping. Often, parks have large areas of turf not used regularly for recreation and rarely for other uses like picnicking. While lawns are visually attractive to many people, they require a large investment to maintain and provide little benefit to the environment. They do not perform in regulating and cleaning water as well as taller, perennial vegetation, and they certainly do not support pollinators, birds, and other wildlife. Their maintenance costs and limited ecological benefits suggest that other landscaping approaches should be considered. If done properly, it is relatively easy and affordable to convert turf to prairie, meadow, or another low-maintenance landscape. These conversions can be phased over time or done as demonstration projects. Public reception of early projects is needed to promote conversion of turf areas and identify planting designs that are more acceptable to the public.

From an economic perspective, by the third or fourth year after planting native vegetation, the cumulative year-to-year cost of installing and maintaining it should be less than the cumulative year-to-year cost of installing and maintaining turf. An argument against native vegetation is its unkempt look. Designers account for this by tailoring the native plantings to the local situation. In developments and parks, this often equates to creating planting plans that are simple, uniform in height and texture, and colorful throughout the seasons. At the same time, the strength and longevity of native plantings lies in diversity—one study demonstrated that at least sixteen species from different groups of plants are needed for native plantings to withstand drought and adapt to environmental change. A mowed strip between plantings and paths, roads, sidewalks, parking lots, or back yards goes a long way to indicate that the planting is intentional and helps reduce objections to the tall vegetation and what some think is an untidy look caused by a variety of plants growing together.

3.2.3 Expansion of Natural Buffers and Native Landscaping in Ankeny

Ankeny already has successful examples of ecological buffers and native landscaping in its parks and around its stormwater basins (e.g., Vintage Lake Basin). Expansion of these practices to other City parks and stormwater basins can be accomplished in a variety of ways. Restore existing or install new natural buffers around stormwater basins, especially areas where pavement or turf currently drain directly to these water bodies. Install filter strips around stormwater Best Management Practices (BMPs), such as rain gardens and infiltration basins, to prevent siltation and reduction of infiltration capacity. Use native, drought-tolerant vegetation at locations where turf is not needed. Reduce or eliminate mowing where taller vegetation is acceptable.

Figure 7 represents a hypothetical “conservation template” at Georgetown Park (basins NW-04 and NW-05). This illustrates how a park could be converted to a lower maintenance recreation area, with water quality benefits and walking and learning opportunities. The recommended “shortgrass prairie” or native planting would be a moderate diversity of shorter-statured species (generally <3 feet tall). Appendix E lists native trees, shrubs, and seed mixes for a variety of ecological restorations in Ankeny, including the shortgrass native planting at Georgetown Park. Optional wildflower plantings could be designed and installed along Northwest Georgetown Boulevard to create a colorful, native garden in a visible location.

Figure 8 illustrates how a detention basin (in this case, the Reinhart Basins, NW-02 and NW-03) could be converted to a more ecologically functional landscape. The design principles illustrated in these templates could be applied to any of Ankeny's stormwater basins or parks, modified according to local condition and goals.

3.2.4 Vegetation Management

Natural buffers and native landscaping will provide the greatest benefits if actively managed. The primary management activity in these areas will be control of invasive species. This control is accomplished by a combination of properly timed and executed mowing, herbicide treatment, and prescribed burning. Specialized training, oversight, and guidance often involves licensing or certification where required by local, state or federal law. Personnel involved in ecological restoration and management, especially prescribed burning, herbicide application, and ecological monitoring, should receive training commensurate with the activity in which they would be involved. Training is especially important for those activities that may have risk and safety implications to people and property.

Appendix F provides a list of undesirable plant species (including Iowa noxious weeds) present now or having the potential to colonize the stormwater basins and surroundings in the future. A relative prioritization is provided for removal and control of these invasive species, based on their individual threat to native ecosystems.

3.3 Stormwater Management Enhancement Opportunities

There are many opportunities to enhance management of stormwater in the vicinity of Ankeny's stormwater basins. Areas that generate concentrated and untreated (or minimally-treated) runoff can often be routed to a rain garden or infiltration system. These stormwater management elements can be designed to work in a variety of settings, even small or linear areas.

Figure 9 is a cross-section of a typical rain garden/infiltration basin. The important design considerations to maximize its effectiveness are:

1. Route concentrated/untreated stormwater to the facility.
2. Provide a filter strip of dense vegetation (e.g., turf or native buffer) to remove sediment prior to runoff reaching the facility.
3. Construct with gentle side slopes and a flat bottom to minimize opportunity for erosion and to maximize infiltration surface.
4. It may be beneficial to amend native soils and/or install an underdrain to increase infiltration rates and overall pollutant removal and runoff volume reduction.
5. Plant with appropriate native species (see Appendix E).
6. Provide an overflow pipe and/or stabilized emergency overflow berm to accommodate storm events larger than the capacity of the facility.
7. Utilize current design standards for stormwater BMPs detailed in the Iowa Stormwater Management Manual.

For example, many existing inlets around the Prairie Ridge Complex basins are turfed depressions, which could be retrofitted to function more like rain gardens and infiltration basins. This would improve water quality in these basins and waters downstream, while also elevating vegetative, habitat, and aesthetic diversity in this heavily-used park.

Other relatively low-cost stormwater management enhancement opportunities exist. For example, curb cuts can be installed at appropriate locations, such as parking lots in public spaces, to divert stormwater from storm drains to level turf areas or swales where water will infiltrate and erosion will not occur.

3.4 Water Quality Benefits of Fountains and Diffusers

Water quality is a priority for the City of Ankeny. Good water quality enhances the appearance of stormwater basins, improves recreational fishing opportunities, and provides healthy aquatic habitat for plants and wildlife. Protecting water quality in a developing community is always a challenge. While manufacturers of fountains and diffusers claim these systems improve water quality, empirical studies of these claims are sparse. A literature review conducted for this project suggests there is limited to no value of these systems for water quality improvement. Most of these studies were conducted in ponds, which are comparable to the study detention basins.

3.4.1 Fountains

Fountains primarily function as a water feature that some find appealing. Fountains typically recirculate basin water, drawing water from near the surface and spraying it into the air. This provides some aeration of the local surface water, but does little for aerating the majority of the basin's volume, including deeper zones where aeration would be most beneficial. Fountains also do little to mix basin waters and reduce summer stratification that concentrates pollutants in the layer receiving the runoff. Fountains can be effective at agitating the water surface to float algae or vegetation away from the spray zone, but they do not remove algae or vegetation. Fountains may limit the breeding of some mosquito species and reduce potentially toxic blue-green algae (cyanobacteria) blooms in small ponds (Clemson 2015).

3.4.2 Diffusers

Diffusers are more efficient than fountains at improving dissolved oxygen levels required for aquatic life and in reducing chemical stratification (Clemson 2015). Elevated dissolved oxygen levels can reduce winter fish kill, increase aerobic microbial decomposition, and increase the fish biomass of a pond (Boyd 1998). Reducing the vertical stratification of dissolved oxygen in a pond can increase aerobic microbial respiration, which contributes to reducing sulfuric pond odors (a "rotten egg smell") caused by anaerobic bacteria (Hasan et al. 2013, Peu et al. 2012). If diffusers are used, fine-bubbled diffusers are more economically efficient than coarse-bubbled diffusers (Rosso et al. 2008). However, they do have some limitations, as the filters of fine-bubbled diffusers need periodic cleaning and are slower at improving dissolved oxygen levels. If used, diffusers should be elevated above the bottom of the basin in order to limit basin bottom erosion and avoid raising suspended sediments.

Based on these findings, fountains are not a recommended method for achieving the City's water quality goals. Diffusers may prove most beneficial in deeper stormwater basins that may experience winter fish kills, lack aquatic species diversity, or emit offensive odors. Fish kills, however, are uncommon in Ankeny's basins.

3.5 Project Prioritization

The City of Ankeny has a responsibility to construct and maintain City facilities that are safe, functional, and maintainable in a manner that minimizes risk to City residents and staff. Engineering functionality is also a priority for the City, given that these stormwater basins are an important part of the stormwater management system, which protects life, property, and associated natural resources. For these reasons, priority improvement projects address safety concerns and engineering functionality.

While addressing priorities over a longer time frame, the City should identify stormwater basins with the greatest needs and best opportunities to meet the City's goals for those basins, considering cost-effectiveness and return on investment. These improvement projects should be completed over a 5 to 20 year period. Stormwater basins require regular maintenance, some short-term and some long-term. These maintenance items can include dredging, repair of inlet and outlet structures, stabilization of shoreline erosion, re-grading other areas of erosion, management of vegetation, and addressing aesthetic and water quality issues.

3.6 Prioritized Capital Improvements

In general, Ankeny's public stormwater basins are in good condition with no critical safety or functionality concerns. The exception is found at the Tradition Basins.

3.6.1 Tradition Basins Outlet Structures

The outlet structures at both Tradition Basins (North and South) have an unsafe design feature. These structures have unscreened openings of approximately 27 inches, and are easily accessible via shallow wading. Water entering the structure plunges vertically into a turbulent vortex. Additionally, the grating on both structures has crudely cut openings with sharp edges (see photos).

These outlets should be replaced with a safer design, such as a SUDAS standard SW-series structure. This report also recommends a more detailed analysis and redesign of the Tradition Basins because they do not appear to currently meet the intended engineering functionality, as evidenced by local erosion, sedimentation, and the large drainage area compared with the

size of the basins. That analysis may recommend substantial reconstruction of the Tradition Basins system. The City may wish to post warning signs at these structures for public safety while that analysis and redesign is underway.

3.6.2 Minor Safety Issues

The following minor safety issues were noted at various basins throughout the City. None of these issues is likely to cause serious injury or fatality. If the City wishes to address these issues, many could be rectified by simple maintenance projects.

1. *NE-01, Otter Creek Basin*. There is a protruding rebar on the 36" RCP inlet, which may represent a tripping/minor injury hazard.
2. *NE-03, Deer Creek Basin*. Along the adjacent NE Frisk Drive, there is an eroded intake on an 8" PVC inlet with no cover. This may cause a minor tripping/injury hazard, and also makes the inlet prone to clogging.
3. *NW-05, Georgetown South Basin*. There is a protruding rebar on the 30" RCP inlet, which may represent a tripping/minor injury hazard.
4. *NW-08 & 09. Prairie Ridge Complex North and South Basins.* There are numerous areas of steep banks around both basins, especially on the southern shorelines. These may cause a tripping hazard, but the water adjacent to them is quite shallow. Therefore, tripping in these areas would not represent a significant drowning risk.
5. *NW-13, Cherry Glen North Basin*. Sub-standard-size rip rap at the inlet may roll underfoot, causing risk of minor injury.
6. *NW-16, Signature Basin*. There is a near-vertical drop along the entire length of the southern shoreline, caused by wave erosion. The adjacent water is quite shallow, minimizing drowning risk, but the severely eroded shoreline does pose a tripping hazard. Stabilization of this eroding shoreline is discussed later in this report.
7. *SW-06, Hy-Vee South Basin*. The slopes of this basin are quite steep, and mowing is likely hazardous. This may pose a rollover/injury hazard. The re-grading of these slopes is not likely feasible, since all surrounding areas are now developed and paved. The consulting team understands these slopes were seeded with native grasses. It is recommended that deck-mowing be avoided on these slopes, and that backpack weed trimmers or similar equipment be used if necessary during native vegetation establishment, and that prescribed burning be used for long-term management.

8. *SW-10, Vintage Park Basin and SW-07, Promenade Park Basin*. Each of these parks has a large concrete outlet flume (discussed in Section 2.2). These structures can be easily accessed on foot. It is recommended that the City consider fencing to prohibit unauthorized entry to the weir edges.
9. *SW-11, Art Center Basin*. Much of the riprap surrounding this basin was quite unstable under foot, resulting in a moderate tripping hazard. Some of the riprap has either slid into the basin or been incorporated into the surrounding slopes. Art Center Basin is one of the older basins in the City.

3.6.3 Engineering Functionality

Tradition Basins

The Tradition Basins are significantly undersized for their watershed area, and are not providing adequate detention of stormwater runoff. Saylor Creek flows directly through both basins. The Basin Classification and Criteria Matrix (Appendix B) shows that the watershed to basin ratio for these basins is approximately 2000:1. This ratio is many times higher than the ratios at other basins throughout the Ankeny stormwater management system, and well beyond widely accepted engineering guidelines. The recommended watershed-to-basin ratio is highly dependent on watershed characteristics, but values ranging from 10:1 to 75:1 are advisable in Iowa. The higher end of this acceptable range is recommended only for watersheds with a significant proportion of permanently vegetated surface, such as prairie or woodland. While there are other stormwater basins and water control features upstream to help manage watershed flows, the Saylor Creek watershed is a large watershed that experiences considerable flow volumes and rates. During our field assessment, the area just upstream of the Tradition Basins was observed to be under repair, apparently due to recent erosive stormwater flows and alignment of a box culvert. Past rainfall events have also caused visible degradation of both basins, as described below.

- A large sand-and-gravel delta has formed at the inlet to Tradition North Basin. In time, this basin will be completely filled with sediment (see photo).

- Significant erosion was observed in soils downstream of both basins, indicating regular passage of large flows over the outlet structures (see photo).

- Significant sedimentation was observed in Tradition South Basin, leaving very little deep water habitat (no photo).

The consulting team recommends that the City conduct a detailed drainage analysis, if one does not exist, to determine the proper sizing for the Tradition Basins system. The analysis should examine the feasibility of upstream volume and rate control measures in conjunction with improving the basins to provide adequate detention. The analysis should also evaluate the effects of taking the Tradition Basins system off-line from the flow-through stream, so that they would provide stormwater detention for only the adjacent development area. Such a project would need to be constructed in conjunction with a stream channel rerouting and stabilization project for Saylor Creek.

Wildflower Basin

This basin is a remnant farm pond that existed prior to development of the area. HR Green's review of historical aerial photography revealed that the basin has existed since at least the 1950s. Development of the adjacent area occurred primarily between 2002 and 2006. There are signs that the Wildflower Basin may not provide adequate stormwater detention. Depressed grass observed in the emergency outlet area indicated that the basin had recently overflowed the emergency outlet weir. Additionally, the fabric matrix reinforcement of the outlet weir area is beginning to erode visibly (see photo). Residents indicated that the basin has been prone to flooding in the past. Based on HR Green's

onsite depth readings, the basin appears to have a maximum depth of approximately 3 feet at normal pool. Extensive siltation of the pond appears to have occurred in the 60 plus years since it was constructed.

HR Green reviewed drainage calculations for the Wildflower Basin performed by other consultants during the development of adjacent areas. One item of concern is that the Rational Method was used in those earlier calculations. The Rational Method is not recommended for drainage areas larger than 40 acres, as it tends to underestimate flows for larger areas. The total watershed area draining to the Wildflower Basin is approximately 63 acres. Although the basin was designed to overflow the outlet weir with the 100-year storm, overflows appear to be occurring much more frequently.

These periodic overflows, however, may be related to the basin's aging and obsolete outlet structure. The outlet consists of a corrugated metal pipe with a conical trash basket (see photo). This type of outlet is prone to clogging and up-lift. Consequently, the outlet may be allowing water levels to rise higher than intended. It is recommended that this outlet structure be replaced with a standard SUDAS-type intake structure.

If replacement of the outlet structure does not remedy high water levels, then it is recommended the City conduct a detailed drainage analysis using more applicable methods in order to evaluate the Wildflower Basin capacity. Because of its long existence prior to development, this basin would likely be considered a jurisdictional wetland by the U.S. Army Corps of Engineers. Thus, any modification or dredging of the basin would require a Section 404 permit. This may create a significant regulatory challenge for any attempt to convert the Wildflower Basin into a deep-water basin. However, other types of beneficial modification could be conducted without the need for mitigation.

Other Outlet Structure Retrofits

A number of other basins also have substandard outlet structures. These deficiencies do not appear to be causing immediate safety or functionality concerns, and are thus lower priority than the basins discussed above. However, these outlet structures may be prone to clogging or breakage, and may be causing unnecessary water level variations. It is recommended that these outlet structures be replaced with a standard SUDAS SW-513 structure or similar to improve their long-term durability. A custom multi-stage outlet could also be installed to better manage runoff from smaller more frequent storms, such as the 1-year storm

(referred to as the channel protection volume in the Iowa Stormwater Management Manual). These basins are as follows:

1. *NE-01, Otter Creek Basin*. This basin has an 18" RCP outlet pipe with a 15" PVC pipe inserted into it, with a 90° PVC slotted elbow. The purpose of this apparently improvised design was not clear, and the PVC elbow is broken.
2. *SW-12, Camden Woods East Basin.* This basin's outlet could not be located during field review. It may be buried in sediment and/or vegetation. A suspected (but unverified) discharge was found in the wooded ravine to the east. No erosion protection was observed at this discharge point and significant erosion was observed in the ravine below the discharge point.
3. *NW-11, Hawkeye Park Basin*. One of the oldest basins in Ankeny, Hawkeye Park Basin has a single 8" PVC outlet pipe protruding at an angle above the water line.

Finally, the inspection forms included in Appendix A provide recommendations for maintenance inspections of various outlet structures where applicable. One noteworthy example is Sawgrass Park Basin (SW-05). Based on the lack of erosion at its discharge point and no evidence of inundation, the Sawgrass outlet appears to be functioning acceptably. However, the outlet is not visible, as it is contained within a large metal cage that could not be accessed during field review. It is recommended that this structure be inspected to verify the condition of the outlet.

Vintage Park Basin Dredging

Among Ankeny's stormwater basins only Vintage Park Basin appeared to be experiencing sedimentation to a degree that may compromise engineering functionality. The sediment is located in the forebay of the basin. Removal of this sediment would provide increased storage capacity and restore the designed functionality of the basin.

Signature Basin Shoreline Stabilization

The eroded south shoreline of Signature Basin warrants stabilization (see photo). Due to the proximity of a sidewalk and possibly buried utilities, there may be constraints to major re-grading of this slope to a stable angle of repose. However, using a combination of stabilization treatments, such as coir logs, erosion blankets, and native plantings, will provide a long-term solution to this erosion issue.

3.6.4 Ecological Functionality

Natural Buffers and Native Landscapes

The multiple benefits of expanding natural buffers around Ankeny's stormwater basins and conversion of under-used turf areas to native landscaping were described in Section 3.2. All of Ankeny's stormwater basins would benefit from wider natural buffers, and City parks would benefit from selective conversion to lower-maintenance native landscapes. These projects should be pursued as the opportunities present themselves. Areas used heavily by geese are a priority candidate for widening natural buffers to discourage geese and increase water quality. Widening natural buffers or installing native landscaping presents an opportunity for a demonstration project. Other City maintenance projects, such as shoreline re-grading or stabilization, is an ideal time for economically creating or widening natural buffers and installing native landscapes in turf areas.

Cattails

The cattails present in Ankeny's stormwater basins are aggressive strains that compete with native wetland plants, reducing their cover and diversity. Maintaining cattail cover at less than 10% at any one basin helps limit the spread of invasive cattails and thereby increases the amount and diversity of native wetland plants, which have greater wildlife benefit than invasive cattails.

Four open water basins were documented as having at least 10% cover by cattails: Cascade Falls Basin (30%), Camden Woods West Basin (25%), Camden Woods East Basin (20%), and Art Center Basin (10%). These basins warrant cattail control to improve native plant cover and diversity. Cherry Glen East Basin and Cherry Glen South Basin each had 8% cover by cattails and should be monitored for change. The three wetland basins (Watercrest Park Wetlands, Prairie Trail Wetland, and Chautauqua Park Wetlands) are dominated by invasive cattails. Cattail control in these wetlands would require a more concerted effort if improvements are desired in native plant cover and diversity.

4 OPINIONS OF PROBABLE COST

Planning and implementing capital improvement projects requires an understanding of cost. Opinions of probable cost for priority projects are discussed below.

4.1 Opinions of Probable Cost for Prioritized Capital Improvements

4.1.1 Tradition Basins

Replacing or retrofitting the Tradition Basin outlet structures is estimated to cost $5,000-$15,000 per outlet. However, based on the magnitude of issues at the Tradition Basins, we recommend the following scope of work phased over two or more years. All cost estimates are preliminary as many unknowns remain.

1. *Detailed Drainage Analysis and Concept Design (Feb-Apr 2016)*. Analyze the Tradition Basins watershed, including analysis of existing land cover, impervious cover, and runoff rate calculations. Based on findings, investigate a minimum of three conceptual alternative projects (including at least one project at the watershed scale and at least one project at local scale) and analyze feasibility and cost of the alternatives.
   Opinion of Probable Cost: $25,000-$50,000
2. *Engineering Design and Construction (Spring 2016-Fall 2017).* Based on highest feasibility and lowest cost alternatives, design and construct up to three watershed BMPs to reduce flow rates and volume at the most feasible locations in the watershed. In addition, re-design and reconstruct the Tradition Basins area to improve stability and function. This may entail creating a meandering stream with off-channel sedimentation basins or a similar flowing system strategy.
   Opinion of Probable Cost: $750,000-$1,500,000

4.1.2 Minor Safety Issues

Repair or replacement of deficient/hazardous structures discussed in Section 3.6.2 generally range from $300 to $3,000 per structure, depending on materials and installation requirements. Ornamental iron fencing (similar to adjacent fencing) could be installed on the Vintage and Promenade outlet weir structures for approximately $130 per linear foot. Estimated costs are not provided for repair of steep banks, replacement or grouting of substandard-sized riprap, or signage.

4.1.3 Outlet Structure Retrofits

Replacement of the four non-standard outlet structures (Wildflower Basin, Otter Creek Basin, Camden Woods East Basin, and Hawkeye Park Basin) is estimated to cost $5,000 to $15,000 each.

4.1.4 Dredging

Dredging the forebay of Vintage Park Basin is estimated to cost $15-25 per cubic yard (including dredge, haul, and disposal), assuming the sediment is not classified as hazardous. The consulting team estimates the sediment volume at approximately 2,500 cubic yards. Therefore, total dredging cost is approximately $62,500. For capital improvement planning, we recommend a budget of $75,000.

4.1.5 Shoreline Stabilization

Stabilization of the south shoreline of Signature Pond should be accomplished by using a combination of treatments. Limited re-grading of the steepest portions of the shoreline will provide a more stable angle of repose. Installation of a riprap toe along the length of the south shoreline will anchor the base of the slope and provide hard-armor protection from wave action. Geotextile and/or erosion control blanket, coupled with seeding of quick-growing cover crop and deep-rooted native prairie plants, will provide a bioengineering-stabilized slope above the riprap toe. Given the bank height (approximately 2-3 feet) and the length of the south

shoreline (approximately 380 feet), we recommend a budget of $30,000 to stabilize this section of shoreline.

4.2 Opinions of Probable Cost for Ecological Restoration and Management

4.2.1 Generalized Ecological Restoration and Management Costs

Planning and implementing ecological restoration and management projects requires an understanding of cost. While there are many variables that can significantly influence unit costs (e.g., size of area being addressed, existing site conditions, slopes), the following generalized unit costs are provided for early planning and budgeting purposes. These costs include full costs of performing the work, including overhead. Costs may vary because overhead typically is not included in project costs when government agencies do the work, and labor costs may be reduced with the use of volunteer or low-cost labor, such as AmeriCorps workers.

Table 1. Generalized Ecological Restoration and Management Unit Costs

Task	Unit	Unit Cost Range
Brushing (cut and stump treat)	acre	$1,500-$3,500
Foliar spray young woody brush	acre	$200-400
Broadcast herbicide	acre/trip	$175-300
Spot herbicide	acre/trip	$200-400
Mowing	acre/trip	$150-350
Prescribed burn (minimum 3 ac)	acre	$300-700
Tilling	acre	$150-350
Native seed (material only)	acre	$200-$1,100
Native seeding (no-till drill, labor only)	acre	$200-500
Native seeding (hand-broadcast, labor only)	acre	$300-600
Straw mulch (spread and crimp)	acre	$600-900
Installed live herbaceous plant plug	each	$3-7
Installed shrub (#2)	each	$25-40
Installed tree (#10, 2” B&B)	each	$150-250, $300-600
Ecological monitoring & reporting	year	$2,500-$6,000

Restoring native plant communities typically requires a moderate initial investment – more than simply seeding with turf or common stabilization grasses such as smooth brome. However, proper installation and management of native plant communities can considerably reduce long-term maintenance costs. Many variables influence the return on investment, but many native landscapes can begin to save landowners money in approximately 2 to 5 years.

Using generalized unit costs for private contractors, the following opinions of probable cost were developed for the conservation templates illustrated in Figures 7 and 8.

4.2.2 Georgetown Park

The Georgetown Park Conservation Template (Figure 7) calls for conversion of approximately 5.18 acres of existing turf to shortgrass prairie.

Table 2. Georgetown Park Conversion Template OPC

Task	Unit	Unit Cost	Units	Total
Broadcast herbicide (2 trips)	ac	$500	5.18	$2,590
Mesic Shortgrass Prairie seed	ac	$600	5.18	$3,108
Install seed (no-till drill)	ac	$350	5.18	$1,813
Year 1 Management	ac	$800	5.18	$4,144
Year 2 Management	ac	$700	5.18	$3,626
Year 3 Management	ac	$500	5.18	$2,590
Total Establishment Cost				**$17,871**

Note: Mobilization costs, which are highly dependent on contractor geography, are not accounted for in this OPC. Perpetual management is not shown in the OPC above. After Year 3, management of this prairie is estimated to cost $1,500/year.

The two optional wildflower plantings along Northwest Georgetown Boulevard could be designed and installed for approximately $2,000 to $2,700 each (cost range due to different designs). Perpetual management of the wildflower plantings is estimated to cost $300-500/year (depending on design).

4.2.3 Reinhart Basins

The Reinhart Basins Conservation Template (Figure 8) calls for conversion of approximately 1.23 acres of existing vegetation to tallgrass prairie.

Table 3. Reinhart Basins Conversion Template OPC

Task	Unit	Unit Cost	Units	Total
Prescribed burn (for seeding prep)	ac	$1,000	1.23	$1,230
Broadcast herbicide (2 trips)	ac	$600	1.23	$738
Mowing (for seeding prep)	ac	$500	1.23	$615
Mesic Tallgrass Prairie seed	ac	$600	1.23	$738
Install seed (hand-broadcast)	ac	$650	1.23	$800
Year 1 Management	ac	$750	1.23	$923
Year 2 Management	ac	$600	1.23	$738
Year 3 Management	ac	$500	1.23	$615
Total Establishment Cost				**$6,397**

Note: Mobilization costs, which are highly dependent on contractor geography, are not accounted for in this OPC. Perpetual management is not shown in the OPC above. After Year 3, management of this prairie is estimated to cost $500/year.

5 STORMWATER DETENTION BASIN ACCEPTANCE RECOMMENDATIONS

In the past, the City of Ankeny has accepted ownership and maintenance responsibilities for many stormwater detention basins that were designed and constructed by others for private development projects. Stormwater detention basins represent a financial obligation of the City, and poorly designed or poorly constructed basins increase that financial obligation. Therefore, the consulting team recommends that new stormwater detention basins that are not designed to become public, recreational, or aesthetic amenities should not be owned or maintained by the City; the City should own and maintain only basins that benefit the community. Rather, private stormwater basins with no additional public benefit should remain under private ownership and be maintained (per City requirements) by a homeowners' association (HOA).

When the City does accept a new stormwater detention basin, it is paramount that it be designed and constructed properly. The consulting team recommends the following general design criteria and post-construction acceptance criteria as prerequisites for the transfer of stormwater detention basins to City ownership and management.

5.1 Design Criteria

Construction of stormwater detention basins should not be permitted unless the following design criteria are met, as determined by City review of proposed development projects. These criteria are in addition to the required performance criteria of the City's stormwater management ordinances, which specify the size of the basin related to basin runoff rates for storms of different sizes. These are minimum criteria and the City may decide to make a more comprehensive acceptance protocol.

1. The basin shoreline at maximum pool elevation is located with a horizontal setback of at least 15 feet from the top of bank to adjacent private property lines. This setback is needed to allow the establishment of natural buffers and for safe access by City personnel for maintenance of the basin and nearby infrastructure.
2. In the case of a single basin within a watershed, the contributing watershed area must be no more than 75 times the normal pool area of the detention basin water surface. If multiple basins are in sequence, the multi-basin system must be designed to manage the contributing watershed area. This design must be substantiated by the presentation of hydrologic and hydraulic modeling results to the City. The Modified Rational Method should not be used, but rather a tabular hydrograph method or similar method.
3. All inlets and outlets are constructed of reinforced concrete pipe (RCP). Emergency overflows must be handled by means of a standard SUDAS intake structure unless a written exception is granted by the City.
4. The basin protects public safety and property and downstream infrastructure. This means that basins are designed with a maximum 4:1 slope (horizontal:vertical) to the water's edge, a shallow submerged safety bench, and an emergency overflow to prevent dam and dike breaches during high water.

5. The basin pre-treats runoff from nearby impervious cover and turf using best management practices, including sediment forebays, bioswales, native buffers, and infiltration trenches or French drains. The pre-treatment is necessary for the reduction of sediment and nutrients.
6. Inlets, outlets, riprap, and other hard structures are designed for minimal maintenance and maximum durability, and these features are integrated into the adjacent slope, soil, and basin contours. If vegetation is intended to be mowed, it should consist of a sturdy, mat-forming turfgrass resistant to trampling and erosion. If vegetation is not intended to be mowed, it should contain no noxious weeds or invasive plants, as specified by this report (Appendix F).

5.2 Post-Construction Acceptance Criteria

Prior to acceptance, the City should inspect the stormwater basin and determine if it is compliant with the design criteria above and meets the following acceptance criteria, in addition to those already required by the City's stormwater management ordinances.

1. A surveyed and certified as-built plan is provided to and reviewed by City.
2. The City has inspected the basin to verify the size, depth, critical elevations, and safety features, and City has verified those features meet design specifications.
3. The City has inspected the integrity of the inlet, outlet, and overflow structures and verified those features meet design specifications.
4. The basin has fully established vegetation prior to acceptance by the City.

6 REFERENCES

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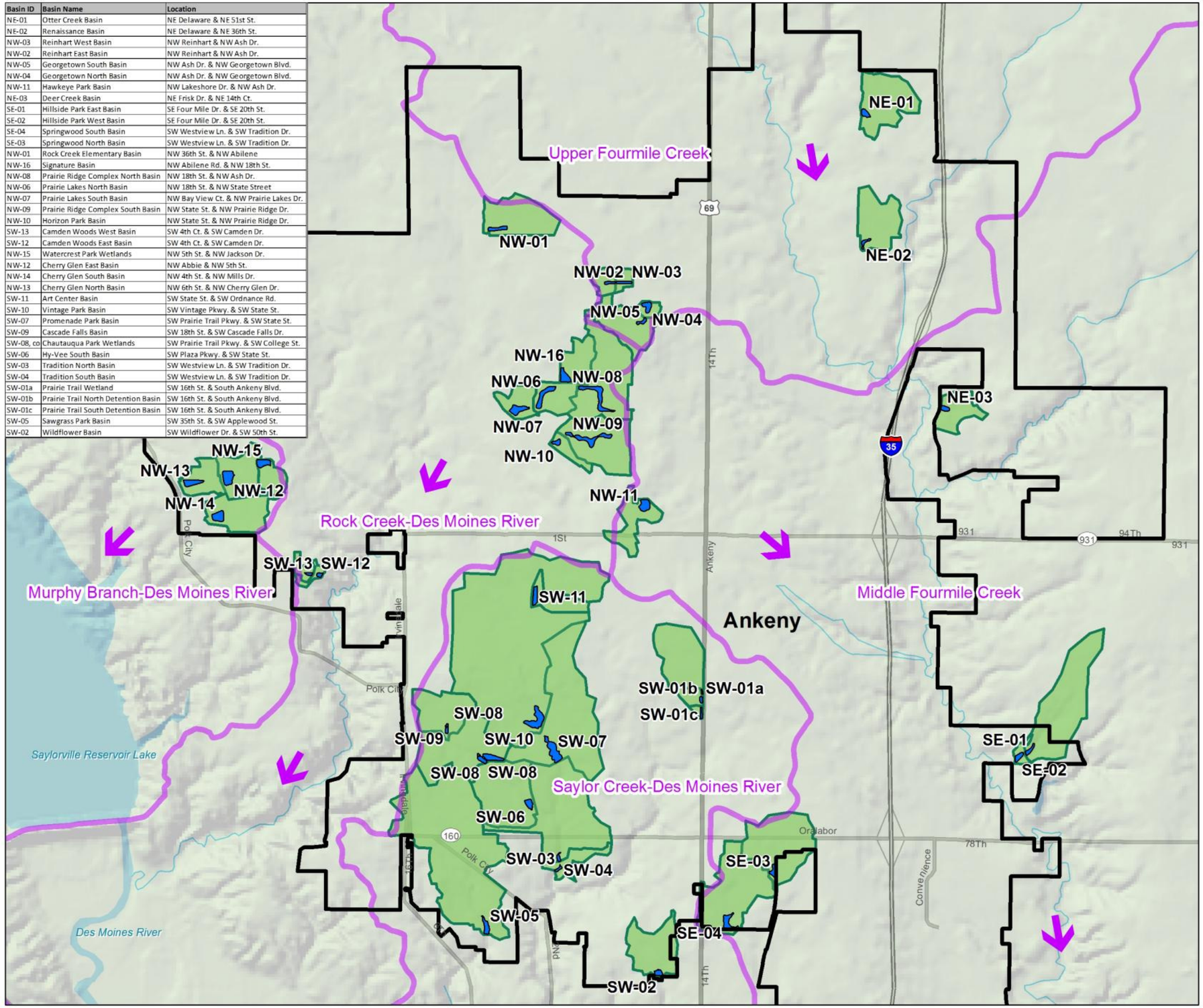
Figure 1. City Stormwater Overview

Basin ID	Basin Name	Location
NE-01	Otter Creek Basin	NE Delaware & NE 51st St.
NE-02	Renaissance Basin	NE Delaware & NE 36th St.
NW-03	Reinhart West Basin	NW Reinhart & NW Ash Dr.
NW-02	Reinhart East Basin	NW Reinhart & NW Ash Dr.
NW-05	Georgetown South Basin	NW Ash Dr. & NW Georgetown Blvd.
NW-04	Georgetown North Basin	NW Ash Dr. & NW Georgetown Blvd.
NW-11	Hawkeye Park Basin	NW Lakeshore Dr. & NW Ash Dr.
NE-03	Deer Creek Basin	NE Frisk Dr. & NE 14th Ct.
SE-01	Hillside Park East Basin	SE Four Mile Dr. & SE 20th St.
SE-02	Hillside Park West Basin	SE Four Mile Dr. & SE 20th St.
SE-04	Springwood South Basin	SW Westview Ln. & SW Tradition Dr.
SE-03	Springwood North Basin	SW Westview Ln. & SW Tradition Dr.
NW-01	Rock Creek Elementary Basin	NW 36th St. & NW Abilene
NW-16	Signature Basin	NW Abilene Rd. & NW 18th St.
NW-08	Prairie Ridge Complex North Basin	NW 18th St. & NW Ash Dr.
NW-06	Prairie Lakes North Basin	NW 18th St. & NW State Street
NW-07	Prairie Lakes South Basin	NW Bay View Ct. & NW Prairie Lakes Dr.
NW-09	Prairie Ridge Complex South Basin	NW State St. & NW Prairie Ridge Dr.
NW-10	Horizon Park Basin	NW State St. & NW Prairie Ridge Dr.
SW-13	Camden Woods West Basin	SW 4th Ct. & SW Camden Dr.
SW-12	Camden Woods East Basin	SW 4th Ct. & SW Camden Dr.
NW-15	Watercrest Park Wetlands	NW 5th St. & NW Jackson Dr.
NW-12	Cherry Glen East Basin	NW Abbie & NW 5th St.
NW-14	Cherry Glen South Basin	NW 4th St. & NW Mills Dr.
NW-13	Cherry Glen North Basin	NW 6th St. & NW Cherry Glen Dr.
SW-11	Art Center Basin	SW State St. & SW Ordnance Rd.
SW-10	Vintage Park Basin	SW Vintage Pkwy. & SW State St.
SW-07	Promenade Park Basin	SW Prairie Trail Pkwy. & SW State St.
SW-09	Cascade Falls Basin	SW 18th St. & SW Cascade Falls Dr.
SW-08, co	Chautauqua Park Wetlands	SW Prairie Trail Pkwy. & SW College St.
SW-06	Hy-Vee South Basin	SW Plaza Pkwy. & SW State St.
SW-03	Tradition North Basin	SW Westview Ln. & SW Tradition Dr.
SW-04	Tradition South Basin	SW Westview Ln. & SW Tradition Dr.
SW-01a	Prairie Trail Wetland	SW 16th St. & South Ankeny Blvd.
SW-01b	Prairie Trail North Detention Basin	SW 16th St. & South Ankeny Blvd.
SW-01c	Prairie Trail South Detention Basin	SW 16th St. & South Ankeny Blvd.
SW-05	Sawgrass Park Basin	SW 35th St. & SW Applewood St.
SW-02	Wildflower Basin	SW Wildflower Dr. & SW 50th St.



City of Ankeny 2015 Public Stormwater Basin Study

City Stormwater Overview

Legend

- City Boundary
- Watershed Unit (HUC 12)
- City Stormwater Basin
- City Stormwater Basin Watershed

Data Sources:
- City of Ankeny
- Iowa Geographic Map Server
- StreetMap USA

AES Project Number: 14-1131
Date: 11/23/2015
File Name: Ankeny_wtsds overview_2015-11-23

APPLIED ECOLOGICAL SERVICES

Applied Ecological Services, Inc.
21938 Mushtown Road
Prior Lake, MN 55372
952-447-1919
www.appliedeco.com

0 0.25 0.5 1 Miles

N

Figure 2. Upper Fourmile Creek Watershed

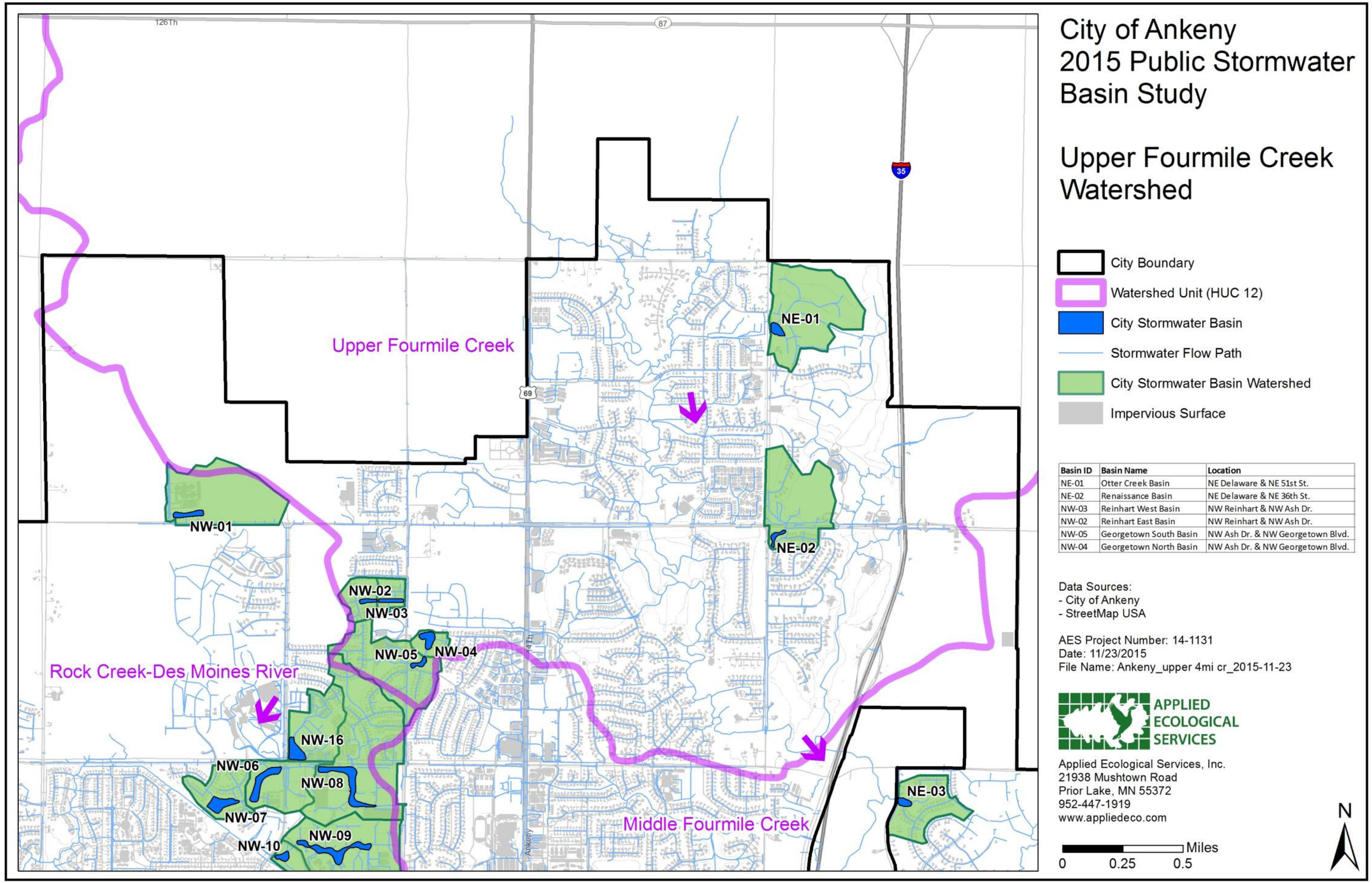
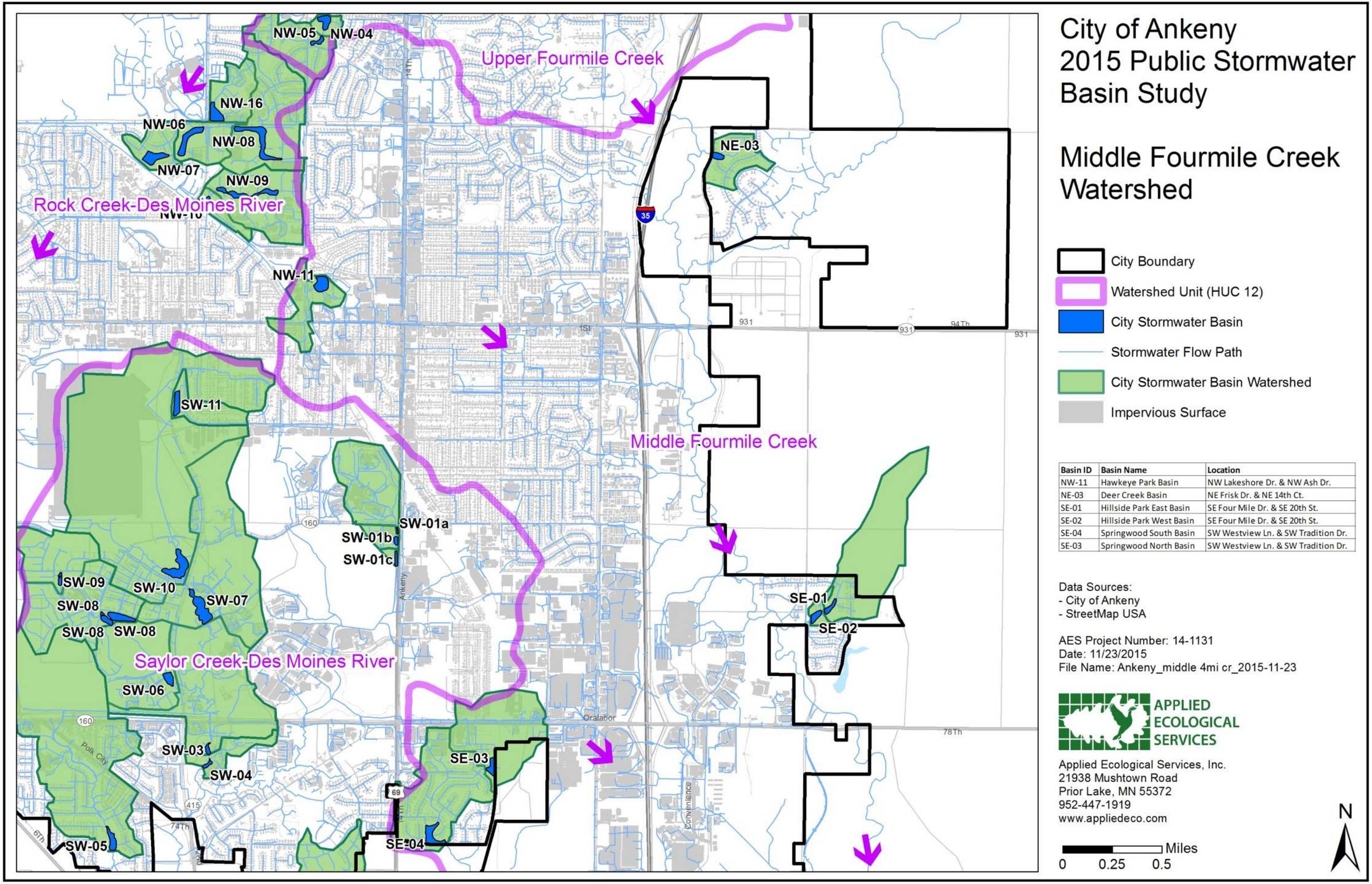


Figure 3. Middle Fourmile Creek Watershed



City of Ankeny 2015 Public Stormwater Basin Study

Middle Fourmile Creek Watershed

- City Boundary
- Watershed Unit (HUC 12)
- City Stormwater Basin
- Stormwater Flow Path
- City Stormwater Basin Watershed
- Impervious Surface

Basin ID	Basin Name	Location
NW-11	Hawkeye Park Basin	NW Lakeshore Dr. & NW Ash Dr.
NE-03	Deer Creek Basin	NE Frisk Dr. & NE 14th Ct.
SE-01	Hillside Park East Basin	SE Four Mile Dr. & SE 20th St.
SE-02	Hillside Park West Basin	SE Four Mile Dr. & SE 20th St.
SE-04	Springwood South Basin	SW Westview Ln. & SW Tradition Dr.
SE-03	Springwood North Basin	SW Westview Ln. & SW Tradition Dr.

Data Sources:
- City of Ankeny
- StreetMap USA

AES Project Number: 14-1131
Date: 11/23/2015
File Name: Ankeny_middle 4mi cr_2015-11-23

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Prior Lake, MN 55372
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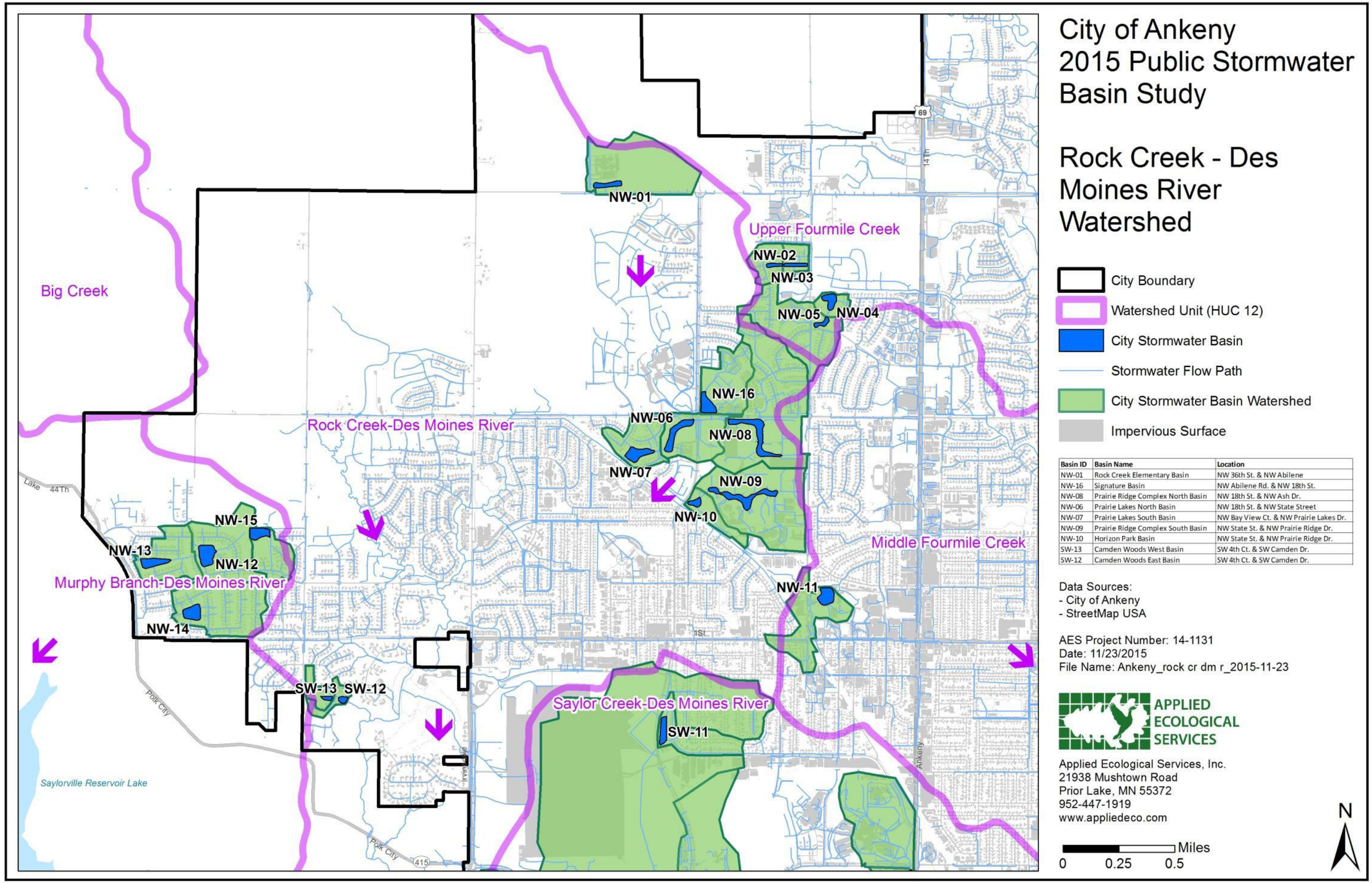
Miles
0 0.25 0.5

N

Figure 4. Rock Creek-Des Moines River Watershed



City of Ankeny 2015 Public Stormwater Basin Study

Rock Creek - Des Moines River Watershed

- City Boundary
- Watershed Unit (HUC 12)
- City Stormwater Basin
- Stormwater Flow Path
- City Stormwater Basin Watershed
- Impervious Surface

Basin ID	Basin Name	Location
NW-01	Rock Creek Elementary Basin	NW 36th St. & NW Abilene
NW-16	Signature Basin	NW Abilene Rd. & NW 18th St.
NW-08	Prairie Ridge Complex North Basin	NW 18th St. & NW Ash Dr.
NW-06	Prairie Lakes North Basin	NW 18th St. & NW State Street
NW-07	Prairie Lakes South Basin	NW Bay View Ct. & NW Prairie Lakes Dr.
NW-09	Prairie Ridge Complex South Basin	NW State St. & NW Prairie Ridge Dr.
NW-10	Horizon Park Basin	NW State St. & NW Prairie Ridge Dr.
SW-13	Camden Woods West Basin	SW 4th Ct. & SW Camden Dr.
SW-12	Camden Woods East Basin	SW 4th Ct. & SW Camden Dr.

Data Sources:
- City of Ankeny
- StreetMap USA

AES Project Number: 14-1131
Date: 11/23/2015
File Name: Ankeny_rock cr dm r_2015-11-23

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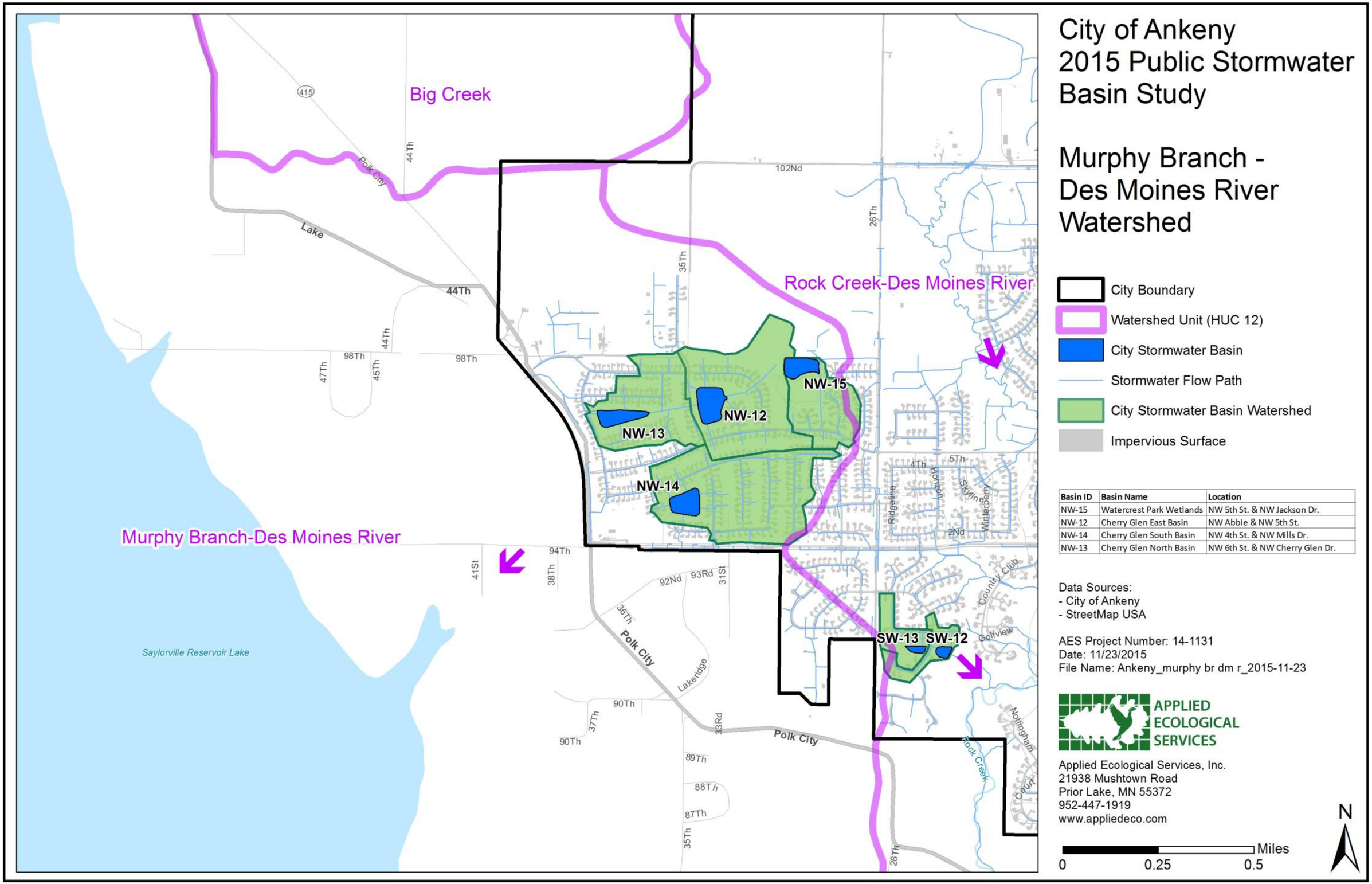
Miles
0 0.25 0.5

N

Figure 5. Murphy Branch-Des Moines River Watershed



City of Ankeny 2015 Public Stormwater Basin Study

Murphy Branch - Des Moines River Watershed

- City Boundary
- Watershed Unit (HUC 12)
- City Stormwater Basin
- Stormwater Flow Path
- City Stormwater Basin Watershed
- Impervious Surface

Basin ID	Basin Name	Location
NW-15	Watercrest Park Wetlands	NW 5th St. & NW Jackson Dr.
NW-12	Cherry Glen East Basin	NW Abbie & NW 5th St.
NW-14	Cherry Glen South Basin	NW 4th St. & NW Mills Dr.
NW-13	Cherry Glen North Basin	NW 6th St. & NW Cherry Glen Dr.

Data Sources:
- City of Ankeny
- StreetMap USA

AES Project Number: 14-1131
Date: 11/23/2015
File Name: Ankeny_murphy br dm r_2015-11-23

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Prior Lake, MN 55372
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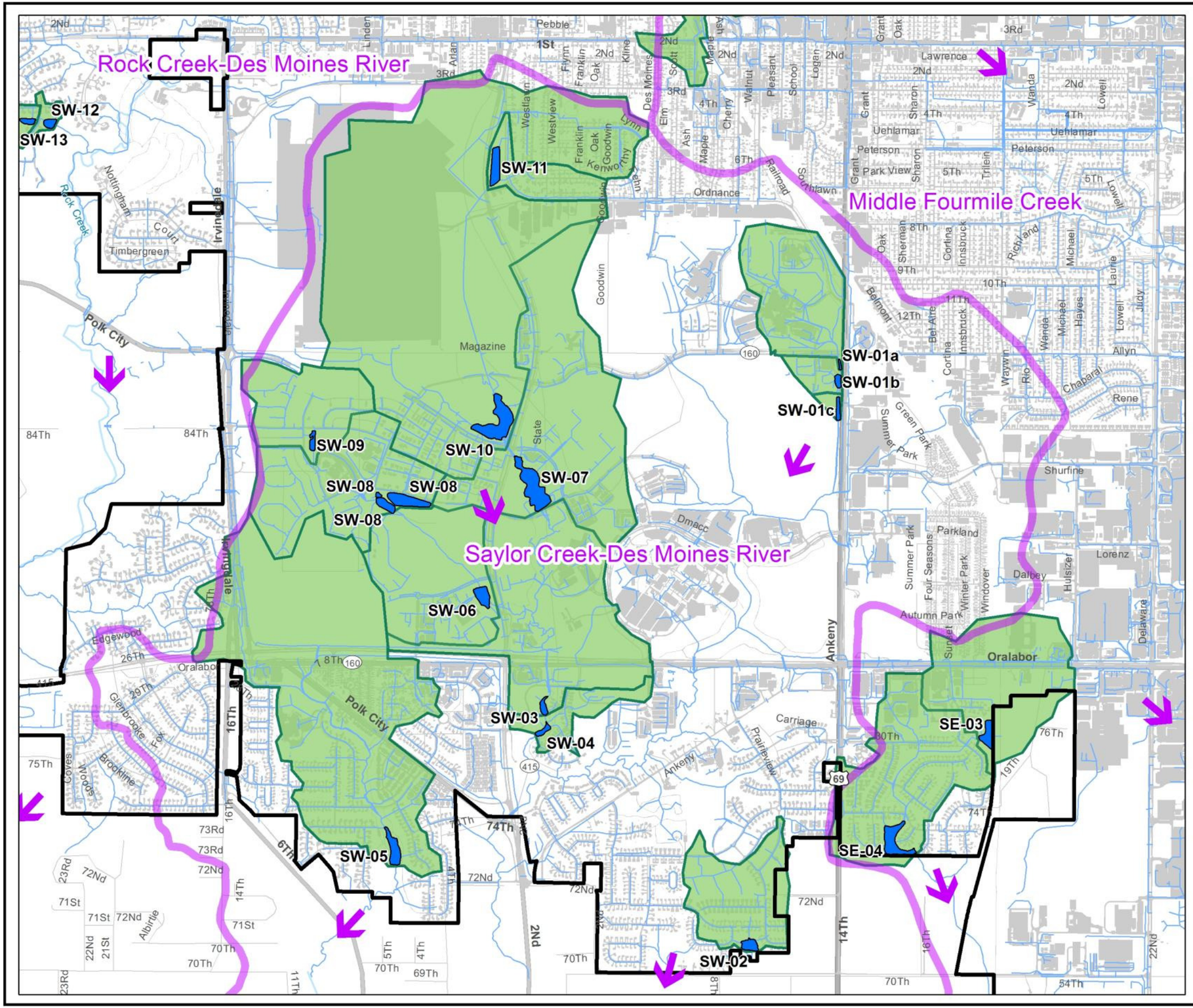
www.appliedeco.com

N

0 0.25 0.5 Miles

Figure 6. Saylor Creek-Des Moines River Watershed



City of Ankeny 2015 Public Stormwater Basin Study

Saylor Creek-Des Moines River Watershed

- City Boundary
- Watershed Unit (HUC 12)
- City Stormwater Basin
- Stormwater Flow Path
- City Stormwater Basin Watershed
- Impervious Surface

Basin ID	Basin Name	Location
SW-11	Art Center Basin	SW State St. & SW Ordnance Rd.
SW-10	Vintage Park Basin	SW Vintage Pkwy. & SW State St.
SW-07	Promenade Park Basin	SW Prairie Trail Pkwy. & SW State St.
SW-09	Cascade Falls Basin	SW 18th St. & SW Cascade Falls Dr.
SW-08	Chautauqua Park Wetlands	SW Prairie Trail Pkwy. & SW College St.
SW-06	Hy-Vee South Basin	SW Plaza Pkwy. & SW State St.
SW-03	Tradition North Basin	SW Westview Ln. & SW Tradition Dr.
SW-04	Tradition South Basin	SW Westview Ln. & SW Tradition Dr.
SW-01a	Prairie Trail Wetland	SW 16th St. & South Ankeny Blvd.
SW-01b	Prairie Trail North Detention Basin	SW 16th St. & South Ankeny Blvd.
SW-01c	Prairie Trail South Detention Basin	SW 16th St. & South Ankeny Blvd.
SW-05	Sawgrass Park Basin	SW 35th St. & SW Applewood St.
SW-02	Wildflower Basin	SW Wildflower Dr. & SW 50th St.

Data Sources:
- City of Ankeny
- StreetMap USA

AES Project Number: 14-1131
Date: 11/23/2015
File Name: Ankeny_saylor cr dm r_2015-11-23

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Prior Lake, MN 55372
952-447-1919
www.appliedeco.com

Miles
0 0.25 0.5

N

Figure 7. Georgetown Park Conservation Template

City of Ankeny 2015 Public Stormwater Basin Study

Georgetown Park Conservation Template

- Concept Area (11.15 ac)
- Turf to Shortgrass Native Plantings (5.18 ac)
- Proposed Mowed Foot Path
- Contour (2-ft interval)
- Parcel Boundary

Data Sources:
- City of Ankeny
- Polk County aerial photo (2014)

AES Project Number: 14-1131
Date: 01/20/2016
File Name: Ankeny_gt conserv template_2016-01-20

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21938 Mushtown Road
Prior Lake, MN 55372
952-447-1919
www.appliedeco.com

0 50 100 200 Feet

N

Figure 8. Reinhart Basins Conservation Template

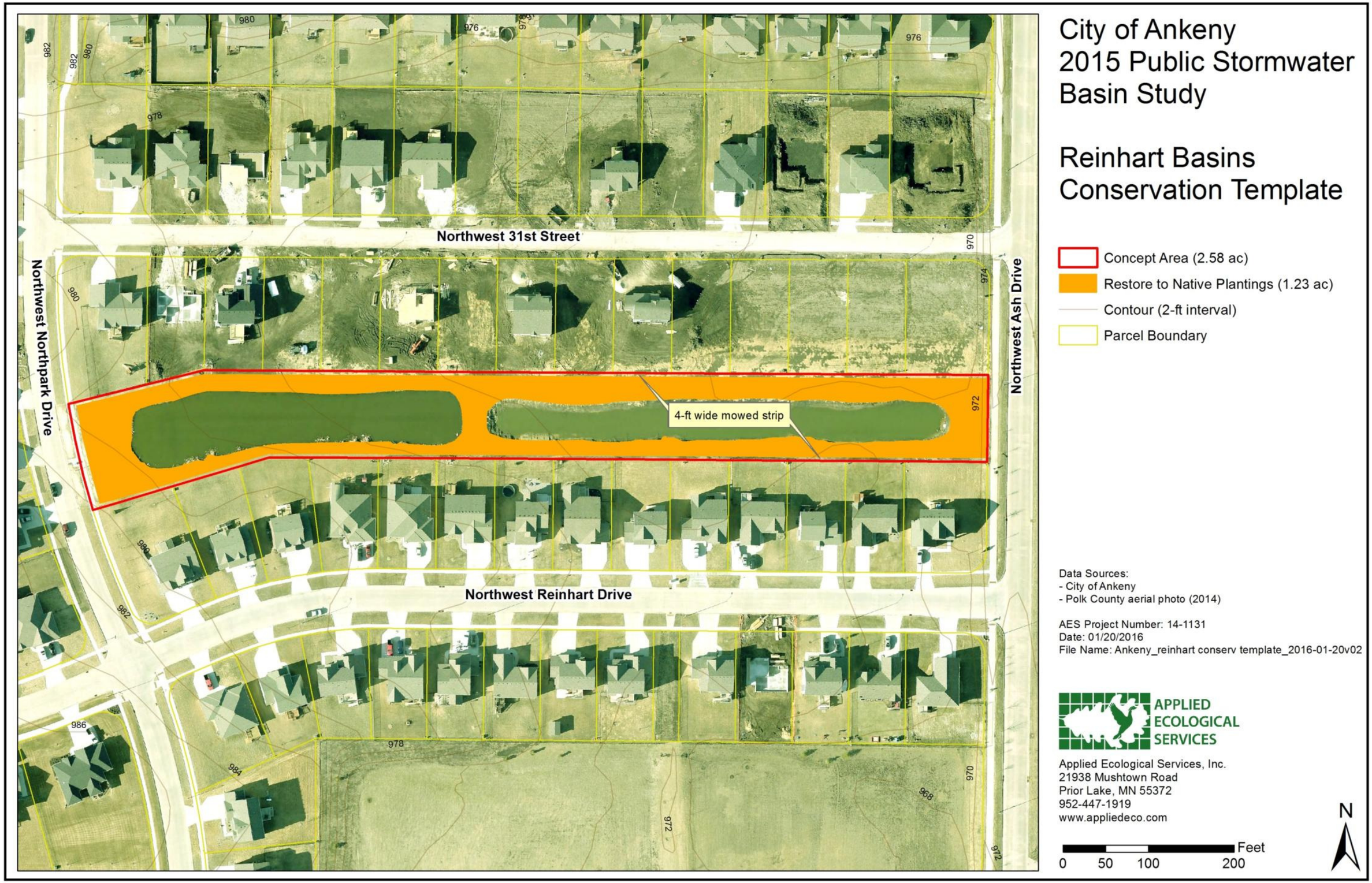

Figure 9. Rain Garden/Infiltration Basin Cross-Section

Appendix A. Basin Characterization and Inspection Forms

City of Ankeny - 2015 Public Stormwater Basin Study - Basin Characterization and Inspection Form

IDENTIFIERS & GENERAL INFORMATION

Site Name	Otter Creek Basin	Basin ID	NE-01
Location	NE Delaware & NE 51st St.		
Classification	Sm Recr&Det Basin	Design High Water Elev.	957.84
Size (ac)	1.36	Design Normal Water Elev.	955.3
Watershed Size (ac)	74.42	Design Max Depth (ft)	NA
Watershed Imperv. Cover (%)	2	Design Avg Depth (ft)	NA

Features (mark all) Trail Dock/Pier Diffuser Fountain Aquatic Bench Other:_____

Management (mark all) Fish Stocking Treatments Other:_____

Inspector	DMM	Inspection Date	7/14/2015
		Inspection Time	8:11

GENERAL CONDITIONS

Note: Inlets, Outlets, Forebays, Spillways	Structure ID No.	Location	Description (size, material, features)	Observations (problems, repairs, other maintenance)	**Action Required?**
Outlet	10N 69	NW Corner	15" PVC in 18" RCP	(See Notes in Box)	Yes
Inlet	10N 70	SE Corner	36" RCP FE Inlet	Protruding Rebar Safety Issue	Yes

Average Natural Buffer Width (ft)		2		
Bank Vegetation	Major Vegetation Types	% Cover	Observations/Concerns	
(Water to 30ft upslope)	Forest/Woodland	0		
	Shrubland	3		
	Natural Grassland	5		
	Maintained Turf	92		
	Total	100		
	Cattails	1		
	Undesirable Plants in Natural Buffer	30		
	Other Species of Note			
Aquatic	Major Vegetation Types	% Cover	Observations/Concerns	
(In the water)	Algae	3		
	Submergents	20		
	Other Aquatic Species of Note			
Fish Reported	Recorded/Observed Species		Comments	
	No fish			

NE-01	Add Notes In Boxes
Opportunities for Improved Runoff Management in Vicinity	wider buffer; opportunities for infiltration/treatment
Opportunities for Inlet, Outlet, Forebay or Spillway Retrofit	18" RCP outlet has a 15" PVC pipe inserted with a 90° PVC slotted elbow. Replace with proper outlet structure. Repair broken inlet.
Safety Concerns/Hazards	36" FE Inlet on SE side has protruding rebar.
Maintenance Needs (mark all) Trash Mowing Weeds Dredging	many geese
Other Comments	

CONDITION RATING

Stormwater & Water Quality	Check One	
Storage (Max/Design Depth)		
Design Max Depth (ft): NA		
Measured Max Depth (ft): 16	X	Acceptable (≥75%) - assumed based on depth measured
Meas. / Design Max Depths (%): NA		Unacceptable (<75%)
Water Clarity (Secchi Disk Depth)		Good (>4 ft)
Feet: 1.8		Fair (2-4 ft)
	X	Poor (<2 ft)
Eroding/Unstable Banks (% of edge)	X	Good (<1%)
Percent: 0		Fair (1-5%)
		Poor (>5%)

Recreation & Aesthetics		
Algae Growth	X	Good (<5%)
Percent: 3		Fair (5-25%)
		Poor (>25%)
Undesirable Plant Cover in Buffer		Good (<5%)
Percent: 30		Fair (5-25%)
	X	Poor (>25%)
Fishing Resource		Good (anglers regularly report catching desirable fish)
NA		Fair (anglers sometimes report catching desirable fish)
		Poor (no or few fish)
Public Use (observed)		High (>5 people)
		Moderate (1-5 people)
	X	Low (no people)

Wildlife & Ecology		
Wildlife Use	X	Good (>100 individuals in all groups)
Species: Canada geese (90), other birds,		Fair (25-100 individuals in all groups)
frogs, Odonata		Poor (<25 individuals in all groups)
Plant Diversity		Good (>50 species)
	X	Fair (10-50 species)
		Poor (<10 species)
Infrastructure Condition		Good (no repairs needed)
Notes:		Fair (minor repairs; functional only)
	X	Poor (major repairs/replacements, functional/safety)

City of Ankeny - 2015 Public Stormwater Basin Study - Basin Characterization and Inspection Form

IDENTIFIERS & GENERAL INFORMATION

Site Name	Renaissance Basin	Basin ID	NE-02
Location	NE Delaware & NE 36th St.		
Classification	Sm Recr&Det Basin	Design High Water Elev.	932
Size (ac)	0.84	Design Normal Water Elev.	929
Watershed Size (ac)	61.13	Design Max Depth (ft)	NA
Watershed Imperv. Cover (%)	15	Design Avg Depth (ft)	NA

Features (mark all) **Trail** Dock/Pier Diffuser **Fountain** Aquatic Bench Other:_____

Management (mark all) **Fish Stocking** Treatments Other:_____

Inspector	DMM	Inspection Date	7/14/2015
		Inspection Time	7:35

GENERAL CONDITIONS

Note: Inlets, Outlets, Forebays, Spillways	Structure ID No.	Location	Description (size, material, features)	Observations (problems, repairs, other maintenance)	**Action Required?**
Inlet	12N 134	NE Corner	36" RCP FE Inlet	Good Condition	No
Inlet	12N 83	E Edge	15" RCP FE Inlet	Good Condition	No
Outlet	12N 133	SW Corner	SW 513 RCP Outlet	Good Condition	No
Average Natural Buffer Width (ft)			3		

Bank Vegetation	Major Vegetation Types	% Cover	Observations/Concerns	
(Water to 30ft upslope)	Forest/Woodland	0		
	Shrubland	1		
	Natural Grassland	5		
	Maintained Turf	94		
	Total	100		
	Cattails	1		
	Undesirable Plants in Natural Buffer	70		
	Other Species of Note			

Aquatic	Major Vegetation Types	% Cover	Observations/Concerns	
(In the water)	Algae	8		
	Submergents	3		
	Other Aquatic Species of Note			

Fish Reported	Recorded/Observed Species	Comments	
	Stocked fish (since 2010): LMB		

NE-02	Add Notes In Boxes
Opportunities for Improved Runoff Management in Vicinity	wider buffer; opportunities for infiltration/treatment
Opportunities for Inlet, Outlet, Forebay or Spillway Retrofit	
Safety Concerns/Hazards	
Maintenance Needs (mark all) Trash Mowing Weeds Dredging	
Other Comments	

CONDITION RATING

Stormwater & Water Quality	Check One	
Storage (Max/Design Depth)		
Design Max Depth (ft): NA		
Measured Max Depth (ft): 14	X	Acceptable (≥75%) - assumed based on depth measured
Meas. / Design Max Depths (%): NA		Unacceptable (<75%)
Water Clarity (Secchi Disk Depth)		Good (>4 ft)
Feet: 2.3	X	Fair (2-4 ft)
		Poor (<2 ft)
Eroding/Unstable Banks (% of edge)	X	Good (<1%)
Percent: <1		Fair (1-5%)
		Poor (>5%)

Recreation & Aesthetics		
Algae Growth		Good (<5%)
Percent: 8	X	Fair (5-25%)
		Poor (>25%)
Undesirable Plant Cover in Buffer		Good (<5%)
Percent: 70		Fair (5-25%)
	X	Poor (>25%)
Fishing Resource		Good (anglers regularly report catching desirable fish)
NA		Fair (anglers sometimes report catching desirable fish)
		Poor (no or few fish)
Public Use (observed)		High (>5 people)
	X	Moderate (1-5 people)
		Low (no people)

Wildlife & Ecology		
Wildlife Use		Good (>100 individuals in all groups)
Species: Canada geese (6), other birds,		Fair (25-100 individuals in all groups)
frogs, Odonata	X	Poor (<25 individuals in all groups)
Plant Diversity		Good (>50 species)
	X	Fair (10-50 species)
		Poor (<10 species)
Infrastructure Condition	X	Good (no repairs needed)
Notes:		Fair (minor repairs; functional only)
		Poor (major repairs/replacements, functional/safety)

IDENTIFIERS & GENERAL INFORMATION

Site Name	Deer Creek Basin	Basin ID	NE-03
Location	NE Frisk Dr. & NE 14th Ct.		
Classification	Detention Basin	Design High Water Elev.	904.37
Size (ac)	1.01	Design Normal Water Elev.	900
Watershed Size (ac)	35.52	Design Max Depth (ft)	13
Watershed Imperv. Cover (%)	24	Design Avg Depth (ft)	6

Features (mark all): Trail Dock/Pier Diffuser Fountain Aquatic Bench Other: adj. sidewalk

Management (mark all): Fish Stocking Treatments Other:_____

Inspector	DMM	Inspection Date	7/14/2015
		Inspection Time	6:48

GENERAL CONDITIONS

Note: Inlets, Outlets, Forebays, Spillways	Structure ID No.	Location	Description (size, material, features)	Observations (problems, repairs, other maintenance)	**Action Required?**
Outlet	14O 47	NW Corner	SW-513	Fairly New, Good Condition	No
Outlet	14O 46	NW Corner	24" RCP FE outlet	Fairly New, Good Condition	No
Inlet	14O 78	NE Corner	21" RCP FE inlet	Fairly New, Good Condition	No
Inlet	14O 41	NE Corner	14" CPE/CPVC inlet	Good Condition	No
Inlet	14O 39	SE Corner	8" PVC inlet	Strange homemade structure	Yes
Inlet	14O 37	S Edge	24" RCP FE inlet	Fairly New, Good Condition	No
Inlet	14O 43	SW Corner	8" CPVC inlet	Eroded intake with no cover	Yes

Average Natural Buffer Width (ft)		2.5		
Bank Vegetation	Major Vegetation Types	% Cover	Observations/Concerns	
(Water to 30ft upslope)	Forest/Woodland	1		
	Shrubland	3		
	Natural Grassland	8		
	Maintained Turf	88		
	Total	100		
	Cattails	2		
	Undesirable Plants in Natural Buffer	15		
	Other Species of Note			
Aquatic	Major Vegetation Types	% Cover	Observations/Concerns	
(In the water)	Algae	50		
	Submergents	50		
	Other Aquatic Species of Note			
Fish Reported	Recorded/Observed Species		Comments	
	No fish			

NE-03	Add Notes In Boxes
Opportunities for Improved Runoff Management in Vicinity	wider buffer; opportunities for infiltration/treatment (e.g., boulevard, around outlet)
Opportunities for Inlet, Outlet, Forebay or Spillway Retrofit	Strange homemade structure made from old couch at SE corner inlet. (Birding blind?) Inspect and possibly remove. Fix SW intake.
Safety Concerns/Hazards	Uncovered vertical inlet in swale.
Maintenance Needs (mark all) Trash Mowing Weeds Dredging	
Other Comments	Quite diverse but narrow (2-3ft) buffer.

CONDITION RATING

Stormwater & Water Quality	Check One	
Storage (Max/Design Depth)		
Design Max Depth (ft): 13		
Measured Max Depth (ft): 13	X	Acceptable (≥75%)
Meas. / Design Max Depths (%): 100		Unacceptable (<75%)
Water Clarity (Secchi Disk Depth)		Good (>4 ft)
Feet: 1.7		Fair (2-4 ft)
	X	Poor (<2 ft)
Eroding/Unstable Banks (% of edge)	X	Good (<1%)
Percent: 0		Fair (1-5%)
		Poor (>5%)

Recreation & Aesthetics		
Algae Growth		Good (<5%)
Percent: 50		Fair (5-25%)
	X	Poor (>25%)
Undesirable Plant Cover in Buffer		Good (<5%)
Percent: 15	X	Fair (5-25%)
		Poor (>25%)
Fishing Resource		Good (anglers regularly report catching desirable fish)
NA		Fair (anglers sometimes report catching desirable fish)
		Poor (no or few fish)
Public Use (observed)		High (>5 people)
	X	Moderate (1-5 people)
		Low (no people)

Wildlife & Ecology		
Wildlife Use	X	Good (>100 individuals in all groups)
		Fair (25-100 individuals in all groups)
Species: Birds, frogs, Odonata		Poor (<25 individuals in all groups)
Plant Diversity		Good (>50 species)
	X	Fair (10-50 species)
		Poor (<10 species)
Infrastructure Condition		Good (no repairs needed)
Notes:	X	Fair (minor repairs; functional only)
		Poor (major repairs/replacements, functional/safety)

IDENTIFIERS & GENERAL INFORMATION

Site Name	Rock Creek Elementary Basin	Basin ID	NW-01
Location	NW 36th St. & NW Abilene		
Classification	Sm Recr&Det Basin	Design High Water Elev.	NA
Size (ac)	1.63	Design Normal Water Elev.	NA
Watershed Size (ac)	68.85	Design Max Depth (ft)	13
Watershed Imperv. Cover (%)	13	Design Avg Depth (ft)	7

Features (mark all) Trail Dock/Pier Diffuser Fountain Aquatic Bench Other:_____
Management (mark all) Fish Stocking Treatments Other:_____

Inspector	DMM	Inspection Date	7/14/2015
		Inspection Time	8:40

GENERAL CONDITIONS

Note: Inlets, Outlets, Forebays, Spillways	Structure ID No.	Location	Description (size, material, features)	Observations (problems, repairs, other maintenance)	**Action Required?**
Inlet	N/A	N Side	18" RCP FE	Good Condition	No
Inlet	N/A	N Side	24" RCP FE	Good Condition	No
Inlet	N/A	N Side	15" RCP FE	Good Condition	No
Inlet	11I 10	S Side	30" RCP FE	Good Condition	No
Inlet	11I 12	S Side	15" RCP FE	Good Condition	No
Inlet	11I 29	W Corner	24" RCP FE	Good Condition	No
Outlet	11I 13	SW Corner	Modified SW 513	Good Condition	No
Rip rap Channel	N/A	SE Corner	Class D Revetment	Good Condition	No

Average Natural Buffer Width (ft)		12		
Bank Vegetation	Major Vegetation Types	% Cover	Observations/Concerns	
(Water to 30ft upslope)	Forest/Woodland	0		
	Shrubland	2		
	Natural Grassland	45		
	Maintained Turf	53		
	Total	100		
	Cattails	2		
	Undesirable Plants in Natural Buffer	75		
	Other Species of Note			
Aquatic	Major Vegetation Types	% Cover	Observations/Concerns	
(In the water)	Algae	4		
	Submergents	0		
	Other Aquatic Species of Note			
Fish Reported	Recorded/Observed Species		Comments	
	No fish			

NW-01	Add Notes In Boxes
Opportunities for Improved Runoff Management in Vicinity	wider buffer; opportunities for infiltration/treatment (e.g., rip rap swale)
Opportunities for Inlet, Outlet, Forebay or Spillway Retrofit	Small eroded channels observed in various places around basin
Safety Concerns/Hazards	
Maintenance Needs (mark all) Trash Mowing Weeds Dredging	
Other Comments	

CONDITION RATING

Stormwater & Water Quality	Check One	
Storage (Max/Design Depth)		
Design Max Depth (ft): 13		
Measured Max Depth (ft): 13	X	Acceptable (≥75%)
Meas. / Design Max Depths (%): 100		Unacceptable (<75%)
Water Clarity (Secchi Disk Depth)		Good (>4 ft)
Feet: 1.2		Fair (2-4 ft)
	X	Poor (<2 ft)
Eroding/Unstable Banks (% of edge)		Good (<1%)
Percent: 1	X	Fair (1-5%)
		Poor (>5%)

Recreation & Aesthetics		
Algae Growth	X	Good (<5%)
Percent: 4		Fair (5-25%)
		Poor (>25%)
Undesirable Plant Cover in Buffer		Good (<5%)
Percent: 75		Fair (5-25%)
	X	Poor (>25%)
Fishing Resource		Good (anglers regularly report catching desirable fish)
NA		Fair (anglers sometimes report catching desirable fish)
		Poor (no or few fish)
Public Use (observed)		High (>5 people)
		Moderate (1-5 people)
	X	Low (no people)

Wildlife & Ecology		
Wildlife Use		Good (>100 individuals in all groups)
	X	Fair (25-100 individuals in all groups)
Species: Birds, frogs, Odonata		Poor (<25 individuals in all groups)
Plant Diversity		Good (>50 species)
	X	Fair (10-50 species)
		Poor (<10 species)
Infrastructure Condition	X	Good (no repairs needed)
Notes:		Fair (minor repairs; functional only)
		Poor (major repairs/replacements, functional/safety)

IDENTIFIERS & GENERAL INFORMATION

Site Name	Reinhart East Basin	Basin ID	NW-02
Location	NW Reinhart & NW Ash Dr.		
Classification	Detention Basin	Design High Water Elev.	969.22
Size (ac)	0.99	Design Normal Water Elev.	961.5
Watershed Size (ac)	24.88	Design Max Depth (ft)	10
Watershed Imperv. Cover (%)	24	Design Avg Depth (ft)	6

Features (mark all) Trail Dock/Pier Diffuser Fountain Aquatic Bench Other:_____
Management (mark all) Fish Stocking Treatments Other:_____

Inspector	DMM	Inspection Date	7/14/2015
		Inspection Time	13:58

GENERAL CONDITIONS

Note: Inlets, Outlets, Forebays, Spillways	Structure ID No.	Location	Description (size, material, features)	Observations (problems, repairs, other maintenance)	**Action Required?**
Outlet	12J 130	E Side	24" RCP FE	Good Condition	No
Inlet	12J 122	S Side	15" RCP FE	Broken Trash Rack	Yes
Inlet	12J 135	W Side	12" CPVC FE	Good Condition	No
Inlet	12J 134	W Side	12" CPVC FE	Good Condition	No
Inlet	12J 181	N Side	15" RCP FE	Good Condition	No

Average Natural Buffer Width (ft)		15		
Bank Vegetation	Major Vegetation Types	% Cover	Observations/Concerns	
(Water to 30ft upslope)	Forest/Woodland	0		
	Shrubland	20		
	Natural Grassland	60		
	Maintained Turf	20		
	Total	100		
	Cattails	3		
	Undesirable Plants in Natural Buffer	90		
	Other Species of Note			
Aquatic	Major Vegetation Types	% Cover	Observations/Concerns	
(In the water)	Algae	3		
	Submergents	20		
	Other Aquatic Species of Note			
Fish Reported	Recorded/Observed Species		Comments	
	No fish			

NW-02	Add Notes In Boxes
Opportunities for Improved Runoff Management in Vicinity	wider buffer on S
Opportunities for Inlet, Outlet, Forebay or Spillway Retrofit	
Safety Concerns/Hazards	
Maintenance Needs (mark all) Trash Mowing **Weeds** Dredging	
Other Comments	Resident expressed concerns re. basin appearance and lack of City management.

CONDITION RATING

Stormwater & Water Quality	Check One	
Storage (Max/Design Depth)		
Design Max Depth (ft): 10		
Measured Max Depth (ft): 8	X	Acceptable (≥75%)
Meas. / Design Max Depths (%): 80%		Unacceptable (<75%)
Water Clarity (Secchi Disk Depth)		Good (>4 ft)
Feet: 1.1		Fair (2-4 ft)
	X	Poor (<2 ft)
Eroding/Unstable Banks (% of edge)	X	Good (<1%)
Percent: <1		Fair (1-5%)
		Poor (>5%)

Recreation & Aesthetics		
Algae Growth	X	Good (<5%)
Percent: 3		Fair (5-25%)
		Poor (>25%)
Undesirable Plant Cover in Buffer		Good (<5%)
Percent: 90		Fair (5-25%)
	X	Poor (>25%)
Fishing Resource		Good (anglers regularly report catching desirable fish)
NA		Fair (anglers sometimes report catching desirable fish)
		Poor (no or few fish)
Public Use (observed)		High (>5 people)
	X	Moderate (1-5 people)
		Low (no people)

Wildlife & Ecology		
Wildlife Use	X	Good (>100 individuals in all groups)
		Fair (25-100 individuals in all groups)
Species: Birds, many frogs, many Odonata		Poor (<25 individuals in all groups)
Plant Diversity		Good (>50 species)
	X	Fair (10-50 species)
		Poor (<10 species)
Infrastructure Condition		Good (no repairs needed)
Notes:	X	Fair (minor repairs; functional only)
		Poor (major repairs/replacements, functional/safety)

IDENTIFIERS & GENERAL INFORMATION

Site Name	Reinhart West Basin	Basin ID	NW-03
Location	NW Reinhart & NW Ash Dr.		
Classification	Detention Basin	Design High Water Elev.	970
Size (ac)	0.69	Design Normal Water Elev.	961.5
Watershed Size (ac)	14.90	Design Max Depth (ft)	9
Watershed Imperv. Cover (%)	26	Design Avg Depth (ft)	5

Features (mark all) Trail Dock/Pier Diffuser Fountain Aquatic Bench Other:_____

Management (mark all) Fish Stocking Treatments Other:_____

Inspector	DMM	Inspection Date	7/14/2015
		Inspection Time	13:44

GENERAL CONDITIONS

Note: Inlets, Outlets, Forebays, Spillways	Structure ID No.	Location	Description (size, material, features)	Observations (problems, repairs, other maintenance)	**Action Required?**
Inlet	12J 119	SE Corner	15" RCP FE	Good Condition	No
Inlet	12J 170	W Side	24" RCP FE	Good Condition	No
Inlet	12J 175	NE Corner	21" RCP FE	Good Condition; 2 Trash Racks	No
Outlet	12J 132	E Side	12" CPVC FE	Broken top; functional	No
Outlet	12J 133	E Side	12" CPVC FE	Good Condition	No
Inlet	N/A	SE Corner	8" CPVC FE	Snapped off end	Yes
Average Natural Buffer Width (ft)			15		
Bank Vegetation	Major Vegetation Types		% Cover	Observations/Concerns	
(Water to 30ft upslope)	Forest/Woodland		0		
	Shrubland		<1		
	Natural Grassland		80		
	Maintained Turf		20		
	Total		100		
	Cattails		2		
	Undesirable Plants in Natural Buffer		90		
	Other Species of Note				
Aquatic	Major Vegetation Types		% Cover	Observations/Concerns	
(In the water)	Algae		3		
	Submergents		6		
	Other Aquatic Species of Note				
Fish Reported	Recorded/Observed Species			Comments	
	Fish fry and/or minnows observed.				

NW-03	Add Notes In Boxes
Opportunities for Improved Runoff Management in Vicinity	wider buffer on S
Opportunities for Inlet, Outlet, Forebay or Spillway Retrofit	
Safety Concerns/Hazards	
Maintenance Needs (mark all) Trash Mowing **Weeds** Dredging	
Other Comments	

CONDITION RATING

Stormwater & Water Quality	Check One	
Storage (Max/Design Depth)		
Design Max Depth (ft): 9		
Measured Max Depth (ft): 7	X	Acceptable (≥75%)
Meas. / Design Max Depths (%): 78		Unacceptable (<75%)
Water Clarity (Secchi Disk Depth)		Good (>4 ft)
Feet: 1.4		Fair (2-4 ft)
	X	Poor (<2 ft)
Eroding/Unstable Banks (% of edge)	X	Good (<1%)
Percent: 0		Fair (1-5%)
		Poor (>5%)

Recreation & Aesthetics		
Algae Growth	X	Good (<5%)
Percent: 3		Fair (5-25%)
		Poor (>25%)
Undesirable Plant Cover in Buffer		Good (<5%)
Percent: 90		Fair (5-25%)
	X	Poor (>25%)
Fishing Resource		Good (anglers regularly report catching desirable fish)
NA		Fair (anglers sometimes report catching desirable fish)
		Poor (no or few fish)
Public Use (observed)		High (>5 people)
		Moderate (1-5 people)
	X	Low (no people)

Wildlife & Ecology		
Wildlife Use		Good (>100 individuals in all groups)
	X	Fair (25-100 individuals in all groups)
Species: Birds, many Odonata, fish		Poor (<25 individuals in all groups)
Plant Diversity		Good (>50 species)
	X	Fair (10-50 species)
		Poor (<10 species)
Infrastructure Condition	X	Good (no repairs needed)
Notes:		Fair (minor repairs; functional only)
		Poor (major repairs/replacements, functional/safety)

IDENTIFIERS & GENERAL INFORMATION

Site Name	Georgetown North Basin	Basin ID	NW-04
Location	NW Ash Dr. & NW Georgetown Blvd.		
Classification	Md Recr&Det Basin	Design High Water Elev.	NA
Size (ac)	1.86	Design Normal Water Elev.	968
Watershed Size (ac)	66.94	Design Max Depth (ft)	16.5
Watershed Imperv. Cover (%)	31	Design Avg Depth (ft)	11

Features (mark all): **Trail** Dock/Pier **Diffuser** Fountain Aquatic Bench Other:_____

Management (mark all): **Fish Stocking** **Monthly Treatments** Other: _____

Inspector	DMM	Inspection Date	7/14/2015
		Inspection Time	9:12

GENERAL CONDITIONS

Note: Inlets, Outlets, Forebays, Spillways	Structure ID No.	Location	Description (size, material, features)	Observations (problems, repairs, other maintenance)	**Action Required?**
Inlet	12K 51	E Side	24" RCP FE	Good Condition	No
Inlet	13K 169	S Side	36" RCP FE	Good Condition	No
Inlet	13K 170	S Side	36" RCP FE	Good Condition	No
Outlet	12K 54	NW Side	36" RCP FE	Good Condition	No
Outlet	12K 55	NW Side	36" RCP FE	Good Condition	No
Average Natural Buffer Width (ft)			1		

Bank Vegetation	Major Vegetation Types	% Cover	Observations/Concerns	
(Water to 30ft upslope)	Forest/Woodland	0		
	Shrubland	0		
	Natural Grassland	1		
	Maintained Turf	99		
	Total	100		
	Cattails	0		
	Undesirable Plants in Natural Buffer	30		
	Other Species of Note			

Aquatic	Major Vegetation Types	% Cover	Observations/Concerns	
(In the water)	Algae	12		
	Submergents	15		
	Other Aquatic Species of Note			

Fish Reported	Recorded/Observed Species	Comments	
	Primary game fish: LMB, C, BLG Secondary game fish: CCF Common carp: N	Stocked fish (since 2010): LMB	

NW-04	Add Notes In Boxes
Opportunities for Improved Runoff Management in Vicinity	wider buffer; opportunities for infiltration/treatment
Opportunities for Inlet, Outlet, Forebay or Spillway Retrofit	Drain tile major eroding inlet to new basin to the north
Safety Concerns/Hazards	
Maintenance Needs (mark all) Trash Mowing Weeds Dredging	
Other Comments	

CONDITION RATING

Stormwater & Water Quality	Check One	
Storage (Max/Design Depth)		
Design Max Depth (ft): 16.5		
Measured Max Depth (ft): 17	X	Acceptable (≥75%)
Meas. / Design Max Depths (%): 103		Unacceptable (<75%)
Water Clarity (Secchi Disk Depth)		Good (>4 ft)
Feet: 3.5	X	Fair (2-4 ft)
		Poor (<2 ft)
Eroding/Unstable Banks (% of edge)		Good (<1%)
Percent: 3	X	Fair (1-5%)
		Poor (>5%)

Recreation & Aesthetics		
Algae Growth		Good (<5%)
Percent: 12	X	Fair (5-25%)
		Poor (>25%)
Undesirable Plant Cover in Buffer		Good (<5%)
Percent: 30		Fair (5-25%)
	X	Poor (>25%)
Fishing Resource		Good (anglers regularly report catching desirable fish)
	X	Fair (anglers sometimes report catching desirable fish)
		Poor (no or few fish)
Public Use (observed)		High (>5 people)
	X	Moderate (1-5 people)
		Low (no people)

Wildlife & Ecology		
Wildlife Use		Good (>100 individuals in all groups)
Species: Canada Goose (32), other birds, many Odonata, paint. turtle	X	Fair (25-100 individuals in all groups)
		Poor (<25 individuals in all groups)
Plant Diversity		Good (>50 species)
		Fair (10-50 species)
	X	Poor (<10 species)
Infrastructure Condition	X	Good (no repairs needed)
Notes:		Fair (minor repairs; functional only)
		Poor (major repairs/replacements, functional/safety)

IDENTIFIERS & GENERAL INFORMATION

Site Name	Georgetown South Basin	Basin ID	NW-05
Location	NW Ash Dr. & NW Georgetown Blvd.		
Classification	Sm Recr&Det Basin	Design High Water Elev.	NA
Size (ac)	0.87	Design Normal Water Elev.	970
Watershed Size (ac)	57.86	Design Max Depth (ft)	13
Watershed Imperv. Cover (%)	33	Design Avg Depth (ft)	10

Features (mark all): Trail Dock/Pier **Diffuser** **Fountain** Aquatic Bench Other:_____

Management (mark all): **Fish Stocking** **Monthly Treatments** Other: _____

Inspector	DMM	Inspection Date	7/14/2015
		Inspection Time	10:06

GENERAL CONDITIONS

Note: Inlets, Outlets, Forebays, Spillways	Structure ID No.	Location	Description (size, material, features)	Observations (problems, repairs, other maintenance)	**Action Required?**
Inlet	13K 20	SW Side	30" RCP FE	Exposed rebar, apron broken	Yes
Inlet	13K 21	SW Side	12" RCP FE	Not found (may not exist?)	Verify
Inlet	13K 71	W Corner	42" RCP FE	Good Condition	No
Outlet	13K 215	N Corner	36" RCP FE	Good Condition	No
Outlet	13K 171	N Corner	36" RCP FE	Good Condition	No
Average Natural Buffer Width (ft)			1		

Bank Vegetation	Major Vegetation Types	% Cover	Observations/Concerns	
(Water to 30ft upslope)	Forest/Woodland	0		
	Shrubland	0		
	Natural Grassland	1		
	Maintained Turf	99		
	Total	100		
	Cattails	0		
	Undesirable Plants in Natural Buffer	30		
	Other Species of Note			

Aquatic	Major Vegetation Types	% Cover	Observations/Concerns	
(In the water)	Algae	35		
	Submergents	50		
	Other Aquatic Species of Note			

Fish Reported	Recorded/Observed Species	Comments
	Primary game fish: BLG Secondary game fish: LMB, CCF, G, H Common carp: N	LMB observed.

NW-05	Add Notes In Boxes
Opportunities for Improved Runoff Management in Vicinity	wider buffer; opportunities for infiltration/treatment; NE slope saturated/puddles - create no mow native garden
Opportunities for Inlet, Outlet, Forebay or Spillway Retrofit	Repair broken 30" RCP inlet wing wall, remove exposed rebar.
Safety Concerns/Hazards	Sinkholes and depressed channels are all around the basin; exposed rebar on 30" RCP inlet
Maintenance Needs (mark all) Trash Mowing Weeds Dredging	
Other Comments	

CONDITION RATING

Stormwater & Water Quality

	Check One	
Storage (Max/Design Depth)		
Design Max Depth (ft):13		
Measured Max Depth (ft): 9		Acceptable (≥75%)
Meas. / Design Max Depths (%): 69	X	Unacceptable (<75%)
Water Clarity (Secchi Disk Depth)	X	Good (>4 ft)
Feet: 5.8		Fair (2-4 ft)
		Poor (<2 ft)
Eroding/Unstable Banks (% of edge)	X	Good (<1%)
Percent: <1		Fair (1-5%)
		Poor (>5%)

Recreation & Aesthetics

Algae Growth		Good (<5%)
Percent: 35		Fair (5-25%)
	X	Poor (>25%)
Undesirable Plant Cover in Buffer		Good (<5%)
Percent: 30		Fair (5-25%)
	X	Poor (>25%)
Fishing Resource	X	Good (anglers regularly report catching desirable fish)
		Fair (anglers sometimes report catching desirable fish)
		Poor (no or few fish)
Public Use (observed)		High (>5 people)
	X	Moderate (1-5 people)
		Low (no people)

Wildlife & Ecology

Wildlife Use	X	Good (>100 individuals in all groups)
		Fair (25-100 individuals in all groups)
Species: Birds, many Odonata, frogs		Poor (<25 individuals in all groups)
Plant Diversity		Good (>50 species)
		Fair (10-50 species)
	X	Poor (<10 species)
Infrastructure Condition		Good (no repairs needed)
Notes:	X	Fair (minor repairs; functional only)
		Poor (major repairs/replacements, functional/safety)

IDENTIFIERS & GENERAL INFORMATION

Site Name	Prairie Lakes North Basin	Basin ID	NW-06
Location	NW 18th St. & NW State Street		
Classification	Md Recr&Det Basin	Design High Water Elev.	960.25
Size (ac)	3.46	Design Normal Water Elev.	958
Watershed Size (ac)	186.94	Design Max Depth (ft)	13
Watershed Imperv. Cover (%)	27	Design Avg Depth (ft)	10

Features (mark all): **Trail** Dock/Pier Diffuser Fountain Aquatic Bench Other:_____

Management (mark all): **Fish Stocking** Treatments Other:_____

Inspector	DMM	Inspection Date	7/14/2015
		Inspection Time	11:08

GENERAL CONDITIONS

Note: Inlets, Outlets, Forebays, Spillways	Structure ID No.	Location	Description (size, material, features)	Observations (problems, repairs, other maintenance)	**Action Required?**
Outlet	14I 53	SW Corner	Iowa DOT SW 513	Good Condition	No
Outlet	14I 51	SW Corner	Iowa DOT SW 513	Good Condition	No
Inlet	14I 107	N Side	24" RCP FE	Good Condition	No
Inlet	14I 117	N Side	12" RCP FE	Sinkhole at pipe location	Inspect
Inlet	14I 49	NE Corner	48" RCP FE	Missing Trash Rack	Yes
Inlet	14I 46	NE Corner	36" RCP FE	Good Condition	No
Inlet	14I 47	NE Corner	36" RCP FE	Good Condition	No
Inlet	14I 48	NE Corner	36" RCP FE	Good Condition	No
Inlet	14I 149	SE Corner	12" RCP FE	Missing Trash Rack	Yes

Average Natural Buffer Width (ft)				
		1		
Bank Vegetation	**Major Vegetation Types**	**% Cover**	**Observations/Concerns**	
(Water to 30ft upslope)	Forest/Woodland	2		
	Shrubland	3		
	Natural Grassland	2		
	Maintained Turf	93		
	Total	100		
	Cattails	0		
	Undesirable Plants in Natural Buffer	30		
	Other Species of Note			
Aquatic	**Major Vegetation Types**	**% Cover**	**Observations/Concerns**	
(In the water)	Algae	50		
	Submergents	50		
	Other Aquatic Species of Note			
Fish Reported	**Recorded/Observed Species**		**Comments**	
	Primary game fish: BLG, C, LMB, P, H Secondary game fish: none Common carp: Y			

NW-06	Add Notes In Boxes
Opportunities for Improved Runoff Management in Vicinity	wider buffer; opportunities for infiltration/treatment
Opportunities for Inlet, Outlet, Forebay or Spillway Retrofit	Missing trash racks on two inlets; 12" RCP on north side not found, and should be inspected further.
Safety Concerns/Hazards	Erosion and some pipes create tripping hazard.
Maintenance Needs (mark all) Trash Mowing Weeds Dredging	
Other Comments	Small patches of diverse native shoreline vegetation left unmowed.

CONDITION RATING

Stormwater & Water Quality	Check One	
Storage (Max/Design Depth)		
Design Max Depth (ft): 13		
Measured Max Depth (ft): 13	X	Acceptable (≥75%)
Meas. / Design Max Depths (%): 100		Unacceptable (<75%)
Water Clarity (Secchi Disk Depth)		Good (>4 ft)
Feet: 3.1	X	Fair (2-4 ft)
		Poor (<2 ft)
Eroding/Unstable Banks (% of edge)	X	Good (<1%)
Percent: <1		Fair (1-5%)
		Poor (>5%)

Recreation & Aesthetics		
Algae Growth		Good (<5%)
Percent: 50		Fair (5-25%)
	X	Poor (>25%)
Undesirable Plant Cover in Buffer		Good (<5%)
Percent: 30		Fair (5-25%)
	X	Poor (>25%)
Fishing Resource	X	Good (anglers regularly report catching desirable fish)
		Fair (anglers sometimes report catching desirable fish)
		Poor (no or few fish)
Public Use (observed)		High (>5 people)
		Moderate (1-5 people)
	X	Low (no people)

Wildlife & Ecology		
Wildlife Use		Good (>100 individuals in all groups)
	X	Fair (25-100 individuals in all groups)
Species: Birds, many Odonata		Poor (<25 individuals in all groups)
Plant Diversity		Good (>50 species)
	X	Fair (10-50 species)
		Poor (<10 species)
Infrastructure Condition		Good (no repairs needed)
Notes:	X	Fair (minor repairs; functional only)
		Poor (major repairs/replacements, functional/safety)

IDENTIFIERS & GENERAL INFORMATION

Site Name	Prairie Lakes South Basin	Basin ID	NW-07
Location	NW Bay View Ct. & NW Prairie Lakes Dr.		
Classification	Md Recr&Det Basin	Design High Water Elev.	956.37
Size (ac)	3.02	Design Normal Water Elev.	953.5
Watershed Size (ac)	214.45	Design Max Depth (ft)	22
Watershed Imperv. Cover (%)	27	Design Avg Depth (ft)	12

Features (mark all): **Trail** Dock/Pier Diffuser Fountain Aquatic Bench Other:_____

Management (mark all): **Fish Stocking** Treatments Other:_____

Inspector	DMM	Inspection Date	7/14/2015
		Inspection Time	11:19

GENERAL CONDITIONS

Note: Inlets, Outlets, Forebays, Spillways	Structure ID No.	Location	Description (size, material, features)	Observations (problems, repairs, other maintenance)	**Action Required?**
Inlet	14I 126	NE Corner	24" RCP FE	Good Condition	No
Inlet	14I 52	NE Corner	36" RCP FE	Good Condition	No
Inlet	14I 54	NE Corner	36" RCP FE	Good Condition	No
Inlet	14I 140	NE Corner	18" RCP FE	Good Condition	No
Inlet	14I 97	NW Corner	24" RCP FE	Good Condition	No
Outlet	14I 157	W Corner	42" RCP FE	Good Condition	No
Outlet	14I 159	W Corner	42" RCP FE	Good Condition	No

Average Natural Buffer Width (ft)				
		1		
Bank Vegetation	**Major Vegetation Types**	**% Cover**	**Observations/Concerns**	
(Water to 30ft upslope)	Forest/Woodland	0		
	Shrubland	0		
	Natural Grassland	1		
	Maintained Turf	99		
	Total	100		
	Cattails	0		
	Undesirable Plants in Natural Buffer	30		
	Other Species of Note			
Aquatic	**Major Vegetation Types**	**% Cover**	**Observations/Concerns**	
(In the water)	Algae	<1		
	Submergents	0		
	Other Aquatic Species of Note			
Fish Reported	**Recorded/Observed Species**		**Comments**	
	Primary game fish: BLG, C, LMB Secondary game fish: none Common carp: Y		Many carp & other fish observed.	

NW-07	Add Notes In Boxes
Opportunities for Improved Runoff Management in Vicinity	wider buffer; limited opportunities for infiltration/treatment
Opportunities for Inlet, Outlet, Forebay or Spillway Retrofit	
Safety Concerns/Hazards	Rubble and erosion can cause tripping hazards.
Maintenance Needs (mark all) Trash Mowing Weeds Dredging	
Other Comments	Steep slopes mowed; would be safer and cheaper as buffer.

CONDITION RATING

Stormwater & Water Quality	Check One	
Storage (Max/Design Depth)		
Design Max Depth (ft): 22		
Measured Max Depth (ft): 20	X	Acceptable (≥75%)
Meas. / Design Max Depths (%): 91		Unacceptable (<75%)
Water Clarity (Secchi Disk Depth)		Good (>4 ft)
Feet: 2.2	X	Fair (2-4 ft)
		Poor (<2 ft)
Eroding/Unstable Banks (% of edge)		Good (<1%)
Percent: 4	X	Fair (1-5%)
		Poor (>5%)

Recreation & Aesthetics		
Algae Growth	X	Good (<5%)
Percent: <1		Fair (5-25%)
		Poor (>25%)
Undesirable Plant Cover in Buffer		Good (<5%)
Percent: 30		Fair (5-25%)
	X	Poor (>25%)
Fishing Resource		Good (anglers regularly report catching desirable fish)
		Fair (anglers sometimes report catching desirable fish)
	X	Poor (no or few fish)
Public Use (observed)		High (>5 people)
		Moderate (1-5 people)
	X	Low (no people)

Wildlife & Ecology		
Wildlife Use		Good (>100 individuals in all groups)
Species: Mallards (16), Odonata, many fish (incl. carp)	X	Fair (25-100 individuals in all groups)
		Poor (<25 individuals in all groups)
Plant Diversity		Good (>50 species)
		Fair (10-50 species)
	X	Poor (<10 species)
Infrastructure Condition	X	Good (no repairs needed)
Notes:		Fair (minor repairs; functional only)
		Poor (major repairs/replacements, functional/safety)

IDENTIFIERS & GENERAL INFORMATION

Site Name	Prairie Ridge Complex N. Basin	Basin ID	NW-08
Location	NW 18th St. & NW Ash Dr.		
Classification	Lg Recr&Det Basin	Design High Water Elev.	966.02
Size (ac)	5.16	Design Normal Water Elev.	963.22
Watershed Size (ac)	114.02	Design Max Depth (ft)	NA
Watershed Imperv. Cover (%)	29	Design Avg Depth (ft)	NA

Features (mark all): **Trail** Dock/Pier Diffuser **Fountain** Aquatic Bench Other:_____
Management (mark all): **Fish Stocking** **Monthly Treatments** Other: _____

Inspector	DMM	Inspection Date	7/14/2015
		Inspection Time	12:15

GENERAL CONDITIONS

Note: Inlets, Outlets, Forebays, Spillways	Structure ID No.	Location	Description (size, material, features)	Observations (problems, repairs, other maintenance)	**Action Required?**
Inlet	14J 49	W Corner	24" RCP FE	Good Condition	No
Outlet	14J 45	W Corner	2 24" RCPs & Weir	Good Condition	No
Inlet	14J 110	W Edge	12" RCP FE	Missing Trash Rack	Yes
Inlet	14J 57	E Edge	12" RCP FE	Missing Trash Rack	Yes
Inlet	14J 50	NE Corner	15" RCP FE	Not Found; buried / silted?	Locate
Inlet	14J 36	NE Corner	30" RCP FE	Good Cond. Measured 27" dia.	No
Inlets	14J 30&29	NE Corner	36" RCP FE	Good Condition	No
Inlet	14J 27	N Edge	15" RCP FE	Not Found; buried / silted?	Locate
Inlet	14J 66	SW Corner	24" RCP FE	Good Condition	No
2 Inlets	14J 71&105	S Edge	12" RCP FE	Erosion Under Aprons	Yes
Inlet	14J 103	SE Corner	24" RCP FE	Good Condition	No
Inlet	14J 43	SE Corner	48" RCP FE	Good Condition	No
Inlet	14J 62	N side, S lobe	12" RCP FE	Broken Trash Rack	Yes

Average Natural Buffer Width (ft)		<1		
Bank Vegetation	Major Vegetation Types	% Cover	Observations/Concerns	
(Water to 30ft upslope)	Forest/Woodland	0		
	Shrubland	1		
	Natural Grassland	1		
	Maintained Turf	98		
	Total	100		
	Cattails	3		
	Undesirable Plants in Natural Buffer	40		
	Other Species of Note			
Aquatic	Major Vegetation Types	% Cover	Observations/Concerns	
(In the water)	Algae	1		
	Submergents	0		
	Other Aquatic Species of Note			
Fish Reported	Recorded/Observed Species		Comments	
	Primary game fish: BLG, C, LMB Secondary game fish: H Common carp: Y			

NW-08	Add Notes In Boxes
Opportunities for Improved Runoff Management in Vicinity	wider buffer; many opportunities to retrofit turf swales/inlets
Opportunities for Inlet, Outlet, Forebay or Spillway Retrofit	Undermining of two small inlets occurring on south end. NE corner and N side inlets should be cleared of debris / muck and located.
Safety Concerns/Hazards	Sinkholes and erosion create tripping hazards along bank
Maintenance Needs (mark all) Trash Mowing Weeds Dredging	Erosion/sloughing banks
Other Comments	

CONDITION RATING

Stormwater & Water Quality	Check One	
Storage (Max/Design Depth)		
Design Max Depth (ft): NA		
Measured Max Depth (ft): 13		Acceptable (≥75%)
Meas. / Design Max Depths (%): NA		Unacceptable (<75%)
Water Clarity (Secchi Disk Depth)		Good (>4 ft)
Feet: 4	X	Fair (2-4 ft)
		Poor (<2 ft)
Eroding/Unstable Banks (% of edge)		Good (<1%)
Percent: 2	X	Fair (1-5%)
		Poor (>5%)

Recreation & Aesthetics		
Algae Growth	X	Good (<5%)
Percent: 1		Fair (5-25%)
		Poor (>25%)
Undesirable Plant Cover in Buffer		Good (<5%)
Percent: 40		Fair (5-25%)
	X	Poor (>25%)
Fishing Resource		Good (anglers regularly report catching desirable fish)
		Fair (anglers sometimes report catching desirable fish)
	X	Poor (no or few fish)
Public Use (observed)		High (>5 people)
		Moderate (1-5 people)
	X	Low (no people)

Wildlife & Ecology		
Wildlife Use		Good (>100 individuals in all groups)
Species: Birds, many Odonata, snapping turtle	X	Fair (25-100 individuals in all groups)
		Poor (<25 individuals in all groups)
Plant Diversity		Good (>50 species)
	X	Fair (10-50 species)
		Poor (<10 species)
Infrastructure Condition		Good (no repairs needed)
Notes:	X	Fair (minor repairs; functional only)
		Poor (major repairs/replacements, functional/safety)

IDENTIFIERS & GENERAL INFORMATION

Site Name	Prairie Ridge Complex S. Basin	Basin ID	NW-09
Location	NW State St. & NW Prairie Ridge Dr.		
Classification	Lg Recr&Det Basin	Design High Water Elev.	967
Size (ac)	4.86	Design Normal Water Elev.	964
Watershed Size (ac)	85.06	Design Max Depth (ft)	15
Watershed Imperv. Cover (%)	21	Design Avg Depth (ft)	10

Features (mark all): Trail Dock/Pier Diffuser Fountain Aquatic Bench Other:_____

Management (mark all): **Fish Stocking** **Monthly Treatments** Other: _____

Inspector	DMM	Inspection Date	7/14/2015
		Inspection Time	12:45

GENERAL CONDITIONS

Note: Inlets, Outlets, Forebays, Spillways	Structure ID No.	Location	Description (size, material, features)	Observations (problems, repairs, other maintenance)	**Action Required?**
Inlet	14J 178	S Corner	18" RCP FE	Missing Trash Rack	Yes
Inlet	14J 184	SW Edge	18" RCP FE	Fair Condition	No
Inlet	14J 188	SW Edge	12" RCP FE	Trash in Trash Rack	Yes
Outlets	14J 09&42	W Corner	Twin 36" RCP FE	Broken Trash Rack	Yes
Inlet	14J 175	NW Corner	12" RCP FE	Trash in Trash Rack	Yes
Inlet	14J 170	NW Edge	15" RCP FE	Broken Trash Rack	Yes
Inlets	14J164,161	N Edge	12" RCP FE	Partially Silted in	Monitor
Inlet	14J 159	N Edge	18" RCP FE	Fair Condition	No
Inlet	14J 148	NE Edge	12" RCP FE	Good Condition	Yes
Inlet	14J 137	E Corner	18" RCP FE	Partially Uncovered, Eroded	Yes
Inlet	14J 146	SE Edge	24" RCP FE	Broken Wing wall	Monitor
Inlet	14J 218	SE Edge	18" RCP FE	Fair Condition	No
Inlets	14J 226-8	S Corner	8" PVC	Fair Condition	No
Average Natural Buffer Width (ft)			<1		
Bank Vegetation	Major Vegetation Types		% Cover	Observations/Concerns	
(Water to 30ft upslope)	Forest/Woodland		0		
	Shrubland		<1		
	Natural Grassland		<1		
	Maintained Turf		99		
	Total		100		
	Cattails		0		
	Undesirable Plants in Natural Buffer		30		
	Other Species of Note				
Aquatic	Major Vegetation Types		% Cover	Observations/Concerns	
(In the water)	Algae		2		
	Submergents		<1		
	Other Aquatic Species of Note				
Fish Reported	Recorded/Observed Species			Comments	
	Primary game fish: BLG, C, LMB Secondary game fish: H, G, CCF Common carp: Y				

NW-09	Add Notes In Boxes
Opportunities for Improved Runoff Management in Vicinity	wider buffer; many opportunities to retrofit turf swales/inlets
Opportunities for Inlet, Outlet, Forebay or Spillway Retrofit	Fix or remove collapsing retaining wall. Replace missing trash racks.
Safety Concerns/Hazards	Eroded hole just east of NW culvert; steep banks.
Maintenance Needs (mark all) Trash Mowing Weeds Dredging	
Other Comments	

CONDITION RATING

Stormwater & Water Quality	Check One	
Storage (Max/Design Depth)		
Design Max Depth (ft)		
Measured Max Depth (ft): 15	X	Acceptable (≥75%)
Meas. / Design Max Depths (%): 100		Unacceptable (<75%)
Water Clarity (Secchi Disk Depth)		Good (>4 ft)
Feet: 2	X	Fair (2-4 ft)
		Poor (<2 ft)
Eroding/Unstable Banks (% of edge)		Good (<1%)
Percent: 5	X	Fair (1-5%)
		Poor (>5%)

Recreation & Aesthetics		
Algae Growth	X	Good (<5%)
Percent: 2		Fair (5-25%)
		Poor (>25%)
Undesirable Plant Cover in Buffer		Good (<5%)
Percent: 30		Fair (5-25%)
	X	Poor (>25%)
Fishing Resource		Good (anglers regularly report catching desirable fish)
	X	Fair (anglers sometimes report catching desirable fish)
		Poor (no or few fish)
Public Use (observed)	X	High (>5 people)
		Moderate (1-5 people)
		Low (no people)

Wildlife & Ecology		
Wildlife Use		Good (>100 individuals in all groups)
	X	Fair (25-100 individuals in all groups)
Species: Birds, Odonata, crayfish		Poor (<25 individuals in all groups)
Plant Diversity		Good (>50 species)
		Fair (10-50 species)
	X	Poor (<10 species)
Infrastructure Condition		Good (no repairs needed)
Notes:	X	Fair (minor repairs; functional only)
		Poor (major repairs/replacements, functional/safety)

IDENTIFIERS & GENERAL INFORMATION

Site Name	Horizon Park Basin	Basin ID	NW-10
Location	NW State St. & NW Prairie Ridge Dr.		
Classification	Sm Recr&Det Basin	Design High Water Elev.	NA
Size (ac)	0.99	Design Normal Water Elev.	963
Watershed Size (ac)	99.31	Design Max Depth (ft)	15
Watershed Imperv. Cover (%)	20	Design Avg Depth (ft)	8

Features (mark all): **Trail** Dock/Pier Diffuser Fountain Aquatic Bench Other:_____

Management (mark all): Fish Stocking Treatments Other:_____

Inspector	DMM	Inspection Date	7/14/2015
		Inspection Time	13:00

GENERAL CONDITIONS

Note: Inlets, Outlets, Forebays, Spillways	Structure ID No.	Location	Description (size, material, features)	Observations (problems, repairs, other maintenance)	**Action Required?**
Inlet	14J 08	NE Corner	36" RCP FE	Good Condition	No
Inlet	14J 41	NE Corner	36" RCP FE	Good Condition	No
Inlet	14J 07	NE Corner	15" RCP FE	Not found; buried / silted?	Locate
Outlet	14I 42	W Corner	48" RCP FE	Good Condition	No
Outlet	14I 41	W Corner	48" RCP FE	Missing Trash Rack	Yes

Average Natural Buffer Width (ft)		2		
Bank Vegetation	Major Vegetation Types	% Cover	Observations/Concerns	
(Water to 30ft upslope)	Forest/Woodland	5		
	Shrubland	20		
	Natural Grassland	5		
	Maintained Turf	70		
	Total	100		
	Cattails	3		
	Undesirable Plants in Natural Buffer	25		
	Other Species of Note			
Aquatic	Major Vegetation Types	% Cover	Observations/Concerns	
(In the water)	Algae	3		
	Submergents	4		
	Other Aquatic Species of Note			
Fish Reported	Recorded/Observed Species		Comments	
	Primary game fish: BLG Secondary game fish: none			

NW-10	Add Notes In Boxes
Opportunities for Improved Runoff Management in Vicinity	wider buffer
Opportunities for Inlet, Outlet, Forebay or Spillway Retrofit	Consider fixing the broken trail bridge; replace outlet trash rack. Locate buried inlet in swamp at SE corner.
Safety Concerns/Hazards	
Maintenance Needs (mark all) Trash Mowing Weeds Dredging	
Other Comments	

CONDITION RATING

Stormwater & Water Quality	Check One	
Storage (Max/Design Depth)		
Design Max Depth (ft): 15		
Measured Max Depth (ft): 14	X	Acceptable (≥75%)
Meas. / Design Max Depths (%): 93		Unacceptable (<75%)
Water Clarity (Secchi Disk Depth)		Good (>4 ft)
Feet: 2.2	X	Fair (2-4 ft)
		Poor (<2 ft)
Eroding/Unstable Banks (% of edge)	X	Good (<1%)
Percent: <1		Fair (1-5%)
		Poor (>5%)

Recreation & Aesthetics		
Algae Growth	X	Good (<5%)
Percent: 3		Fair (5-25%)
		Poor (>25%)
Undesirable Plant Cover in Buffer		Good (<5%)
Percent: 25	X	Fair (5-25%)
		Poor (>25%)
Fishing Resource		Good (anglers regularly report catching desirable fish)
		Fair (anglers sometimes report catching desirable fish)
	X	Poor (no or few fish)
Public Use (observed)		High (>5 people)
	X	Moderate (1-5 people)
		Low (no people)

Wildlife & Ecology		
Wildlife Use		Good (>100 individuals in all groups)
Species: Birds, many Odonata, Eastern cottontail	X	Fair (25-100 individuals in all groups)
		Poor (<25 individuals in all groups)
Plant Diversity		Good (>50 species)
		Fair (10-50 species)
	X	Poor (<10 species)
Infrastructure Condition		Good (no repairs needed)
Notes:	X	Fair (minor repairs; functional only)
		Poor (major repairs/replacements, functional/safety)

IDENTIFIERS & GENERAL INFORMATION

Site Name	Hawkeye Park Basin	Basin ID	NW-11
Location	NW Lakeshore Dr. & NW Ash Dr.		
Classification	Md Recr&Det Basin	Design High Water Elev.	983
Size (ac)	2.84	Design Normal Water Elev.	981
Watershed Size (ac)	42.12	Design Max Depth (ft)	11
Watershed Imperv. Cover (%)	34	Design Avg Depth (ft)	6

Features (mark all): Trail Dock/Pier Diffuser Fountain Aquatic Bench Other:_____

Management (mark all): **Fish Stocking** Treatments Other:_____

Inspector	DMM	Inspection Date	7/14/2015
		Inspection Time	14:28

GENERAL CONDITIONS

Note: Inlets, Outlets, Forebays, Spillways	Structure ID No.	Location	Description (size, material, features)	Observations (problems, repairs, other maintenance)	**Action Required?**
Inlet	15K 02	SW Corner	36" RCP FE	Good Condition	No
Outlet	15K 270	NE Corner	8" PVC	Fair Condition	No
Inlet	15K 180	S Side	8" RCP in conc.	Fair Condition	No
Inlet	15K 145	S Side	14" VCP in conc.	Old struct., seems functional	No
Average Natural Buffer Width (ft)			<1		

Bank Vegetation	Major Vegetation Types	% Cover	Observations/Concerns	
(Water to 30ft upslope)	Forest/Woodland	3		
	Shrubland	<1		
	Natural Grassland	1		
	Maintained Turf	95		
	Total	100		
	Cattails	0		
	Undesirable Plants in Natural Buffer	30		
	Other Species of Note			

Aquatic	Major Vegetation Types	% Cover	Observations/Concerns	
(In the water)	Algae	1		
	Submergents	<1		
	Other Aquatic Species of Note			

Fish Reported	Recorded/Observed Species	Comments
	Primary game fish: C, BLG, G Secondary game fish: YP, LMB, SMB Common carp: Y (and koi)	Fish observed.

NW-11	Add Notes In Boxes
Opportunities for Improved Runoff Management in Vicinity	wider buffer; opportunities for infiltration/treatment
Opportunities for Inlet, Outlet, Forebay or Spillway Retrofit	Old clay inlet seems obsolete, but functional. Single 8" PVC outlet offers little control. Water level seems to fluctuate widely.
Safety Concerns/Hazards	
Maintenance Needs (mark all) Trash Mowing Weeds Dredging	
Other Comments	

CONDITION RATING

Stormwater & Water Quality	Check One	
Storage (Max/Design Depth)		
Design Max Depth (ft): 11		
Measured Max Depth (ft): 10	X	Acceptable (≥75%)
Meas. / Design Max Depths (%): 91		Unacceptable (<75%)
Water Clarity (Secchi Disk Depth)		Good (>4 ft)
Feet: 2.9	X	Fair (2-4 ft)
		Poor (<2 ft)
Eroding/Unstable Banks (% of edge)		Good (<1%)
Percent: 3	X	Fair (1-5%)
		Poor (>5%)

Recreation & Aesthetics		
Algae Growth	X	Good (<5%)
Percent: 1		Fair (5-25%)
		Poor (>25%)
Undesirable Plant Cover in Buffer		Good (<5%)
Percent: 30		Fair (5-25%)
	X	Poor (>25%)
Fishing Resource		Good (anglers regularly report catching desirable fish)
		Fair (anglers sometimes report catching desirable fish)
	X	Poor (no or few fish)
Public Use (observed)		High (>5 people)
	X	Moderate (1-5 people)
		Low (no people)

Wildlife & Ecology		
Wildlife Use	X	Good (>100 individuals in all groups)
Species: Mallards (>70), other birds,		Fair (25-100 individuals in all groups)
Odonata, fish		Poor (<25 individuals in all groups)
Plant Diversity		Good (>50 species)
		Fair (10-50 species)
	X	Poor (<10 species)
Infrastructure Condition	X	Good (no repairs needed)
Notes:		Fair (minor repairs; functional only)
		Poor (major repairs/replacements, functional/safety)

IDENTIFIERS & GENERAL INFORMATION

Site Name	Cherry Glen East Basin	Basin ID	NW-12
Location	NW Abbie & NW 5th St.		
Classification	Md Recr&Det Basin	Design High Water Elev.	NA
Size (ac)	3.67	Design Normal Water Elev.	979
Watershed Size (ac)	50.59	Design Max Depth (ft)	22
Watershed Imperv. Cover (%)	20	Design Avg Depth (ft)	14

Features (mark all) **Trail** Dock/Pier **Diffuser** **Fountain** Aquatic Bench Other:_____

Management (mark all) **Fish Stocking** **Monthly Treatments** Other:_____

Inspector	DMM	Inspection Date	7/14/2015
		Inspection Time	15:28

GENERAL CONDITIONS

Note: Inlets, Outlets, Forebays, Spillways	Structure ID No.	Location	Description (size, material, features)	Observations (problems, repairs, other maintenance)	**Action Required?**
Outlet	15E 77	W Side	15" RCP FE	Good Cond., cattail clogged	No
Inlet	15E 101	NW Corner	15" RCP FE	Good Cond., cattail clogged	No
Inlet	15E 99	N Side	21" RCP FE	Good Condition	No
Inlet	15E 85	E Side	21" RCP FE	Not found	Verify
Inlet	15E 76	E Side	15" RCP FE	Good Cond., cattail clogged	No
Inlet	15E 10	SW Corner	21" RCP FE	Missing Trash Rack	Yes
Inlet/Grass Culvert	N/A	SE Corner	18" CPVC	Good Condition	No

Average Natural Buffer Width (ft)		4		
Bank Vegetation	Major Vegetation Types	% Cover	Observations/Concerns	
(Water to 30ft upslope)	Forest/Woodland	0		
	Shrubland	2		
	Natural Grassland	5		
	Maintained Turf	93		
	Total	100		
	Cattails	8		
	Undesirable Plants in Natural Buffer	40		
	Other Species of Note			
Aquatic	Major Vegetation Types	% Cover	Observations/Concerns	
(In the water)	Algae	30		
	Submergents	40		
	Other Aquatic Species of Note			
Fish Reported	Recorded/Observed Species		Comments	
	Stocked fish (since 2010): LMB, CCF, BLG			

NW-12	Add Notes In Boxes
Opportunities for Improved Runoff Management in Vicinity	wider buffer; opportunities for infiltration/treatment
Opportunities for Inlet, Outlet, Forebay or Spillway Retrofit	Eroded channel on NW Corner of basin. Many inlet structures silted in. One plan-shown inlet not found.
Safety Concerns/Hazards	
Maintenance Needs (mark all) Trash Mowing Weeds Dredging	Clear inlets/outlet of sediment & cattails. Replace missing Trash Rack.
Other Comments	

CONDITION RATING

Stormwater & Water Quality	Check One	
Storage (Max/Design Depth)		
Design Max Depth (ft): 22		
Measured Max Depth (ft): 22	X	Acceptable (≥75%)
Meas. / Design Max Depths (%): 100		Unacceptable (<75%)
Water Clarity (Secchi Disk Depth)		Good (>4 ft)
Feet: 2.9	X	Fair (2-4 ft)
		Poor (<2 ft)
Eroding/Unstable Banks (% of edge)	X	Good (<1%)
Percent: <1		Fair (1-5%)
		Poor (>5%)

Recreation & Aesthetics		
Algae Growth		Good (<5%)
Percent: 30		Fair (5-25%)
	X	Poor (>25%)
Undesirable Plant Cover in Buffer		Good (<5%)
Percent: 40		Fair (5-25%)
	X	Poor (>25%)
Fishing Resource	X	Good (anglers regularly report catching desirable fish)
		Fair (anglers sometimes report catching desirable fish)
		Poor (no or few fish)
Public Use (observed)		High (>5 people)
		Moderate (1-5 people)
	X	Low (no people)

Wildlife & Ecology		
Wildlife Use		Good (>100 individuals in all groups)
	X	Fair (25-100 individuals in all groups)
Species: Birds, Odonata		Poor (<25 individuals in all groups)
Plant Diversity		Good (>50 species)
	X	Fair (10-50 species)
		Poor (<10 species)
Infrastructure Condition		Good (no repairs needed)
Notes:	X	Fair (minor repairs; functional only)
		Poor (major repairs/replacements, functional/safety)

IDENTIFIERS & GENERAL INFORMATION

Site Name	Cherry Glen North Basin	Basin ID	NW-13
Location	NW 6th St. & NW Cherry Glen Dr.		
Classification	Md Recr&Det Basin	Design High Water Elev.	975.87
Size (ac)	2.53	Design Normal Water Elev.	973.5
Watershed Size (ac)	83.73	Design Max Depth (ft)	19
Watershed Imperv. Cover (%)	23	Design Avg Depth (ft)	9

Features (mark all): **Trail** Dock/Pier **Diffuser** **Fountain** Aquatic Bench Other:_____

Management (mark all): **Fish Stocking** **Monthly Treatments** Other:_____

Inspector	DMM	Inspection Date	7/14/2015
		Inspection Time	15:09

GENERAL CONDITIONS

Note: Inlets, Outlets, Forebays, Spillways	Structure ID No.	Location	Description (size, material, features)	Observations (problems, repairs, other maintenance)	**Action Required?**
Outlet	15E 229	NW Corner	18" RCP FE	Broken Trash Rack	Yes
Inlet	15E 230	NW Corner	15" RCP FE	Good Condition	No
Inlet	15E 247	N Side	21" RCP FE	Good Condition	No
Inlet	15E 133	NE Corner	36" RCP FE	Good Condition	No
Inlet	15E 224	S Side	15" RCP FE	Good Condition	No
Average Natural Buffer Width (ft)			15		

Bank Vegetation	Major Vegetation Types	% Cover	Observations/Concerns	
(Water to 30ft upslope)	Forest/Woodland	0		
	Shrubland	15		
	Natural Grassland	70		
	Maintained Turf	15		
	Total	100		
	Cattails	<1		
	Undesirable Plants in Natural Buffer	15		
	Other Species of Note			

Aquatic	Major Vegetation Types	% Cover	Observations/Concerns	
(In the water)	Algae	1		
	Submergents	15		
	Other Aquatic Species of Note			

Fish Reported	Recorded/Observed Species	Comments	
	Primary game fish: LMB, BLG, C Secondary game fish: none Common carp: N	Fish fry/minnows observed. Stocked fish (since 2010): WHA, LMB, CCF, BLG	

NW-13	Add Notes In Boxes
Opportunities for Improved Runoff Management in Vicinity	
Opportunities for Inlet, Outlet, Forebay or Spillway Retrofit	
Safety Concerns/Hazards	Steep Embankment and loose rip rap
Maintenance Needs (mark all) Trash Mowing Weeds Dredging	
Other Comments	

CONDITION RATING

Stormwater & Water Quality

	Check One	
Storage (Max/Design Depth)		
Design Max Depth (ft): 19		
Measured Max Depth (ft): 17	X	Acceptable (≥75%)
Meas. / Design Max Depths (%): 89		Unacceptable (<75%)
Water Clarity (Secchi Disk Depth)		Good (>4 ft)
Feet: 1.6	X	Fair (2-4 ft)
		Poor (<2 ft)
Eroding/Unstable Banks (% of edge)	X	Good (<1%)
Percent: 0		Fair (1-5%)
		Poor (>5%)

Recreation & Aesthetics

Algae Growth	X	Good (<5%)
Percent: 1		Fair (5-25%)
		Poor (>25%)
Undesirable Plant Cover in Buffer		Good (<5%)
Percent: 15	X	Fair (5-25%)
		Poor (>25%)
Fishing Resource	X	Good (anglers regularly report catching desirable fish)
		Fair (anglers sometimes report catching desirable fish)
		Poor (no or few fish)
Public Use (observed)		High (>5 people)
		Moderate (1-5 people)
	X	Low (no people)

Wildlife & Ecology

Wildlife Use		Good (>100 individuals in all groups)
	X	Fair (25-100 individuals in all groups)
Species: Birds, Odonata		Poor (<25 individuals in all groups)
Plant Diversity		Good (>50 species)
	X	Fair (10-50 species)
		Poor (<10 species)
Infrastructure Condition		Good (no repairs needed)
Notes:	X	Fair (minor repairs; functional only)
		Poor (major repairs/replacements, functional/safety)

IDENTIFIERS & GENERAL INFORMATION

Site Name	Cherry Glen South Basin	Basin ID	NW-14
Location	NW 4th St. & NW Mills Dr.		
Classification	Md Recr&Det Basin	Design High Water Elev.	980.03
Size (ac)	2.74	Design Normal Water Elev.	977
Watershed Size (ac)	56.69	Design Max Depth (ft)	20
Watershed Imperv. Cover (%)	30	Design Avg Depth (ft)	11

Features (mark all): Trail Dock/Pier **Diffuser** **Fountain** Aquatic Bench Other:_____

Management (mark all): **Fish Stocking** **Monthly Treatments** Other:_____

Inspector	DMM	Inspection Date	7/14/2015
		Inspection Time	15:50

GENERAL CONDITIONS

Note: Inlets, Outlets, Forebays, Spillways	Structure ID No.	Location	Description (size, material, features)	Observations (problems, repairs, other maintenance)	**Action Required?**
Outlet	15E 70	S Side	24" RCP FE	Good Cond., debris clogged	No
Inlet	15E 217	SW Corner	12" RCP From Swale	Good Cond., debris clogged	No
Inlet	15E 219	W Side	12" RCP FE	Good Cond., silted in	Monitor
Inlet	15 E 54	NW Corner	15" RCP FE	Good Condition	No
Inlet	15E 60	N Side	42" RCP FE	Good Condition	No
Inlet	15E 197	NE Corner	21" RCP FE	Good Condition	No
Inlet	15E 203	SE Corner	27" RCP FE	Good Condition	No
Average Natural Buffer Width (ft)			4		

Bank Vegetation	Major Vegetation Types	% Cover	Observations/Concerns	
(Water to 30ft upslope)	Forest/Woodland	0		
	Shrubland	3		
	Natural Grassland	7		
	Maintained Turf	90		
	Total	100		
	Cattails	8		
	Undesirable Plants in Natural Buffer	30		
	Other Species of Note			

Aquatic	Major Vegetation Types	% Cover	Observations/Concerns	
(In the water)	Algae	35		
	Submergents	25		
	Other Aquatic Species of Note			

Fish Reported	Recorded/Observed Species	Comments
	Primary game fish: BLG, LMB Secondary game fish: C Stocked fish (since 2010): WHA, LMB, CCF, BLG	Fish fry/minnows & BLG observed.

NW-14	Add Notes In Boxes
Opportunities for Improved Runoff Management in Vicinity	wider buffer
Opportunities for Inlet, Outlet, Forebay or Spillway Retrofit	
Safety Concerns/Hazards	
Maintenance Needs (mark all) Trash Mowing Weeds Dredging	Clear debris and vegetation at outlet and SW inlet.
Other Comments	

CONDITION RATING

Stormwater & Water Quality	Check One	
Storage (Max/Design Depth)		
Design Max Depth (ft): 20		
Measured Max Depth (ft): 23	X	Acceptable (≥75%)
Meas. / Design Max Depths (%): 115		Unacceptable (<75%)
Water Clarity (Secchi Disk Depth)		Good (>4 ft)
Feet: 3.8	X	Fair (2-4 ft)
		Poor (<2 ft)
Eroding/Unstable Banks (% of edge)	X	Good (<1%)
Percent: 0		Fair (1-5%)
		Poor (>5%)

Recreation & Aesthetics		
Algae Growth		Good (<5%)
Percent: 35		Fair (5-25%)
	X	Poor (>25%)
Undesirable Plant Cover in Buffer		Good (<5%)
Percent: 30		Fair (5-25%)
	X	Poor (>25%)
Fishing Resource		Good (anglers regularly report catching desirable fish)
	X	Fair (anglers sometimes report catching desirable fish)
		Poor (no or few fish)
Public Use (observed)		High (>5 people)
		Moderate (1-5 people)
	X	Low (no people)

Wildlife & Ecology		
Wildlife Use		Good (>100 individuals in all groups)
	X	Fair (25-100 individuals in all groups)
Species: Birds, frog, fish		Poor (<25 individuals in all groups)
Plant Diversity		Good (>50 species)
	X	Fair (10-50 species)
		Poor (<10 species)
Infrastructure Condition	X	Good (no repairs needed)
Notes:		Fair (minor repairs; functional only)
		Poor (major repairs/replacements, functional/safety)

IDENTIFIERS & GENERAL INFORMATION

Site Name	Watercrest Park Wetlands	Basin ID	NW-15
Location	NW 5th St. & NW Jackson Dr.		
Classification	Wetland	Design High Water Elev.	980.5
Size (ac)	2.45	Design Normal Water Elev.	978
Watershed Size (ac)	22.50	Design Max Depth (ft)	NA
Watershed Imperv. Cover (%)	23	Design Avg Depth (ft)	NA

Features (mark all): **Trail** Dock/Pier Diffuser Fountain Aquatic Bench Other:_____

Management (mark all): Fish Stocking Treatments Other:_____

Inspector	DMM	Inspection Date	7/14/2015
		Inspection Time	16:12

GENERAL CONDITIONS

Note: Inlets, Outlets, Forebays, Spillways	Structure ID No.	Location	Description (size, material, features)	Observations (problems, repairs, other maintenance)	**Action Required?**
Inlet	15F 122	SE Corner	18" RCP FE	Not Found	Verify
Inlet Pipe/Swale	N/A	SE Corner	2 18" PVC FEs	Good Condition	No
Outlet	15F 201	Middle	12" PVC	Not Found	Verify
Average Natural Buffer Width (ft)			NA		

Bank Vegetation	Major Vegetation Types	% Cover	Observations/Concerns	
(Water to 30ft upslope)	Forest/Woodland	2		
	Shrubland	2		
	Natural Grassland	96		
	Maintained Turf	0		
	Total	100		
	Cattails	60		
	Undesirable Plants in Natural Buffer	65		
	Other Species of Note			

Aquatic	Major Vegetation Types	% Cover	Observations/Concerns	
(In the water)	Algae	2		
	Submergents	0		
	Other Aquatic Species of Note			

Fish Reported	Recorded/Observed Species	Comments	
	No fish		

NW-15	Add Notes In Boxes
Opportunities for Improved Runoff Management in Vicinity	
Opportunities for Inlet, Outlet, Forebay or Spillway Retrofit	
Safety Concerns/Hazards	
Maintenance Needs (mark all) Trash Mowing Weeds Dredging	
Other Comments	Shallow, virtually no water.

CONDITION RATING

Stormwater & Water Quality	Check One	
Storage (Max/Design Depth)		
Design Max Depth (ft): NA		
Measured Max Depth (ft): NA		Acceptable (≥75%)
Meas. / Design Max Depths (%): NA		Unacceptable (<75%)
Water Clarity (Secchi Disk Depth)		Good (>4 ft)
Feet: NA		Fair (2-4 ft)
		Poor (<2 ft)
Eroding/Unstable Banks (% of edge)	X	Good (<1%)
Percent: 0		Fair (1-5%)
		Poor (>5%)

Recreation & Aesthetics		
Algae Growth	X	Good (<5%)
Percent: 2		Fair (5-25%)
		Poor (>25%)
Undesirable Plant Cover in Buffer		Good (<5%)
Percent: 65		Fair (5-25%)
	X	Poor (>25%)
Fishing Resource		Good (anglers regularly report catching desirable fish)
NA		Fair (anglers sometimes report catching desirable fish)
		Poor (no or few fish)
Public Use (observed)		High (>5 people)
		Moderate (1-5 people)
	X	Low (no people)

Wildlife & Ecology		
Wildlife Use		Good (>100 individuals in all groups)
		Fair (25-100 individuals in all groups)
Species: Birds, monarch butterfly	X	Poor (<25 individuals in all groups)
Plant Diversity		Good (>50 species)
Upper end of range; Very good native diversity	X	Fair (10-50 species)
		Poor (<10 species)
Infrastructure Condition	X	Good (no repairs needed)
Notes:		Fair (minor repairs; functional only)
		Poor (major repairs/replacements, functional/safety)

IDENTIFIERS & GENERAL INFORMATION

Site Name	Signature Basin	Basin ID	NW-16
Location	NW Abilene Rd. & NW 18th St.		
Classification	Md Recr&Det Basin	Design High Water Elev.	963
Size (ac)	2.66	Design Normal Water Elev.	960
Watershed Size (ac)	36.48	Design Max Depth (ft)	35
Watershed Imperv. Cover (%)	27	Design Avg Depth (ft)	19.5

Features (mark all) Trail Dock/Pier Diffuser Fountain Aquatic Bench Other:_____

Management (mark all) Fish Stocking **Monthly Treatments** Other: _____

Inspector	DMM	Inspection Date	7/14/2015
		Inspection Time	10:47

GENERAL CONDITIONS

Note: Inlets, Outlets, Forebays, Spillways	Structure ID No.	Location	Description (size, material, features)	Observations (problems, repairs, other maintenance)	**Action Required?**
Inlet	13J 233	SE Corner	24" RCP FE	Missing Trash Rack	Yes
Inlet	13J 322	SE Corner	15" RCP FE	Good Condition	No
Inlet	13J 221	SE Corner	24" RCP FE	Missing Trash Rack	Yes
Outlet	13J 249	SW Corner	30" RCP FE	Missing Trash Rack	Yes
Outlet	13J 248	SW Corner	30" RCP FE	Missing Trash Rack	Yes
Average Natural Buffer Width (ft)			2		

Bank Vegetation	Major Vegetation Types	% Cover	Observations/Concerns	
(Water to 30ft upslope)	Forest/Woodland	0		
	Shrubland	6		
	Natural Grassland	3		
	Maintained Turf	91		
	Total	100		
	Cattails	<1		
	Undesirable Plants in Natural Buffer	40		
	Other Species of Note			

Aquatic	Major Vegetation Types	% Cover	Observations/Concerns	
(In the water)	Algae	2		
	Submergents	5		
	Other Aquatic Species of Note			

Fish Reported	Recorded/Observed Species	Comments	
	Primary game fish: BLG, C, LMB, P, H Secondary game fish: none Common carp: N	BLG & dead bass observed.	

NW-16	Add Notes In Boxes
Opportunities for Improved Runoff Management in Vicinity	wider buffer; limited opportunities for infiltration/treatment
Opportunities for Inlet, Outlet, Forebay or Spillway Retrofit	
Safety Concerns/Hazards	4.5 ft. drop on eroded S shoreline.
Maintenance Needs (mark all) Trash Mowing Weeds Dredging	Erosion repair on S shoreline.
Other Comments	

CONDITION RATING

Stormwater & Water Quality	Check One	
Storage (Max/Design Depth)		
Design Max Depth (ft): 35		
Measured Max Depth (ft): 20		Acceptable (≥75%)
Meas. / Design Max Depths (%): 57	X	Unacceptable (<75%) - but unsure if constructed 35ft deep
Water Clarity (Secchi Disk Depth)	X	Good (>4 ft)
Feet: 8.6		Fair (2-4 ft)
		Poor (<2 ft)
Eroding/Unstable Banks (% of edge)		Good (<1%)
Percent: 30		Fair (1-5%)
	X	Poor (>5%)

Recreation & Aesthetics		
Algae Growth	X	Good (<5%)
Percent: 2		Fair (5-25%)
		Poor (>25%)
Undesirable Plant Cover in Buffer		Good (<5%)
Percent: 40		Fair (5-25%)
	X	Poor (>25%)
Fishing Resource	X	Good (anglers regularly report catching desirable fish)
		Fair (anglers sometimes report catching desirable fish)
		Poor (no or few fish)
Public Use (observed)		High (>5 people)
		Moderate (1-5 people)
	X	Low (no people)

Wildlife & Ecology		
Wildlife Use		Good (>100 individuals in all groups)
	X	Fair (25-100 individuals in all groups)
Species: Birds, Odonata, fish		Poor (<25 individuals in all groups)
Plant Diversity		Good (>50 species)
	X	Fair (10-50 species)
		Poor (<10 species)
Infrastructure Condition		Good (no repairs needed)
Notes:	X	Fair (minor repairs; functional only)
		Poor (major repairs/replacements, functional/safety)

IDENTIFIERS & GENERAL INFORMATION

Site Name	Hillside Park East Basin	Basin ID	SE-01
Location	SE Four Mile Dr. & SE 20th St.		
Classification	Sm Recr&Det Basin	Design High Water Elev.	904.77
Size (ac)	1.05	Design Normal Water Elev.	900
Watershed Size (ac)	128.88	Design Max Depth (ft)	14
Watershed Imperv. Cover (%)	4	Design Avg Depth (ft)	5

Features (mark all): Trail Dock/Pier **Diffuser** Fountain Aquatic Bench Other:_____

Management (mark all): **Fish Stocking** **Monthly Treatments** Other: _____

Inspector	DMM	Inspection Date	7/15/2015
		Inspection Time	12:18

GENERAL CONDITIONS

Note: Inlets, Outlets, Forebays, Spillways	Structure ID No.	Location	Description (size, material, features)	Observations (problems, repairs, other maintenance)	**Action Required?**
Inlet	18P 53	NE Side	24" RCP FE	Good Condition	No
Outlet	18P 21	W Side	SW 513 to 30" RCP	Good Condition	No
Manhole	18P 19	Between Basins	SW 401	Overgrown and lid ajar	Yes
Emergency Spillway	N/A	SW Corner	RC Overflow Weir	Minor Mower Chipping	No

Average Natural Buffer Width (ft)		6		
Bank Vegetation	Major Vegetation Types	% Cover	Observations/Concerns	
(Water to 30ft upslope)	Forest/Woodland	2		
	Shrubland	3		
	Natural Grassland	15		
	Maintained Turf	80		
	Total	100		
	Cattails	0		
	Undesirable Plants in Natural Buffer	50		
	Other Species of Note			
Aquatic	Major Vegetation Types	% Cover	Observations/Concerns	
(In the water)	Algae	40		
	Submergents	15		
	Other Aquatic Species of Note			
Fish Reported	Recorded/Observed Species		Comments	
	Primary game fish: none Secondary game fish: LMB Common carp: N			

SE-01	Add Notes In Boxes
Opportunities for Improved Runoff Management in Vicinity	wider buffer where currently turf
Opportunities for Inlet, Outlet, Forebay or Spillway Retrofit	
Safety Concerns/Hazards	
Maintenance Needs (mark all) Trash Mowing Weeds Dredging	
Other Comments	

CONDITION RATING

Stormwater & Water Quality	Check One	
Storage (Max/Design Depth)		
Design Max Depth (ft): 14		
Measured Max Depth (ft): 14	X	Acceptable (≥75%)
Meas. / Design Max Depths (%): 100		Unacceptable (<75%)
Water Clarity (Secchi Disk Depth)	X	Good (>4 ft)
Feet: 5.1		Fair (2-4 ft)
		Poor (<2 ft)
Eroding/Unstable Banks (% of edge)	X	Good (<1%)
Percent: 0		Fair (1-5%)
		Poor (>5%)

Recreation & Aesthetics		
Algae Growth		Good (<5%)
Percent: 40		Fair (5-25%)
	X	Poor (>25%)
Undesirable Plant Cover in Buffer		Good (<5%)
Percent: 50		Fair (5-25%)
	X	Poor (>25%)
Fishing Resource		Good (anglers regularly report catching desirable fish)
	X	Fair (anglers sometimes report catching desirable fish)
		Poor (no or few fish)
Public Use (observed)		High (>5 people)
		Moderate (1-5 people)
	X	Low (no people)

Wildlife & Ecology		
Wildlife Use		Good (>100 individuals in all groups)
	X	Fair (25-100 individuals in all groups)
Species: Birds, Odonata		Poor (<25 individuals in all groups)
Plant Diversity		Good (>50 species)
	X	Fair (10-50 species)
		Poor (<10 species)
Infrastructure Condition		Good (no repairs needed)
Notes:	X	Fair (minor repairs; functional only)
		Poor (major repairs/replacements, functional/safety)

IDENTIFIERS & GENERAL INFORMATION

Site Name	Hillside Park West Basin	Basin ID	SE-02
Location	SE Four Mile Dr. & SE 20th St.		
Classification	Sm Recr&Det Basin	Design High Water Elev.	890.77
Size (ac)	1.28	Design Normal Water Elev.	887
Watershed Size (ac)	136.48	Design Max Depth (ft)	16
Watershed Imperv. Cover (%)	5	Design Avg Depth (ft)	8

Features (mark all): Trail Dock/Pier Diffuser **Fountain** Aquatic Bench Other:_____

Management (mark all): **Fish Stocking** **Monthly Treatments** Other: _____

Inspector	DMM	Inspection Date	7/15/2015
		Inspection Time	12:04

GENERAL CONDITIONS

Note: Inlets, Outlets, Forebays, Spillways	Structure ID No.	Location	Description (size, material, features)	Observations (problems, repairs, other maintenance)	**Action Required?**
Inlet	18P 22	NE Corner	18" RCP FE	Trash Rack detached	Yes
Inlet	18P 18	N Side	42" RCP FE	Good Condition	No
Inlet	N/A	S Side	8" CPVC FE	Good Condition	Monitor
Outlet	18P 15	E Side	SW-513 to 30" RCP	Good Condition, Debris covered	Yes

Average Natural Buffer Width (ft)		7		
Bank Vegetation	Major Vegetation Types	% Cover	Observations/Concerns	
(Water to 30ft upslope)	Forest/Woodland	2		
	Shrubland	3		
	Natural Grassland	20		
	Maintained Turf	75		
	Total	100		
	Cattails	2		
	Undesirable Plants in Natural Buffer	50		
	Other Species of Note			
Aquatic	Major Vegetation Types	% Cover	Observations/Concerns	
(In the water)	Algae	50		
	Submergents	0		
	Other Aquatic Species of Note			
Fish Reported	Recorded/Observed Species		Comments	
	Primary game fish: none Secondary game fish: BLG Common carp: N			

SE-02	Add Notes In Boxes
Opportunities for Improved Runoff Management in Vicinity	wider buffer where currently turf
Opportunities for Inlet, Outlet, Forebay or Spillway Retrofit	Clear the derbis covering the outlet structure, Consider clearing some of the brush around the inlets for easier access
Safety Concerns/Hazards	
Maintenance Needs (mark all) Trash Mowing **Weeds** Dredging	Large patch of bull thistle near trail; Canada thistle also present.
Other Comments	

CONDITION RATING

Stormwater & Water Quality	Check One	
Storage (Max/Design Depth)		
Design Max Depth (ft): 16		
Measured Max Depth (ft): 14	X	Acceptable (≥75%)
Meas. / Design Max Depths (%): 88		Unacceptable (<75%)
Water Clarity (Secchi Disk Depth)	X	Good (>4 ft)
Feet: 9.2		Fair (2-4 ft)
		Poor (<2 ft)
Eroding/Unstable Banks (% of edge)	X	Good (<1%)
Percent: 0		Fair (1-5%)
		Poor (>5%)

Recreation & Aesthetics		
Algae Growth		Good (<5%)
Percent: 50		Fair (5-25%)
	X	Poor (>25%)
Undesirable Plant Cover in Buffer		Good (<5%)
Percent: 50		Fair (5-25%)
	X	Poor (>25%)
Fishing Resource		Good (anglers regularly report catching desirable fish)
	X	Fair (anglers sometimes report catching desirable fish)
		Poor (no or few fish)
Public Use (observed)		High (>5 people)
	X	Moderate (1-5 people)
		Low (no people)

Wildlife & Ecology		
Wildlife Use		Good (>100 individuals in all groups)
	X	Fair (25-100 individuals in all groups)
Species: Birds, frogs		Poor (<25 individuals in all groups)
Plant Diversity		Good (>50 species)
	X	Fair (10-50 species)
		Poor (<10 species)
Infrastructure Condition		Good (no repairs needed)
Notes:	X	Fair (minor repairs; functional only)
		Poor (major repairs/replacements, functional/safety)

IDENTIFIERS & GENERAL INFORMATION

Site Name	Springwood North Basin	Basin ID	SE-03
Location	SE Peachtree Dr. & SE Magnolia Dr.		
Classification	Sm Recr&Det Basin	Design High Water Elev.	NA
Size (ac)	1.63	Design Normal Water Elev.	938
Watershed Size (ac)	102.81	Design Max Depth (ft)	12
Watershed Imperv. Cover (%)	26	Design Avg Depth (ft)	5

Features (mark all): **Trail** Dock/Pier **Diffuser** **Fountain** Aquatic Bench Other:_____

Management (mark all): **Fish Stocking** **Monthly Treatments** Other: _____

Inspector	DMM	Inspection Date	7/15/2015
		Inspection Time	11:35

GENERAL CONDITIONS

Note: Inlets, Outlets, Forebays, Spillways	Structure ID No.	Location	Description (size, material, features)	Observations (problems, repairs, other maintenance)	**Action Required?**
Inlet	21L 07	W Side	18" RCP FE	Eroding	Rip rap
Inlet	21L 12	NE Corner	48" RCP FE	Erosion around apron	Rip rap
Inlet	21L 44	NE Corner	48" RCP FE	Erosion around apron	Rip rap
Inlet	21L 11	NW Corner	24" RCP FE	Broken apron, exposed rebar	Yes
Inlet	21L 16	E Side	15" RCP FE	Good Condition	No
Inlet	21L 46	SW Corner	12" RCP FE	Good Condition	No
Outlet	21L 50	SE Corner	RC Box, 2 24" RCPs	Good Condition	No

Average Natural Buffer Width (ft)		8		
Bank Vegetation	Major Vegetation Types	% Cover	Observations/Concerns	
(Water to 30ft upslope)	Forest/Woodland	25		
	Shrubland	5		
	Natural Grassland	15		
	Maintained Turf	55		
	Total	100		
	Cattails	0		
	Undesirable Plants in Natural Buffer	40		
	Other Species of Note			
Aquatic	Major Vegetation Types	% Cover	Observations/Concerns	
(In the water)	Algae	20		
	Submergents	2		
	Other Aquatic Species of Note			
Fish Reported	Recorded/Observed Species		Comments	
	Primary game fish: BLG, C, LMB, G, H Secondary game fish: none Common carp: N			

SE-03	Add Notes In Boxes
Opportunities for Improved Runoff Management in Vicinity	wider buffer on W; opportunities for infiltration/treatment
Opportunities for Inlet, Outlet, Forebay or Spillway Retrofit	Consider removing old fountain control boxes, add riprap around and under aprons to prevent further erosion; repair broken apron
Safety Concerns/Hazards	
Maintenance Needs (mark all) Trash Mowing Weeds Dredging	
Other Comments	

CONDITION RATING

Stormwater & Water Quality	Check One	
Storage (Max/Design Depth)		
Design Max Depth (ft): 12		
Measured Max Depth (ft): 13	X	Acceptable (≥75%)
Meas. / Design Max Depths (%): 108		Unacceptable (<75%)
Water Clarity (Secchi Disk Depth)	X	Good (>4 ft)
Feet: 5.9		Fair (2-4 ft)
		Poor (<2 ft)
Eroding/Unstable Banks (% of edge)	X	Good (<1%)
Percent: 0		Fair (1-5%)
		Poor (>5%)

Recreation & Aesthetics		
Algae Growth		Good (<5%)
Percent: 20	X	Fair (5-25%)
		Poor (>25%)
Undesirable Plant Cover in Buffer		Good (<5%)
Percent: 40		Fair (5-25%)
	X	Poor (>25%)
Fishing Resource	X	Good (anglers regularly report catching desirable fish)
		Fair (anglers sometimes report catching desirable fish)
		Poor (no or few fish)
Public Use (observed)		High (>5 people)
		Moderate (1-5 people)
	X	Low (no people)

Wildlife & Ecology		
Wildlife Use		Good (>100 individuals in all groups)
Species: Birds, many Odonata, monarch	X	Fair (25-100 individuals in all groups)
caterpillar, crayfish		Poor (<25 individuals in all groups)
Plant Diversity		Good (>50 species)
	X	Fair (10-50 species)
		Poor (<10 species)
Infrastructure Condition		Good (no repairs needed)
Notes:	X	Fair (minor repairs; functional only)
		Poor (major repairs/replacements, functional/safety)

IDENTIFIERS & GENERAL INFORMATION

Site Name	Springwood South Basin	Basin ID	SE-04
Location	SE 33rd St. & SE Jasmine Ct.		
Classification	Md Recr&Det Basin	Design High Water Elev.	954.1
Size (ac)	3.04	Design Normal Water Elev.	950.7
Watershed Size (ac)	220.83	Design Max Depth (ft)	19
Watershed Imperv. Cover (%)	30	Design Avg Depth (ft)	8

Features (mark all): **Trail** Dock/Pier **Diffuser** **Fountain** Aquatic Bench Other:_____

Management (mark all): **Fish Stocking** **Monthly Treatments** Other: _____

Inspector	DMM	Inspection Date	7/15/2015
		Inspection Time	9:41

GENERAL CONDITIONS

Note: Inlets, Outlets, Forebays, Spillways	Structure ID No.	Location	Description (size, material, features)	Observations (problems, repairs, other maintenance)	**Action Required?**
Inlet	20L 15	W Side	12" RCP FE	Missing Trash Rack	Yes
Inlet	20L 185	N Side	Conc. Channel	Good Condition	No
Inlet	N/A	N Side	<8" CPVC?	Hidden in bank	Monitor
Old RR Culvert	20L 183	E Side	30" CMP	Eroded channel	Rip rap
Outlet	20L 56	W Corner	18" RCP FE	Missing Trash Rack	Yes
Average Natural Buffer Width (ft)			<1		

Bank Vegetation	Major Vegetation Types	% Cover	Observations/Concerns	
(Water to 30ft upslope)	Forest/Woodland	0		
	Shrubland	0		
	Natural Grassland	1		
	Maintained Turf	99		
	Total	100		
	Cattails	0		
	Undesirable Plants in Natural Buffer	45		
	Other Species of Note			

Aquatic	Major Vegetation Types	% Cover	Observations/Concerns	
(In the water)	Algae	2		
	Submergents	1		
	Other Aquatic Species of Note			

Fish Reported	Recorded/Observed Species	Comments	
	Primary game fish: none Secondary game fish: C, BLG, LMB Common carp: Y	BLG observed.	

SE-04	Add Notes In Boxes
Opportunities for Improved Runoff Management in Vicinity	wider buffer; opportunities for infiltration/treatment
Opportunities for Inlet, Outlet, Forebay or Spillway Retrofit	Riprap could be improved on old east channel, replace the missing FE trash racks
Safety Concerns/Hazards	
Maintenance Needs (mark all) Trash Mowing Weeds Dredging	
Other Comments	

CONDITION RATING

Stormwater & Water Quality	Check One	
Storage (Max/Design Depth)		
Design Max Depth (ft): 19		
Measured Max Depth (ft): 18	X	Acceptable (≥75%)
Meas. / Design Max Depths (%): 95		Unacceptable (<75%)
Water Clarity (Secchi Disk Depth)		Good (>4 ft)
Feet: 2	X	Fair (2-4 ft)
		Poor (<2 ft)
Eroding/Unstable Banks (% of edge)		Good (<1%)
Percent: 1	X	Fair (1-5%)
		Poor (>5%)

Recreation & Aesthetics		
Algae Growth	X	Good (<5%)
Percent: 2		Fair (5-25%)
		Poor (>25%)
Undesirable Plant Cover in Buffer		Good (<5%)
Percent: 45		Fair (5-25%)
	X	Poor (>25%)
Fishing Resource		Good (anglers regularly report catching desirable fish)
		Fair (anglers sometimes report catching desirable fish)
	X	Poor (no or few fish)
Public Use (observed)		High (>5 people)
		Moderate (1-5 people)
	X	Low (no people)

Wildlife & Ecology		
Wildlife Use		Good (>100 individuals in all groups)
Species: Birds, Odonata, many crickets, frogs, crayfish	X	Fair (25-100 individuals in all groups)
		Poor (<25 individuals in all groups)
Plant Diversity		Good (>50 species)
	X	Fair (10-50 species)
		Poor (<10 species)
Infrastructure Condition		Good (no repairs needed)
Notes:	X	Fair (minor repairs; functional only)
		Poor (major repairs/replacements, functional/safety)

IDENTIFIERS & GENERAL INFORMATION

Site Name	Prairie Trail Wetland	Basin ID	SW-01a
Location	SW 16th St. & South Ankeny Blvd.		
Classification	Wetland	Design High Water Elev.	NA
Size (ac)	0.15	Design Normal Water Elev.	NA
Watershed Size (ac)	74.00	Design Max Depth (ft)	NA
Watershed Imperv. Cover (%)	27	Design Avg Depth (ft)	NA

Features (mark all): **Trail** Dock/Pier Diffuser Fountain Aquatic Bench Other:_____

Management (mark all): Fish Stocking Treatments Other:_____

Inspector	DMM	Inspection Date	7/15/2015
		Inspection Time	10:50

GENERAL CONDITIONS

Note: Inlets, Outlets, Forebays, Spillways	Structure ID No.	Location	Description (size, material, features)	Observations (problems, repairs, other maintenance)	**Action Required?**
NA					

Average Natural Buffer Width (ft)		10		
Bank Vegetation	Major Vegetation Types	% Cover	Observations/Concerns	
(Water to 30ft upslope)	Forest/Woodland	0		
	Shrubland	3		
	Natural Grassland	77		
	Maintained Turf	20		
	Total	100		
	Cattails	60		
	Undesirable Plants in Natural Buffer	85		
	Other Species of Note			
Aquatic	Major Vegetation Types	% Cover	Observations/Concerns	
(In the water)	Algae	0		
	Submergents	0		
	Other Aquatic Species of Note			
Fish Reported	Recorded/Observed Species		Comments	

SW-01a	Add Notes In Boxes
Opportunities for Improved Runoff Management in Vicinity	wider buffer
Opportunities for Inlet, Outlet, Forebay or Spillway Retrofit	
Safety Concerns/Hazards	
Maintenance Needs (mark all) Trash Mowing **Weeds** Dredging	
Other Comments	Basin is a flow-through wetland.

CONDITION RATING

Stormwater & Water Quality	Check One	
Storage (Max/Design Depth)		
Design Max Depth (ft): NA		
Measured Max Depth (ft): NA		Acceptable (≥75%)
Meas. / Design Max Depths (%): NA		Unacceptable (<75%)
Water Clarity (Secchi Disk Depth)		Good (>4 ft)
Feet: NA		Fair (2-4 ft)
		Poor (<2 ft)
Eroding/Unstable Banks (% of edge)	X	Good (<1%)
Percent: 0		Fair (1-5%)
		Poor (>5%)

Recreation & Aesthetics		
Algae Growth	X	Good (<5%)
Percent: 0		Fair (5-25%)
		Poor (>25%)
Undesirable Plant Cover in Buffer		Good (<5%)
Percent: 85		Fair (5-25%)
	X	Poor (>25%)
Fishing Resource		Good (anglers regularly report catching desirable fish)
NA		Fair (anglers sometimes report catching desirable fish)
		Poor (no or few fish)
Public Use (observed)		High (>5 people)
		Moderate (1-5 people)
	X	Low (no people)

Wildlife & Ecology		
Wildlife Use		Good (>100 individuals in all groups)
		Fair (25-100 individuals in all groups)
Species: Birds	X	Poor (<25 individuals in all groups)
Plant Diversity		Good (>50 species)
	X	Fair (10-50 species)
		Poor (<10 species)
Infrastructure Condition	X	Good (no repairs needed)
Notes:		Fair (minor repairs; functional only)
		Poor (major repairs/replacements, functional/safety)

IDENTIFIERS & GENERAL INFORMATION

Site Name	Prairie Trail N. Detention Basin	Basin ID	SW-01b
Location	SW 16th St. & South Ankeny Blvd.		
Classification	Detention Basin	Design High Water Elev.	NA
Size (ac)	0.47	Design Normal Water Elev.	NA
Watershed Size (ac)	85.19	Design Max Depth (ft)	8
Watershed Imperv. Cover (%)	26	Design Avg Depth (ft)	5

Features (mark all): **Trail** Dock/Pier Diffuser Fountain Aquatic Bench Other:_____

Management (mark all): Fish Stocking Treatments Other:_____

Inspector	DMM	Inspection Date	7/15/2015
		Inspection Time	11:02

GENERAL CONDITIONS

Note: Inlets, Outlets, Forebays, Spillways	Structure ID No.	Location	Description (size, material, features)	Observations (problems, repairs, other maintenance)	**Action Required?**
Inlet	18K 50	S Side	24" RCP FE	Good Condition	No
Inlet	18K 31	W Side	15" RCP FE	Good Condition	No
Inlet	18K 54	NW Corner	24" RCP FE	Good Condition	No
Inlet	18K 58	NE Corner	24" RCP FE	Good Condition	No
Outlet	18K 60	S Side	Iowa DOT SW-513	Good Condition	No
Average Natural Buffer Width (ft)			8		

Bank Vegetation	Major Vegetation Types	% Cover	Observations/Concerns	
(Water to 30ft upslope)	Forest/Woodland	0		
	Shrubland	8		
	Natural Grassland	60		
	Maintained Turf	32		
	Total	100		
	Cattails	1		
	Undesirable Plants in Natural Buffer	85		
	Other Species of Note			

Aquatic	Major Vegetation Types	% Cover	Observations/Concerns	
(In the water)	Algae	95		
	Submergents	NA		
	Other Aquatic Species of Note			

Fish Reported	Recorded/Observed Species	Comments	

SW-01b	Add Notes In Boxes
Opportunities for Improved Runoff Management in Vicinity	wider buffer
Opportunities for Inlet, Outlet, Forebay or Spillway Retrofit	Major erosion on NW side of basin, alge covering many intakes/outlets
Safety Concerns/Hazards	
Maintenance Needs (mark all) Trash Mowing **Weeds** Dredging	
Other Comments	

CONDITION RATING

Stormwater & Water Quality	Check One	
Storage (Max/Design Depth)		
Design Max Depth (ft): 8		
Measured Max Depth (ft): 9	X	Acceptable (≥75%)
Meas. / Design Max Depths (%): 113		Unacceptable (<75%)
Water Clarity (Secchi Disk Depth)	X	Good (>4 ft)
Feet: 5.8		Fair (2-4 ft)
		Poor (<2 ft)
Eroding/Unstable Banks (% of edge)		Good (<1%)
Percent: 2	X	Fair (1-5%)
		Poor (>5%)

Recreation & Aesthetics		
Algae Growth		Good (<5%)
Percent: 95		Fair (5-25%)
	X	Poor (>25%)
Undesirable Plant Cover in Buffer		Good (<5%)
Percent: 85		Fair (5-25%)
	X	Poor (>25%)
Fishing Resource		Good (anglers regularly report catching desirable fish)
NA		Fair (anglers sometimes report catching desirable fish)
		Poor (no or few fish)
Public Use (observed)		High (>5 people)
		Moderate (1-5 people)
	X	Low (no people)

Wildlife & Ecology		
Wildlife Use		Good (>100 individuals in all groups)
	X	Fair (25-100 individuals in all groups)
Species: Birds, many crickets		Poor (<25 individuals in all groups)
Plant Diversity		Good (>50 species)
	X	Fair (10-50 species)
		Poor (<10 species)
Infrastructure Condition	X	Good (no repairs needed)
Notes:		Fair (minor repairs; functional only)
		Poor (major repairs/replacements, functional/safety)

City of Ankeny - 2015 Public Stormwater Basin Study - Basin Characterization and Inspection Form

IDENTIFIERS & GENERAL INFORMATION

Site Name	Prairie Trail S. Detention Basin	Basin ID	SW-01c
Location	SW 16th St. & South Ankeny Blvd.		
Classification	Detention Basin	Design High Water Elev.	NA
Size (ac)	0.57	Design Normal Water Elev.	NA
Watershed Size (ac)	88.21	Design Max Depth (ft)	2
Watershed Imperv. Cover (%)	25	Design Avg Depth (ft)	1

Features (mark all): **Trail** Dock/Pier Diffuser Fountain Aquatic Bench Other:_____

Management (mark all): Fish Stocking Treatments Other:_____

Inspector	DMM	Inspection Date	7/15/2015
		Inspection Time	11:08

GENERAL CONDITIONS

Note: Inlets, Outlets, Forebays, Spillways	Structure ID No.	Location	Description (size, material, features)	Observations (problems, repairs, other maintenance)	**Action Required?**
Inlet	18K 61	N Side	36" RCP FE	Good Condition	No
Inlet	18K 80	E Side	48" RCP FE	Good Condition	No
Outlet	18K 84	S Side	Weir and SW-513	Good Condition	No
Average Natural Buffer Width (ft)			6		

Bank Vegetation	Major Vegetation Types	% Cover	Observations/Concerns	
(Water to 30ft upslope)	Forest/Woodland	0		
	Shrubland	2		
	Natural Grassland	75		
	Maintained Turf	23		
	Total	100		
	Cattails	0		
	Undesirable Plants in Natural Buffer	85		
	Other Species of Note			

Aquatic	Major Vegetation Types	% Cover	Observations/Concerns	
(In the water)	Algae	70		
	Submergents	NA		
	Other Aquatic Species of Note			

Fish Reported	Recorded/Observed Species	Comments	

SW-01c	Add Notes In Boxes
Opportunities for Improved Runoff Management in Vicinity	wider buffer
Opportunities for Inlet, Outlet, Forebay or Spillway Retrofit	
Safety Concerns/Hazards	
Maintenance Needs (mark all) Trash Mowing **Weeds** Dredging	
Other Comments	Unclear if basin constructed to plans (much deeper than design).

CONDITION RATING

Stormwater & Water Quality	Check One	
Storage (Max/Design Depth)		
Design Max Depth (ft): 2		
Measured Max Depth (ft): 9	X	Acceptable (≥75%) - but much deeper than design
Meas. / Design Max Depths (%): 450		Unacceptable (<75%)
Water Clarity (Secchi Disk Depth)	X	Good (>4 ft)
Feet: 4.4		Fair (2-4 ft)
		Poor (<2 ft)
Eroding/Unstable Banks (% of edge)		Good (<1%)
Percent: 2	X	Fair (1-5%)
		Poor (>5%)

Recreation & Aesthetics		
Algae Growth		Good (<5%)
Percent: 70		Fair (5-25%)
	X	Poor (>25%)
Undesirable Plant Cover in Buffer		Good (<5%)
Percent: 85		Fair (5-25%)
	X	Poor (>25%)
Fishing Resource		Good (anglers regularly report catching desirable fish)
NA		Fair (anglers sometimes report catching desirable fish)
		Poor (no or few fish)
Public Use (observed)		High (>5 people)
		Moderate (1-5 people)
	X	Low (no people)

Wildlife & Ecology		
Wildlife Use		Good (>100 individuals in all groups)
	X	Fair (25-100 individuals in all groups)
Species: Birds, many Odonata, frogs, fish		Poor (<25 individuals in all groups)
Plant Diversity		Good (>50 species)
	X	Fair (10-50 species)
		Poor (<10 species)
Infrastructure Condition	X	Good (no repairs needed)
Notes:		Fair (minor repairs; functional only)
		Poor (major repairs/replacements, functional/safety)

IDENTIFIERS & GENERAL INFORMATION

Site Name	Wildflower Basin	Basin ID	SW-02
Location	SW Wildflower Dr. & SW 50th St.		
Classification	Detention Basin	Design High Water Elev.	926
Size (ac)	1.06	Design Normal Water Elev.	924
Watershed Size (ac)	63.60	Design Max Depth (ft)	NA
Watershed Imperv. Cover (%)	19	Design Avg Depth (ft)	NA

Features (mark all) Trail Dock/Pier Diffuser Fountain Aquatic Bench Other:_____

Management (mark all) Fish Stocking Treatments Other:_____

Inspector	DMM	Inspection Date	7/15/2015
		Inspection Time	10:09

GENERAL CONDITIONS

Note: Inlets, Outlets, Forebays, Spillways	Structure ID No.	Location	Description (size, material, features)	Observations (problems, repairs, other maintenance)	**Action Required?**
Inlet	21K 41	NW Side	24" RCP FE	Silt/vegetation	Monitor
Inlet	21K 82	N Side	12" RCP FE	Completely submerged	No
Inlet	21K 74	NE Side	36" RCP FE	Good Condition	No
Outlet	21K 100	S Side	21" CMP	Workable Condition	No
Spillway	N/A	SW Side	18' Conc. Weir	Slight erosion around back	Monitor
Average Natural Buffer Width (ft)			25		

Bank Vegetation	Major Vegetation Types	% Cover	Observations/Concerns	
(Water to 30ft upslope)	Forest/Woodland	70		
	Shrubland	15		
	Natural Grassland	7		
	Maintained Turf	8		
	Total	100		
	Cattails	3		
	Undesirable Plants in Natural Buffer	50		
	Other Species of Note			

Aquatic	Major Vegetation Types	% Cover	Observations/Concerns	
(In the water)	Algae	35		
	Submergents	90		
	Other Aquatic Species of Note			

Fish Reported	Recorded/Observed Species	Comments	
	No fish		

SW-02	Add Notes In Boxes
Opportunities for Improved Runoff Management in Vicinity	wider buffer near back yards; opportunities for infiltration/treatment in 2 turf areas
Opportunities for Inlet, Outlet, Forebay or Spillway Retrofit	
Safety Concerns/Hazards	
Maintenance Needs (mark all) Trash Mowing Weeds Dredging	Very shallow; may need dredging.
Other Comments	Property owners very unhappy with the flooding and swamp like aspects of basin.

CONDITION RATING

Stormwater & Water Quality	Check One	
Storage (Max/Design Depth)		
Design Max Depth (ft): NA		
Measured Max Depth (ft): 3		Acceptable (≥75%)
Meas. / Design Max Depths (%): NA		Unacceptable (<75%)
Water Clarity (Secchi Disk Depth)		Good (>4 ft)
Feet: >2	X	Fair (2-4 ft)
		Poor (<2 ft)
Eroding/Unstable Banks (% of edge)	X	Good (<1%)
Percent: 0		Fair (1-5%)
		Poor (>5%)

Recreation & Aesthetics		
Algae Growth		Good (<5%)
Percent: 35		Fair (5-25%)
	X	Poor (>25%)
Undesirable Plant Cover in Buffer		Good (<5%)
Percent: 50		Fair (5-25%)
	X	Poor (>25%)
Fishing Resource		Good (anglers regularly report catching desirable fish)
NA		Fair (anglers sometimes report catching desirable fish)
		Poor (no or few fish)
Public Use (observed)		High (>5 people)
		Moderate (1-5 people)
	X	Low (no people)

Wildlife & Ecology		
Wildlife Use		Good (>100 individuals in all groups)
	X	Fair (25-100 individuals in all groups)
Species: Birds, Odonata, frogs,		Poor (<25 individuals in all groups)
Plant Diversity		Good (>50 species)
	X	Fair (10-50 species)
		Poor (<10 species)
Infrastructure Condition		Good (no repairs needed)
Notes:	X	Fair (minor repairs; functional only)
		Poor (major repairs/replacements, functional/safety)

IDENTIFIERS & GENERAL INFORMATION

Site Name	Tradition North Basin	Basin ID	SW-03
Location	SW Westview Ln. & SW Tradition Dr.		
Classification	Detention Basin	Design High Water Elev.	NA
Size (ac)	0.60	Design Normal Water Elev.	878
Watershed Size (ac)	1145.77	Design Max Depth (ft)	8
Watershed Imperv. Cover (%)	28	Design Avg Depth (ft)	6

Features (mark all): **Trail** Dock/Pier Diffuser **Fountain** Aquatic Bench Other:_____

Management (mark all): Fish Stocking Treatments Other:_____

Inspector	DMM	Inspection Date	7/15/2015
		Inspection Time	7:32

GENERAL CONDITIONS

Note: Inlets, Outlets, Forebays, Spillways	Structure ID No.	Location	Description (size, material, features)	Observations (problems, repairs, other maintenance)	**Action Required?**
Inlet	20J 126	N up Creek	Large box culvert	Excellent condition	No
Inlet	20J 137	SE Corner	15" RCP FE	Silted in	Yes
Inlet	20J 53	SW Corner	48" RCP FE	Good Condition	No
Outlet	20J 51	S Side	RC Structure	Safety concern	Yes

Average Natural Buffer Width (ft)				
		20		
Bank Vegetation	**Major Vegetation Types**	**% Cover**	**Observations/Concerns**	
(Water to 30ft upslope)	Forest/Woodland	15		
	Shrubland	5		
	Natural Grassland	65		
	Maintained Turf	15		
	Total	100		
	Cattails	<1		
	Undesirable Plants in Natural Buffer	15		
	Other Species of Note			
Aquatic	**Major Vegetation Types**	**% Cover**	**Observations/Concerns**	
(In the water)	Algae	1		
	Submergents	20		
	Other Aquatic Species of Note			
Fish Reported	**Recorded/Observed Species**		**Comments**	
	Fish fry and/or minnows observed.			

SW-03	Add Notes In Boxes
Opportunities for Improved Runoff Management in Vicinity	wider buffer on E shore; opportunities for infiltration/treatment
Opportunities for Inlet, Outlet, Forebay or Spillway Retrofit	Major erosion, dangerous outlet structure design. Fountain control cable on ground
Safety Concerns/Hazards	Outlet structure seems like unsafe design (lacks safety grate).
Maintenance Needs (mark all) Trash Mowing Weeds Dredging	Erosion control needed upstream (recent stream reconstruction)
Other Comments	Basin appears significantly undersized for drainage area. Recent high/flood flows apparent, with upstream erosion & high water marks.

CONDITION RATING

Stormwater & Water Quality	Check One	
Storage (Max/Design Depth)		
Design Max Depth (ft): 8		
Measured Max Depth (ft): 6	X	Acceptable (≥75%)
Meas. / Design Max Depths (%): 75		Unacceptable (<75%)
Water Clarity (Secchi Disk Depth)		Good (>4 ft)
Feet: 0.9		Fair (2-4 ft)
	X	Poor (<2 ft)
Eroding/Unstable Banks (% of edge)		Good (<1%)
Percent: 3	X	Fair (1-5%)
		Poor (>5%)

Recreation & Aesthetics		
Algae Growth	X	Good (<5%)
Percent: 1		Fair (5-25%)
		Poor (>25%)
Undesirable Plant Cover in Buffer		Good (<5%)
Percent: 15	X	Fair (5-25%)
		Poor (>25%)
Fishing Resource		Good (anglers regularly report catching desirable fish)
		Fair (anglers sometimes report catching desirable fish)
	X	Poor (no or few fish)
Public Use (observed)		High (>5 people)
	X	Moderate (1-5 people)
		Low (no people)

Wildlife & Ecology		
Wildlife Use		Good (>100 individuals in all groups)
Species: Birds, Odonata, frogs, raccoon, fish	X	Fair (25-100 individuals in all groups)
		Poor (<25 individuals in all groups)
Plant Diversity		Good (>50 species)
	X	Fair (10-50 species)
		Poor (<10 species)
Infrastructure Condition		Good (no repairs needed)
Notes:		Fair (minor repairs; functional only)
	X	Poor (major repairs/replacements, functional/safety)

IDENTIFIERS & GENERAL INFORMATION

Site Name	Tradition South Basin	Basin ID	SW-04
Location	SW Westview Ln. & SW Tradition Dr.		
Classification	Detention Basin	Design High Water Elev.	890
Size (ac)	0.54	Design Normal Water Elev.	875
Watershed Size (ac)	1169.18	Design Max Depth (ft)	10
Watershed Imperv. Cover (%)	28	Design Avg Depth (ft)	6

Features (mark all): **Trail** Dock/Pier Diffuser **Fountain** Aquatic Bench Other:_____

Management (mark all): Fish Stocking Treatments Other:_____

Inspector	DMM	Inspection Date	7/15/2015
		Inspection Time	8:01

GENERAL CONDITIONS

Note: Inlets, Outlets, Forebays, Spillways	Structure ID No.	Location	Description (size, material, features)	Observations (problems, repairs, other maintenance)	**Action Required?**
Inlet	20J 185	NW Side	18" RCP FE	Sediment and plants inside	Yes
Inlet	20J 197	N Side	24" RCP FE	Not found	Yes
Inlet	20J 89	NE Side	18" RCP FE	Broken apron, no rip rap	Yes
Outlet	20J 189	SW Side	RC Structure	Dangerous design. See notes.	Yes

Average Natural Buffer Width (ft)		8		
Bank Vegetation	Major Vegetation Types	% Cover	Observations/Concerns	
(Water to 30ft upslope)	Forest/Woodland	3		
	Shrubland	20		
	Natural Grassland	37		
	Maintained Turf	40		
	Total	100		
	Cattails	0		
	Undesirable Plants in Natural Buffer	15		
	Other Species of Note			
Aquatic	Major Vegetation Types	% Cover	Observations/Concerns	
(In the water)	Algae	1		
	Submergents	3		
	Other Aquatic Species of Note			
Fish Reported	Recorded/Observed Species		Comments	
	Primary game fish: LMB, BLG Secondary game fish: none			

SW-04	Add Notes In Boxes
Opportunities for Improved Runoff Management in Vicinity	wider buffer, especially on E; opportunities for infiltration/treatment (e.g., N end)
Opportunities for Inlet, Outlet, Forebay or Spillway Retrofit	Major erosion upstream/downstream, dangerous outlet structure design, riprap needed
Safety Concerns/Hazards	Outlet structure is a hazard.
Maintenance Needs (mark all) Trash Mowing Weeds Dredging	Repair erosion holes.
Other Comments	Basin appears significantly undersized for drainage area. Recent high/flood flows apparent, with upstream erosion & high water marks.

CONDITION RATING

Stormwater & Water Quality	Check One	
Storage (Max/Design Depth)		
Design Max Depth (ft): 10		
Measured Max Depth (ft): 7		Acceptable (≥75%)
Meas. / Design Max Depths (%): 70	X	Unacceptable (<75%)
Water Clarity (Secchi Disk Depth)		Good (>4 ft)
Feet: 1		Fair (2-4 ft)
	X	Poor (<2 ft)
Eroding/Unstable Banks (% of edge)		Good (<1%)
Percent: 2	X	Fair (1-5%)
		Poor (>5%)

Recreation & Aesthetics		
Algae Growth	X	Good (<5%)
Percent: 1		Fair (5-25%)
		Poor (>25%)
Undesirable Plant Cover in Buffer		Good (<5%)
Percent: 15	X	Fair (5-25%)
		Poor (>25%)
Fishing Resource		Good (anglers regularly report catching desirable fish)
		Fair (anglers sometimes report catching desirable fish)
	X	Poor (no or few fish)
Public Use (observed)		High (>5 people)
	X	Moderate (1-5 people)
		Low (no people)

Wildlife & Ecology		
Wildlife Use		Good (>100 individuals in all groups)
Species: Birds, raccoon, mink, Eastern cottontail		Fair (25-100 individuals in all groups)
	X	Poor (<25 individuals in all groups)
Plant Diversity		Good (>50 species)
	X	Fair (10-50 species)
		Poor (<10 species)
Infrastructure Condition		Good (no repairs needed)
Notes:		Fair (minor repairs; functional only)
	X	Poor (major repairs/replacements, functional/safety)

IDENTIFIERS & GENERAL INFORMATION

Site Name	Sawgrass Park Basin	Basin ID	SW-05
Location	SW 35th St. & SW Applewood St.		
Classification	Md Recr&Det Basin	Design High Water Elev.	NA
Size (ac)	1.96	Design Normal Water Elev.	NA
Watershed Size (ac)	314.99	Design Max Depth (ft)	20
Watershed Imperv. Cover (%)	23	Design Avg Depth (ft)	14

Features (mark all): **Trail** **Dock/Pier** **Diffuser** **Fountain** Aquatic Bench Other: **Bridge**

Management (mark all): **Fish Stocking** **Monthly Treatments** Other: _____

Inspector	DMM	Inspection Date	7/15/2015
		Inspection Time	8:51

GENERAL CONDITIONS

Note: Inlets, Outlets, Forebays, Spillways	Structure ID No.	Location	Description (size, material, features)	Observations (problems, repairs, other maintenance)	**Action Required?**
Inlet	21I 55	SE Side	21" RCP FE	Missing Trash Rack	Yes
Outlet	21I 69	S Side	RC & Steel Outlet	Appears to be adjustable	Inspect
Inlet	21I 66	W Side	24" RCP FE (GIS)	Not found	Verify
Inlet	20I 28	N Side	30" RCP FE (GIS)	Not found	Verify
Inlet	20I 26	N Side	66" RCP FE	Twin 36". Debris clogged	Yes
Inlet	20I 25	N Side	66" RCP FE	Twin 36" . Debris clogged	Yes
Inlet	21I 65	NE Side	24" RCP FE	Not Found	Verify
Discharge		South of dam	CMP	Good condition	No

Average Natural Buffer Width (ft)		18		
Bank Vegetation	Major Vegetation Types	% Cover	Observations/Concerns	
(Water to 30ft upslope)	Forest/Woodland	40		
	Shrubland	10		
	Natural Grassland	15		
	Maintained Turf	35		
	Total	100		
	Cattails	0		
	Undesirable Plants in Natural Buffer	50		
	Other Species of Note			
Aquatic	Major Vegetation Types	% Cover	Observations/Concerns	
(In the water)	Algae	8		
	Submergents	55		
	Other Aquatic Species of Note			
Fish Reported	Recorded/Observed Species		Comments	
	Primary game fish: BLG, C, LMB Secondary game fish: CCF		BLG & LMB observed.	

SW-05	Add Notes In Boxes
Opportunities for Improved Runoff Management in Vicinity	wider buffer on E
Opportunities for Inlet, Outlet, Forebay or Spillway Retrofit	Internal inspection of outlet structure recommended.
Safety Concerns/Hazards	
Maintenance Needs (mark all) Trash Mowing Weeds Dredging	Clear debris from inlet road culverts.
Other Comments	

CONDITION RATING

Stormwater & Water Quality	Check One	
Storage (Max/Design Depth)		
Design Max Depth (ft): 20		
Measured Max Depth (ft): 23	X	Acceptable (≥75%)
Meas. / Design Max Depths (%): 115		Unacceptable (<75%)
Water Clarity (Secchi Disk Depth)	X	Good (>4 ft)
Feet: 9.2		Fair (2-4 ft)
		Poor (<2 ft)
Eroding/Unstable Banks (% of edge)	X	Good (<1%)
Percent: 0		Fair (1-5%)
		Poor (>5%)

Recreation & Aesthetics		
Algae Growth		Good (<5%)
Percent: 8	X	Fair (5-25%)
		Poor (>25%)
Undesirable Plant Cover in Buffer		Good (<5%)
Percent: 50		Fair (5-25%)
	X	Poor (>25%)
Fishing Resource	X	Good (anglers regularly report catching desirable fish)
		Fair (anglers sometimes report catching desirable fish)
		Poor (no or few fish)
Public Use (observed)		High (>5 people)
	X	Moderate (1-5 people)
		Low (no people)

Wildlife & Ecology		
Wildlife Use		Good (>100 individuals in all groups)
Species: Birds, Odonata, frogs, mon.	X	Fair (25-100 individuals in all groups)
butterfly, fish, E. cottontail		Poor (<25 individuals in all groups)
Plant Diversity		Good (>50 species)
	X	Fair (10-50 species)
		Poor (<10 species)
Infrastructure Condition		Good (no repairs needed)
Notes:	X	Fair (minor repairs; functional only)
		Poor (major repairs/replacements, functional/safety)

IDENTIFIERS & GENERAL INFORMATION

Site Name	Hy-Vee South Basin	Basin ID	SW-06
Location	SW Plaza Pkwy. & SW State St.		
Classification	Detention Basin	Design High Water Elev.	916
Size (ac)	1.54	Design Normal Water Elev.	913
Watershed Size (ac)	266.02	Design Max Depth (ft)	10
Watershed Imperv. Cover (%)	11	Design Avg Depth (ft)	8

Features (mark all): Trail Dock/Pier Diffuser Fountain Aquatic Bench Other: Bridge

Management (mark all): Fish Stocking Treatments Other:_____

Inspector	DMM	Inspection Date	7/15/2015
		Inspection Time	6:49

GENERAL CONDITIONS

Note: Inlets, Outlets, Forebays, Spillways	Structure ID No.	Location	Description (size, material, features)	Observations (problems, repairs, other maintenance)	**Action Required?**
Inlet	19I 57	NW Side	48" RCP FE Inlet	Good Condition	No
Inlet	19I 54	N Side	72" RCBC Inlet	Good Condition	No
Inlet	19I 103	SE Side	18" RCP FE Inlet	Heavily silted in	Yes
Outlet	N/A	SE Side	Conc. Box struct.	Minor debris accumulation	No
Average Natural Buffer Width (ft)			4		

Bank Vegetation	Major Vegetation Types	% Cover	Observations/Concerns	
(Water to 30ft upslope)	Forest/Woodland	0		
	Shrubland	<1		
	Natural Grassland	25		
	Maintained Turf	75		
	Total	100		
	Cattails	<1		
	Undesirable Plants in Natural Buffer	75		
	Other Species of Note			

Aquatic	Major Vegetation Types	% Cover	Observations/Concerns	
(In the water)	Algae	1		
	Submergents	<1		
	Other Aquatic Species of Note			

Fish Reported	Recorded/Observed Species	Comments	
	Fish fry/minnows & green sunfish observed.		

SW-06	Add Notes In Boxes
Opportunities for Improved Runoff Management in Vicinity	wider buffer
Opportunities for Inlet, Outlet, Forebay or Spillway Retrofit	
Safety Concerns/Hazards	Rutting on steep-sloped banks suggested hazardous mowing.
Maintenance Needs (mark all) Trash Mowing **Weeds** Dredging	Clear 18" RCP inlet of silt.
Other Comments	

CONDITION RATING

Stormwater & Water Quality	Check One	
Storage (Max/Design Depth)		
Design Max Depth (ft): 10		
Measured Max Depth (ft): 10	X	Acceptable (≥75%)
Meas. / Design Max Depths (%): 100		Unacceptable (<75%)
Water Clarity (Secchi Disk Depth)		Good (>4 ft)
Feet: 2.8	X	Fair (2-4 ft)
		Poor (<2 ft)
Eroding/Unstable Banks (% of edge)		Good (<1%)
Percent: 1	X	Fair (1-5%)
		Poor (>5%)

Recreation & Aesthetics		
Algae Growth	X	Good (<5%)
Percent: 1		Fair (5-25%)
		Poor (>25%)
Undesirable Plant Cover in Buffer		Good (<5%)
Percent: 75		Fair (5-25%)
	X	Poor (>25%)
Fishing Resource		Good (anglers regularly report catching desirable fish)
NA		Fair (anglers sometimes report catching desirable fish)
		Poor (no or few fish)
Public Use (observed)		High (>5 people)
		Moderate (1-5 people)
	X	Low (no people)

Wildlife & Ecology		
Wildlife Use		Good (>100 individuals in all groups)
Species: Birds, Odonata, insects, frogs,	X	Fair (25-100 individuals in all groups)
crayfish, fish, sm. mammal		Poor (<25 individuals in all groups)
Plant Diversity		Good (>50 species)
	X	Fair (10-50 species)
		Poor (<10 species)
Infrastructure Condition		Good (no repairs needed)
Notes:	X	Fair (minor repairs; functional only)
		Poor (major repairs/replacements, functional/safety)

IDENTIFIERS & GENERAL INFORMATION

Site Name	Promenade Park Basin	Basin ID	SW-07
Location	SW Prairie Trail Pkwy. & SW State St.		
Classification	Lg Recr&Det Basin	Design High Water Elev.	933
Size (ac)	5.28	Design Normal Water Elev.	926.4
Watershed Size (ac)	718.05	Design Max Depth (ft)	13
Watershed Imperv. Cover (%)	36	Design Avg Depth (ft)	9

Features (mark all): Trail Dock/Pier Diffuser Fountain Aquatic Bench Other: Bridge

Management (mark all): Fish Stocking Treatments Other:_____

Inspector	DMM	Inspection Date	7/14/2015
		Inspection Time	19:54

GENERAL CONDITIONS

Note: Inlets, Outlets, Forebays, Spillways	Structure ID No.	Location	Description (size, material, features)	Observations (problems, repairs, other maintenance)	**Action Required?**
Inlet	18I 10	N Side	Two 96" RCBCs	Good Condition	No
Inlet	18I 321	N Side	48" RCP FE Inlet	Good Condition	No
Inlet	19I 127	S Side	24" RCP FE Inlet	Good Condition	No
Outlet	18J 06	S Side	RC Weir Structure	Good Condition	No
Inlet	18J 13	SE Corner	36" RCP FE	Good Condition	No
Inlet	18J 15	SE Corner	36" RCP FE	Good Condition	No
Inlet	18J 143	E Side	36" RCP FE	Good Condition	No
Inlet	N/A	NE Side	12" RCP	Good Condition	No

Average Natural Buffer Width (ft)		10		
Bank Vegetation	Major Vegetation Types	% Cover	Observations/Concerns	
(Water to 30ft upslope)	Forest/Woodland	0		
	Shrubland	8		
	Natural Grassland	72		
	Maintained Turf	20		
	Total	100		
	Cattails	<1		
	Undesirable Plants in Natural Buffer	30		
	Other Species of Note			
Aquatic	Major Vegetation Types	% Cover	Observations/Concerns	
(In the water)	Algae	3		
	Submergents	5		
	Other Aquatic Species of Note			
Fish Reported	Recorded/Observed Species		Comments	
	Primary game fish: BLG, LMB Secondary game fish: C		BLG & LMB observed.	

SW-07	Add Notes In Boxes
Opportunities for Improved Runoff Management in Vicinity	wider buffer
Opportunities for Inlet, Outlet, Forebay or Spillway Retrofit	
Safety Concerns/Hazards	Easy accessibility of outlet structure may be of some concern.
Maintenance Needs (mark all) Trash Mowing Weeds Dredging	
Other Comments	

CONDITION RATING

Stormwater & Water Quality	Check One	
Storage (Max/Design Depth)		
Design Max Depth (ft): 13		
Measured Max Depth (ft): 13	X	Acceptable (≥75%)
Meas. / Design Max Depths (%): 100		Unacceptable (<75%)
Water Clarity (Secchi Disk Depth)		Good (>4 ft)
Feet: 3.7	X	Fair (2-4 ft)
		Poor (<2 ft)
Eroding/Unstable Banks (% of edge)	X	Good (<1%)
Percent: <1		Fair (1-5%)
		Poor (>5%)

Recreation & Aesthetics		
Algae Growth	X	Good (<5%)
Percent: 3		Fair (5-25%)
		Poor (>25%)
Undesirable Plant Cover in Buffer		Good (<5%)
Percent: 30		Fair (5-25%)
	X	Poor (>25%)
Fishing Resource		Good (anglers regularly report catching desirable fish)
	X	Fair (anglers sometimes report catching desirable fish)
		Poor (no or few fish)
Public Use (observed)		High (>5 people)
	X	Moderate (1-5 people)
		Low (no people)

Wildlife & Ecology		
Wildlife Use		Good (>100 individuals in all groups)
Species: Birds, Odonata, monarch	X	Fair (25-100 individuals in all groups)
butterfly, fish		Poor (<25 individuals in all groups)
Plant Diversity		Good (>50 species)
	X	Fair (10-50 species)
		Poor (<10 species)
Infrastructure Condition	X	Good (no repairs needed)
Notes:		Fair (minor repairs; functional only)
		Poor (major repairs/replacements, functional/safety)

IDENTIFIERS & GENERAL INFORMATION

Site Name	Chautauqua Park Wetlands	Basin ID	SW-08
Location	SW Prairie Trail Pkwy. & SW College St.		
Classification	Wetland	Design High Water Elev.	NA
Size (ac)	3.74	Design Normal Water Elev.	NA
Watershed Size (ac)	165.33	Design Max Depth (ft)	NA
Watershed Imperv. Cover (%)	13	Design Avg Depth (ft)	NA

Features (mark all): Trail Dock/Pier Diffuser Fountain Aquatic Bench Other: Bridge

Management (mark all): Fish Stocking Treatments Other:_____

Inspector	DMM	Inspection Date	7/14/2015
		Inspection Time	18:05

GENERAL CONDITIONS

Note: Inlets, Outlets, Forebays, Spillways	Structure ID No.	Location	Description (size, material, features)	Observations (problems, repairs, other maintenance)	**Action Required?**
Inlet	18H 338	NW cell	18" RCP FE	Good Condition	No
Inlet	18I 207	NW corner	24" RCP FE	Good Condition	No
Inlet	18I 191	N side	24" RCP FE	Good Condition	No
Inlet	18I 177	NE corner	15" RCP FE	Good Condition	No
Outlet	18I 216	SW Corner	12" RCP FE	Not found	Verify
Inlet	18H 335	W channel	15" RCP FE	Good Condition	No
Inlet	18H 52&53	W channel	Twin 30" RCP FE	Good Condition	No
Average Natural Buffer Width (ft)			>30		

Bank Vegetation	Major Vegetation Types	% Cover	Observations/Concerns	
(Water to 30ft upslope)	Forest/Woodland	0		
	Shrubland	2		
	Natural Grassland	98		
	Maintained Turf	0		
	Total	100		
	Cattails	65		
	Undesirable Plants in Natural Buffer	70		
	Other Species of Note			

Aquatic	Major Vegetation Types	% Cover	Observations/Concerns	
(In the water)	Algae	60		
	Submergents	80		
	Other Aquatic Species of Note			

Fish Reported	Recorded/Observed Species	Comments	
	No fish		

SW-08	Add Notes In Boxes
Opportunities for Improved Runoff Management in Vicinity	
Opportunities for Inlet, Outlet, Forebay or Spillway Retrofit	
Safety Concerns/Hazards	
Maintenance Needs (mark all) Trash Mowing **Weeds** Dredging	Invasive veg. control needed, especially in higher quality restoration areas.
Other Comments	Only one small area of open water observed.

CONDITION RATING

Stormwater & Water Quality	Check One	
Storage (Max/Design Depth)		
Design Max Depth (ft): NA		
Measured Max Depth (ft): NA		Acceptable (≥75%)
Meas. / Design Max Depths (%): NA		Unacceptable (<75%)
Water Clarity (Secchi Disk Depth)		Good (>4 ft)
Feet: NA		Fair (2-4 ft)
		Poor (<2 ft)
Eroding/Unstable Banks (% of edge)	X	Good (<1%)
Percent: 0		Fair (1-5%)
		Poor (>5%)

Recreation & Aesthetics		
Algae Growth		Good (<5%)
Percent: 60		Fair (5-25%)
	X	Poor (>25%)
Undesirable Plant Cover in Buffer		Good (<5%)
Percent: 70		Fair (5-25%)
	X	Poor (>25%)
Fishing Resource		Good (anglers regularly report catching desirable fish)
NA		Fair (anglers sometimes report catching desirable fish)
		Poor (no or few fish)
Public Use (observed)		High (>5 people)
		Moderate (1-5 people)
	X	Low (no people)

Wildlife & Ecology		
Wildlife Use	X	Good (>100 individuals in all groups)
Species: Many birds, Odonata, many grasshoppers		Fair (25-100 individuals in all groups)
		Poor (<25 individuals in all groups)
Plant Diversity	X	Good (>50 species)
		Fair (10-50 species)
		Poor (<10 species)
Infrastructure Condition	X	Good (no repairs needed)
Notes:		Fair (minor repairs; functional only)
		Poor (major repairs/replacements, functional/safety)

IDENTIFIERS & GENERAL INFORMATION

Site Name	Cascade Falls Basin	Basin ID	SW-09
Location	SW 18th St. & SW Cascade Falls Dr.		
Classification	Detention Basin	Design High Water Elev.	962.16
Size (ac)	0.60	Design Normal Water Elev.	956
Watershed Size (ac)	60.60	Design Max Depth (ft)	8
Watershed Imperv. Cover (%)	6	Design Avg Depth (ft)	4

Features (mark all) Trail Dock/Pier Diffuser Fountain Aquatic Bench Other: Bridge
Management (mark all) Fish Stocking Treatments Other:_____

Inspector	DMM	Inspection Date	7/14/2015
		Inspection Time	18:39

GENERAL CONDITIONS

Note: Inlets, Outlets, Forebays, Spillways	Structure ID No.	Location	Description (size, material, features)	Observations (problems, repairs, other maintenance)	**Action Required?**
Outlet Control	N/A	S Side	Adjustable Weir	Good Condition, looks new	No
Emergency Outlet	18H 181	S Side	RCP Structure	Good Condition	No
Inlet	N/A	SE Corner	8" CPVC Inlet	Good Condition; silted	No
Inlet	18H 115	N Side	24" RCP FE Inlet	Good Condition	No
Inlet	18H 137	NW Corner	42" RCP FE Inlet	Good Condition	No
Average Natural Buffer Width (ft)			4		

Bank Vegetation	Major Vegetation Types	% Cover	Observations/Concerns	
(Water to 30ft upslope)	Forest/Woodland	0		
	Shrubland	2		
	Natural Grassland	48		
	Maintained Turf	50		
	Total	100		
	Cattails	30		
	Undesirable Plants in Natural Buffer	60		
	Other Species of Note			

Aquatic	Major Vegetation Types	% Cover	Observations/Concerns	
(In the water)	Algae	<1		
	Submergents	0		
	Other Aquatic Species of Note			

Fish Reported	Recorded/Observed Species	Comments	
	No fish		

SW-09	Add Notes In Boxes
Opportunities for Improved Runoff Management in Vicinity	wider buffer; opportunities for infiltration/treatment
Opportunities for Inlet, Outlet, Forebay or Spillway Retrofit	Beehive outlet draining to 18H 115 buried in sediment. Channel erosion in places. Evidence of high water fluctuations
Safety Concerns/Hazards	
Maintenance Needs (mark all) Trash Mowing Weeds Dredging	Clear silt from 8" CPVC inlet.
Other Comments	

CONDITION RATING

Stormwater & Water Quality	Check One	
Storage (Max/Design Depth)		
Design Max Depth (ft): 8		
Measured Max Depth (ft): 6	X	Acceptable (≥75%)
Meas. / Design Max Depths (%): 75		Unacceptable (<75%)
Water Clarity (Secchi Disk Depth)	X	Good (>4 ft)
Feet: 5		Fair (2-4 ft)
		Poor (<2 ft)
Eroding/Unstable Banks (% of edge)	X	Good (<1%)
Percent: 0		Fair (1-5%)
		Poor (>5%)

Recreation & Aesthetics		
Algae Growth	X	Good (<5%)
Percent: <1		Fair (5-25%)
		Poor (>25%)
Undesirable Plant Cover in Buffer		Good (<5%)
Percent: 60		Fair (5-25%)
	X	Poor (>25%)
Fishing Resource		Good (anglers regularly report catching desirable fish)
NA		Fair (anglers sometimes report catching desirable fish)
		Poor (no or few fish)
Public Use (observed)		High (>5 people)
	X	Moderate (1-5 people)
		Low (no people)

Wildlife & Ecology		
Wildlife Use		Good (>100 individuals in all groups)
Species: Can. Goose (35), other birds,	X	Fair (25-100 individuals in all groups)
Odonata, frogs, insects		Poor (<25 individuals in all groups)
Plant Diversity		Good (>50 species)
	X	Fair (10-50 species)
		Poor (<10 species)
Infrastructure Condition	X	Good (no repairs needed)
Notes:		Fair (minor repairs; functional only)
		Poor (major repairs/replacements, functional/safety)

IDENTIFIERS & GENERAL INFORMATION

Site Name	Vintage Park Basin	Basin ID	SW-10
Location	SW Vintage Pkwy. & SW State St.		
Classification	Lg Recr&Det Basin	Design High Water Elev.	943
Size (ac)	5.22	Design Normal Water Elev.	941.56
Watershed Size (ac)	524.69	Design Max Depth (ft)	15
Watershed Imperv. Cover (%)	44	Design Avg Depth (ft)	8

Features (mark all): Trail Dock/Pier Diffuser Fountain Aquatic Bench Other: Bridge

Management (mark all): Fish Stocking Treatments Other:_____

Inspector	DMM	Inspection Date	7/14/2015
		Inspection Time	19:08

GENERAL CONDITIONS

Note: Inlets, Outlets, Forebays, Spillways	Structure ID No.	Location	Description (size, material, features)	Observations (problems, repairs, other maintenance)	**Action Required?**
Inlet	18I 110A	N Corner	2 120" RCBCs	Good Condition	No
Forebay	N/A	N Corner	Siltation Forebay	Silted in	Yes
Silt dam	18I 231	N Corner	RC Mat	Good Condition	No
Inlet	18I 254	N Corner	12" RCP FE Inlet	Good Condition	No
Inlet	18I 230	NE Side	15" RCP FE Inlet	Good Condition	No
Inlet	18I 221	SE Corner	20" RCP FE Inlet	Not found	Verify
Outlet	18I 219B	SE Corner	RC Poured Weir	Some Cracking	Inspect
Inlet	18I 29	S Side	24" RCP FE Inlet	Good Condition	No
Inlet	18I 34	S Side	15" RCP FE Inlet	Good Condition	No
Inlet	18I 281	SW Corner	24" CPVC Inlet	Good Condition	No

Average Natural Buffer Width (ft)		>30		
Bank Vegetation	Major Vegetation Types	% Cover	Observations/Concerns	
(Water to 30ft upslope)	Forest/Woodland	1		
	Shrubland	5		
	Natural Grassland	94		
	Maintained Turf	0		
	Total	100		
	Cattails	1		
	Undesirable Plants in Natural Buffer	10		
	Other Species of Note			
Aquatic	Major Vegetation Types	% Cover	Observations/Concerns	
(In the water)	Algae	2		
	Submergents	1		
	Other Aquatic Species of Note			
Fish Reported	Recorded/Observed Species		Comments	
	Primary game fish: C, G Secondary game fish: BLG, LMB			

SW-10	Add Notes In Boxes
Opportunities for Improved Runoff Management in Vicinity	
Opportunities for Inlet, Outlet, Forebay or Spillway Retrofit	Cracks in outlet structure should be inspected by structural engineer.
Safety Concerns/Hazards	Some hidden rip rap.
Maintenance Needs (mark all) Trash Mowing Weeds Dredging	Inlet forebay may need to be dredged. Appears full of sediment.
Other Comments	

CONDITION RATING

Stormwater & Water Quality	Check One	
Storage (Max/Design Depth)		
Design Max Depth (ft): 15		
Measured Max Depth (ft): 15	X	Acceptable (≥75%)
Meas. / Design Max Depths (%): 100		Unacceptable (<75%)
Water Clarity (Secchi Disk Depth)		Good (>4 ft)
Feet: 2.6	X	Fair (2-4 ft)
		Poor (<2 ft)
Eroding/Unstable Banks (% of edge)	X	Good (<1%)
Percent: 0		Fair (1-5%)
		Poor (>5%)

Recreation & Aesthetics		
Algae Growth	X	Good (<5%)
Percent: 2		Fair (5-25%)
		Poor (>25%)
Undesirable Plant Cover in Buffer		Good (<5%)
Percent: 10	X	Fair (5-25%)
		Poor (>25%)
Fishing Resource		Good (anglers regularly report catching desirable fish)
	X	Fair (anglers sometimes report catching desirable fish)
		Poor (no or few fish)
Public Use (observed)		High (>5 people)
		Moderate (1-5 people)
	X	Low (no people)

Wildlife & Ecology		
Wildlife Use		Good (>100 individuals in all groups)
	X	Fair (25-100 individuals in all groups)
Species: Birds, Odonata, frogs		Poor (<25 individuals in all groups)
Plant Diversity	X	Good (>50 species)
		Fair (10-50 species)
		Poor (<10 species)
Infrastructure Condition		Good (no repairs needed)
Notes:	X	Fair (minor repairs; functional only)
		Poor (major repairs/replacements, functional/safety)

IDENTIFIERS & GENERAL INFORMATION

Site Name	Art Center Basin	Basin ID	SW-11
Location	SW State St. & SW Ordnance Rd.		
Classification	Md Recr&Det Basin	Design High Water Elev.	968.5
Size (ac)	2.03	Design Normal Water Elev.	966.4
Watershed Size (ac)	29.38	Design Max Depth (ft)	9
Watershed Imperv. Cover (%)	28	Design Avg Depth (ft)	5

Features (mark all): Trail Dock/Pier Diffuser **Fountain** Aquatic Bench Other: Bridge

Management (mark all): Fish Stocking **Monthly Treatments** Other:_____

Inspector	DMM	Inspection Date	7/14/2015
		Inspection Time	17:32

GENERAL CONDITIONS

Note: Inlets, Outlets, Forebays, Spillways	Structure ID No.	Location	Description (size, material, features)	Observations (problems, repairs, other maintenance)	**Action Required?**
Outlet	16I 52	NW Corner	24" RCP FE Outlet	Missing Trash Rack	Yes
Inlet	16I 53	NW Corner	18" RCP FE Inlet	Not found	Verify
Inlet	16I 54	SW Corner	36" RCP FE Inlet	Missing Trash Rack	Yes
Inlet	16I 31	SE Corner	36" RCP FE Inlet	Missing Trash Rack	Yes
Inlet/Swale	16I 57	NE Corner	30" RCP Into Swale	Good condition	No
Average Natural Buffer Width (ft)			10		

Bank Vegetation	Major Vegetation Types	% Cover	Observations/Concerns	
(Water to 30ft upslope)	Forest/Woodland	1		
	Shrubland	3		
	Natural Grassland	46		
	Maintained Turf	50		
	Total	100		
	Cattails	10		
	Undesirable Plants in Natural Buffer	80		
	Other Species of Note			

Aquatic	Major Vegetation Types	% Cover	Observations/Concerns	
(In the water)	Algae	12		
	Submergents	70		
	Other Aquatic Species of Note			

Fish Reported	Recorded/Observed Species	Comments	
	Primary game fish: BLG, C, G, LMB Secondary game fish: H Common carp: N	LMB & BLG observed.	

SW-11	Add Notes In Boxes
Opportunities for Improved Runoff Management in Vicinity	wider buffer; opportunities for infiltration/treatment along N swale
Opportunities for Inlet, Outlet, Forebay or Spillway Retrofit	Replace trash guards on RCP inlets and outlet.
Safety Concerns/Hazards	Rip rap along parts of basin may be possible tripping hazard.
Maintenance Needs (mark all) Trash Mowing Weeds Dredging	
Other Comments	

CONDITION RATING

Stormwater & Water Quality	Check One	
Storage (Max/Design Depth)		
Design Max Depth (ft): 9		
Measured Max Depth (ft): 10	X	Acceptable (≥75%)
Meas. / Design Max Depths (%): 111		Unacceptable (<75%)
Water Clarity (Secchi Disk Depth)	X	Good (>4 ft)
Feet: 6.3		Fair (2-4 ft)
		Poor (<2 ft)
Eroding/Unstable Banks (% of edge)	X	Good (<1%)
Percent: 0		Fair (1-5%)
		Poor (>5%)

Recreation & Aesthetics		
Algae Growth		Good (<5%)
Percent: 12	X	Fair (5-25%)
		Poor (>25%)
Undesirable Plant Cover in Buffer		Good (<5%)
Percent: 80		Fair (5-25%)
	X	Poor (>25%)
Fishing Resource	X	Good (anglers regularly report catching desirable fish)
		Fair (anglers sometimes report catching desirable fish)
		Poor (no or few fish)
Public Use (observed)		High (>5 people)
		Moderate (1-5 people)
	X	Low (no people)

Wildlife & Ecology		
Wildlife Use		Good (>100 individuals in all groups)
	X	Fair (25-100 individuals in all groups)
Species: Birds, Odonata, fish		Poor (<25 individuals in all groups)
Plant Diversity		Good (>50 species)
High end	X	Fair (10-50 species)
		Poor (<10 species)
Infrastructure Condition		Good (no repairs needed)
Notes:	X	Fair (minor repairs; functional only)
		Poor (major repairs/replacements, functional/safety)

IDENTIFIERS & GENERAL INFORMATION

Site Name	Camden Woods East Basin	Basin ID	SW-12
Location	SW 4th Ct. & SW Camden Dr.		
Classification	Detention Basin	Design High Water Elev.	975
Size (ac)	0.62	Design Normal Water Elev.	971
Watershed Size (ac)	16.28	Design Max Depth (ft)	16
Watershed Imperv. Cover (%)	24	Design Avg Depth (ft)	7

Features (mark all): Trail Dock/Pier **Diffuser** **Fountain** Aquatic Bench Other: Bridge

Management (mark all): Fish Stocking **Monthly Treatments** Other:_____

Inspector	DMM	Inspection Date	7/14/2015
		Inspection Time	16:50

GENERAL CONDITIONS

Note: Inlets, Outlets, Forebays, Spillways	Structure ID No.	Location	Description (size, material, features)	Observations (problems, repairs, other maintenance)	**Action Required?**
Inlet	16F 60	NW Corner	15" RCP FE	No rip rap, but no erosion	No
Inlet	16F 66	NE Corner	15" RCP FE	Good Condition	No
Outlet	N/A	E Side	Not found	Not found; see notes	Locate
Discharge	N/A	In East ravine	8" CMP	No rip rap; erosion observed	Yes

Average Natural Buffer Width (ft)		10		
Bank Vegetation	Major Vegetation Types	% Cover	Observations/Concerns	
(Water to 30ft upslope)	Forest/Woodland	15		
	Shrubland	5		
	Natural Grassland	50		
	Maintained Turf	30		
	Total	100		
	Cattails	20		
	Undesirable Plants in Natural Buffer	70		
	Other Species of Note			
Aquatic	Major Vegetation Types	% Cover	Observations/Concerns	
(In the water)	Algae	4		
	Submergents	<1		
	Other Aquatic Species of Note			
Fish Reported	Recorded/Observed Species		Comments	
	Primary game fish: BLG, C, LMB Secondary game fish: none			

SW-12	Add Notes In Boxes
Opportunities for Improved Runoff Management in Vicinity	wider buffer (especially NW bank)
Opportunities for Inlet, Outlet, Forebay or Spillway Retrofit	Outlet could not be found at basin. Presumed discharge found in ravine. No riprap or FE on end of discharge CMP
Safety Concerns/Hazards	
Maintenance Needs (mark all) Trash Mowing Weeds Dredging	
Other Comments	

CONDITION RATING

Stormwater & Water Quality	Check One	
Storage (Max/Design Depth)		
Design Max Depth (ft): 16		
Measured Max Depth (ft): 18	X	Acceptable (≥75%)
Meas. / Design Max Depths (%): 113		Unacceptable (<75%)
Water Clarity (Secchi Disk Depth)		Good (>4 ft)
Feet: 2.2	X	Fair (2-4 ft)
		Poor (<2 ft)
Eroding/Unstable Banks (% of edge)	X	Good (<1%)
Percent: 0		Fair (1-5%)
		Poor (>5%)

Recreation & Aesthetics		
Algae Growth	X	Good (<5%)
Percent: 4		Fair (5-25%)
		Poor (>25%)
Undesirable Plant Cover in Buffer		Good (<5%)
Percent: 70		Fair (5-25%)
	X	Poor (>25%)
Fishing Resource		Good (anglers regularly report catching desirable fish)
	X	Fair (anglers sometimes report catching desirable fish)
		Poor (no or few fish)
Public Use (observed)		High (>5 people)
		Moderate (1-5 people)
	X	Low (no people)

Wildlife & Ecology		
Wildlife Use		Good (>100 individuals in all groups)
		Fair (25-100 individuals in all groups)
Species: Birds, Odonata, frogs	X	Poor (<25 individuals in all groups)
Plant Diversity		Good (>50 species)
	X	Fair (10-50 species)
		Poor (<10 species)
Infrastructure Condition		Good (no repairs needed)
Notes:	X	Fair (minor repairs; functional only)
		Poor (major repairs/replacements, functional/safety)

IDENTIFIERS & GENERAL INFORMATION

Site Name	Camden Woods West Basin	Basin ID	SW-13
Location	SW 4th Ct. & SW Camden Dr.		
Classification	Detention Basin	Design High Water Elev.	985
Size (ac)	0.49	Design Normal Water Elev.	981.91
Watershed Size (ac)	8.84	Design Max Depth (ft)	12
Watershed Imperv. Cover (%)	20	Design Avg Depth (ft)	5

Features (mark all): Trail Dock/Pier **Diffuser** **Fountain** Aquatic Bench Other: Bridge

Management (mark all): Fish Stocking **Monthly Treatments** Other:_____

Inspector	DMM	Inspection Date	7/14/2015
		Inspection Time	17:07

GENERAL CONDITIONS

Note: Inlets, Outlets, Forebays, Spillways	Structure ID No.	Location	Description (size, material, features)	Observations (problems, repairs, other maintenance)	**Action Required?**
Inlet	16F 56	NE Corner	18" RCP FE	Good Condition	No
Grass Culvert/Inlet	N/A	NW Corner	10" CPVC FE	Good Condition	No
Grass culvert/Inlet	N/A	S Side	10" CPVC FE	Good Condition	No
Outlet	16F 57	NW Corner	8" PVC & SW-511	Good Condition	No
Average Natural Buffer Width (ft)			4		

Bank Vegetation	Major Vegetation Types	% Cover	Observations/Concerns	
(Water to 30ft upslope)	Forest/Woodland	0		
	Shrubland	<1		
	Natural Grassland	30		
	Maintained Turf	70		
	Total	100		
	Cattails	25		
	Undesirable Plants in Natural Buffer	80		
	Other Species of Note			

Aquatic	Major Vegetation Types	% Cover	Observations/Concerns	
(In the water)	Algae	4		
	Submergents	5		
	Other Aquatic Species of Note			

Fish Reported	Recorded/Observed Species	Comments	
	LMB reported		

SW-13	Add Notes In Boxes
Opportunities for Improved Runoff Management in Vicinity	wider buffer
Opportunities for Inlet, Outlet, Forebay or Spillway Retrofit	
Safety Concerns/Hazards	
Maintenance Needs (mark all) Trash Mowing Weeds Dredging	
Other Comments	Property owner expressed disapproval of cattail growth around basin

CONDITION RATING

Stormwater & Water Quality	Check One	
Storage (Max/Design Depth)		
Design Max Depth (ft): 12		
Measured Max Depth (ft): 12	X	Acceptable (≥75%)
Meas. / Design Max Depths (%): 100		Unacceptable (<75%)
Water Clarity (Secchi Disk Depth)		Good (>4 ft)
Feet: 2.2	X	Fair (2-4 ft)
		Poor (<2 ft)
Eroding/Unstable Banks (% of edge)	X	Good (<1%)
Percent: 0		Fair (1-5%)
		Poor (>5%)

Recreation & Aesthetics		
Algae Growth	X	Good (<5%)
Percent: 4		Fair (5-25%)
		Poor (>25%)
Undesirable Plant Cover in Buffer		Good (<5%)
Percent: 80		Fair (5-25%)
	X	Poor (>25%)
Fishing Resource		Good (anglers regularly report catching desirable fish)
	X	Fair (anglers sometimes report catching desirable fish)
		Poor (no or few fish)
Public Use (observed)		High (>5 people)
		Moderate (1-5 people)
	X	Low (no people)

Wildlife & Ecology		
Wildlife Use		Good (>100 individuals in all groups)
	X	Fair (25-100 individuals in all groups)
Species: Birds, Odonata, frogs		Poor (<25 individuals in all groups)
Plant Diversity		Good (>50 species)
	X	Fair (10-50 species)
		Poor (<10 species)
Infrastructure Condition	X	Good (no repairs needed)
Notes:		Fair (minor repairs; functional only)
		Poor (major repairs/replacements, functional/safety)

Appendix B. Basin Classification and Criteria Matrix

City of Ankeny - 2015 Public Stormwater Basin Study (14-1131)
Basin Classification & Criteria Matrix

Basin Identifiers				Classification Factors			Other Characteristics				Condition Criteria		
Sort Order	Basin Classification	Basin ID	Basin Name	Intentional Public Access	Basin Size (ac) large >4 medium 4-1.75 small <1.75	Max Depth (ft) deep >15 med 15-8 shallow <8	Watershed Area (ac) large >200 medium 200-70 small <70	Watershed Impervious (%) high >24 medium 24-15 low <15	Watershed to Basin Ratio high >75 medium 75-30 low <30	Existing Buffer Width (ft) wide >25 medium 25-5 narrow <5	Algae Cover (% of water surface) good <5 fair 5-25 poor >25	Secchi Transparency (ft) good >4 fair 4-2 poor <2	Fishery
1	Large Recr & Det Basin	SW-07	Promenade Park Basin	Yes	5.28	13	718	36	136	10	3	3.7	fair
2	Large Recr & Det Basin	SW-10	Vintage Park Basin	Yes	5.22	15	525	44	101	30	2	2.6	fair
3	Large Recr & Det Basin	NW-08	Prairie Ridge Complex N. Basin	Yes	5.16	13	114	29	22	0.5	1	4	poor
4	Large Recr & Det Basin	NW-09	Prairie Ridge Complex S. Basin	Yes	4.86	15	85	21	18	0.5	2	2	fair
5	Medium Recr & Det Basin	NW-12	Cherry Glen East Basin	Yes	3.67	17	51	20	14	4	30	2.9	good
6	Medium Recr & Det Basin	NW-06	Prairie Lakes N. Basin	Yes	3.46	13	187	27	54	1	50	3.1	good
7	Medium Recr & Det Basin	SE-04	Springwood S. Basin	Yes	3.04	18	221	30	73	0.5	2	2	poor
8	Medium Recr & Det Basin	NW-07	Prairie Lakes S. Basin	Yes	3.02	20	214	27	71	1	1	2.2	poor
9	Medium Recr & Det Basin	NW-11	Hawkeye Park Basin	Yes	2.84	10	42	34	15	0.5	1	2.9	poor
10	Medium Recr & Det Basin	NW-14	Cherry Glen S. Basin	Yes	2.74	23	57	30	21	4	35	3.8	fair
11	Medium Recr & Det Basin	NW-16	Signature Basin	Yes	2.66	20	36	27	14	2	2	8.6	good
12	Medium Recr & Det Basin	NW-13	Cherry Glen N. Basin	Yes	2.53	22	84	23	33	15	1	2.9	good
13	Medium Recr & Det Basin	SW-11	Art Center Basin	Yes	2.03	10	29	28	14	10	12	6.3	good
14	Medium Recr & Det Basin	SW-05	Sawgrass Park Basin	Yes	1.96	23	315	23	161	18	8	9.2	good
15	Medium Recr & Det Basin	NW-04	Georgetown N. Basin	Yes	1.86	17	67	31	36	1	12	3.5	fair
16	Small Recr & Det Basin	SE-03	Springwood N. Basin	Yes	1.63	13	103	26	63	8	20	5.9	good
17	Small Recr & Det Basin	SE-02	Hillside Park W. Basin	Yes	1.28	14	136	5	107	7	50	9.2	fair
18	Small Recr & Det Basin	SE-01	Hillside Park E. Basin	Yes	1.05	14	129	4	123	6	40	5.1	fair
19	Small Recr & Det Basin	NW-10	Horizon Park Basin	Yes	0.99	14	99	20	101	2	3	2.2	poor
20	Small Recr & Det Basin	NW-05	Georgetown S. Basin	Yes	0.87	9	58	33	66	1	35	5.8	good
21	Small Recr & Det Basin	NE-02	Renaissance Basin	Yes	0.84	14	61	15	73	3	8	2.3	NA
22	Small Recr & Det Basin	NW-01	Rock Creek Elementary Basin	Yes	1.63	13	69	13	42	12	4	1.2	NA
23	Small Recr & Det Basin	NE-01	Otter Creek Basin	No	1.36	16	74	2	55	2	3	1.8	NA
24	Detention Basin	SW-09	Cascade Falls Basin	No	0.60	6	61	6	100	4	1	5	NA
25	Detention Basin	SW-03	Tradition N. Basin	No	0.60	6	1146	28	1922	20	1	0.9	poor
26	Detention Basin	SW-04	Tradition S. Basin	No	0.54	7	1169	28	2176	8	1	1	poor
27	Detention Basin	SW-06	Hy-Vee South Basin	No	1.54	10	266	11	173	4	1	2.8	NA
28	Detention Basin	SW-02	Wildflower Basin	No	1.06	3	64	19	60	25	35	>2	NA
29	Detention Basin	NE-03	Deer Creek Basin	No	1.01	13	36	24	35	2.5	50	1.7	NA
30	Detention Basin	NW-02	Reinhart E. Basin	No	0.99	8	25	24	25	15	3	1.1	NA
31	Detention Basin	NW-03	Reinhart W. Basin	No	0.69	7	15	26	22	15	3	1.4	NA
32	Detention Basin	SW-12	Camden Woods E. Basin	No	0.62	18	16	24	26	10	4	2.2	fair
33	Detention Basin	SW-01c	Prairie Trail S. Detention Basin	No	0.57	9	88	25	155	6	70	4.4	NA
34	Detention Basin	SW-13	Camden Woods W. Basin	No	0.49	12	9	20	18	4	4	2.2	fair
35	Detention Basin	SW-01b	Prairie Trail N. Detention Basin	No	0.47	9	85	26	181	8	95	5.8	NA
36	Wetland	SW-08	Chautauqua Park Wetlands	No	3.74	0.5	165	13	44	30	60	NA	NA
37	Wetland	NW-15	Watercrest Park Wetlands	Yes	2.45	0.5	23	23	9	30	2	NA	NA
38	Wetland	SW-01a	Prairie Trail Wetland	No	0.15	0.5	74	27	493	10	NA	NA	NA

NA = Not Applicable

Appendix C. Basin Summaries

City of Ankeny - 2015 Public Stormwater Basin Study
Basin Summary

1. ***Basin Name & Identifier***
   Otter Creek Basin, NE-01

2. ***Basin Location***
   NE Delaware & NE 51st St.
   Upper Fourmile Creek Watershed

3. ***Basin Classification Type***
   Small Recreation & Detention Basin

4. ***Classification Justification***
   This basin meets all the characteristics of a Small Recreation & Detention Basin type, except for having little public access.

5. ***2015 Condition***
   a. Algae: Good (3% algae growth)
   b. Average Natural Buffer Width: 2 ft
   c. Fishing Resource: No information
   d. Water Clarity: Poor (1.8 ft)
   e. Infrastructure: Poor (major repairs/replacements needed)

6. ***Basin Goals***
   Engineering: Fully functional for detention of runoff, as designed.
   Recreation: Good public access with fair fishing potential; designed for light to moderate public use.
   Aesthetics & Ecology:
   - Little algae growth (<25%)
   - Fair visibility (≥2 ft)
   - Shoreline treatment: 0-0.5 feet buffer at access points; elsewhere natural buffer from water's edge to definable feature, or to ≥10 feet if no definable feature exists.

7. ***Goals Justification***
   The goals for this basin type are appropriate and met at this basin, except for the shoreline buffer, which is narrower than the goal, and the water clarity criterion, which is worse than the goal.

8. ***Recommended Future City Actions***
   - Cut and repair protruding rebar on 36" RCP inlet at SE corner of basin.
   - Replace damaged, sub-standard outlet pipe with standard SUDAS type intake structure.
   - Widen buffer.
   - Improve water clarity.
   - Improve public access.

City of Ankeny - 2015 Public Stormwater Basin Study
Basin Summary

1. ***Basin Name & Identifier***
   Renaissance Basin, NE-02

2. ***Basin Location***
   NE Delaware & NE 36th St.
   Upper Fourmile Creek Watershed

3. ***Basin Classification Type***
   Small Recreation & Detention Basin

4. ***Classification Justification***
   This basin fully meets all the characteristics of a Small Recreation & Detention Basin type.

5. ***2015 Condition***
   a. Algae: Fair (8% algae growth)
   b. Average Natural Buffer Width: 3 ft
   c. Fishing Resource: No information
   d. Water Clarity: Fair (2.3 ft)
   e. Infrastructure: Good (no repairs needed)

6. ***Basin Goals***
   Engineering: Fully functional for detention of runoff, as designed.
   Recreation: Good public access with fair fishing potential; designed for light to moderate public use.
   Aesthetics & Ecology:
   - Little algae growth (<25%)
   - Fair visibility (≥2 ft)
   - Shoreline treatment: 0-0.5 feet buffer at access points; elsewhere natural buffer from water's edge to definable feature, or to ≥10 feet if no definable feature exists.

7. ***Goals Justification***
   The goals for this basin type are appropriate and met at this basin, except for the shoreline buffer, which is narrower than the goal.

8. ***Recommended Future City Actions***
   - Widen buffer.

City of Ankeny - 2015 Public Stormwater Basin Study
Basin Summary

1. ***Basin Name & Identifier***
   Deer Creek Basin, NE-03

2. ***Basin Location***
   NE Frisk Dr. & NE 14th Ct.
   Middle Fourmile Creek Watershed

3. ***Basin Classification Type***
   Detention Basin

4. ***Classification Justification***
   This basin fully meets all the characteristics of a Detention Basin type.

5. ***2015 Condition***
   a. Algae: Poor (50% algae growth)
   b. Average Natural Buffer Width: 2.5 ft
   c. Fishing Resource: NA
   d. Water Clarity: Poor (1.7 ft)
   e. Infrastructure: Fair (minor repairs to improve functionality)

6. ***Basin Goals***
   Engineering: Fully functional for detention of runoff, as designed.
   Recreation: Minimal public access and no fishing potential; designed for minimal public use.
   Aesthetics & Ecology:
   - Algae growth: No goal
   - Visibility: No goal
   - Shoreline treatment: Buffer width not specified, but from water's edge to logical topographic break, trail, property line (with mowed strip), mowed areas, or other notable feature.

7. ***Goals Justification***
   The goals for this basin type are appropriate and fully met at this basin.

8. ***Recommended Future City Actions***
   - Fill erosion around 8" PVC intake along road near SW corner of basin; install cover on intake.
   - Inspect and/or remove possible unauthorized private structure at SE corner of basin.

City of Ankeny - 2015 Public Stormwater Basin Study
Basin Summary

1. ***Basin Name & Identifier***
   Rock Creek Elementary Basin, NW-01

2. ***Basin Location***
   NW 36th St. & NW Abilene
   Rock Creek – Des Moines River Watershed

3. ***Basin Classification Type***
   Small Recreation & Detention Basin

4. ***Classification Justification***
   This basin fully meets all the characteristics of a Small Recreation & Detention Basin type.

5. ***2015 Condition***
   a. Algae: Good (4% algae growth)
   b. Average Natural Buffer Width: 12 ft
   c. Fishing Resource: No information
   d. Water Clarity: Good (1.2 ft)
   e. Infrastructure: Good (no repairs needed)

6. ***Basin Goals***
   Engineering: Fully functional for detention of runoff, as designed.
   Recreation: Good public access with fair fishing potential; designed for light to moderate public use.
   Aesthetics & Ecology:
   - Little algae growth (<25%)
   - Fair visibility (≥2 ft)
   - Shoreline treatment: 0-0.5 feet buffer at access points; elsewhere natural buffer from water's edge to definable feature, or to ≥10 feet if no definable feature exists.

7. ***Goals Justification***
   The goals for this basin type are appropriate and met at this basin, except for the visibility criterion, which is worse than the goal.

8. ***Recommended Future City Actions***
   - Improve water clarity.

City of Ankeny - 2015 Public Stormwater Basin Study
Basin Summary

1. ***Basin Name & Identifier***
   Reinhart East Basin, NW-02

2. ***Basin Location***
   NW Reinhart & NW Ash Dr.
   Upper Fourmile Creek Watershed

3. ***Basin Classification Type***
   Detention Basin

4. ***Classification Justification***
   This basin fully meets all the characteristics of a Detention Basin type.

5. ***2015 Condition***
   a. Algae: Good (3% algae growth)
   b. Average Natural Buffer Width: 15 ft
   c. Fishing Resource: NA
   d. Water Clarity: Poor (1.1 ft)
   e. Infrastructure: Good (no repairs needed)

6. ***Basin Goals***
   Engineering: Fully functional for detention of runoff, as designed.
   Recreation: Minimal public access and no fishing potential; designed for minimal public use.
   Aesthetics & Ecology:
   - Algae growth: No goal
   - Visibility: No goal
   - Shoreline treatment: Buffer width not specified, but recommend from water's edge to logical topographic break, trail, property line (with mowed strip), mowed areas, or other notable feature.

7. ***Goals Justification***
   The goals for this basin type are appropriate and fully met at this basin.

8. ***Recommended Future City Actions***
   - None

City of Ankeny - 2015 Public Stormwater Basin Study
Basin Summary

1. ***Basin Name & Identifier***
   Reinhart West Basin, NW-03

2. ***Basin Location***
   NW Reinhart & NW Ash Dr.
   Upper Fourmile Creek Watershed

3. ***Basin Classification Type***
   Detention Basin

4. ***Classification Justification***
   This basin fully meets all the characteristics of a Detention Basin type.

5. ***2015 Condition***
   a. Algae: Good (3% algae growth)
   b. Average Natural Buffer Width: 15 ft
   c. Fishing Resource: NA
   d. Water Clarity: Poor (1.4 ft)
   e. Infrastructure: Good (no repairs needed)

6. ***Basin Goals***
   Engineering: Fully functional for detention of runoff, as designed.
   Recreation: Minimal public access and no fishing potential; designed for minimal public use.
   Aesthetics & Ecology:
   - Algae growth: No goal
   - Visibility: No goal
   - Shoreline treatment: Buffer width not specified, but from water's edge to logical topographic break, trail, property line (with mowed strip), mowed areas, or other notable feature.

7. ***Goals Justification***
   The goals for this basin type are appropriate and fully met at this basin.

8. ***Recommended Future City Actions***
   - Monitor broken 8" CPVC inlet at SE corner and repair if condition worsens.

City of Ankeny - 2015 Public Stormwater Basin Study
Basin Summary

1. ***Basin Name & Identifier***
   Georgetown North Basin, NW-04

2. ***Basin Location***
   NW Ash Dr. & NW Georgetown Blvd.
   Upper Fourmile Creek Watershed

3. ***Basin Classification Type***
   Medium Recreation & Detention Basin

4. ***Classification Justification***
   This basin fully meets all the characteristics of a Medium Recreation & Detention Basin type.

5. ***2015 Condition***
   a. Algae: Fair (12% algae growth)
   b. Average Natural Buffer Width: 1 ft
   c. Fishing Resource: Fair
   d. Water Clarity: Fair (3.5 ft)
   e. Infrastructure: Good (no repairs needed)

6. ***Basin Goals***
   Engineering: Fully functional for detention of runoff, as designed.
   Recreation: Good public access with good fishing potential; designed for moderate to heavy public use.
   Aesthetics & Ecology:
   - Little algae growth (<25%)
   - Fair visibility (≥2 ft)
   - Shoreline treatment: 0-0.5 feet buffer at access points; elsewhere natural buffer from water's edge to definable feature, or to ≥10 feet if no definable feature exists.

7. ***Goals Justification***
   The goals for this basin type are appropriate and met at this basin, except for fishing potential and shoreline buffer, which are respectively worse and narrower than the goals.

8. ***Recommended Future City Actions***
   - Improve fishery.
   - Widen buffer.

City of Ankeny - 2015 Public Stormwater Basin Study
Basin Summary

1. ***Basin Name & Identifier***
   Georgetown South Basin, NW-05

2. ***Basin Location***
   NW Ash Dr. & NW Georgetown Blvd.
   Upper Fourmile Creek Watershed

3. ***Basin Classification Type***
   Small Recreation & Detention Basin

4. ***Classification Justification***
   This basin fully meets all the characteristics of a Small Recreation & Detention Basin type.

5. ***2015 Condition***
   a. Algae: Poor (35% algae growth)
   b. Average Natural Buffer Width: 1 ft
   c. Fishing Resource: Good
   d. Water Clarity: Good (5.8 ft)
   e. Infrastructure: Fair (minor repairs to improve functionality)

6. ***Basin Goals***
   Engineering: Fully functional for detention of runoff, as designed.
   Recreation: Good public access with fair fishing potential; designed for light to moderate public use.
   Aesthetics & Ecology:
   - Little algae growth (<25%)
   - Fair visibility (≥2 ft)
   - Shoreline treatment: 0-0.5 feet buffer at access points; elsewhere natural buffer from water's edge to definable feature, or to ≥10 feet if no definable feature exists.

7. ***Goals Justification***
   The goals for this basin type are appropriate and met at this basin, except for the shoreline buffer, which is narrower than the goal, and the algae growth criterion, which is worse than the goal.

8. ***Recommended Future City Actions***
   - Cut and repair exposed rebar on 30" RCP inlet along SW side of basin; repair broken concrete apron.
   - Widen buffer.
   - Reduce algae growth.

City of Ankeny - 2015 Public Stormwater Basin Study
Basin Summary

1. ***Basin Name & Identifier***
   Prairie Lakes North Basin, NW-06

2. ***Basin Location***
   NW 18th St. & NW State Street
   Rock Creek – Des Moines River Watershed

3. ***Basin Classification Type***
   Medium Recreation & Detention Basin

4. ***Classification Justification***
   This basin fully meets all the characteristics of a Medium Recreation & Detention Basin type.

5. ***2015 Condition***
   a. Algae: Poor (50% algae growth)
   b. Average Natural Buffer Width: 1 ft
   c. Fishing Resource: Good
   d. Water Clarity: Fair (3.1 ft)
   e. Infrastructure: Fair (minor repairs)

6. ***Basin Goals***
   Engineering: Fully functional for detention of runoff, as designed.
   Recreation: Good public access with good fishing potential; designed for moderate to heavy public use.
   Aesthetics & Ecology:
   - Little algae growth (<25%)
   - Fair visibility (≥2 ft)
   - Shoreline treatment: 0-0.5 feet buffer at access points; elsewhere natural buffer from water's edge to definable feature, or to ≥10 feet if no definable feature exists.

7. ***Goals Justification***
   The goals for this basin type are appropriate and met at this basin, except for algae growth, which is worse than the goal.

8. ***Recommended Future City Actions***
   - Install trash racks on two inlets where missing (see evaluation form).
   - Reduce algae growth.

City of Ankeny - 2015 Public Stormwater Basin Study
Basin Summary

1. ***Basin Name & Identifier***
   Prairie Lakes South Basin, NW-07

2. ***Basin Location***
   NW Bay View Ct. & NW Prairie Lakes Dr.
   Rock Creek – Des Moines River Watershed

3. ***Basin Classification Type***
   Medium Recreation & Detention Basin

4. ***Classification Justification***
   This basin fully meets all the characteristics of a Medium Recreation & Detention Basin type.

5. ***2015 Condition***
   a. Algae: Good (<1% algae growth)
   b. Average Natural Buffer Width: 1 ft
   c. Fishing Resource: Poor
   d. Water Clarity: Fair (2.2 ft)
   e. Infrastructure: Good (no repairs needed)

6. ***Basin Goals***
   Engineering: Fully functional for detention of runoff, as designed.
   Recreation: Good public access with good fishing potential; designed for moderate to heavy public use.
   Aesthetics & Ecology:
   - Little algae growth (<25%)
   - Fair visibility (≥2 ft)
   - Shoreline treatment: 0-0.5 feet buffer at access points; elsewhere natural buffer from water's edge to definable feature, or to ≥10 feet if no definable feature exists.

7. ***Goals Justification***
   The goals for this basin type are appropriate and fully met at this basin, except for the shoreline buffer, which is narrower than the goal, and the fishing potential, which is poor.

8. ***Recommended Future City Actions***
   - Widen buffer.
   - Improve fishery.

City of Ankeny - 2015 Public Stormwater Basin Study
Basin Summary

1. ***Basin Name & Identifier***
   Prairie Ridge Complex North Basin, NW-08

2. ***Basin Location***
   NW 18th St. & NW Ash Dr.
   Rock Creek – Des Moines River Watershed

3. ***Basin Classification Type***
   Large Recreation & Detention Basin

4. ***Classification Justification***
   This basin meets all the characteristics of a Large Recreation & Detention Basin type, except for having poor fishing resources.

5. ***2015 Condition***
   a. Algae: Good (1% algae growth)
   b. Average Natural Buffer Width: 0.5 ft
   c. Fishing Resource: Poor
   d. Water Clarity: Fair (4 ft)
   e. Infrastructure: Fair (minor repairs to improve functionality)

6. ***Basin Goals***
   Engineering: Fully functional for detention of runoff, as designed.
   Recreation: Good public access with fair fishing potential; designed for heavy public use.
   Aesthetics & Ecology:
   - Very little algae growth (<5%)
   - Fair visibility (≥2 ft)
   - Shoreline treatment: 0-0.5 feet buffer at access points; elsewhere natural buffer from water's edge to definable feature, or to ≥15 feet if no definable feature exists

7. ***Goals Justification***
   The goals for this basin type are appropriate and met at this basin, except for the shoreline buffer, which is narrower than the goal.

8. ***Recommended Future City Actions.***
   - Monitor erosion on banks at locations (see evaluation form).
   - Repair/replace broken or missing trash racks on several inlets. (See evaluation form.)
   - Locate (or confirm the absence) of inlets not found during inspection, which may be buried in silt and/or vegetation; specifically structures 14J-50 and 14J-27.
   - Widen buffer.

City of Ankeny - 2015 Public Stormwater Basin Study
Basin Summary

1. ***Basin Name & Identifier***
   Prairie Ridge Complex South Basin, NW-09

2. ***Basin Location***
   NW State St. & NW Prairie Ridge Dr.
   Rock Creek – Des Moines River Watershed

3. ***Basin Classification Type***
   Large Recreation & Detention Basin

4. ***Classification Justification***
   This basin fully meets all the characteristics of a Large Recreation & Detention Basin type.

5. ***2015 Condition***
   a. Algae: Good (2% algae growth)
   b. Average Natural Buffer Width: 0.5 ft
   c. Fishing Resource: Fair
   d. Water Clarity: Fair (2 ft)
   e. Infrastructure: Fair (minor repairs to improve functionality)

6. ***Basin Goals***
   Engineering: Fully functional for detention of runoff, as designed.
   Recreation: Good public access with fair fishing potential; designed for heavy public use.
   Aesthetics & Ecology:
   - Very little algae growth (<5%)
   - Fair visibility (≥2 ft)
   - Shoreline treatment: 0-0.5 feet buffer at access points; elsewhere natural buffer from water's edge to definable feature, or to ≥15 feet if no definable feature exists

7. ***Goals Justification***
   The goals for this basin type are appropriate and met at this basin, except for the shoreline buffer, which is narrower than the goal.

8. ***Recommended Future City Actions.***
   - Repair or replace missing or broken trash racks on inlets as noted on evaluation form.
   - Monitor cracked wing wall on structure 14J-146 and repair if condition worsens.
   - Monitor sedimentation of north inlets and clear as needed.
   - Retrofit existing inlets with turf-covered depressions around the Prairie Ridge Complex basins to function more like rain gardens and infiltration basins.
   - Widen buffer.

City of Ankeny - 2015 Public Stormwater Basin Study
Basin Summary

1. ***Basin Name & Identifier***
   Horizon Park Basin, NW-10

2. ***Basin Location***
   NW State St. & NW Prairie Ridge Dr.
   Rock Creek – Des Moines River Watershed

3. ***Basin Classification Type***
   Small Recreation & Detention Basin

4. ***Classification Justification***
   This basin fully meets all the characteristics of a Small Recreation & Detention Basin type.

5. ***2015 Condition***
   a. Algae: Good (3% algae growth)
   b. Average Natural Buffer Width: 2 ft
   c. Fishing Resource: Poor
   d. Water Clarity: Fair (2.2 ft)
   e. Infrastructure: Fair (minor repairs to improve functionality)

6. ***Basin Goals***
   Engineering: Fully functional for detention of runoff, as designed.
   Recreation: Good public access with fair fishing potential; designed for light to moderate public use.
   Aesthetics & Ecology:
   - Little algae growth (<25%)
   - Fair visibility (≥2 ft)
   - Shoreline treatment: 0-0.5 feet buffer at access points; elsewhere natural buffer from water's edge to definable feature, or to ≥10 feet if no definable feature exists.

7. ***Goals Justification***
   The goals for this basin type are appropriate and met at this basin, except for the shoreline buffer, which is too narrow, and the fishing potential, which is poor.

8. ***Recommended Future City Actions***
   - Repair broken trail bridge.
   - Replace trash rack on outlet culvert.
   - Locate and inspect buried inlet pipe (if it exists) in SE corner.
   - Widen buffer.
   - Improve fishery.

City of Ankeny - 2015 Public Stormwater Basin Study
Basin Summary

1. ***Basin Name & Identifier***
   Hawkeye Park Basin, NW-11

2. ***Basin Location***
   NW Lakeshore Dr. & NW Ash Dr.
   Middle Fourmile Creek Watershed

3. ***Basin Classification Type***
   Medium Recreation & Detention Basin

4. ***Classification Justification***
   This basin fully meets all the characteristics of a Medium Recreation & Detention Basin type.

5. ***2015 Condition***
   a. Algae: Good (1% algae growth)
   b. Average Natural Buffer Width: <1 ft
   c. Fishing Resource: Poor
   d. Water Clarity: Fair (2.9 ft)
   e. Infrastructure: Good (no repairs needed)

6. ***Basin Goals***
   Engineering: Fully functional for detention of runoff, as designed.
   Recreation: Good public access with good fishing potential; designed for moderate to heavy public use.
   Aesthetics & Ecology:
   - Little algae growth (<25%)
   - Fair visibility (≥2 ft)
   - Shoreline treatment: 0-0.5 feet buffer at access points; elsewhere natural buffer from water's edge to definable feature, or to ≥10 feet if no definable feature exists.

7. ***Goals Justification***
   The goals for this basin type are appropriate and fully met at this basin, except for the shoreline buffer, which is narrower than the goal, and the fishing potential, which is also poorer than the goal.

8. ***Recommended Future City Actions***
   - Single, plain-end 8" PVC outlet pipe offers little control and may be vulnerable to damage; consider replacing with standard SUDAS type intake structure.
   - Widen buffer.
   - Improve fishery.

City of Ankeny - 2015 Public Stormwater Basin Study
Basin Summary

1. ***Basin Name & Identifier***
   Cherry Glen East Basin, NW-12

2. ***Basin Location***
   NW Abbie & NW 5th St.
   Murphy Branch – Des Moines River Watershed

3. ***Basin Classification Type***
   Medium Recreation & Detention Basin

4. ***Classification Justification***
   This basin fully meets all the characteristics of a Medium Recreation & Detention Basin type.

5. ***2015 Condition***
   a. Algae: Poor (30% algae growth)
   b. Average Natural Buffer Width: 4 ft
   c. Fishing Resource: Good
   d. Water Clarity: Fair (2.9 ft)
   e. Infrastructure: Fair (minor repairs to improve functionality)

6. ***Basin Goals***
   Engineering: Fully functional for detention of runoff, as designed.
   Recreation: Good public access with good fishing potential; designed for moderate to heavy public use.
   Aesthetics & Ecology:
   - Little algae growth (<25%)
   - Fair visibility (≥2 ft)
   - Shoreline treatment: 0-0.5 feet buffer at access points; elsewhere natural buffer from water's edge to definable feature, or to ≥10 feet if no definable feature exists.
   - Monitor cattails and maintain at < 10% cover.

7. ***Goals Justification***
   The goals for this basin type are appropriate and met at this basin, except for algae growth and water clarity, which are both worse than the goal.

8. ***Recommended Future City Actions***
   - Clear inlet and outlet pipes of sediment, cattails and debris.
   - Install trash rack on 21" RCP inlet in SW corner.
   - Reduce algae growth.
   - Improve water clarity.

City of Ankeny - 2015 Public Stormwater Basin Study
Basin Summary

1. ***Basin Name & Identifier***
   Cherry Glen North Basin, NW-13

2. ***Basin Location***
   NW 6th St. & NW Cherry Glen Dr.
   Murphy Branch – Des Moines River Watershed

3. ***Basin Classification Type***
   Medium Recreation & Detention Basin

4. ***Classification Justification***
   This basin fully meets all the characteristics of a Medium Recreation & Detention Basin type.

5. ***2015 Condition***
   a. Algae: Good (1% algae growth)
   b. Average Natural Buffer Width: 15 ft
   c. Fishing Resource: Good
   d. Water Clarity: Fair (1.6 ft)
   e. Infrastructure: Good (no repairs needed)

6. ***Basin Goals***
   Engineering: Fully functional for detention of runoff, as designed.
   Recreation: Good public access with good fishing potential; designed for moderate to heavy public use.
   Aesthetics & Ecology:
   - Little algae growth (<25%)
   - Fair visibility (≥2 ft)
   - Shoreline treatment: 0-0.5 feet buffer at access points; elsewhere natural buffer from water's edge to definable feature, or to ≥10 feet if no definable feature exists.

7. ***Goals Justification***
   The goals for this basin type are appropriate and fully met at this basin, except for water clarity, which is lower than the goal.

8. ***Recommended Future City Actions***
   - Change the substandard-size rip rap at the inlet to limit minor injuries.
   - Improve water clarity.

City of Ankeny - 2015 Public Stormwater Basin Study
Basin Summary

1. ***Basin Name & Identifier***
   Cherry Glen South Basin, NW-14

2. ***Basin Location***
   NW 4th St. & NW Mills Dr.
   Murphy Branch – Des Moines River Watershed

3. ***Basin Classification Type***
   Medium Recreation & Detention Basin

4. ***Classification Justification***
   This basin fully meets all the characteristics of a Medium Recreation & Detention Basin type.

5. ***2015 Condition***
   a. Algae: Poor (35% algae growth)
   b. Average Natural Buffer Width: 4 ft
   c. Fishing Resource: Fair
   d. Water Clarity: Fair (3.8 ft)
   e. Infrastructure: Good (no repairs needed)

6. ***Basin Goals***
   Engineering: Fully functional for detention of runoff, as designed.
   Recreation: Good public access with good fishing potential; designed for moderate to heavy public use.
   Aesthetics & Ecology:
   - Little algae growth (<25%)
   - Fair visibility (≥2 ft)
   - Shoreline treatment: 0-0.5 feet buffer at access points; elsewhere natural buffer from water's edge to definable feature, or to ≥10 feet if no definable feature exists.
   - Monitor cattails and maintain at < 10% cover.

7. ***Goals Justification***
   The goals for this basin type are appropriate and fully met at this basin, except for algae growth and fishing potential, which are both worse than the goal.

8. ***Recommended Future City Actions***
   - Clear debris and vegetation from outlet and SW inlet pipes.
   - Reduce algae growth.
   - Improve fishery.

City of Ankeny - 2015 Public Stormwater Basin Study
Basin Summary

1. ***Basin Name & Identifier***
   Watercrest Park Wetlands, NW-15

2. ***Basin Location***
   NW 5th St. & NW Jackson Dr.
   Murphy Branch – Des Moines River Watershed

3. ***Basin Classification Type***
   Wetland

4. ***Classification Justification***
   This basin fully meets all the characteristics of a Wetland type.

5. ***2015 Condition***
   a. Algae: Good (2% algae growth)
   b. Average Natural Buffer Width: NA
   c. Fishing Resource: NA
   d. Water Clarity: NA
   e. Infrastructure: Good (no repairs needed)

6. ***Basin Goals***
   Engineering: Fully functional for detention of runoff, as designed.
   Recreation: Minimal public access and no fishing potential; designed for little public use.
   Aesthetics & Ecology:
   - Algae growth: No goal
   - Shoreline treatment: ≥5 ft buffer, or natural buffer from wetland's edge to definable feature.
   - Increase native plant cover over time.

7. ***Goals Justification***
   The goals for this basin type are appropriate and fully met at this basin.

8. ***Recommended Future City Actions***
   - None

City of Ankeny - 2015 Public Stormwater Basin Study
Basin Summary

1. ***Basin Name & Identifier***
   Signature Basin, NW-16

2. ***Basin Location***
   NW Abilene Rd. & NW 18th St.
   Rock Creek – Des Moines River Watershed

3. ***Basin Classification Type***
   Medium Recreation & Detention Basin

4. ***Classification Justification***
   This basin fully meets all the characteristics of a Medium Recreation & Detention Basin type.

5. ***2015 Condition***
   a. Algae: Good (2% algae growth)
   b. Average Natural Buffer Width: 2 ft
   c. Fishing Resource: Good
   d. Water Clarity: Good (8.6 ft)
   e. Infrastructure: Fair (minor repairs to improve functionality)

6. ***Basin Goals***
   Engineering: Fully functional for detention of runoff, as designed.
   Recreation: Good public access with good fishing potential; designed for moderate to heavy public use.
   Aesthetics & Ecology:
   - Little algae growth (<25%)
   - Fair visibility (≥2 ft)
   - Shoreline treatment: 0-0.5 feet buffer at access points; elsewhere natural buffer from water's edge to definable feature, or to ≥10 feet if no definable feature exists.

7. ***Goals Justification***
   The goals for this basin type are appropriate and fully met at this basin.

8. ***Recommended Future City Actions***
   - Repair extensive erosion along south shoreline.
   - Install trash racks on inlet structures 13J-233, 221, 249 and 248 (see evaluation form.)

City of Ankeny - 2015 Public Stormwater Basin Study
Basin Summary

1. ***Basin Name & Identifier***
   Hillside Park East Basin, SE-01

2. ***Basin Location***
   SE Four Mile Dr. & SE 20th St.
   Middle Fourmile Creek Watershed

3. ***Basin Classification Type***
   Small Recreation & Detention Basin

4. ***Classification Justification***
   This basin fully meets all the characteristics of a Small Recreation & Detention Basin type.

5. ***2015 Condition***
   a. Algae: Poor (40% algae growth)
   b. Average Natural Buffer Width: 6 ft
   c. Fishing Resource: Fair
   d. Water Clarity: Good (5.1 ft)
   e. Infrastructure: Good (no repairs needed)

6. ***Basin Goals***
   Engineering: Fully functional for detention of runoff, as designed.
   Recreation: Good public access with fair fishing potential; designed for light to moderate public use.
   Aesthetics & Ecology:
   - Little algae growth (<25%)
   - Fair visibility (≥2 ft)
   - Shoreline treatment: 0-0.5 feet buffer at access points; elsewhere natural buffer from water's edge to definable feature, or to ≥10 feet if no definable feature exists.

7. ***Goals Justification***
   The goals for this basin type are appropriate and met at this basin, except for algae growth, which is worse than the goal.

8. ***Recommended Future City Actions***
   - Reset lid on manhole between east and west basins.
   - Reduce algae growth.

City of Ankeny - 2015 Public Stormwater Basin Study
Basin Summary

1. ***Basin Name & Identifier***
   Hillside Park West Basin, SE-02

2. ***Basin Location***
   SE Four Mile Dr. & SE 20th St.
   Middle Fourmile Creek Watershed

3. ***Basin Classification Type***
   Small Recreation & Detention Basin

4. ***Classification Justification***
   This basin fully meets all the characteristics of a Small Recreation & Detention Basin type.

5. ***2015 Condition***
   a. Algae: Poor (50% algae growth)
   b. Average Natural Buffer Width: 7 ft
   c. Fishing Resource: Fair
   d. Water Clarity: Good (9.2 ft)
   e. Infrastructure: Good (no repairs needed)

6. ***Basin Goals***
   Engineering: Fully functional for detention of runoff, as designed.
   Recreation: Good public access with fair fishing potential; designed for light to moderate public use.
   Aesthetics & Ecology:
   - Little algae growth (<25%)
   - Fair visibility (≥2 ft)
   - Shoreline treatment: 0-0.5 feet buffer at access points; elsewhere natural buffer from water's edge to definable feature, or to ≥10 feet if no definable feature exists.

7. ***Goals Justification***
   The goals for this basin type are appropriate and met at this basin, except for algae growth, which is worse than the goal.

8. ***Recommended Future City Actions***
   - Clear debris clogging outlet structure; consider clearing brush around inlet pipes for easier access and to prevent long-term damage to pipes.
   - Reduce algae growth.

City of Ankeny - 2015 Public Stormwater Basin Study
Basin Summary

1. ***Basin Name & Identifier***
   Springwood North Basin, SE-03

2. ***Basin Location***
   SE Peachtree Dr. & SE Magnolia Dr.
   Middle Fourmile Creek Watershed

3. ***Basin Classification Type***
   Small Recreation & Detention Basin

4. ***Classification Justification***
   This basin fully meets all the characteristics of a Small Recreation & Detention Basin type.

5. ***2015 Condition***
   a. Algae: Fair (20% algae growth)
   b. Average Natural Buffer Width: 8 ft
   c. Fishing Resource: Good
   d. Water Clarity: Good (5.9 ft)
   e. Infrastructure: Fair (minor repairs to improve functionality)

6. ***Basin Goals***
   Engineering: Fully functional for detention of runoff, as designed.
   Recreation: Good public access with fair fishing potential; designed for light to moderate public use.
   Aesthetics & Ecology:
   - Little algae growth (<25%)
   - Fair visibility (≥2 ft)
   - Shoreline treatment: 0-0.5 feet buffer at access points; elsewhere natural buffer from water's edge to definable feature, or to ≥10 feet if no definable feature exists.

7. ***Goals Justification***
   The goals for this basin type are appropriate and fully met at this basin.

8. ***Recommended Future City Actions***
   - Install trash racks on outlet and west side inlet.
   - Monitor erosion on east side near old railroad culvert; install rip rap if condition worsens.
   - Consider reducing algae growth because condition is at high end of acceptable range

City of Ankeny - 2015 Public Stormwater Basin Study
Basin Summary

1. ***Basin Name & Identifier***
   Springwood South Basin, SE-04

2. ***Basin Location***
   SE 33rd St. & SE Jasmine Ct.
   Rock Creek – Des Moines River Watershed

3. ***Basin Classification Type***
   Medium Recreation & Detention Basin

4. ***Classification Justification***
   This basin fully meets all the characteristics of a Medium Recreation & Detention Basin type.

5. ***2015 Condition***
   a. Algae: Good (2% algae growth)
   b. Average Natural Buffer Width: <1 ft
   c. Fishing Resource: Poor
   d. Water Clarity: Fair (2 ft)
   e. Infrastructure: Fair (minor repairs to improve functionality)

6. ***Basin Goals***
   Engineering: Fully functional for detention of runoff, as designed.
   Recreation: Good public access with good fishing potential; designed for moderate to heavy public use.
   Aesthetics & Ecology:
   - Little algae growth (<25%)
   - Fair visibility (≥2 ft)
   - Shoreline treatment: 0-0.5 feet buffer at access points; elsewhere natural buffer from water's edge to definable feature, or to ≥10 feet if no definable feature exists.

7. ***Goals Justification***
   The goals for this basin type are appropriate and fully met at this basin.

8. ***Recommended Future City Actions***
   - Cut and repair exposed rebar on 24" RCP inlet at NW corner.
   - Monitor erosion around inlet structures on west side and NE corner; install riprap if condition worsens.
   - Consider removing old fountain control boxes if fountains will not be used.

City of Ankeny - 2015 Public Stormwater Basin Study
Basin Summary

1. ***Basin Name & Identifier***
   Prairie Trail Wetland, SW-01a

2. ***Basin Location***
   SW 16th St. & South Ankeny Blvd.
   Saylor Creek – Des Moines River Watershed

3. ***Basin Classification Type***
   Wetland

4. ***Classification Justification***
   This basin fully meets all the characteristics of a Wetland type.

5. ***2015 Condition***
   a. Algae: Good (0% algae growth)
   b. Average Natural Buffer Width: 10
   c. Fishing Resource: NA
   d. Water Clarity: NA
   e. Infrastructure: Good (no repairs needed)

6. ***Basin Goals***
   Engineering: Fully functional for detention of runoff, as designed.
   Recreation: Minimal public access and no fishing potential; designed for little public use.
   Aesthetics & Ecology:
   - Algae growth: No goal
   - Shoreline treatment: ≥5 ft buffer, or natural buffer from wetland's edge to definable feature.
   - Increase native plant cover over time.

7. ***Goals Justification***
   The goals for this basin type are appropriate and fully met at this basin.

8. ***Recommended Future City Actions***
   - None

City of Ankeny - 2015 Public Stormwater Basin Study
Basin Summary

1. ***Basin Name & Identifier***
   Prairie Trail North Detention Basin, SW-01b

2. ***Basin Location***
   SW 16th St. & South Ankeny Blvd.
   Saylor Creek – Des Moines River Watershed

3. ***Basin Classification Type***
   Detention Basin

4. ***Classification Justification***
   This basin fully meets all the characteristics of a Detention Basin type.

5. ***2015 Condition***
   a. Algae: Poor (95% algae growth)
   b. Average Natural Buffer Width: 8 ft
   c. Fishing Resource: NA
   d. Water Clarity: Good (5.8 ft)
   e. Infrastructure: Good (no repairs needed)

6. ***Basin Goals***
   Engineering: Fully functional for detention of runoff, as designed.
   Recreation: Minimal public access and no fishing potential; designed for minimal public use.
   Aesthetics & Ecology:
   - Algae growth: No goal
   - Visibility: No goal
   - Shoreline treatment: Buffer width not specified, but recommend from water's edge to logical topographic break, trail, property line (with mowed strip), mowed areas, or other notable feature.

7. ***Goals Justification***
   The goals for this basin type are appropriate and fully met at this basin.

8. ***Recommended Future City Actions***
   - None

City of Ankeny - 2015 Public Stormwater Basin Study
Basin Summary

1. ***Basin Name & Identifier***
   Prairie Trail South Detention Basin, SW-01c

2. ***Basin Location***
   SW 16th St. & South Ankeny Blvd.
   Saylor Creek – Des Moines River Watershed

3. ***Basin Classification Type***
   Detention Basin

4. ***Classification Justification***
   This basin fully meets all the characteristics of a Detention Basin type.

5. ***2015 Condition***
   a. Algae: Poor (70% algae growth)
   b. Average Natural Buffer Width: 6 ft
   c. Fishing Resource: NA
   d. Water Clarity: Good (4.4 ft)
   e. Infrastructure: Good (no repairs needed)

6. ***Basin Goals***
   Engineering: Fully functional for detention of runoff, as designed.
   Recreation: Minimal public access and no fishing potential; designed for minimal public use.
   Aesthetics & Ecology:
   - Algae growth: No goal
   - Visibility: No goal
   - Shoreline treatment: Buffer width not specified, but recommend from water's edge to logical topographic break, trail, property line (with mowed strip), mowed areas, or other notable feature.

7. ***Goals Justification***
   The goals for this basin type are appropriate and fully met at this basin.

8. ***Recommended Future City Actions***
   - None

City of Ankeny - 2015 Public Stormwater Basin Study
Basin Summary

1. ***Basin Name & Identifier***
   Wildflower Basin, SW-02

2. ***Basin Location***
   SW Wildflower Dr. & SW 50th St.
   Saylor Creek – Des Moines River Watershed

3. ***Basin Classification Type***
   Detention Basin

4. ***Classification Justification***
   This basin fully meets all the characteristics of a Detention Basin type.

5. ***2015 Condition***
   a. Algae: Poor (35% algae growth)
   b. Average Natural Buffer Width: 25 ft
   c. Fishing Resource: NA
   d. Water Clarity: Fair (>2 ft)
   e. Infrastructure: Fair (minor repairs to improve functionality)

6. ***Basin Goals***
   Engineering: Fully functional for detention of runoff, as designed.
   Recreation: Minimal public access and no fishing potential; designed for minimal public use.
   Aesthetics & Ecology:
   - Algae growth: No goal
   - Visibility: No goal
   - Shoreline treatment: Buffer width not specified, but from water's edge to logical topographic break, trail, property line (with mowed strip), mowed areas, or other notable feature.

7. ***Goals Justification***
   The goals for this basin type are appropriate and fully met at this basin.

8. ***Recommended Future City Actions***
   - Monitor erosion at emergency overflow weir and repair if condition worsens.
   - Consider replacing obsolete outlet pipe with standard SUDAS type intake. Obsolete outlet pipe may be prone to clogging and uplift, which may contribute to high water levels.
   - Consider re-evaluating basin capacity by means of appropriate calculation methods.

City of Ankeny - 2015 Public Stormwater Basin Study
Basin Summary

1. ***Basin Name & Identifier***
   Tradition North Basin, SW-03

2. ***Basin Location***
   SW Westview Ln. & SW Tradition Dr.
   Saylor Creek – Des Moines River Watershed

3. ***Basin Classification Type***
   Detention Basin

4. ***Classification Justification***
   This basin fully meets all the characteristics of a Detention Basin type.

5. ***2015 Condition***
   a. Algae: Good (1% algae growth)
   b. Average Natural Buffer Width: 20 ft
   c. Fishing Resource: Poor
   d. Water Clarity: Poor (0.9 ft)
   e. Infrastructure: Poor (major repair and replacement; safety hazards)

6. ***Basin Goals***
   Engineering: Fully functional for detention of runoff, as designed.
   Recreation: Minimal public access and no fishing potential; designed for minimal public use.
   Aesthetics & Ecology:
   - Algae growth: No goal
   - Visibility: No goal
   - Shoreline treatment: Buffer width not specified, but recommend from water's edge to logical topographic break, trail, property line (with mowed strip), mowed areas, or other notable feature.

7. ***Goals Justification***
   The goals for this basin type are appropriate and fully met at this basin.

8. ***Recommended Future City Actions***
   - Basin does not appear to have adequate capacity for its location. Extensive erosion, sedimentation and unsafe outlet structure design were observed. A conceptual design study is recommended to determine the nature and extent of needed modifications.

City of Ankeny - 2015 Public Stormwater Basin Study
Basin Summary

1. ***Basin Name & Identifier***
   Tradition South Basin, SW-04

2. ***Basin Location***
   SW Westview Ln. & SW Tradition Dr.
   Saylor Creek – Des Moines River Watershed

3. ***Basin Classification Type***
   Detention Basin

4. ***Classification Justification***
   This basin fully meets all the characteristics of a Detention Basin type.

5. ***2015 Condition***
   a. Algae: Good (1% algae growth)
   b. Average Natural Buffer Width: 8 ft
   c. Fishing Resource: Poor
   d. Water Clarity: Poor (1 ft)
   e. Infrastructure: Poor (major repair or replacement; safety hazard)

6. ***Basin Goals***
   Engineering: Fully functional for detention of runoff, as designed.
   Recreation: Minimal public access and no fishing potential; designed for minimal public use.
   Aesthetics & Ecology:
   - Algae growth: No goal
   - Visibility: No goal
   - Shoreline treatment: Buffer width not specified, but recommend from water's edge to logical topographic break, trail, property line (with mowed strip), mowed areas, or other notable feature.

7. ***Goals Justification***
   The goals for this basin type are appropriate and fully met at this basin.

8. ***Recommended Future City Actions***
   - Basin does not appear to have adequate capacity for its location. Extensive erosion, sedimentation and unsafe outlet structure design were observed. A conceptual design study is recommended to determine the nature and extent of needed modifications.

City of Ankeny - 2015 Public Stormwater Basin Study
Basin Summary

1. ***Basin Name & Identifier***
   Sawgrass Park Basin, SW-05

2. ***Basin Location***
   SW 35th St. & SW Applewood St.
   Saylor Creek – Des Moines River Watershed

3. ***Basin Classification Type***
   Medium Recreation & Detention Basin

4. ***Classification Justification***
   This basin fully meets all the characteristics of a Medium Recreation & Detention Basin type.

5. ***2015 Condition***
   a. Algae: Fair (8% algae growth)
   b. Average Natural Buffer Width: 18 ft
   c. Fishing Resource: Good
   d. Water Clarity: Good (9.2 ft)
   e. Infrastructure: Fair (minor repairs to improve functionality)

6. ***Basin Goals***
   Engineering: Fully functional for detention of runoff, as designed.
   Recreation: Good public access with good fishing potential; designed for moderate to heavy public use.
   Aesthetics & Ecology:
   - Little algae growth (<25%)
   - Fair visibility (≥2 ft)
   - Shoreline treatment: 0-0.5 feet buffer at access points; elsewhere natural buffer from water's edge to definable feature, or to ≥10 feet if no definable feature exists.

7. ***Goals Justification***
   The goals for this basin type are appropriate and fully met at this basin.

8. ***Recommended Future City Actions***
   - Install trash guard on 21" RCP inlet on SE side.
   - Inspect outlet structure every 3-5 years. It was inaccessible during study, but appears to be functioning acceptably.
   - Locate (or confirm absence) of inlets not found during 2015 inspection on west side. Remove sedimentation or debris as needed.

City of Ankeny - 2015 Public Stormwater Basin Study
Basin Summary

1. ***Basin Name & Identifier***
   Hy-Vee South Basin, SW-06

2. ***Basin Location***
   SW Plaza Pkwy. & SW State St.
   Saylor Creek – Des Moines River Watershed

3. ***Basin Classification Type***
   Detention Basin

4. ***Classification Justification***
   This basin fully meets all the characteristics of a Detention Basin type.

5. ***2015 Condition***
   a. Algae: Good (1% algae growth)
   b. Average Natural Buffer Width: 4 ft
   c. Fishing Resource: NA
   d. Water Clarity: Fair (2.8 ft)
   e. Infrastructure: Fair (minor repairs to improve functionality)

6. ***Basin Goals***
   Engineering: Fully functional for detention of runoff, as designed.
   Recreation: Minimal public access and no fishing potential; designed for minimal public use.
   Aesthetics & Ecology:
   - Algae growth: No goal
   - Visibility: No goal
   - Shoreline treatment: Buffer width not specified, but recommend from water's edge to logical topographic break, trail, property line (with mowed strip), mowed areas, or other notable feature.

7. ***Goals Justification***
   The goals for this basin type are appropriate and fully met at this basin.

8. ***Recommended Future City Actions***
   - Clear sediment from 18" RCP inlet at SE corner of basin.
   - Consider converting slopes to low-maintenance native prairie, which would eliminate or reduce the need for regular mowing.

City of Ankeny - 2015 Public Stormwater Basin Study
Basin Summary

1. ***Basin Name & Identifier***
   Promenade Park Basin, SW-07

2. ***Basin Location***
   SW Prairie Trail Pkwy. & SW State St.
   Saylor Creek – Des Moines River Watershed

3. ***Basin Classification Type***
   Large Recreation & Detention Basin

4. ***Classification Justification***
   This basin fully meets all the characteristics of a Large Recreation & Detention Basin type.

5. ***2015 Condition***
   a. Algae: Good (3% algae growth)
   b. Average Natural Buffer Width: 10 ft
   c. Fishing Resource: Fair
   d. Water Clarity: Fair (3.7 ft)
   e. Infrastructure: Good (no repairs needed)

6. ***Basin Goals***
   Engineering: Fully functional for detention of runoff, as designed.
   Recreation: Good public access with fair fishing potential; designed for heavy public use.
   Aesthetics & Ecology:
   - Very little algae growth (<5%)
   - Fair visibility (≥2 ft)
   - Shoreline treatment: 0-0.5 feet buffer at access points; elsewhere natural buffer from water's edge to definable feature, or to ≥15 feet if no definable feature exists

7. ***Goals Justification***
   The goals for this basin type are appropriate and fully met at this basin.

8. ***Recommended Future City Actions***
   - Consider adding fence to outlet structure to prevent unauthorized entry and minimize potential fall hazard.

City of Ankeny - 2015 Public Stormwater Basin Study
Basin Summary

1. ***Basin Name & Identifier***
   Chautauqua Park Wetlands, SW-08

2. ***Basin Location***
   SW Prairie Trail Pkwy. & SW College St.
   Saylor Creek – Des Moines River Watershed

3. ***Basin Classification Type***
   Wetland

4. ***Classification Justification***
   This basin fully meets all the characteristics of a Wetland type.

5. ***2015 Condition***
   a. Algae: Poor (60% algae growth)
   b. Average Natural Buffer Width: NA
   c. Fishing Resource: NA
   d. Water Clarity: NA
   e. Infrastructure: Good (no repairs needed)

6. ***Basin Goals***
   Engineering: Fully functional for detention of runoff, as designed.
   Recreation: Minimal public access and no fishing potential; designed for little public use.
   Aesthetics & Ecology:
   - Algae growth: No goal
   - Shoreline treatment: ≥5 ft buffer, or natural buffer from wetland's edge to definable feature.
   - Increase native plant cover over time.

7. ***Goals Justification***
   The goals for this basin type are appropriate and fully met at this basin.

8. ***Recommended Future City Actions***
   - None

City of Ankeny - 2015 Public Stormwater Basin Study
Basin Summary

1. ***Basin Name & Identifier***
   Cascade Falls Basin, SW-09

2. ***Basin Location***
   SW 18th St. & SW Cascade Falls Dr.
   Saylor Creek – Des Moines River Watershed

3. ***Basin Classification Type***
   Detention Basin

4. ***Classification Justification***
   This basin fully meets all the characteristics of a Detention Basin type.

5. ***2015 Condition***
   a. Algae: Good (<1% algae growth)
   b. Average Natural Buffer Width: 4 ft
   c. Fishing Resource: NA
   d. Water Clarity: Good (5ft)
   e. Infrastructure: Good (no repairs needed)

6. ***Basin Goals***
   Engineering: Fully functional for detention of runoff, as designed.
   Recreation: Minimal public access and no fishing potential; designed for minimal public use.
   Aesthetics & Ecology:
   - Algae growth: No goal
   - Visibility: No goal
   - Shoreline treatment: Buffer width not specified, but recommend from water's edge to logical topographic break, trail, property line (with mowed strip), mowed areas, or other notable feature.
   - Manage cattails for <10% cover.

7. ***Goals Justification***
   The goals for this basin type are appropriate and fully met at this basin.

8. ***Recommended Future City Actions***
   - None

City of Ankeny - 2015 Public Stormwater Basin Study
Basin Summary

1. ***Basin Name & Identifier***
   Vintage Park Basin, SW-10

2. ***Basin Location***
   SW Vintage Pkwy. & SW State St.
   Saylor Creek – Des Moines River Watershed

3. ***Basin Classification Type***
   Large Recreation & Detention Basin

4. ***Classification Justification***
   This basin fully meets all the characteristics of a Large Recreation & Detention Basin type.

5. ***2015 Condition***
   a. Algae: Good (2% algae growth)
   b. Average Natural Buffer Width: 30 ft
   c. Fishing Resource: Fair
   d. Water Clarity: Fair (2.6 ft)
   e. Infrastructure: Fair/Good: (no repairs needed)

6. ***Basin Goals***
   Engineering: Fully functional for detention of runoff, as designed.
   Recreation: Good public access with fair fishing potential; designed for heavy public use.
   Aesthetics & Ecology:
   - Very little algae growth (<5%)
   - Fair visibility (≥2 ft)
   - Shoreline treatment: 0-0.5 feet buffer at access points; elsewhere natural buffer from water's edge to definable feature, or to ≥15 feet if no definable feature exists

7. ***Goals Justification***
   The goals for this basin type are appropriate and fully met at this basin.

8. ***Recommended Future City Actions.***
   - Dredge accumulated sediments from inlet siltation forebay at north end.
   - Monitor cracking of outlet structure concrete, which currently is not of major structural concern.
   - Consider installing fence on outlet structure to prevent unauthorized entry and minimize potential fall hazard.

City of Ankeny - 2015 Public Stormwater Basin Study
Basin Summary

1. ***Basin Name & Identifier***
   Art Center Basin, SW-11

2. ***Basin Location***
   SW State St. & SW Ordnance Rd.
   Saylor Creek – Des Moines River Watershed

3. ***Basin Classification Type***
   Medium Recreation & Detention Basin

4. ***Classification Justification***
   This basin fully meets all the characteristics of a Medium Recreation & Detention Basin type.

5. ***2015 Condition***
   a. Algae: Fair (12% algae growth)
   b. Average Natural Buffer Width: 10 ft
   c. Fishing Resource: Good
   d. Water Clarity: Good (6.3 ft)
   e. Infrastructure: Fair (minor repairs to improve functionality)

6. ***Basin Goals***
   Engineering: Fully functional for detention of runoff, as designed.
   Recreation: Good public access with good fishing potential; designed for moderate to heavy public use.
   Aesthetics & Ecology:
   - Little algae growth (<25%)
   - Fair visibility (≥2 ft)
   - Shoreline treatment: 0-0.5 feet buffer at access points; elsewhere natural buffer from water's edge to definable feature, or to ≥10 feet if no definable feature exists.
   - Manage cattails for <10% cover.

7. ***Goals Justification***
   The goals for this basin type are appropriate and fully met at this basin.

8. ***Recommended Future City Actions***
   - Install trash racks on inlet and outlet pipes
   - Monitor degradation of riprap shorelines and consider additional riprap if erosion or safety concerns develop.

City of Ankeny - 2015 Public Stormwater Basin Study
Basin Summary

1. ***Basin Name & Identifier***
   Camden Woods East Basin, SW-12

2. ***Basin Location***
   SW 4th Ct. & SW Camden Dr.
   Rock Creek – Des Moines River Watershed

3. ***Basin Classification Type***
   Detention Basin

4. ***Classification Justification***
   This basin fully meets all the characteristics of a Detention Basin type, except in its depth, which is deeper than the type.

5. ***2015 Condition***
   a. Algae: Good (4% algae growth)
   b. Average Natural Buffer Width: 10 ft
   c. Fishing Resource: Fair
   d. Water Clarity: Fair (2.2 ft)
   e. Infrastructure: Fair (minor repairs to improve functionality)

6. ***Basin Goals***
   Engineering: Fully functional for detention of runoff, as designed.
   Recreation: Minimal public access and no fishing potential; designed for minimal public use.
   Aesthetics & Ecology:
   - Algae growth: No goal
   - Visibility: No goal
   - Shoreline treatment: Buffer width not specified, but recommend from water's edge to logical topographic break, trail, property line (with mowed strip), mowed areas, or other notable feature.
   - Manage cattails for <10% cover.

7. ***Goals Justification***
   The goals for this basin type are appropriate and fully met at this basin.

8. ***Recommended Future City Actions***
   - Locate outlet pipe, which could not be found during site visit.
   - Consider erosion control (riprap) at outlet discharge in adjacent ravine.

City of Ankeny - 2015 Public Stormwater Basin Study
Basin Summary

1. ***Basin Name & Identifier***
   Camden Woods West Basin, SW-13

2. ***Basin Location***
   SW 4th Ct. & SW Camden Dr.
   Rock Creek – Des Moines River Watershed

3. ***Basin Classification Type***
   Detention Basin

4. ***Classification Justification***
   This basin fully meets all the characteristics of a Detention Basin type.

5. ***2015 Condition***
   a. Algae: Good (4% algae growth)
   b. Average Natural Buffer Width: 4 ft
   c. Fishing Resource: Fair
   d. Water Clarity: Fair (2.2 ft)
   e. Infrastructure: Good (no repairs needed)

6. ***Basin Goals***
   Engineering: Fully functional for detention of runoff, as designed.
   Recreation: Minimal public access and no fishing potential; designed for minimal public use.
   Aesthetics & Ecology:
   - Algae growth: No goal
   - Visibility: No goal
   - Shoreline treatment: Buffer width not specified, but recommend from water's edge to logical topographic break, trail, property line (with mowed strip), mowed areas, or other notable feature.
   - Manage cattails for <10% cover.

7. ***Goals Justification***
   The goals for this basin type are appropriate and fully met at this basin.

8. ***Recommended Future City Actions***
   - None

Appendix D. Condition Rating Matrix

City of Ankeny - 2015 Public Stormwater Basin Study (14-1131)
Condition Rating Matrix

Basin Identifiers		Stormwater & Water Quality			Recreation & Aesthetics				Wildlife & Ecology		
Basin ID	**Basin Name**	**Storage (Max/Design Depth)** Acceptable (≥ 75%) Unacceptable (< 75%)	**Water Clarity (ft)** good >4 fair 4-2 poor <2	**Eroding/Unstable Banks (% of edge)** good <1 fair 1-5 poor >5	**Algae Cover (% of water surface)** good <5 fair 5-25 poor >25	**Undesirable Plant Cover in Buffer (%)** good <5 fair 5-25 poor >25	**Fishing Resource** good (anglers regularly catch desirable fish) fair (anglers sometimes catch desirable fish) poor (no or few fish)	**Public Use (observed)** high (>5 people) moderate (1-5 people) low (no people)	**Wildlife Use** good (>100 individuals) fair (25-100 individuals) poor (<25 individuals)	**Plant Diversity** good (>50 species) fair (10-50 species) poor (<10 species)	**Infrastructure Condition** good (no repairs needed) fair (minor repairs; functional only) poor (major repairs/replacements; functional/safety)
Large Recr & Det Basin											
SW-07	Promenade Park Basin	Acceptable	fair	good	good	poor	fair	moderate	fair	fair	good
SW-10	Vintage Park Basin	Acceptable	fair	good	good	fair	fair	low	fair	good	fair
NW-08	Prairie Ridge Complex N. Basin	NA	fair	fair	good	poor	poor	low	fair	fair	fair
NW-09	Prairie Ridge Complex S. Basin	Acceptable	fair	fair	good	poor	fair	high	fair	poor	fair
Medium Recr & Det Basin											
NW-12	Cherry Glen East Basin	Acceptable	fair	good	poor	poor	good	low	fair	fair	fair
NW-06	Prairie Lakes N. Basin	Acceptable	fair	good	poor	poor	good	low	fair	fair	fair
SE-04	Springwood S. Basin	Acceptable	fair	fair	good	poor	poor	low	fair	fair	fair
NW-07	Prairie Lakes S. Basin	Acceptable	fair	fair	good	poor	poor	low	fair	poor	good
NW-11	Hawkeye Park Basin	Acceptable	fair	fair	good	poor	poor	moderate	good	poor	good
NW-14	Cherry Glen S. Basin	Acceptable	fair	good	poor	poor	fair	low	fair	fair	good
NW-16	Signature Basin	Unacceptable	good	poor	good	poor	good	low	fair	fair	fair
NW-13	Cherry Glen N. Basin	Acceptable	fair	good	good	fair	good	low	fair	fair	fair
SW-11	Art Center Basin	Acceptable	good	good	fair	poor	good	low	fair	fair	fair
SW-05	Sawgrass Park Basin	Acceptable	good	good	fair	poor	good	moderate	fair	fair	fair
NW-04	Georgetown N. Basin	Acceptable	fair	fair	fair	poor	fair	moderate	fair	poor	good
Small Recr & Det Basin											
SE-03	Springwood N. Basin	Acceptable	good	good	fair	poor	good	low	fair	fair	fair
SE-02	Hillside Park W. Basin	Acceptable	good	good	poor	poor	fair	moderate	fair	fair	fair
SE-01	Hillside Park E. Basin	Acceptable	good	good	poor	poor	fair	low	fair	fair	fair
NW-10	Horizon Park Basin	Acceptable	fair	good	good	fair	poor	moderate	fair	poor	fair
NW-05	Georgetown S. Basin	Unacceptable	good	good	poor	poor	good	moderate	good	poor	fair
NE-02	Renaissance Basin	Acceptable	fair	good	fair	poor	NA	moderate	poor	fair	good
NW-01	Rock Creek Elementary Basin	Acceptable	poor	fair	good	poor	NA	low	fair	fair	good
NE-01	Otter Creek Basin	Acceptable	poor	good	good	poor	NA	low	good	fair	poor
Detention Basin											
SW-09	Cascade Falls Basin	Acceptable	good	good	good	poor	NA	moderate	fair	fair	good
SW-03	Tradition N. Basin	Acceptable	poor	fair	good	fair	poor	moderate	fair	fair	poor
SW-04	Tradition S. Basin	Unacceptable	poor	fair	good	fair	poor	moderate	poor	fair	poor
SW-06	Hy-Vee South Basin	Acceptable	fair	fair	good	poor	NA	low	fair	fair	fair
SW-02	Wildflower Basin	NA	fair	good	poor	poor	NA	low	fair	fair	fair
NE-03	Deer Creek Basin	Acceptable	poor	good	poor	fair	NA	moderate	good	fair	fair
NW-02	Reinhart E. Basin	Acceptable	poor	good	good	poor	NA	moderate	good	fair	fair
NW-03	Reinhart W. Basin	Acceptable	poor	good	good	poor	NA	low	fair	fair	good
SW-12	Camden Woods E. Basin	Acceptable	fair	good	good	poor	fair	low	poor	fair	fair
SW-01c	Prairie Trail S. Detention Basin	Acceptable	good	fair	poor	poor	NA	low	fair	fair	good
SW-13	Camden Woods W. Basin	Acceptable	fair	good	good	poor	fair	low	fair	fair	good
SW-01b	Prairie Trail N. Detention Basin	Acceptable	good	fair	poor	poor	NA	low	fair	fair	good
Wetland											
SW-08	Chautauqua Park Wetlands	NA	NA	good	poor	poor	NA	low	good	good	good
NW-15	Watercrest Park Wetlands	NA	NA	good	good	poor	NA	low	poor	fair	good
SW-01a	Prairie Trail Wetland	NA	NA	good	good	poor	NA	low	poor	fair	good

NA = Not Applicable

Appendix E. Native Species Lists Appropriate for Central Iowa Ecological Restoration Projects

Appendix E. Native Species Lists Appropriate for Central Iowa Ecological Restoration Projects

Native Species Lists Native Canopy Trees

Common Name	Scientific Name	Notes
Black Maple	*Acer nigrum*	
Red Maple	*Acer rubrum*	
Sugar Maple	*Acer saccharum*	
Ohio Buckeye	*Aesculus glabra*	
River Birch	*Betula nigra*	
Shagbark Hickory	*Carya ovata*	
Hackberry	*Celtis occidentalis*	
Honeylocust	*Gleditsia triacanthos*	
Kentucky Coffee-tree	*Gymnocladus dioica*	use male species if desired
Black Walnut	*Juglans nigra*	
Eastern Red Cedar	*Juniperus virginiana*	evergreen
Eastern White Pine	*Pinus strobus*	evergreen
Eastern Cottonwood	*Populus deltoides*	use male species if desired
Quaking Aspen	*Populus tremuloides*	
Black Cherry	*Prunus serotina*	
White Oak	*Quercus alba*	
Swamp White Oak	*Quercus bicolor*	
Bur Oak	*Quercus macrocarpa*	
Black Willow	*Salix nigra*	wet areas
Eastern White Cedar	*Thuja occidentalis*	evergreen
Basswood	*Tilia americana*	

Native Understory Trees and Shrubs

Common Name	Scientific Name	Form	Notes
Low Serviceberry	*Amelanchier humilis*	Shrub	
Black Chokeberry	*Aronia melanocarpa*	Shrub	
American Hornbeam	*Carpinus caroliniana*	Short Tree	
Pagoda Dogwood	*Cornus alternifolia*	Shrub	
Gray Dogwood	*Cornus racemosa*	Shrub	
Red-twig Dogwood	*Cornus sericea*	Shrub	
American Hazelnut	*Corylus americana*	Shrub	
Fireberry Hawthorn	*Crataegus chrysocarpa*	Short Tree	
Witch Hazel	*Hamamelis virginiana*	Shrub	
Ironwood	*Ostrya virginiana*	Short Tree	
Ninebark	*Physocarpus opulifolius*	Shrub	
Wild Plum	*Prunus americana*	Shrub	
Chokecherry	*Prunus virginiana*	Shrub	
Smooth Sumac	*Rhus glabra*	Shrub	
Smooth Rose	*Rosa blanda*	Shrub	
Pussy willow	*Salix discolor*	Shrub	wet areas
Prairie Willow	*Salix humilis*	Shrub	
American Black Elderberry	*Sambucus nigra* ssp *canadensis*	Shrub	
Nannyberry	*Viburnum lentago*	Shrub	
Highbush Cranberry	*Viburnum opulus var. americanum (trilobum)*	Shrub	

Mesic Tallgrass Prairie Seed Mix

Common Name	Scientific Name	oz/ac	Notes
Big bluestem	*Andropogon gerardii*	24	
Drummond's aster	*Aster drummondii*	1	
Smooth blue aster	*Aster laevis*	2	
Side-flowering aster	*Aster lateriflorus*	0.2	
New England aster	*Aster novae-angliae*	1	
Canadian milk vetch	*Astragalus canadensis*	3	nitrogen-fixing legume
Short beak sedge	*Carex brevior*	0.5	
Fox sedge, Brown fox sedge	*Carex vulpinoidea*	0.5	
Partridge pea	*Cassia fasciculata*	16	nitrogen-fixing legume
Tall coreopsis	*Coreopsis tripteris*	2	
Canada wild rye	*Elymus canadensis*	32	
Rattlesnake master	*Eryngium yuccifolium*	6	
Maximilian sunflower	*Helianthus maximiliani*	4	
False sunflower	*Heliopsis helianthoides*	16	
Prairie alum root	*Heuchera richardsonii*	0.1	
Round-headed Bush Clover	*Lespedeza capitata*	1	nitrogen-fixing legume
Wild bergamot	*Monarda fistulosa*	2	
Common evening primrose	*Oenothera biennis*	1	
Switch grass	*Panicum virgatum*	16	
Virginia mountain mint	*Pycnanthemum virginianum*	0.5	
Yellow coneflower	*Ratibida pinnata*	4	
Black-eyed Susan	*Rudbeckia hirta*	6	
Sweet black-eyed susan	*Rudbeckia subtomentosa*	1	
Brown-eyed susan	*Rudbeckia triloba*	1	
Early figwort	*Scrophularia lanceolata*	0.5	
Rosin weed	*Silphium integrifolium*	2	
Stiff goldenrod	*Solidago rigida*	4	
Indiangrass	*Sorghastrum nutans*	32	
Wood germander	*Teucrium canadense*	1	
Spiderwort	*Tradescantia ohiensis*	4	
Culver's root	*Veronicastrum virginicum*	0.5	
Golden alexanders	*Zizia aurea*	6	
Total		**191**	

Mesic Shortgrass Prairie Seed Mix

Common Name	Scientific Name	oz/ac	Notes
Nodding Onion	*Allium cernuum*	1	
Leadplant	*Amorpha canescens*	1	nitrogen-fixing legume
Whorled milkweed	*Asclepias verticillata*	0.3	used by Monarch Butterfly
Common Milkweed	*Asclepias syriaca*	2	used by Monarch Butterfly
Side-flowering aster	*Aster lateriflorus*	0.15	
New England aster	*Aster novae-angliae*	0.3	
Canadian milk vetch	*Astragalus canadensis*	3	nitrogen-fixing legume
Side Oats Grama	*Bouteloua curtipendula*	40	
Blue grama	*Bouteloua gracilis*	2	
Short beak sedge	*Carex brevior*	1	
Fox sedge, Brown fox sedge	*Carex vulpinoidea*	0.3	
Partridge pea	*Cassia fasciculata*	16	nitrogen-fixing legume
Prairie coreopsis	*Coreopsis palmata*	0.3	
Purple Prairie Clover	*Dalea purpurea*	3	nitrogen-fixing legume
Canada wild rye	*Elymus canadensis*	16	
False sunflower	*Heliopsis helianthoides*	9	
Prairie alum root	*Heuchera richardsonii*	0.1	
Round-headed Bush Clover	*Lespedeza capitata*	1	nitrogen-fixing legume
Meadow blazing star	*Liatris ligulistylis*	1	
Wild bergamot	*Monarda fistulosa*	1.5	
Prairie cinquefoil	*Potentilla arguta*	0.15	
Virginia mountain mint	*Pycnanthemum virginianum*	0.15	
Black-eyed Susan	*Rudbeckia hirta*	8	
Little bluestem	*Schizachyrium scoparium*	48	
Stiff goldenrod	*Solidago rigida*	1.5	
Prairie dropseed	*Sporobolus heterolepis*	4	
Wood germander	*Teucrium canadense*	0.75	
Spiderwort	*Tradescantia ohiensis*	2	
Hoary vervain	*Verbena stricta*	1	
Culver's root	*Veronicastrum virginicum*	0.5	
Golden alexanders	*Zizia aurea*	6	
Total		**171**	

Native Wet Prairie/Wet Meadow Seed Mix

Common Name	Scientific Name	oz/ac	Notes
Swamp Milkweed	*Asclepias incarnata*	4	
New England Aster	*Aster novae-angliae*	1	
American Slough Grass	*Beckmannia syzigachne*	2	
Blue Joint Grass	*Calamagrostis canadensis*	1	
Small Yellow Fox Sedge	*Carex annectens xanthocarpa*	1	
Crested Oval Sedge	*Carex cristatella*	1	
Lance-fruited Oval Sedge	*Carex scoparia*	2	
Common Fox Sedge	*Carex stipata*	2	
Brown Fox Sedge	*Carex vulpinoidea*	4	
Virginia Wild Rye	*Elymus virginicus*	24	
Cinnamon Willow Herb	*Epilobium coloratum*	0.5	
Joe Pye Weed	*Eupatorium maculatum*	1	tall
Boneset	*Eupatorium perfoliatum*	0.5	
Fowl Manna Grass	*Glyceria striata*	4	
Sneezeweed	*Helenium autumnale*	1	
Torrey's Rush	*Juncus torreyi*	0.1	
Prairie Blazing Star	*Liatris pycnostachya*	4	
Cardinal Flower	*Lobelia cardinalis*	0.25	short-lived perennial
Great Blue Lobelia	*Lobelia siphilitica*	0.5	
Water Horehound	*Lycopus americanus*	1	
Prairie Loosestrife	*Lysimachia quadriflora*	1	
Winged Loosestrife	*Lythrum alatum*	0.05	
Wild Mint	*Mentha arvensis*	0.25	
Switch grass	*Panicum virgatum*	32	
Obedient Plant	*Physostegia virginiana*	2	
Fowl Bluegrass	*Poa palustris*	4	
Mountain Mint	*Pycnanthemum virginianum*	1	
Dark-green Bulrush	*Scirpus atrovirens*	0.5	
Great Bulrush	*Scirpus validus*	1	very wet areas
Grass-leaved Goldenrod	*Solidago graminifolia*	0.5	
Ohio Goldenrod	*Solidago ohioensis*	1	
Cord Grass	*Spartina pectinata*	8	
Culver's Root	*Veronicastrum virginicum*	0.1	
Total		**106**	

Native Rain Garden/Bioswale Seed Mix

Common Name	Scientific Name	Height (in)	lbs/ac
Graminoids			
Fringed Brome	*Bromus ciliatus*	24-48	1.21
Bluejoint	*Calamagrostis canadensis*	24-60	0.16
Fox Sedge	*Carex vulpinoidea*	36	0.61
Virginia Wild Rye	*Elymus virginicus*	48	5.45
Tall Manna Grass	*Glyceria grandis*	48-60	0.18
Fowl Manna Grass	*Glyceria striata*	36	0.16
Dark Green Bulrush	*Scirpus atrovirens*	60	0.12
Prairie Cordgrass	*Spartina pectinata*	48-80	1.44
	Total Graminoids		**9.32**

Forbs			
Canada Anemone	*Anemone canadensis*	12-24	0.95
Swamp Milkweed	*Asclepias incarnata*	21-48	1.27
Flat-Topped Aster	*Aster umbellatus*	40-72	0.27
Common Boneset	*Eupatorium perfoliatum*	36-60	0.17
Grass-Leaved Goldenrod	*Euthamia graminifolia*	24	0.10
Autumn Sneezeweed	*Helenium autumnale*	24-36	0.20
Great Blazing Star	*Liatris pycnostachya*	24-48	0.97
Great Lobelia	*Lobelia siphilitica*	12-48	0.09
Virginia Mountain Mint	*Pycnanthemum virginianum*	12-36	0.15
Red-Stemmed Aster	*Aster puniceus*	60	0.27
Blue Vervain	*Verbena hastata*	24-72	0.31
Golden Alexanders	*Zizia aurea*	12-36	1.21
	Total Forbs		**5.97**

Appendix F. Undesirable Plant Species

City of Ankeny - 2015 Public Stormwater Basin Study (14-1131)
Undesirable Plant Species

Iowa Department of Agriculture and Land Stewardship. 2002. The Iowa weed law (20 October 2003). Iowa Department of Agriculture & Land Stewardship.

Introduced, Invasive, and Noxious Plants (Iowa): Table adapted from: http://plants.usda.gov/java/noxious?rptType=State&statefips=19

Symbol	Scientific Name	Noxious Common Name	State Noxious Status†	Native Status*	Observed In Ankeny	Priority for Control
CIAR4	*Cirsium arvense (L.) Scop.*	Canada thistle	PRNW	L48 (I), AK (I), CAN (I), GL (I), SPM (I)	x	high
LOMA6	*Lonicera maackii (Rupr.) Herder*	amur honeysuckle	AES invasive	L48 (I), CAN (I)	x	high
LOMO2	*Lonicera morrowii*	Morrow's honeysuckle	AES invasive	L48 (I), CAN (I)	x	high
LOCO6	*Lotus corniculatus*	bird's-foot trefoil	AES invasive	L48 (I), CAN (I), SPM (I)	x	high
LYSA2	*Lythrum salicaria L.* [1]	purple loosestrife	SNW	L48 (I), CAN (I), SPM (I)	x	high
PASA2	*Pastinaca sativa*	wild parsnip	AES invasive	L48 (I), AK (I), CAN (W), SPM (W)	x	high
PHAR3	*Phalaris arundinacea*	reed canarygrass	AES invasive	L48 (N), AK (I), CAN (N), SPM (I)	x	high
RHAMN	*Rhamnus L.* [2]	buckthorn	PRNW		x	high
SEVA4	*Securigera varia (L.) Lassen*	crown vetch	AES invasive	L48 (I), HI (I), CAN (I)	x	high
COMA2	*Conium maculatum L.*	poison hemlock	SNW	L48 (I), CAN (I)		high
CIVU	*Cirsium vulgare (Savi) Ten.*	bull thistle	PRNW	L48 (I), AK (I), HI (I), CAN (I), SPM (I)	x	moderate
ABTH	*Abutilon theophrasti Medik.*	butterprint, velvetleaf	SNW	L48 (I), CAN (I)	x	low
COAR4	*Convolvulus arvensis L.*	European morning glory, field bindweed	PRNW	L48 (I), HI (I), CAN (I)	x	low
DACA6	*Daucus carota L.*	wild carrot, Queen Anne's lace	SNW	L48 (I), PR (I), CAN (I), SPM (I)	x	low
ELRE4	*Elymus repens (L.) Gould*	quackgrass	PRNW	L48 (I), AK (I), CAN (I), GL (I), SPM (I)	x	low
PLLA	*Plantago lanceolata L.*	narrowleaf plantain	SNW	(I), L48 (I), AK (I), HI (I), PR (I), CAN (I), GL (I), SPM (I)	x	low
RUCR	*Rumex crispus L.*	sour dock	SNW	L48 (I), AK (I), HI (I), PR (I), CAN (I), SPM (I)	x	low
SOCA3	*Solanum carolinense L.*	horse nettle	PRNW	L48 (N), CAN (I)	x	low
SOAR2	*Sonchus arvensis L.*	perennial sowthistle	PRNW	L48 (I), AK (I), CAN (I), SPM (I)	x	low
XASTC	*Xanthium strumarium L. var. canadense (Mill.) Torr. & A. Gray*	cocklebur	SNW	(I), L48 (N), HI (I), CAN (N)	x	low
ACRE3	*Acroptilon repens (L.) DC.*	hardheads; Russian knapweed	PRNW	L48 (I), CAN (I)		
CADR	*Cardaria draba (L.) Desv.*	whitetop; perennial pepper-grass	PRNW	L48 (I), CAN (I)		
CARDU	*Carduus L.*	thistle	PRNW			
CIRSI	*Cirsium Mill.*	thistle	PRNW			
DIFU2	*Dipsacus fullonum L.*	teasel	SNW	L48 (I), CAN (I)		
DILA4	*Dipsacus laciniatus L.*	teasel	SNW	L48 (I), CAN (I)		
DISA9	*Dipsacus sativus (L.) Honck.*	teasel	SNW	L48 (I)		
EUES	*Euphorbia esula L.*	leafy spurge	PRNW	L48 (I), CAN (I)		
HEAN3	*Helianthus annuus L.*	wild sunflower	SNW	L48 (N), AK (I), HI (I), PR (I), CAN (I), SPM (I)		
LYVI3	*Lythrum virgatum L.*	purple loosestrife	SNW	L48 (I)		
ROMU	*Rosa multiflora Thunb.* [3]	multiflora rose	SNW	L48 (I), CAN (I)		
RUAC3	*Rumex acetosella L.*	sheep sorrel	SNW	L48 (I), AK (I), HI (I), CAN (I), GL (I), SPM (I)		
RUAL4	*Rumex altissimus Alph. Wood*	smooth dock	SNW	L48 (N), CAN (N), SPM (N)		
SIAR4	*Sinapis arvensis L.*	charlock mustard	---	L48 (I), AK (I), HI (I), VI (I), CAN (I), GL (I), SPM (I)		
SIARA	*Sinapis arvensis L. subsp. arvensis*	wild mustard	SNW	L48 (I), AK (I), HI (I), VI (I), CAN (I), GL (I), SPM (I)		
SOBI2	*Sorghum bicolor (L.) Moench* [4]	shattercane	SNW	(I), L48 (I), HI (I), PR (I), VI (I), CAN (I)		
TRTE	*Tribulus terrestris L.*	puncturevine	SNW	(I), L48 (I), HI (I), CAN (W)		

†Code	Noxious Status
PRNW	Primary noxious weed
SNW	Secondary noxious weed
***Code**	**Native Status**
I	Introduced
N	Native
W	Waif
***Code**	**Native Status Jursdiction**
L48	Lower 48 States
AK	Alaska
HI	Hawaii
PR	Puerto Rico
VI	Virgin Islands
CAN	Canada
GL	Greenland
SPM	St. Pierre and Miquelon

[1] it is illegal to import, sell, offer for sale, or distribute the seeds or the plants of purple loosestrife in any form

[2] except R. frangula

[3] not considered a noxious weed when used as a rootstock for cultivated roses

[4] not a noxious weed when cultivated