

# **Lorson Ranch Metropolitan District Operations and Maintenance Manual Extended Detention Ponds**

Extended detention basins have low to moderate maintenance requirements. Routine and non-routine maintenance is necessary to assure performance, enhance aesthetics, and protect structural integrity. The dry basins can result in nuisance complaints if not properly designed or maintained. Bio-degradable pesticides may be required to limit insect problems. Frequent debris removal and grass-mowing can reduce aesthetic complaints. If a shallow wetland or marshy area is included, mosquito breeding and nuisance odors could occur if the water becomes stagnant.

## **1. Lorson Ranch Ponds maintained by Lorson Ranch Metropolitan District.**

There are multiple ponds within Lorson Ranch that the metro district owns and maintains. The following is a list of the ponds, type of pond, and the name of the subdivision within Lorson Ranch that built the pond. Attached to this manual is a location map of all the ponds owned/maintained by the Lorson Ranch Metropolitan District.

- a. Pond A1 – Extended Detention Basin with WQCV. Pond A1 was built in 2006 as part of the Fontaine Blvd/Old Glory street improvement project. The final drainage report for Fontaine Blvd/Old Glory covers the drainage calculations for this pond.
- b. Pond A2 – Extended Detention Basin (no WQCV). Pond A2 was built in 2006 as part of the Fontaine Blvd/Old Glory street improvement project. The final drainage report for Fontaine Blvd/Old Glory covers the drainage calculations for this pond.
- c. Pond A4 – Extended Detention Basin (no WQCV). Pond A4 was built in 2010 as part of the Pioneer Landing Filing No. 1 development. The final drainage report for Pioneer Landing Filing No. 1 covers the drainage calculations for this pond.
- d. Pond A5 - Extended Detention Basin with WQCV. Pond A5 was built in 2009-2010 as part of the Townhomes at Lorson Ranch Filing 1A development. The final drainage report covers the drainage calculations for this pond.
- e. Pond B1 – Extended Detention Basin with WQCV. Pond B1 was built in 2016 as part of the Pioneer Landing Filing No. 2 development. The final drainage report for Pioneer Landing Filing No. 2 covers the drainage calculations for this pond.
- f. Pond B2 – Extended Detention Basin with WQCV. Pond B2 was built in 2013 as part of the Meadows at Lorson Ranch Filing No. 3 development. The final drainage report for Meadows at Lorson Ranch Filing No. 3 covers the drainage calculations for this pond.
- g. Pond C1-R – Extended Detention Basin with WQCV. Pond C1 was built in 2011 as part of the Allegiant at Lorson Ranch development. The final drainage report for Allegiant at Lorson Ranch covers the drainage calculations for this pond.
- h. Pond C3a– Extended Detention Basin with WQCV. Pond C3a was built in 2014 as part of the Meadows at Lorson Ranch Filing No. 4 development. The final

- drainage report for Meadows 4 at Lorson Ranch covers the drainage calculations for this pond.
- i. Pond G1-G2 – Extended Detention Basin with WQCV. Full spectrum Pond G1-G2 will be built in 2017 as part of the Carriage Meadows South development. The final drainage report for Carriage Meadows South covers the drainage calculations for this pond.
  - j. Pond G3 – Extended Detention Basin with WQCV. Full Spectrum Pond G3 will be built in 2017 as part of the Carriage Meadows South development. The final drainage report for Carriage Meadows South covers the drainage calculations for this pond.
  - k. Pond C5 - Extended Detention Basin with WQCV. Full Spectrum Pond C5 will be built in 2018 as part of the Lorson Ranch East development. The final drainage report for Lorson Ranch East Filing No. 1 covers the drainage calculations for this pond.
  - l. Pond D2 - Extended Detention Basin with WQCV. Full Spectrum Pond D2 will be built in 2018 as part of the Lorson Ranch East development. The final drainage report for Lorson Ranch East Filing No. 1 covers the drainage calculations for this pond.
  - m. Pond CMN-1. Extended Detention Basin with WQCV. Full Spectrum Pond CMN-1 will be built in 2018 as part of the Carriage Meadows North Filing No. 1 development. The final drainage report for Carriage Meadows North Filing No. 1 covers the drainage calculations for this pond.
  - n. Pond C3. Interim Detention Basin (no WQCV). Ponds C3 will be built in 2018 as part of the Lorson Ranch East Filing No. 2 development. The final drainage report for Lorson Ranch East Filing No. 2 covers the interim drainage calculations for this pond. The interim pond is a detention basin with a pipe storm sewer draining the pond.

## **1.1 Lorson Ranch Grass Buffer for Backyard Water Quality Treatment maintained by Lorson Ranch Metropolitan District.**

There are multiple areas that the backyards of houses drain directly to the East Tributary of Jimmy Camp Creek or the main channel of Jimmy Camp Creek. A grass buffer WQ CMP located in a separate tract of land will be used for these areas within Lorson Ranch and the metro district will own and maintain the buffer tracts. The following is a list of the grass buffer BMP's and the the name of the subdivision within Lorson Ranch that built the BMP. Attached to this manual is a location map of all the ponds and BMP's owned/maintained by the Lorson Ranch Metropolitan District. See Section 4.0 for maintenance of Grass Buffers.

- a.1. Carriage Meadows North at Lorson Ranch Filing No. 1 – Tract C – Grass Buffer BMP
- a.2 Lorson Ranch East Filing No. 1 – Tract D – Grass Buffer BMP
- a.3 Lorson Ranch East Filing No. 2 – Tract B – Grass Buffer BMP

## **2. Pond Inspections**

### ***Inspection and Frequency***

- Annually inspect basins to insure that the basin continues to function as initially intended. The annual inspection should evaluate the forebay, pond side slopes, inflow storm sewer, the spillway condition, the depth of sediment in the forebay, outlet structure, trash rack, downstream storm sewer, and the condition of the downstream face of the pond. A site survey will be the best indication of excessive sediment buildup and degradation of the spillway. In addition, an inspection of the vegetation on the berm, inside the detention area and the downstream face of the spillway should be conducted. Any bare areas should be noted and repaired using native grasses. Any sloughing or erosion of the embankment should be noted and repaired. Items to record will include any items inspected and the mowing frequency of the vegetation on the facility.
- Just before annual storm seasons (that is, April and May) and following significant rainfall events, inspect for litter and debris that may plug outlets. Of notable importance, the inspections should also include the water quality orifice plate and trash rack to ensure plugging has not occurred.
- A baseline survey should be performed at the time of construction and comparison surveys conducted every ten to twenty years after to monitor overall performance of the pond. Results of inspections should be recorded and kept at a central location for review and recording by the district.

### ***Inspection Personnel***

A qualified engineer, surveyor, or certified storm water inspector should conduct inspections of the facility.

## **3.0 Operations**

No specific operating instructions are required.

## **4.0 Maintenance**

4.1 Maintenance of the Water Quality Ponds shall be in accordance with the guidelines included in Table EDB-1, attached.

4.2 Maintenance of Grass Buffers shall be in accordance with the guidelines included in the appendix

**6.0 EXTENDED DETENTION BASINS (EDB)**



Extended detention basins have low to moderate maintenance requirements. Routine and nonroutine maintenance is necessary to assure performance, enhance aesthetics, and protect structural integrity. The dry basins can result in nuisance complaints if not properly designed or maintained. Bio-degradable pesticides may be required to limit insect problems. Frequent debris removal and grass-mowing can reduce aesthetic complaints. If a shallow wetland or marshy area is included, mosquito breeding and nuisance odors could occur if the water becomes stagnant. Access to critical elements of the pond (inlet, outlet, spillway, and sediment collection areas) must be provided. The basic elements of the maintenance requirements are presented in Table EDB-1.

**Table EDB-1—Extended Detention Basin Maintenance Considerations**

<b>Required Action</b>	<b>Maintenance Objective</b>	<b>Frequency of Action</b>
Lawn mowing and lawn care	Occasional mowing to limit unwanted vegetation. Maintain irrigated turf grass as 2 to 4 inches tall and nonirrigated native turf grasses at 4 to 6 inches.	Routine – Depending on aesthetic requirements.
Debris and litter removal	Remove debris and litter from the entire pond to minimize outlet clogging and improve aesthetics.	Routine – Including just before annual storm seasons (that is, April and May) and following significant rainfall events.
Erosion and sediment control	Repair and revegetate eroded areas in the basin and channels.	Nonroutine – Periodic and repair as necessary based on inspection.
Structural	Repair pond inlets, outlets, forebays, low flow channel liners, and energy dissipators whenever damage is discovered.	Nonroutine – Repair as needed based on regular inspections.

<b>Required Action</b>	<b>Maintenance Objective</b>	<b>Frequency of Action</b>
Inspections	Inspect basins to insure that the basin continues to function as initially intended. Examine the outlet for clogging, erosion, slumping, excessive sedimentation levels, overgrowth, embankment and spillway integrity, and damage to any structural element.	Routine – Annual inspection of hydraulic and structural facilities. Also check for obvious problems during routine maintenance visits, especially for plugging of outlets.
Nuisance control	Address odor, insects, and overgrowth issues associated with stagnant or standing water in the bottom zone.	Nonroutine – Handle as necessary per inspection or local complaints.
Sediment removal	Remove accumulated sediment from the forebay, micro-pool, and the bottom of the basin.	Nonroutine – Performed when sediment accumulation occupies 20 percent of the WQCV. This may vary considerably, but expect to do this every 10 to 20 years, as necessary per inspection if no construction activities take place in the tributary watershed. More often if they do. The forebay and the micro-pool will require more frequent cleanout than other areas of the basin, say every 1 or 2 years.

## 4.0 Grass Buffers and Swales

Grass buffers and swales require maintenance of the turf cover and repair of rill or gully development. Healthy vegetation can often be maintained without using fertilizers because runoff from lawns and other areas contains the needed nutrients. Periodically inspecting the vegetation over the first few years will help to identify emerging problems and help to plan for long-term restorative maintenance needs. This section presents a summary of specific maintenance requirements and a suggested frequency of action.



**Photograph 6-2.** A lack of sediment removal in this grass swale has resulted in a grade change due to growth over the deposition and ponding upstream.

### 4.1 Inspection

Inspect vegetation at least twice annually for uniform cover and traffic impacts. Check for sediment accumulation and rill and gully development.

### 4.2 Debris and Litter Removal

Remove litter and debris to prevent rill and gully development from preferential flow paths around accumulated debris, enhance aesthetics, and prevent floatables from being washed offsite. This should be done as needed based on inspection, but no less than two times per year.

### 4.3 Aeration

Aerating manicured grass will supply the soil and roots with air. It reduces soil compaction and helps control thatch while helping water move into the root zone. Aeration is done by punching holes in the ground using an aerator with hollow punches that pull the soil cores or "plugs" from the ground. Holes should be at least 2 inches deep and no more than 4 inches apart.

Aeration should be performed at least once per year when the ground is not frozen. Water the turf thoroughly prior to aeration. Mark sprinkler heads and shallow utilities such as irrigation lines and cable TV lines to ensure those lines will not be damaged. Avoid aerating in extremely hot and dry conditions. Heavy traffic areas may require aeration more frequently.

### 4.4 Mowing

When starting from seed, mow native/drought-tolerant grasses only when required to deter weeds during the first three years. Following this period, mowing of native/drought tolerant grass may stop or be reduced to maintain a length of no less than six inches. Mowing of manicured grasses may vary from as frequently as weekly during the summer, to no mowing during the winter. See the inset for additional recommendations from the CSU Extension.

#### 4.5 Irrigation Scheduling and Maintenance

Adjust irrigation schedules throughout the growing season to provide the proper irrigation application rate to maintain healthy vegetation. Less irrigation is typically needed in early summer and fall, with more irrigation needed during July and August. Native grass should not require irrigation after establishment, except during prolonged dry periods when supplemental, temporary irrigation may aid in maintaining healthy vegetation cover. Check for broken sprinkler heads and repair them, as needed. Do not overwater. Signs of overwatering and/or broken sprinkler heads may include soggy areas and unevenly distributed areas of lush growth.

Completely drain and blowout the irrigation system before the first winter freeze each year. Upon reactivation of the irrigation system in the spring, inspect all components and replace damaged parts, as needed.

#### 4.6 Fertilizer, Herbicide, and Pesticide Application

Use the minimum amount of biodegradable nontoxic fertilizers and herbicides needed to establish and maintain dense vegetation cover that is reasonably free of weeds. Fertilizer application may be significantly reduced or eliminated by the use of mulch-mowers, as opposed to bagging and removing clippings. To keep clippings out of receiving waters, maintain a 25-foot buffer adjacent to open water areas where clippings are bagged. Hand-pull the weeds in areas with limited weed problems.

Frequency of fertilizer, herbicide, and pesticide application should be on an as-needed basis only and should decrease following establishment of vegetation. See BMP Fact Sheet S-8 in Chapter 5 for additional information. For additional information on managing vegetation in a manner that conserves water and protects water quality, see the 2008 *GreenCO Best Management Practices Manual* ([www.greenco.org](http://www.greenco.org)) for a series of Colorado-based BMP fact sheets on topics such as irrigation, plant care, and soil amendments.

#### CSU Extension Recommendations for Mowing Manicured Turf (Source: T. Koski and V. Skinner, 2003)

The two most important facets of mowing are mowing height and frequency. The minimum height for any lawn is 2 inches. The preferred mowing height for all Colorado species is 2.5 to 3 inches. Mowing to less than 2 inches can result in decreased drought and heat tolerance and higher incidence of insects, diseases and weeds. Mow the lawn at the same height all year. There is no reason to mow the turf shorter in late fall.

Mow the turf often enough so no more than 1/3 of the grass height is removed at any single mowing. If your mowing height is 2 inches, mow the grass when it is 3 inches tall. You may have to mow a bluegrass or fescue lawn every three to four days during the spring when it is actively growing but only once every seven to 10 days when growth is slowed by heat, drought or cold. Buffalograss lawns may require mowing once every 10 to 20 days, depending on how much they are watered.

If weather or another factor prevents mowing at the proper time, raise the height of the mower temporarily to avoid cutting too much at one time. Cut the grass again a few days later at the normal mowing height.

## 4.7 Sediment Removal

Remove sediment as needed based on inspection. Frequency depends on site-specific conditions. For planning purposes, it can be estimated that 3 to 10% of the swale length or buffer interface length will require sediment removal on an annual basis.

- **For Grass Buffers:** Using a shovel, remove sediment at the interface between the impervious area and buffer.
- **For Grass Swales:** Remove accumulated sediment near culverts and in channels to maintain flow capacity. Spot replace the grass areas as necessary.

Reseed and/or patch damaged areas in buffer, sideslopes, and/or channel to maintain healthy vegetative cover. This should be conducted as needed based on inspection. Over time, and depending on pollutant loads, a portion of the buffer or swale may need to be rehabilitated due to sediment deposition. Periodic sediment removal will reduce the frequency of revegetation required. Expect turf replacement for the buffer interface area every 10 to 20 years.

## 5.0 Bioretention (Rain Garden or Porous Landscape Detention)

The primary maintenance objective for bioretention, also known as porous landscape detention, is to keep vegetation healthy, remove sediment and trash, and ensure that the facility is draining properly. The growing medium may need to be replaced eventually to maintain performance. This section summarizes key maintenance considerations for bioretention.

### 5.1 Inspection

Inspect the infiltrating surface at least twice annually following precipitation events to determine if the bioretention area is providing acceptable infiltration. Bioretention facilities are designed with a maximum depth for the WQCV of one foot and soils that will typically drain the WQCV over approximately 12 hours. If standing water persists for more than 24 hours after runoff has ceased, clogging should be further investigated and remedied. Additionally, check for erosion and repair as necessary.

### 5.2 Debris and Litter Removal

Remove debris and litter from the infiltrating surface to minimize clogging of the media. Remove debris and litter from the overflow structure.

### 5.3 Mowing and Plant Care

- **All vegetation:** Maintain healthy, weed-free vegetation. Weeds should be removed before they flower. The frequency of weeding will depend on the planting scheme and cover. When the growing media is covered with mulch or densely vegetated, less frequent weeding will be required.
- **Grasses:** When started from seed, allow time for germination and establishment of grass prior to mowing. If mowing is required during this period for weed control, it should be accomplished with hand-held string trimmers to minimize disturbance to the seedbed. After established, mow as desired or as needed for weed control. Following this period, mowing of native/drought tolerant grasses may stop or be reduced to maintain a length of no less than 6 inches. Mowing of manicured grasses may vary from as frequently as weekly during the summer, to no mowing during the winter. See Section 4.4 for additional guidance on mowing.



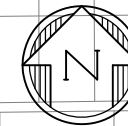
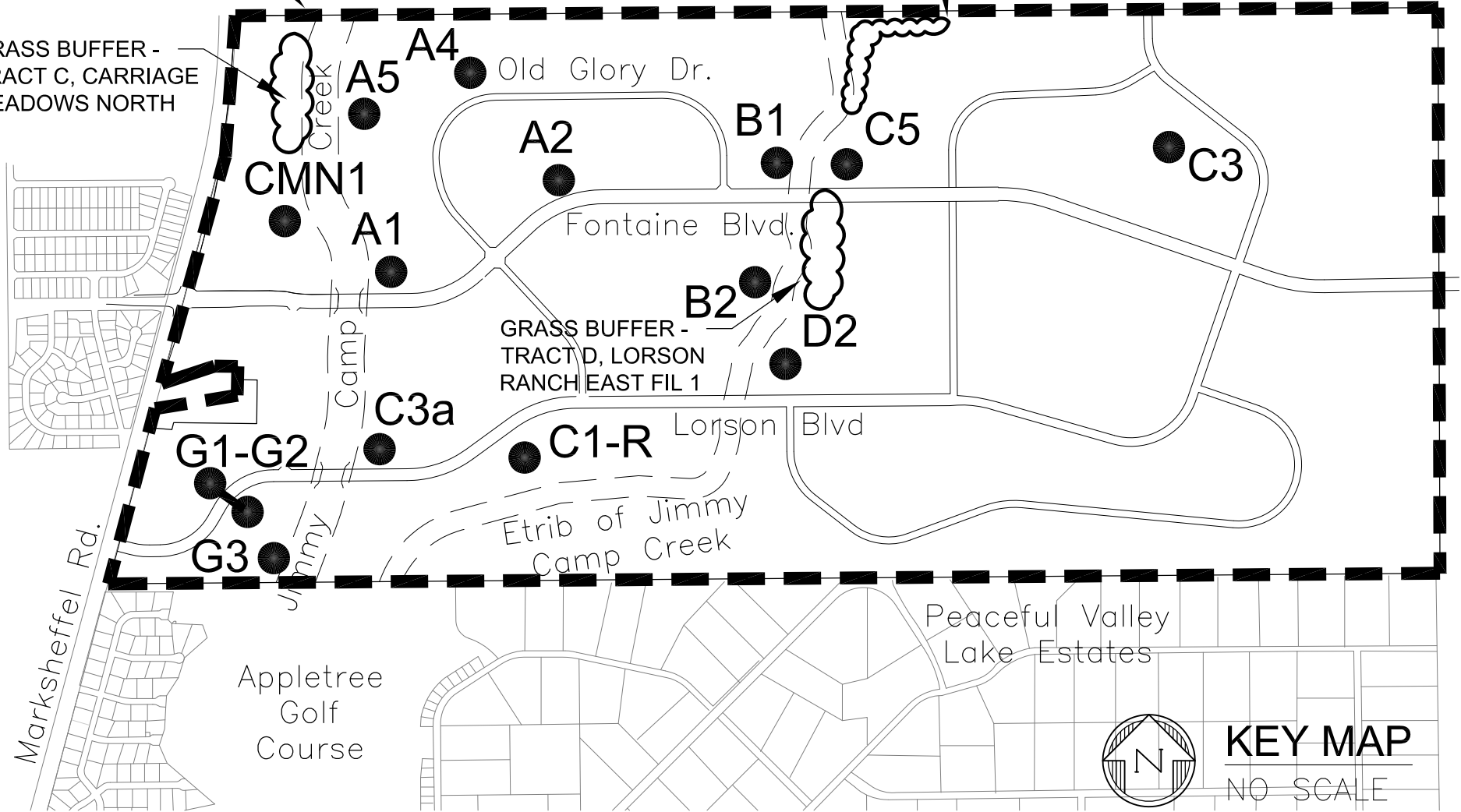
# LORSON RANCH

Banning Lewis Ranch

GRASS BUFFER - TRACT B, LORSON RANCH EAST FIL 2

Rolling Hills Ranch

GRASS BUFFER - TRACT C, CARRIAGE MEADOWS NORTH



**KEY MAP**  
NO SCALE



**CORE**  
ENGINEERING GROUP

15004 1ST AVE. S.  
BURNSVILLE, MN 55306  
PH: 719.570.1100

CONTACT: RICHARD L. SCHINDLER, P.E.  
EMAIL: Rich@ceg1.com

## LORSON RANCH DETENTION POND and GRASS BUFFER LOCATION MAP

SCALE:  
NTS

DATE:  
OCTOBER, 2018

FIGURE NO.  
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