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 – 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 C3 – Extended Detention Basin with WQCV. Pond C3 was built in 2014 as part of the Meadows at Lorson Ranch Filing No. 4 development. The final

drainage report for Allegiant 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 C5 and D2. Extended Detention Basin with WQCV. Full Spectrum Ponds C5 and D2 will be built in 2018 as part of the Lorson Ranch East Filing No. 1 development. The final drainage report for Lorson Ranch East Filing No. 1 covers the drainage calculations for this 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

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

Required Action	Maintenance Objective	Frequency of Action
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.

Required Action	Maintenance Objective	Frequency of Action
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

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.

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.

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

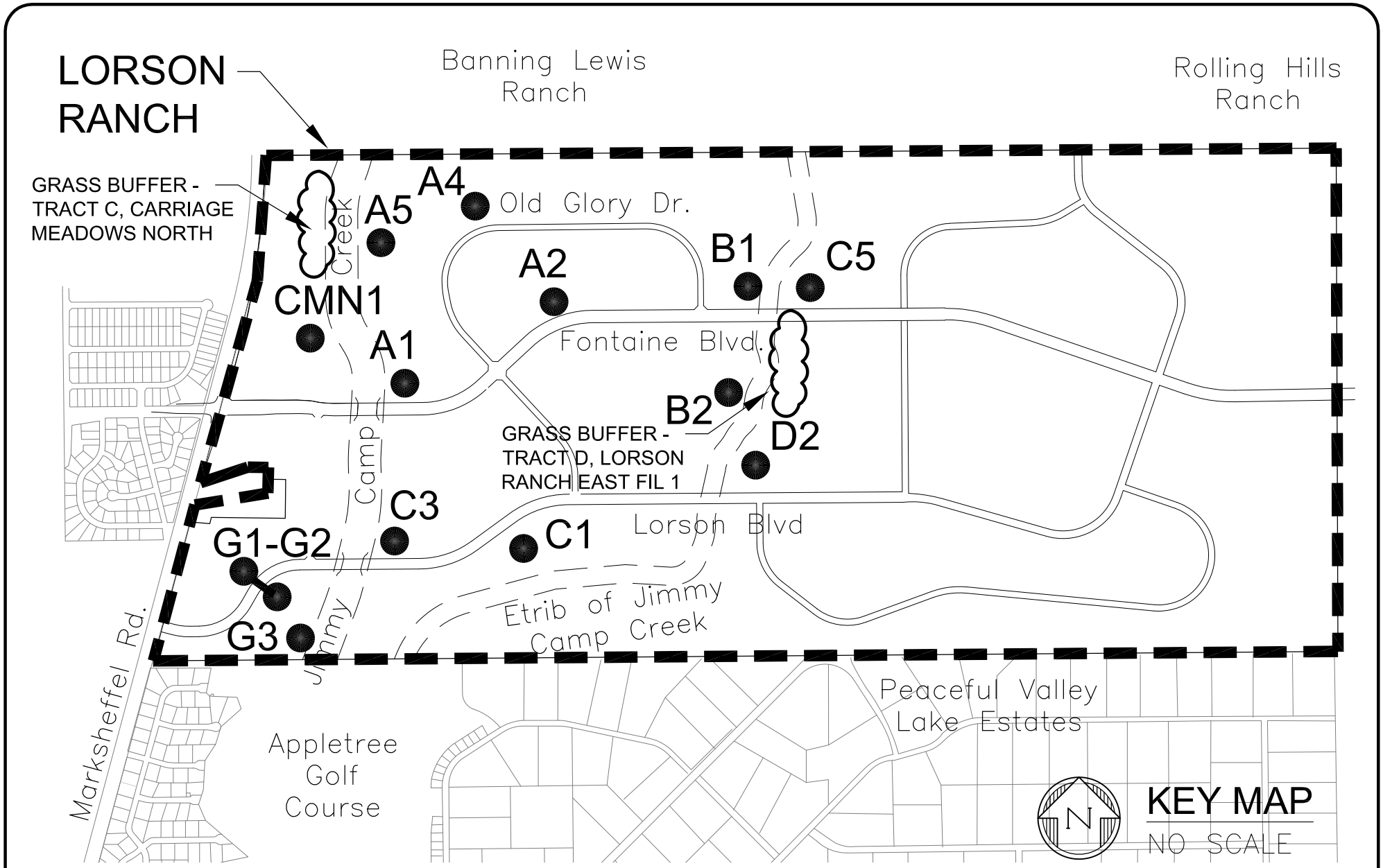
Aerating manicured grass will supply the soil and roots with air. It reduces soil compaction and helps control thatch while helping water move into the root zone. Aeration is done by punching holes in the ground using an aerator with hollow punches that pull the soil cores or "plugs" from the ground. 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.

Include pages 6-6 and 6-7



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LORSON RANCH DETENTION POND and GRASS BUFFER LOCATION MAP

SCALE:	DATE:	FIGURE NO.
NTS	MARCH, 2018	--