

Chapter Six

STORMWATER

Lawson Hills
Master Planned Development

OVERVIEW

The purpose of this section is to describe the overall stormwater goals for the site, describe the stormwater concept for the entire site, and provide standards for stormwater management at the development parcel level to ensure the overall goals are met.

Stormwater for the Lawson Hills MPD is managed through collection, treatment, and release to surface water bodies. The components of the stormwater management plan for the site include conventional detention ponds, wetland recharge, and water quality facilities. Facilities to serve the entire development have been planned and approximate locations determined (See Figure 6-1).

The site has been divided into stormwater basins based on natural discharge location, mitigation of potential impacts and topography. Each development parcel will be required to manage stormwater consistent with the standards for the basin within which it is located.

STORMWATER MANAGEMENT GOALS

The overall goals of this stormwater management plan are as follows:

- Maintain surface water and groundwater quality and quantities consistent with the requirements of the Department of Ecology's 2005 Stormwater Manual for Western Washington;
- Avoid impacts to water quality in Lake Sawyer by providing stormwater treatment that removes phosphorus for those basins that drain to Lake Sawyer;
- Avoid impacts to Lawson Creek, which shows signs of erosion, by limiting the volume of additional stormwater discharged to the creek;
- Avoid impacts to steep slopes by routing excess stormwater away from slopes to a stormwater management facility;
- Maintain hydrology for wetlands on the site by recharging them with the same volume of stormwater as would occur under pre-developed conditions.

2005 STORMWATER MANUAL FOR WESTERN WASHINGTON

This stormwater management plan has been prepared to meet the requirements of the Department of Ecology, 2005 Stormwater Management Manual for Western Washington (DOE Manual). This plan assumes that the City of Black Diamond will adopt the 2005 DOE Manual. The DOE Manual requires the following:

- The duration of stormwater discharge in the developed condition must match predeveloped durations for the range of pre-developed discharge rates from 50% of the 2-year peak flow up to the full 50-year peak flow (Minimum Requirement #7: Flow Control);
- Basic water quality treatment for stormwater generated by residential development;

- Enhanced water quality treatment for stormwater generated from commercial development, multi-family development and roads with Annual Average Daily Traffic (AADT) above 7,500, except when that stormwater from land uses requiring enhanced treatment constitutes less than 50% of the total stormwater volume within a threshold discharge; and
- Phosphorus treatment for stormwater released to surface waters (Ginder Creek, Lawson Creek, the unnamed creek, and Jones Lake) that ultimately drain to Lake Sawyer

KEY STORMWATER MANAGEMENT ISSUES

The following issues have been identified as important and addressed through the stormwater management plan and design of the overall stormwater system for the project.

LAKE SAWYER

All Basins within the site drain to water bodies that ultimately drain to Lake Sawyer. As such, all basins will provide flow control per the DOE Manual, in the form of a detention pond or vault and must meet the DOE Manual requirement for phosphorous treatment.

LAWSON CREEK

Downstream of the site, Lawson Creek shows signs of erosion. In order to minimize the impacts of the project on Lawson Creek, a portion of the stormwater within the basin tributary to Lawson Creek will be conveyed directly to Jones Lake, bypassing Lawson Creek.

STEEP SLOPES AND DOWN GRADIENT WELLS

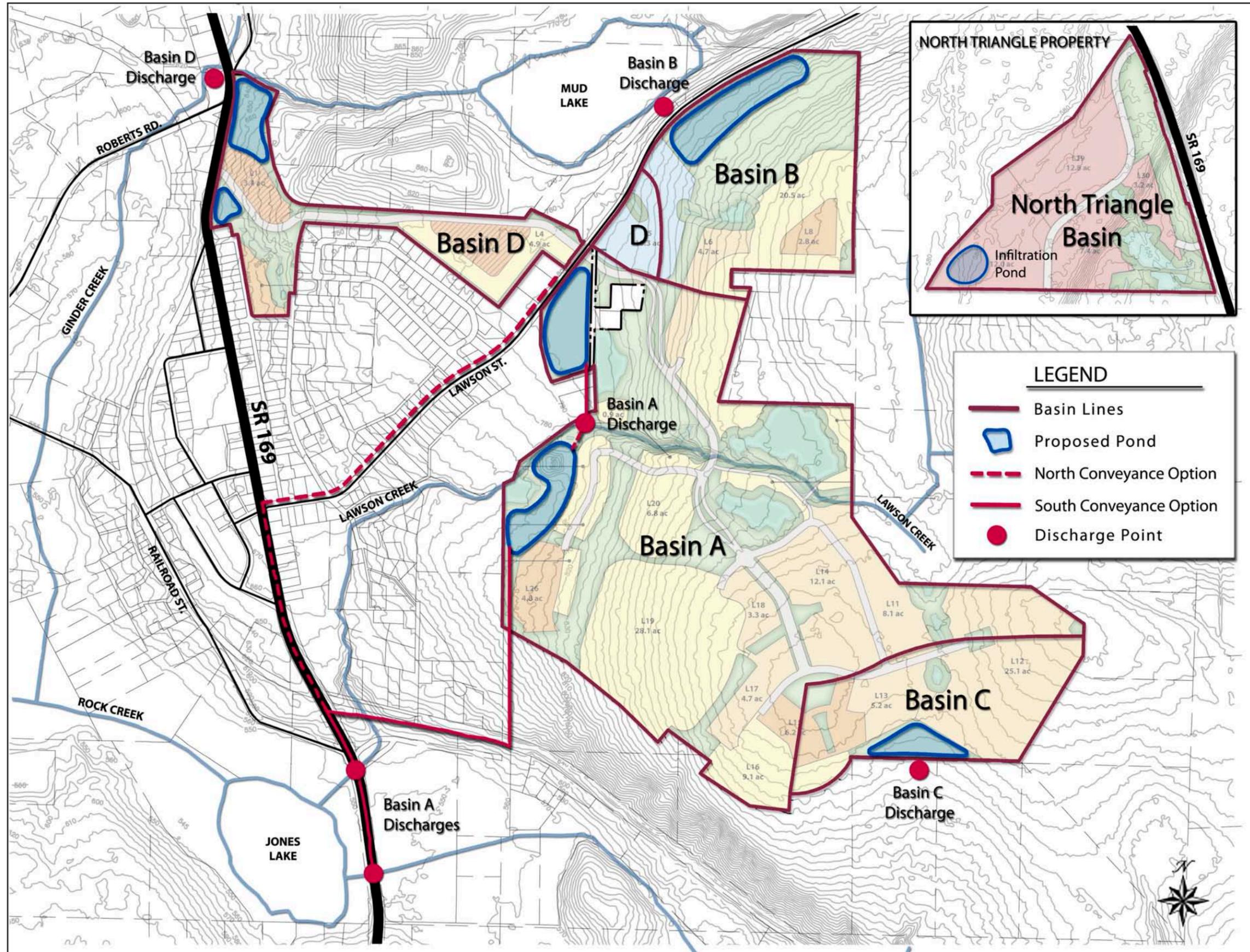
Steep slopes exist to the southwest of the site above an unnamed creek. No drainage flow paths were found above the steep slopes. Any stormwater discharges along these steep slopes would likely cause erosion problems. To minimize erosion impacts, stormwater in areas tributary to these steep slopes will be routed to facilities within the Lawson Creek Basin.

WETLAND RECHARGE

There are many wetland complexes throughout the Lawson Hills site. To maintain wetland hydrology, the areas to be developed which are tributary to wetlands have been identified. Runoff from rooftops and or yards will be used to match the existing stormwater volume that these areas contribute to each of the wetlands. Excess stormwater in areas originally tributary to a wetland will be routed to stormwater facilities within the basin.

STORMWATER BASINS AND STANDARDS

The Lawson Hills MPD has been divided into stormwater management zones. Individual developments are required to meet the overall requirements as well as the stormwater requirements unique to the stormwater basin in which each is located.



REQUIREMENTS APPLICABLE TO ALL STORMWATER ZONES

- Stormwater facilities shall be designed to meet the requirements of the Department of Ecology, 2005 Stormwater Management Manual for Western Washington (DOE Manual).
- Stormwater from roof-tops does not require water quality treatment prior to discharge unless combined with stormwater from pollution-generating surfaces.
- Where wetland recharge is needed, runoff from roof-tops and pervious areas will be used to match the predeveloped volume of stormwater tributary to each wetland.

STORMWATER BASIN A

Stormwater Basin A consists of the central portion of the main Lawson Hills project site. Basin A is underlined with till soils and shallow bedrock. In the predeveloped condition, all stormwater runoff from Basin A flows into Lawson Creek.

Stormwater in Basin A will be managed through the use of two approximately equal sized detention ponds combined with large wetponds for phosphorous removal and water quality treatment (Pond A South and Pond A North). In addition to the stormwater runoff from Basin A, these ponds will also detain and treat stormwater from a portion of Basin C to mitigate possible steep slope disturbance along the southwest side of the site.

Downstream of the Lawson Hills site, Lawson Creek shows signs of erosion. To minimize the erosion impact from the Lawson Hills project, one of the Basin A ponds (approximately half of the stormwater) will be conveyed directly to Jones Lake in a pipeline, bypassing Lawson Creek. The other pond will discharge to Lawson Creek to maintain flows. There are two possible routes for this bypass pipeline. The southern route begins at Pond A South and heads south down the slopes until it reaches the railroad grade. The pipe will continue west along the railroad grade, across Lawson Creek and turn south along SR 169. A flow splitter is proposed to convey half of the flows each to Lawson Creek and the unnamed creek near Jones Lake. In this option, the discharge from Pond A North will be directly to Lawson Creek. The northern option begins at Pond A North, heads west along Lawson Street and turns south at SR 169. This system also proposes to use a flow splitter to provide half of the flows to each creek near Jones Lake. In this option, the discharge from Pond A South will be directly to Lawson Creek. Manholes are proposed to be set over the existing discharge pipes under SR 169 to reduce impacts on the streams. Other alternatives may be considered at engineering design.

STORMWATER BASIN B

Stormwater Basin B consists of the northeastern portion of the main Lawson Hills project site. Basin B is within the same threshold discharge area as Basin D. Basin B is underlined with till soils and shallow bedrock. In the predeveloped condition, stormwater runoff from Basin B flows to Mud Lake which lies to the north of the Lawson Hills project.

In the developed condition, stormwater runoff from Basin B will be routed to a detention pond combined with a large wetpond to provide phosphorous removal and water quality treatment. A portion of Basin B may be too low in elevation to drain to this pond and will be routed to the Basin D stormwater facilities.

STORMWATER BASIN C

Stormwater Basin C consists of the southern portion of the main Lawson Hills project area. In the existing condition, Basin C consists of approximately the south 74 acres of the Lawson Hills project site. Basin C is underlined with till soils and shallow bedrock. In the predeveloped condition, all drainage from Basin C flows to the unnamed creek to the south of the project site and ultimately to Jones Lake. Basin C can be broken into three sub-basins which are the west, central and east sub-basins of Basin C. The three sub-basins drain in three different directions but combine less than a quarter mile downstream from the site at unnamed creek. Along the southern edge of the west and central sub-basins of Basin C there are steep slopes. Above these slopes, no flow channels are present. Any discharge from stormwater facilities above these steep slopes could cause potential erosion problems.

In order to minimize the erosion potential of these steep slopes, stormwater runoff from the west and central sub-basins of Basin C will be routed to the stormwater facilities in Basin A. See the Basin A discussion above for routing of Basin A discharges to Jones Lake. The eastern portion of Basin C will be routed to a detention pond combined with a large wetpond for phosphorous removal and water quality treatment located near the southeast corner of the Lawson Hills site. The discharge from this pond will be located in an area where a more obvious flow path is present and proposes to use a level spreader to disperse discharged flows. The pond will discharge stormwater at rates matching the predeveloped rates from the area tributary to the pond. Stormwater from this pond will provide water to the unnamed creek and associated wetlands.

STORMWATER BASIN D

Stormwater Basin D consists of the western portion of the main Lawson Hills project site. Basin D is underlined with till soils and shallow bedrock. In the predeveloped condition, stormwater runoff from Basin D eventually flows to Ginder Creek.

Depending on the land uses and traffic loading within Basin D, enhanced water quality treatment may be required. In the developed condition, stormwater runoff will be routed to detention and water quality facilities. These facilities will contain a combination of detention ponds, detention vaults, wetponds, wetvaults and sand filters depending on the water quality requirements for the land use of actual build out.

NORTH TRIANGLE STORMWATER BASIN

The North Triangle Stormwater Basin consists of all areas within the North Triangle Property of the Lawson Hills project which lies to the northwest of the main portion of the Lawson Hills project site. The North Triangle Basin is underlain with a mix of till and outwash soils. Stormwater runoff from the southeast third of the North Triangle (which is underlain with till soils) flows to the northwest, where it infiltrates in the outwash soils covering the remaining two-thirds of the basin. The infiltrated stormwater eventually flows into Ravensdale Creek.

In the developed condition, stormwater runoff from the North Triangle development will be infiltrated in the lower portion of the site along with runoff from offsite that currently infiltrates on the lower portion of the North Triangle. Runoff from roof tops and other non pollution generating surfaces do not require water quality treatment prior to infiltration and are proposed to be infiltrated directly.

The North Triangle is proposed to be developed with commercial and office space and will require enhanced water quality treatment. In addition, the outwash soils between the site and Ravensdale Creek do not provide sufficient treatment to allow for phosphorous treatment credits to be applied to the basin, therefore, phosphorous removal will be required onsite. The options available for water quality treatment of runoff from pollution generating surfaces prior to infiltration include; large sand filter, amended sand filter, stormwater treatment wetland, compost amended filter strip and two facility treatment trains. Where possible sand filters are proposed to co-exist with landscaping and then to infiltrate below the sand filter. In addition to infiltrating runoff from the North Triangle, a combination of LID measures are proposed for the North Triangle consisting of one or more of the following; reduced street widths, use of native or adapted plants in landscaping and porous pavements.