

Project Name | BCWD Permit 22-18 Stillwater Oaks**Date** | 09/08/2023**To / Contact info** | BCWD Board of Managers**Cc / Contact info** | Jason Palmby, Fairway Estates of Grant / Scott Dahlke, Civil Engineering Site Design**Cc / Contact info** | Karen Kill, Administrator / BCWD**From / Contact info** | Camilla Correll, PE; Ryan Fleming, PE; Paul Nation, PE; John Sarafolean / EOR**Regarding** | Permit Application No. 22-18 Engineer's Report

The following review of the above mentioned project located within the legal jurisdiction of the Brown's Creek Watershed District (BCWD) was conducted to determine compliance with the BCWD rules for purposes of the engineer's recommendation to the Board of Managers for its determination of the permit application.

Applicant: Jason Palmby, Fairway Estates of Grant**Permit Submittal Date:** 7/26/2023**Completeness Determination:** 08/01/2023**Board Action Required By:** 09/30/2023**Review based on BCWD Rules effective April 1, 2020****Recommendation: Consider Variance Request**

GENERAL COMMENTS

Existing Conditions: The 148-acre site is the former Sawmill Golf Club. It is located south of Dellwood Road (County Road 96), southwest of McKusick Road and west of Manning Avenue. Existing large acreage lots are adjacent to the site to the north, east and west. There is a commercial restaurant property to the southeast (Gasthaus Bavarian Hunter) and another golf course to the south (Loggers Trail Golf Course). All existing impervious areas – cart paths, parking lot, and buildings – are to be removed prior to commencement of the proposed residential site redevelopment.

The entire site has three main discharge points:

- The northern portion of the site (67 acres + 3.6 acres of offsite drainage; area north of 88th Street North) has numerous discharge points along the Brown's Creek State Trail, all of which run east to a Manage 1 wetland complex located across Dellwood Road to the north and directly to the east of Knollwood Dr. N. This portion of the site includes 24 wetlands. All of these wetlands are less than an acre in size.
- The southern portion of the site (66 acres + 10.5 acres of offsite drainage; area between 88th Street North and Lofton Avenue) drains to a series of wetlands and discharges to the east towards the Gasthaus Bavarian Hunter. This portion of the site includes 8 wetlands. All of these wetlands are less than an acre in size.
- The southwestern portion of the site (15 acres + 2 acres of offsite drainage; west of Lofton Avenue) discharges west to the back of residential properties off of Lake Elmo Avenue. This portion of the site includes 1 wetland. This is the only wetland on the site that is greater than an acre in size.

The entire site is within one mile of Brown's Creek. The MPCA's Construction Stormwater Permit has additional requirements for projects with a discharge point within one (1) mile (aerial radius measurement) of and which flows to an impaired water as described under Rule 2.0 Stormwater Management and Rule 3.0 Erosion and Sediment Control.

Proposed Conditions: The proposed project will subdivide the existing 148-acre site into 15 residential properties and include the construction of approximately 2,600 linear feet of new street with bituminous pavement, and rural ditches with driveway culverts. The residential lots will be sold individually to builders for construction of the driveways and homes. The stormwater management plan provides for 0.5-acre impervious coverage to account for the home and the driveway on each lot. Each builder and homeowner will determine the final design and layout, and adjustments and modifications to the stormwater plan may need to be submitted as permit modifications or will be addressed in individual-lot permits.

The proposed redevelopment will maintain the three main discharge points as well as the discrete discharge points described above under existing conditions as follows:

- The northern portion of the site, shaded red on Figure 1, will be subdivided into eight (8) lots. Stormwater runoff from the northern portion of the site will be collected via roadway ditches from the streets, driveways, and front lawns and routed to one stormwater management basin (wet pond) located at the most westerly entrance from McKusick Road. This basin has been designed to capture stormwater runoff for reuse via irrigation. Rear lot drainage is routed to existing wetlands or smaller detention basins (5) designed to meet the stormwater management requirements before discharging to the Brown's Creek State Trail or to the main discharge point under McKusick Road. This portion of the site is subdivided into 26 subwatersheds and includes 24 wetlands. Six of the wetlands were determined to be incidental under the Wetland Conservation Act; that is, not protected under WCA. One wetland is going to be incorporated into a new, larger wetland; the remaining 5 incidental wetlands will remain undisturbed. In addition, 6.5 acres of tree preservation and native vegetation restoration areas will provide volume control through evapotranspiration.
- The southern portion of the site, shaded purple on Figure 1, will be subdivided into seven (7) lots. Stormwater runoff from the southern portion of the site will be collected via roadway ditches from the streets, driveways, and front lawns and routed to three stormwater management basins (wet ponds), two of which are located at the entrance from 88th Street N and one which is located near the entrance road (Leeward Circle) cul-de-sac. One of these basins has also been designed to capture stormwater runoff for reuse via irrigation. Rear lot drainage is routed to existing wetlands and an infiltration basin before discharging east towards Brown's Creek State Trail. In addition, 4.7 acres of tree preservation and native vegetation restoration areas will provide evapotranspiration-based volume control where infiltration is not feasible.

- Stormwater runoff from the southwestern portion of the site, shaded yellow on Figure 1, drains to the larger wetland and the back of the adjacent residential properties. 1.6 acres of tree preservation and native vegetation restoration areas will provide evapotranspiration-based volume control because geotechnical analysis found that infiltration is not feasible.

Recommendation: As discussed under Section 10.0 – Variances, the BCWD engineer does support approval of the variance requested by the applicant from the volume control requirement.

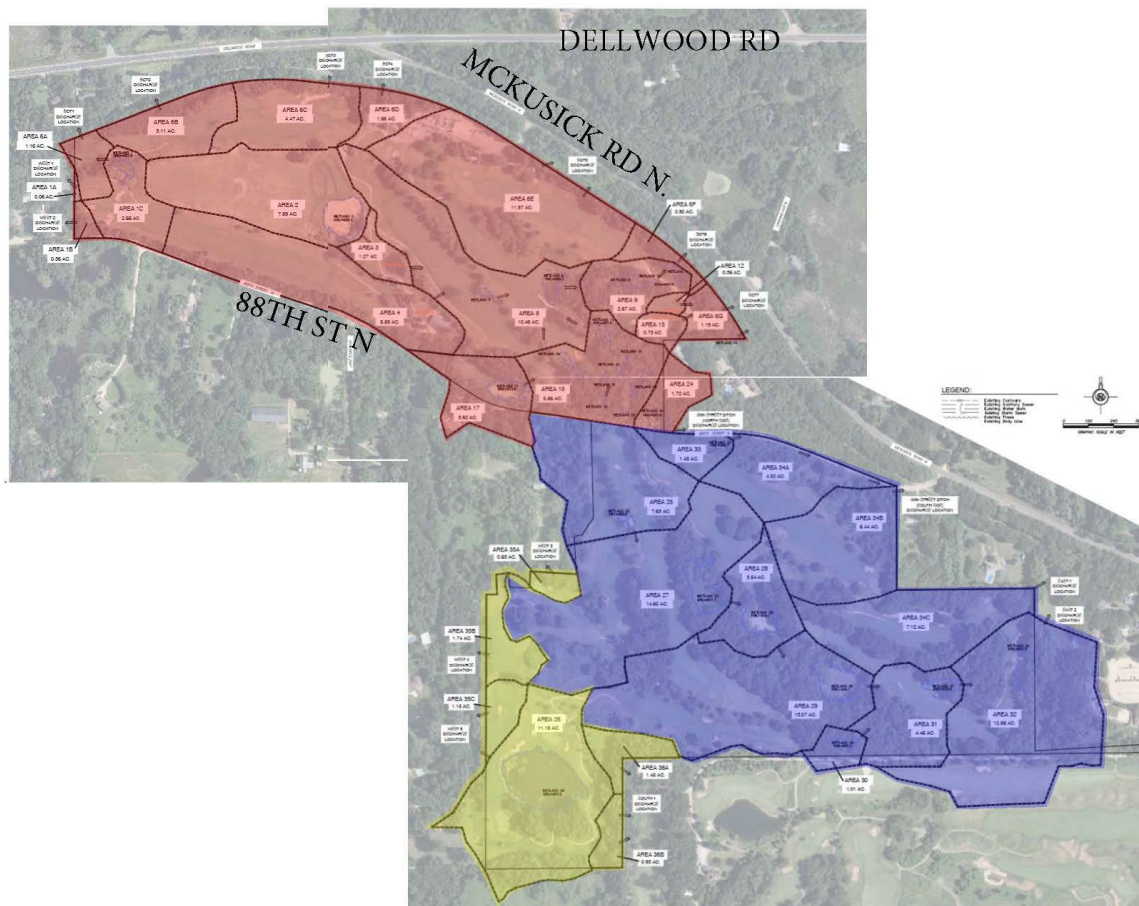


Figure 1 - Site Plan

Rule 2.0—STORMWATER MANAGEMENT

Under 2.2(b) of the rule, the proposed project triggers the application of Rule 2.0 Stormwater Management because it is a residential subdivision of more than four lots. The site is outside the Diversion Structure Drainage area, so the criteria in subsection 2.4.1a apply. Since the proposed activity will disturb more than 50 percent of existing impervious surface, the Stormwater Management Standards will apply to all impervious surface and disturbed areas.

The stormwater management plan for the project includes:

- Roadway ditches which capture runoff from the roadway and the front of the lots and route it to the stormwater management facilities.
- Four (4) stormwater management basins (wet ponds) holding permanent pools allowing pollutants and sediment to settle out, two of which will be used for stormwater harvest and reuse for irrigation of the surrounding homes.
- Five (5) detention basins (rate control/dry ponds) that control peak flow rate and reduce the effects of erosion.
- One infiltration basin.
- 12.8 acres of tree preservation and native vegetation restoration areas which will provide evapotranspiration-based volume control where infiltration is not feasible.
- The applicant is requesting a variance concerning the rate and volume requirements that is addressed in Section 10.0 – Variances.

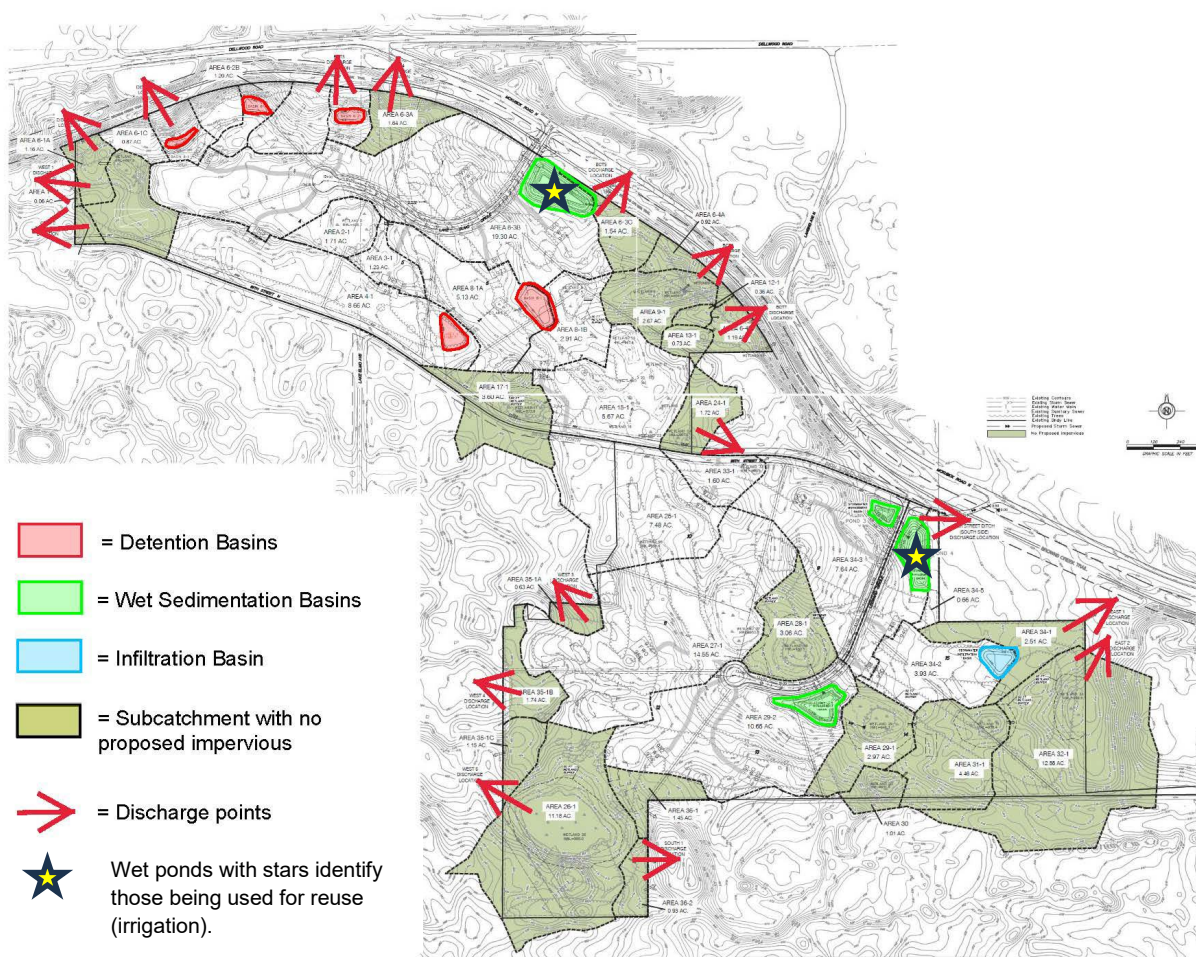


Figure 2 - Proposed stormwater facilities and offsite discharge points

Rate Control

According to BCWD Rule 2.4.1(a)(i), an applicant for a stormwater management permit must demonstrate to the District that the proposed land-altering activity will not increase peak stormwater flow from the site, as compared with the pre-settlement condition, for a 24-hour precipitation event with a return frequency of two, 10 or 100 years for all points where discharges leave a site.

☒ Rule Requirement Not Met – See Section 10.0 Variances

The stormwater management plan developed for the site was evaluated using a HydroCAD model of pre-settlement and post-development site conditions. A comparison of the modeled peak flow rates is included in Tables 1 & 2. Offsite discharge rates that exceed the pre-settlement rate are underlined and marked with an asterisk. See Section 10.0 for further analysis and discussion of this variance request.

Table 1 - Peak Discharge Rate Summary – North Drainage Area

Subcatchment Area [Pre-settlement / Post-development]	Pre-settlement Runoff Rates [cfs]			Proposed Runoff Rates [cfs]		
	2 yr (2.81")	10 yr (4.17")	100 yr (7.23")	2 yr (2.81")	10 yr (4.17")	100 yr (7.23")
Area 1A to West 1	0.04	0.10	0.27	0.04	0.10	<u>0.28*</u>
Area 1-1A to West 1*						
Area 1B to West 2	0.22	0.60	1.63	0.22	0.60	1.63
Area 1-1B to West 2*						
Area 6A & WL1 to BCT1	0.72	1.92	5.26	0.72	1.92	5.26
Area 6-1A & WL1 to BCT1*						
Area 6B to BCT2	1.94	5.15	14.10	1.66	3.74	13.08
Area 6-1B, C, D to BCT2						
Area 6C to BCT3	2.78	7.40	20.26	2.22	5.10	11.92
Area 6-2A, B, C to BCT3						
Area 6D to BCT4	1.03	2.73	7.48	<u>1.12*</u>	<u>2.86*</u>	<u>7.65*</u>
Area 6-3A to BCT4*						
Area 6E to BCT5	4.32	14.72	46.44	1.31	9.34	25.25
Area 6-3C & Basin 1 to BCT5						
Area 6F & WL9 to BCT6	1.66	5.75	44.25	0.96	5.49	28.79
Area 6-4A & WL9 to BCT6						
Area 6G, 12, 13 to BCT7*	1.42	3.78	10.33	<u>1.62*</u>	<u>4.08*</u>	<u>10.77*</u>
Area 6G, 12, 13 to BCT7*						
Wetland 24 to North Ditch	0	0	0.40	0	0	0.40
Wetland 24 to North Ditch						

Table 2 - Peak Discharge Rate Summary – South Drainage Area

Subcatchment Area [Pre-settlement / Post-development]	Pre-settlement Runoff Rates [cfs]			Proposed Runoff Rates [cfs]		
	2 yr (2.81")	10 yr (4.17")	100 yr (7.23")	2 yr (2.81")	10 yr (4.17")	100 yr (7.23")
WL 33, 34A, 34B to S Ditch	0.04	1.08	14.19	0.03	0.42	5.80
WL 33, Basin 34-4, Area 34-5 to S Ditch						
Area 34-C to East 1	0.09	1.39	10.30	0	0.15	10.06
Area 34-1, Basin 34-2 to East 1						
Wetland 32 to East 2	0	0	4.70	0	0	<u>5.41*</u>
Wetland 32 to East 2*						
Area 35A to West 3	0.11	0.53	2.03	<u>0.17*</u>	<u>0.67*</u>	<u>2.28*</u>
Area 35-1A to West 3*						
Area 35B to West 4	1.08	2.88	7.89	<u>1.51*</u>	<u>3.52*</u>	<u>8.78*</u>
Area 35-1B to West 4*						
Area 35C & WL 26 to West 5	0.72	1.90	5.21	<u>1.00*</u>	<u>2.32*</u>	<u>5.80*</u>
Area 35-1C & WL 26 to West 5*						
Area 36A, 36B to South 1	0.11	1.06	5.77	<u>0.15*</u>	<u>1.20*</u>	<u>6.08*</u>
Area 36-1, 36-2 to South 1*						

Volume Control

According to BCWD Rule 2.4.1(a)(ii), an applicant for a stormwater management permit must demonstrate to the District that the proposed land-altering activity will not increase stormwater flow volume from all points where discharge leaves the site, as compared with the pre-settlement condition, for a 24-hour precipitation event with a return frequency of two years, or five years within a landlocked basin or a subwatershed draining to a landlocked basin.

Rule Requirement Not Met – See Section 10.0 Variances

The stormwater management plan developed for the site was evaluated using a HydroCAD model of pre-settlement and post-development site conditions. A comparison of the modeled runoff volume is included in Table 3. Offsite discharge volumes that exceed the pre-settlement volume are underlined and marked with an asterisk. See Section 10.0 for further analysis and discussion of this variance request.

Table 3 – 2-Year 24-Hour Event Discharge Volume

<i>Discharge Point</i>	<i>Pre-settlement Runoff Volume [cf]</i>	<i>Proposed Runoff Volume [cf]</i>	<i>Volume Control Required [cf]</i>	<i>Volume Reduction Provided [cf]</i>	<i>Volume Shortfall [cf]</i>
West 1	133	142	9	0	<u>9*</u>
West 2	799	799	0	0	0
<i>SUB-TOTAL</i>			9	0	<u>9*</u>
BCT1	2,574	2,574	0	1,103	0
BCT2	6,901	8,481	1,580	0	<u>1,580*</u>
BCT3	9,919	13,658	3,739	0	<u>3,739*</u>
BCT4	3,661	3,891	230	0	<u>230*</u>
BCT5	18,336	53,721	35,385	27,205	<u>8,180*</u>
BCT6	7,001	22,479	15,478	11,795	<u>3,683*</u>
BCT7	5,059	5,588	529	0	<u>529*</u>
<i>SUB-TOTAL</i>			56,941	40,103	<u>16,838*</u>
N. 88 th Ditch	0	0	0	749	0
S. 88 th Ditch	843	8,804	7,961	12,130	0
<i>SUB-TOTAL</i>			7,961	12,879	0
East 1	1,569	7,906	6,337	7,906	0
East 2	0	0	0	10,784	0
<i>SUB-TOTAL</i>			6,337	18,690	0
West 3	612	815	203	0	<u>203*</u>
West 4	3,861	4,990	1,129	0	<u>1,129*</u>
West 5	2,552	3,298	746	2,004	0
<i>SUB-TOTAL</i>			2,078	2,004	<u>74*</u>
South 1	1,126	1,298	172	0	<u>172*</u>
<i>SUB-TOTAL</i>			172	0	<u>172*</u>
TOTAL			73,489	73,676	n/a

Pollutant Loading

According to BCWD Rule 2.4.1(a)(iii), an applicant for a stormwater management permit must demonstrate to the District that the proposed land-altering activity will not at the downgradient property boundary or to an onsite receiving waterbody or wetland, increase annual phosphorus loading as compared with the pre-development condition.

Rule Requirement Met

The Permit Applicant submitted MIDS Calculator results demonstrating that annual phosphorus loading does not increase when compared to pre-development conditions at the 17 individual discharge points as shown in Table 4.

Table 4 - Offsite Annual Phosphorus Loading

<i>Discharge Point</i>	<i>Pre-Development Phosphorus Load (lbs/yr)</i>	<i>Proposed Phosphorus Load (lbs/yr)</i>
West 1*	No Change (Proposed = Pre-development Phosphorus Load)	
West 2*	No Change (Proposed = Pre-development Phosphorus Load)	
BCT1*	No Change (Proposed = Pre-development Phosphorus Load)	
BCT2	1.6	0.6
BCT3	1.8	1.8
BCT4	0.8	0.4
BCT5	24.9	17.9
BCT6	2.0	1.9
BCT7	0.6	0.5
N. 88 th Ditch (Wetland 25)	1.7	1.7
S. 88 th Ditch (Basin 4)	2.2**	2.1
East 1 (Infiltration Basin)	1.1**	0.00
East 2	13.6	10.3
West 3	0.2	0.2
West 4	0.7	0.7
West 5	3.7	3.2
South 1	0.8	0.4

*The drainage area and vegetation coverage discharging to these locations will remain unchanged from the pre-development condition, i.e., they will remain perennial vegetation without impervious. Therefore, there will be no increase in annual phosphorus loading as compared with the pre-development condition at the downgradient property boundary in these locations.

**Area weighted loading based on combined MIDS model of “Pre-development for areas south of 88th Street that drain east to Browns Creek Trail”

Table 5 demonstrates that annual phosphorus loading is reduced from pre-development conditions for each onsite receiving wetland. Pollutant loading analysis was not conducted for, and the related criterion was not applied to, the six incidental wetlands because they are manmade aesthetic or irrigation-system features of low quality that do not provide cognizable wetland functions and values.

Table 5 – Onsite Receiving Wetland Phosphorus Loading

Wetland	Pre-Development Annual Phosphorus Loading (lbs/yr)	Proposed Annual Phosphorus Loading (lbs/yr)
1	0.9	0.8
2	3.3	0.2
5	1.4	1.0
8	1.5	1.4
9	0.3	0.3
10	0.1	0.1
11	0.2	0.2
15	0.2	0.2
16	0.5	0.5
17	0.3	0.3
18	0.3	0.3
19	0.1	0.1
20	0.0	0.0
21	0.1	0.1
22	0.2	0.2
23	0.2	0.2
24	0.2	0.1
25	1.7	1.7
26	3.3	3.3
27	3.6	3.5
28	0.5	0.4
29	4.0	3.4
30	0.1	0.1
31	0.6	0.6
32	1.2	1.2
33	0.4	0.4

Infiltration Pretreatment

According to BCWD Rule 2.5.2 surface flows to infiltration facilities must be pretreated for long-term removal of at least 50 percent of sediment loads.

Rule Requirement Met

The project includes an infiltration basin to meet the stormwater requirements (rate, volume, and water quality). Therefore, pretreatment is required for runoff directed to this facility.

All runoff being routed to the infiltration basin will first be directed to a grass swale. The Permit Applicant submitted MIDS Calculator results demonstrating compliance with Rule 2.5.2. The pretreatment requirement is met as demonstrated by the results in Table 6.

Table 6 - Infiltration Basin Pretreatment

<i>Practice</i>	<i>TSS Inflow Loading (lb/yr)</i>	<i>TSS Outflow Loading (lb/yr)</i>	<i>TSS Reduction (%)</i>
Grass Swale	312.1	31.7	90

Lake/Wetland Bounce

According to BCWD Rule 2.4.1(a)(iv), an applicant for a stormwater management permit must demonstrate to the District that the proposed land-altering activity will not increase the bounce in water level or duration of inundation, for a 24-hour precipitation event with a return frequency of two, 10 or 100 years in the subwatershed in which the site is located, for any downstream lake or wetland beyond the limit specified in Appendix 2.1.

Rule Requirement Met

Wetland bounce and duration of inundation was analyzed for the 2-year, 10-year, and 100-year 24-hour rainfall events. All wetlands onsite are classified as Manage 2 wetlands which have a permitted bounce of Pre-development plus 1.0 feet, and a permitted increase in inundation of 2 days and 14 days for the 2-year and 10-year events, respectively. Table 7 and Table 8 display that the standards are met for Rule 2.4.1(a)(iv). Note that wetlands 8, 9, and 15 form complexes with other onsite wetlands that act as a single waterbody hydrologically, and therefore, have been grouped in the tables below.

Table 7 – Wetland Duration of Inundation

<i>Wetland</i>	<i>Pre-Settlement Duration of Inundation (hrs)</i>		<i>Proposed Duration of Inundation (hrs)</i>		<i>Change in Duration of Inundation (hrs)</i>	
	<i>2-year</i>	<i>10-year</i>	<i>2-year</i>	<i>10-year</i>	<i>2-year</i>	<i>10-year</i>
1	12	12	12	12	0	0
2	24	26	14	18	-10	-8
8 Complex	14	23	49	54	35	31
9 Complex	13	24	44	48	31	24
15 Complex	13	14	21	22	8	8
17	10	11	10	11	0	0
24	12	13	12	13	0	0
25	15	15	21	23	6	8
26	12	11	10	12	-2	-1
27	22	23	26	28	4	5
28	24	25	23	24	-1	-1
29	30	32	35	38	5	6
30	12	13	12	13	0	0
31	43	35	71	41	28	6
32	7	31	11	42	4	11
33	12	13	18	20	6	7

Table 8 - Wetland Bounce

Wetland	*Pre-Settlement Peak Elevation (ft)			Proposed Peak Elevation (ft)			Bounce (ft)		
	2-yr	10-yr	100-yr	2-yr	10-yr	100-yr	2-yr	10-yr	100-yr
1	995.48	996.60	997.54	995.55	996.67	997.56	0.1	0.1	0.0
2	988.72	988.89	989.35	988.19	988.39	988.75	-0.5	-0.5	-0.6
8 Complex	961.59	962.03	962.70	961.88	962.01	962.39	0.3	0.0	-0.3
9 Complex	953.85	954.01	954.76	954.21	954.41	954.90	0.4	0.4	0.1
15 Complex	966.86	967.28	967.62	966.93	967.34	967.64	0.1	0.1	0.0
17	972.35	972.90	973.86	972.38	972.94	973.87	0.0	0.0	0.0
24	965.59	966.59	967.56	965.59	966.59	967.56	0.0	0.0	0.0
25	959.92	960.11	960.59	959.94	960.18	960.64	0.0	0.1	0.0
26	966.41	966.85	967.94	966.45	966.92	968.03	0.0	0.1	0.1
27	952.69	953.00	953.75	952.75	953.11	953.83	0.1	0.1	0.1
28	947.99	948.31	949.09	947.90	948.22	950.08	-0.1	-0.1	1.0
29	945.37	945.75	946.68	945.32	945.68	946.29	0.0	-0.1	-0.4
30	949.58	950.22	951.41	949.58	950.22	951.41	0.0	0.0	0.0
31	936.54	937.77	938.77	935.63	937.73	938.41	-0.9	0.0	-0.4
32	915.56	919.39	923.49	915.71	919.41	923.51	0.2	0.0	0.0
33	964.40	965.09	965.70	964.76	965.47	965.81	0.4	0.4	0.1

Wetlands onsite were evaluated for bounce and inundation against pre-settlement conditions for a conservative evaluation as pre-settlement runoff is less than existing conditions, therefore meeting pre-settlement bounce and duration of inundation is a stricter threshold than existing conditions.

Maintenance

According to BCWD Rule 2.6, Permit applicants must provide a maintenance, inspection and, if required, monitoring plan that identifies and protects the design, capacity and functionality of onsite and offsite stormwater management facilities; provides specifications, methods and a schedule for the inspection and maintenance in perpetuity of the facility, with documentation retained onsite and available to the District on reasonable notice; and contains at a minimum the requirements in the District’s standard maintenance declaration. The maintenance plan will be recorded on the deed in a form acceptable to the District.

☒ Rule Requirements Met with Conditions

The following conditions must be addressed in the maintenance plans provided by the applicant:

- *Include in the maintenance plan protection of all natural areas to be used to meet stormwater-management requirements through evapotranspiration.*
- *Include protection of all vegetated areas that must be preserved for irrigation use on individual properties in the maintenance plan and require documentation of the weekly depth of water to be used for irrigation and the dates during which the irrigation system will be active.*
- *Include in the maintenance plan detail on the frequency of infiltration basin inspections and routine maintenance.*
- *Include a vegetation maintenance schedule.*

Rule 2.0 Conditions:

- 2-1. Provide BCWD with the final Civil Plan Set (BCWD 2.7.9)
- 2-2. Provide a stormwater facility maintenance declaration in a form acceptable to the District and proof of recordation with Washington County. Resolve conditions above concerning the submitted maintenance plan. A template is available under the permit section of the District's website. The maintenance declaration shall be recorded with the County after a draft is approved by the District (BCWD Rule 2.6).
- 2-3. Provide documentation as to the status of a National Pollutant Discharge Elimination System stormwater permit for the project from the Minnesota pollution Control Agency and provide an updated Storm Water Pollution Prevention Plan (SWPPP) if any changes are made from the current version. (BCWD Rule 2.7.15).
- 2-4. Provide the District with a spreadsheet tracking the amount of impervious coverage per lot, the drainage areas impervious is located, and compared to the assumed in the stormwater management plan / calculations. The BCWD will use this tracking tool to make sure that the construction of individual lots complies with what is approved under this permit.
- 2-5. Submit irrigation-utilization plans showing the irrigation capacity of the system and the areas that will be irrigated, along with requirement that property owners utilize irrigation system.
- 2-6. The orifice size on the plan set for outlet control structure 1 (OCS-1) is different from the HydroCAD model which the rate control analysis is based on. Correct the orifice size in the OCS-1 structure for wet sedimentation basin 1 so the specifications of the structure correspond to the HydroCAD model inputs.

Rule 3.0—EROSION CONTROL

According to BCWD Rule 3.2, All persons undertaking any grading, filling, or other land-altering activities which involve movement of more than 50 cubic yards of earth or removal of vegetative cover on 5,000 square feet or more of land must submit an erosion control plan to BCWD, and secure a permit from BCWD approving the erosion control plan. The proposed project triggers the application of Rule 3.0 Erosion Control because the proposed development activity will both move more than 50 cubic yards of earth and remove more than 5,000 square feet of vegetation.

Rule Requirements Met with Conditions

The erosion and sediment control plan includes:

- SWPPP
- Rock construction entrances
- Storm sewer inlet protection
- Fiber log ditch checks
- Silt fence perimeter controls
- Wood fiber logs
- Rip Rap at flared end outlets
- Construction fence to protect natural areas

The following conditions must be addressed in the erosion and sediment control plan to comply with the District's requirements:

Rule 3.0 Conditions:

3-1. Provide the District with contact information for the Erosion Control Supervisor and the construction schedule when available (BCWD 3.3.2).

Rule 4.0—LAKE, STREAM, AND WETLAND BUFFER REQUIREMENTS

According to BCWD Rule 4.2.1, Rule 4.0 applies to land that is (a) adjacent to Brown's Creek; a tributary of Brown's Creek designated as a public water pursuant to Minnesota Statutes section 103G.005, subdivision 15; a lake, as defined in these rules; a wetland one acre or larger; or a groundwater-dependent natural resource; and (b) that has been either (i) subdivided or (ii) subject to a new primary use for which a necessary rezoning, conditional use permit, special-use permit or variance has been approved on or after April 9, 2007, (for wetlands and groundwater-dependent natural resources other than public waters) or January 1, 2000 (for other waters).

Rule Requirements Met

Rule 4.0 applies to the site because there is a wetland onsite (adjacent) that is larger than an acre in size and the property is being subdivided after April 9, 2007 (triggers Rule 4.2.1(b)). Under Rule 4.3, a buffer width of 50 feet applies to the wetland because it has been classified as a Manage 2 wetland (BCWD 4.3.1).

There are a total of 33 wetlands located on the 148-acre site. All but one of these wetlands are less than an acre in size. A wetland evaluation was conducted using the Minnesota Routine Assessment Method (MNRAM) for evaluating wetland function. This assessment found all 33 wetlands to be Manage 2 wetlands and not groundwater dependent. EOR reviewed the MNRAM Assessment and

agrees with this finding. Wetland 26, which is the only wetland that is an acre or larger, is subject to Rule 4.3.1 and requires a 50-foot buffer.

Under Rule 4.4.1, at the time a buffer is created under Rule 4.0, the District may require a planting or landscaping plan to establish adequate native vegetative cover for area that (a) has vegetation composed more than 30 percent of undesirable plant species (including, but not limited to reed canary grass, common buckthorn, purple loosestrife, leafy spurge, bull thistle, or other noxious weeds); or (b) consists more than 10 percent of bare or disturbed soil or turf grass.

Review of the current vegetative condition in the proposed buffer has not been assessed. As a condition of permit approval, the buffer vegetation needs to be analyzed and the project landscaping plan should be modified as appropriate to establish native vegetative cover given the findings of the analysis.

Rule 4.0 Conditions:

- 4-1. Provide a buffer declaration in a form acceptable to the District and proof of recordation with Washington County. A template is available under the permit section of the District's website. The buffer declaration shall be recorded with the County after a draft is approved by the District (BCWD Rule 4.2.2).
- 4-2. Conduct an assessment of the proposed buffer area to determine the vegetative composition of undesirable plant species, bare, disturbed soil or turf grass and provide BCWD with a buffer establishment plan for review and approval.

Rule 5.0—SHORELINE AND STREAMBANK ALTERATIONS

According to BCWD Rule 5.2, no person may disturb the natural shoreline or streambank partially or wholly below the ordinary high water mark of a waterbody, without first securing a permit from the District.

- Rule Not Applicable to Permit. *There are no proposed shoreline or streambank alterations.*

Rule 6.0—WATERCOURSE AND BASIN CROSSINGS

According to Rule 6.2, no person shall use the beds of any waterbody within the District for the placement of roads, highways and utilities without first securing a permit from the District.

- Rule Not Applicable to Permit. *There are no proposed watercourse or basin crossings.*

Rule 7.0—FLOODPLAIN AND DRAINAGE ALTERATIONS

According to Rule 7.2, no person shall alter or fill land below the 100-year flood elevation of any waterbody, wetland, or stormwater management basin, or place fill in a landlocked basin, without first obtaining a permit from the District. No person shall alter stormwater flows at a property boundary by changing land contours, diverting or obstructing surface or channel flow, or creating a basin outlet, without first obtaining a permit from the District.

- Rule Requirements Met

No fill is proposed below the 100-year flood elevation of any waterbody, wetland, or storm water management basin. Stormwater flows are proposed to be altered at discharge points as outlined in Section 10.0 – Variances.

According to BCWD rule 7.3.2 all new and reconstructed buildings must be constructed such that the lowest floor is at least two feet above the 100-year high water elevation or one foot above the emergency overflow (EOF) of a constructed basin.

Rule Requirements Met

Table 9 – Freeboard Requirement Summary

<i>Lot</i>	<i>Waterbody</i>	<i>EOF</i>	<i>100-Year HWL</i>	<i>Allowable Basement Floor</i>	<i>Lowest Proposed Basement Floor</i>
1	Basin 6-3	947.60	947.60	948.60	970
2	Basin 6-21	978.00	977.67	979.00	990
3	Basin 6-1	994.00	993.84	995.00	1002
3	Wetland 1	997.40	997.56	999.56	1002
4	Wetland 2	988.70	988.75	990.75	997
5	Wetland 2	989.00	988.75	990.00	991
6	Basin 8-1	966.00	965.94	967.00	973
7	Wetland 17	973.80	973.87	975.87	976
8	Basin 6-3	947.60	947.60	948.60	952
9	Basin 34-3	934.60	932.95	934.95	965
10	Wetland 33	965.50	965.81	967.81	970
10	Wetland 25	959.90	960.64	962.64	970
10	Wetland 27	952.60	953.83	955.83	970
11	Wetland 27	952.60	953.83	955.83	966
12	Wetland 26	970.20	968.03	970.03	974
13	Basin 29-2	947.75	947.57	948.75	982
15	Basin 34-4	935.50	932.93	934.93	940
15	Infiltration Basin 34-2	931.50	932.10	934.10	940

According to Rule 7.3.5, The District will issue a permit to alter surface flows under paragraph 7.2, above, only on a finding that the alteration will not have an unreasonable impact on an upstream or downstream landowner and will not adversely affect flood risk, basin or channel stability, groundwater hydrology, stream baseflow, water quality or aquatic or riparian habitat.

Rule Requirements Met

When evaluating existing versus proposed conditions, the volume increases at two discharge locations (BCT2 & BCT3). However, the discharge locations are attenuated by a vegetated swale along the Brown’s Creek Trail which ultimately discharges to a wetland system northeast of McKusick Rd. As a result, there are no downstream impacts.

Rule 8.0—FEES

Fees for this project as outlined below:

1. Stormwater management fee	\$3,100
2. Erosion control fee for grading	\$1,500
3. Shoreline and streambank alterations fee	\$NA
4. Stream and lake crossings fee	\$NA
5. Floodplain and drainage alterations fee	\$500
▪ TOTAL FEES	\$5,100

Rule 9.0—FINANCIAL ASSURANCES

Financial assurances for this project are as outlined below:

1. Grading or Alteration (18.0 acres disturbed x \$2,000/acre)	\$36,000
2. Stormwater Management Facilities (125% of facility cost)	\$TBD
▪ TOTAL FINANCIAL ASSURANCES (\$5,000 Minimum Performance Financial Assurance)	\$TBD

The BCWD engineer is currently waiting on the engineer's estimate provided by the applicant and will use this estimate to determine the required financial assurance.

Rule 9.0 Conditions:

- 9-1. Final estimate of stormwater facilities cost as agreed upon by applicant's engineer and BCWD engineer.

Rule 10.0—VARIANCES

According to BCWD Rule 10.0, the Board of Managers may hear requests for variances from the literal provisions of these Rules in instances where their strict enforcement would cause undue hardship because of the circumstances unique to the property under consideration. The Board of Managers may grant variances where it is demonstrated that such action will be keeping with the spirit and intent of these rules. Variance approval may be conditioned on an applicant's preventing or mitigating adverse impacts from the activity.

The Permit Applicant is requesting a variance to the following rules:

- Rule 2.4.1(a)(i) No increase in peak stormwater flow from the site, as compared with pre-settlement condition, for a 24-hour precipitation event with a return frequency of two, 10 or 100 years for all points where discharge leaves a site.
- Rule 2.4.1(a)(ii) No increase in stormwater flow volume from all points where discharge leaves a site, as compared with the pre-settlement condition, for a 24-hour precipitation event with a return frequency of two years.

The basis for the variance request and the Engineer's assessment of this request is addressed below for each rule requirement.

Rule 2.4.1(a)(i) Rate Control Requirement: There are a total of 17 discharge points from the site. The stormwater management plan meets the rule requirement of matching pre-settlement rate control at six (6) of these points. Therefore, 11 discharge points do not meet the pre-settlement rate control requirement. The permit applicant is requesting a variance from this rule requirement, arguing that the project largely preserves the existing land cover and does not substantially increase impervious area in the subcatchments. The increase in runoff from pre-settlement conditions is due to the fact that the existing vegetation does not perform as well as native vegetation in terms of capturing, slowing, and infiltrating stormwater runoff. The applicant has stated that meeting the pre-settlement rate control requirement would mean additional land disturbance from that which is currently proposed for the development. All 17 discharge points match or are less than the existing (pre-development) rates discharging from the site, as shown in Table 10 and Table 11 (note that an asterisk for proposed rates indicates the discharge does not meet the pre-settlement discharge rate).

Table 10 – Rate of discharge - north

<i>Subcatchment Area [Pre-settlement / Post-development]</i>	<i>Pre-development Runoff Rates [cfs]</i>			<i>Proposed Runoff Rates [cfs]</i>		
	<i>2 yr (2.81")</i>	<i>10 yr (4.17")</i>	<i>100 yr (7.23")</i>	<i>2 yr (2.81")</i>	<i>10 yr (4.17")</i>	<i>100 yr (7.23")</i>
	Area 1A to West 1	0.04	0.11	0.29	0.04	0.10
Area 1-1A to West 1*						
Area 1B to West 2	0.22	0.60	1.63	0.22	0.60	1.63
Area 1-1B to West 2*						
Area 6A & WL1 to BCT1	0.86	2.13	5.56	0.72	1.92	5.26
Area 6-1A & WL1 to BCT1*						
Area 6B to BCT2	2.37	5.78	14.97	1.66	3.74	13.08
Area 6-1B, C, D to BCT2						
Area 6C to BCT3	3.71	8.75	22.12	2.22	5.10	11.92
Area 6-2A, B, C to BCT3						
Area 6D to BCT4	1.80	3.66	8.54	1.12*	2.86*	7.65*
Area 6-3A to BCT4*						
Area 6E to BCT5	8.76	20.95	54.75	1.31	9.34	25.25
Area 6-3C & Basin 1 to BCT5						
Area 6F & WL9 to BCT6	2.33	7.30	56.51	0.96	5.49	28.79
Area 6-4A & WL9 to BCT6						
Area 6G, 12, 13 to BCT7*	1.66	4.12	10.81	1.62*	4.08*	10.77*
Area 6G, 12, 13 to BCT7*						
Wetland 24 to North Ditch	0	0	0.40	0	0	0.40

Table 11 – Rate of discharge - south

<i>Subcatchment Area [Pre-settlement / Post-development]</i>	<i>Pre-development Runoff Rates [cfs]</i>			<i>Proposed Runoff Rates [cfs]</i>		
	<i>2 yr (2.81")</i>	<i>10 yr (4.17")</i>	<i>100 yr (7.23")</i>	<i>2 yr (2.81")</i>	<i>10 yr (4.17")</i>	<i>100 yr (7.23")</i>
WL 33, 34A, 34B to S Ditch	0.12	1.97	17.72	0.03	0.42	5.80
WL 33, Basin 34-4, Area 34-5 to S Ditch						
Area 34-C to East 1	0.38	2.30	12.35	0	0.15	10.06
Area 34-1, Basin 34-2 to East 1						
Wetland 32 to East 2	0	0	6.83	0	0	5.41
Wetland 32 to East 2*						
Area 35A to West 3	0.17	0.67	2.28	0.17*	0.67*	2.28*
Area 35-1A to West 3*						
Area 35B to West 4	1.51	3.52	8.78	1.51*	3.52*	8.78*
Area 35-1B to West 4*						
Area 35C & WL 26 to West 5	1.00	2.32	5.80	1.00*	2.32*	5.80*
Area 35-1C & WL 26 to West 5*						
Area 36A, 36B to South 1	0.15	1.20	6.08	0.15*	1.20*	6.08*
Area 36-1, 36-2 to South 1*						

The rates from Basins 2 (subcatchment area Wetland 32 to East 2) and 4 (subcatchment area WL 33, Basin 34-4, Area 34-5 to S. Ditch) will actually be less than what is presented in Table 11 since stormwater reuse (for irrigation) has not been accounted for in the HydroCAD model.

The rule standard of setting peak rate and volume control at a pre-settlement level provides protection of sensitive high-value downstream resources (BCWD Rules SONAR, 2007). The implication of increasing stormwater discharge rate leaving the site is that it presents a higher risk of erosion which damages vegetation and carries sediment and pollutants to downstream resources. The flow paths and downstream resources at each location that do not meet the pre-settlement rate control standard are analyzed in Table 12.

Table 12 - Rate Control Variance Analysis

Subcatchment Area [Pre-settlement / Post-development]	Pre-settlement Runoff Rates [cfs]			Proposed Runoff Rates [cfs]		
	2 yr (2.81")	10 yr (4.17")	100 yr (7.23")	2 yr (2.81")	10 yr (4.17")	100 yr (7.23")
Area 1A to West 1	0.04	0.10	0.27	0.04	0.10	0.28*
Area 1-1A to West 1*						
<u>Analysis:</u> Increase of 0.01 cfs for the 100-year event is within expected inherent error of model parameter inputs and calculation methods. Insignificant change in flow rate and within acceptable error for small watershed modeling and large volume events.						
Area 6D to BCT4	1.03	2.73	7.48	1.12*	2.86*	7.65*
Area 6-3A to BCT4*						
<u>Analysis:</u> Minor increase in flow rate from pre-settlement; flow rate is less than existing conditions. Discharges to gently sloping ditch along Brown's Creek Trail, thence into the McKusick Road ditch (3% slope). Enters wetland north of McKusick Road 1,800 feet away. Flow will experience significant attenuation due to nature of slope, vegetation, and length such that erosion and sediment deposition risk to the downstream resource is minimized in this case.						
Area 6G, 12, 13 to BCT7*	1.42	3.78	10.33	1.62*	4.08*	10.77*
Area 6G, 12, 13 to BCT7*						
<u>Analysis:</u> Minor increase in flow rate from pre-settlement; flow rate is less than existing conditions. Discharges to heavily wooded ditch along Brown's Creek Trail, thence beneath the trail via 12" pipe, beneath McKusick Road, and into a large wetland categorized as a GDNR approximately 500 feet away. Flow will experience significant attenuation due to nature of slope, vegetation, length, and restrictive pipe such that erosion and sediment deposition risk to the downstream resource is minimized in this case.						
Wetland 32 to East 2	0	0	4.70	0	0	5.41*
Wetland 32 to East 2*						
<u>Analysis:</u> Increase in flow rate from pre-settlement for 100-year only; flow rate is less than existing conditions. Discharges to nearly flat open turf area before crossing beneath Brown's Creek Trail, McKusick Road, and to a small wetland located on private property 950 feet away. Flow will experience significant attenuation due to non-concentrated sheet flow across the open turf area and length of the flow path to the downstream resource such that erosion and sediment deposition risk to the downstream resource is minimized in this case.						
Area 35A to West 3	0.11	0.53	2.03	0.17*	0.67*	2.28*
Area 35-1A to West 3*						
<u>Analysis:</u> Minor increase in flow rate from pre-settlement; flow rate is less than existing conditions. Discharges to a small wetland complex which outlets back onto the project site approximately 500 feet away and to the north. Small, flat catchment area at 0.63 acres in size generating low volume and rates for all rain events, which proportions to low risk of erosion and sediment deposition. Flow will experience significant attenuation when entering the downstream wetland such that erosion and sediment deposition risk to the downstream resource is minimized in this case.						

Subcatchment Area [Pre-settlement / Post-development]	Pre-settlement Runoff Rates [cfs]			Proposed Runoff Rates [cfs]		
	2 yr (2.81")	10 yr (4.17")	100 yr (7.23")	2 yr (2.81")	10 yr (4.17")	100 yr (7.23")
Area 35B to West 4	1.08	2.88	7.89	<u>1.51*</u>	<u>3.52*</u>	<u>8.78*</u>
Area 35-1B to West 4*						
<i>Analysis: Minor increase in flow rate from pre-settlement; flow rate is less than existing conditions. Wide flat swale discharges to a wooded depression located on private property before flowing to a wetland on an adjacent property approximately 550 feet away. Flow will experience significant attenuation by sheet flow across the wide flat swale, the woods, and the depression before entering the downstream wetland such that erosion and sediment deposition risk to the wooded area and downstream resource is minimized in this case.</i>						
Area 35C & WL 26 to West 5	0.72	1.90	5.21	<u>1.00*</u>	<u>2.32*</u>	<u>5.80*</u>
Area 35-1C & WL 26 to West 5*						
<i>Analysis: Minor increase in flow rate from pre-settlement; flow rate is less than existing conditions. Discharges to a small wetland complex which outlets back onto the project site approximately 250 feet away and to the south. Small, catchment area at 1.15 acres in size generating low volume and rates for all rain events, which proportions to low risk of erosion and sediment deposition. Flow will experience significant attenuation when entering the downstream wetland, thence further attenuated through the second wetland such that erosion and sediment deposition risk to the downstream resource is minimized in this case.</i>						
Area 36A, 36B to South 1	0.11	1.06	5.77	<u>0.15*</u>	<u>1.20*</u>	<u>6.08*</u>
<i>Analysis: Very minor increase in flow rate from pre-settlement; flow rate is less than existing conditions. Discharges down a heavily wooded slope, onto a flat turf fairway on the neighboring golf course, thence through a wooded area to a wetland approximately 1,000 feet away. Small, gently sloping catchment area at 1.45 acres in size generating low volume and rates for all rain events, which proportions to low risk of erosion and sediment deposition. Flow will experience significant attenuation when entering the wooded area and flat turf fairway such that erosion and sediment deposition risk to the downstream resource is minimized in this case.</i>						

BCWD engineer finds that there is adequate technical basis to support the managers' granting a variance from the rate-control requirement as the findings in the above analysis conclude that meeting the existing conditions peak discharge rates, at these specific locations, is technically satisfactory to sufficiently protect downstream resources, and will not result in adverse impacts to downstream properties. Note that proposed values marked with an asterisk in Table 12 are higher than the pre-settlement discharge rate standard.

Rule 2.4.1(a)(ii) Volume Control Requirement: As previously stated, there are a total of 17 discharge points from the site. The stormwater management plan meets the rule requirement of matching pre-settlement runoff volumes for the 2-year, 24-hour event at six (6) of these points (West 2, BCT1, N 88th Ditch, East 1, East 2, West 5). This means that 11 discharge points do not meet the pre-settlement volume control requirement (West 1, BCT2, BCT3, BCT4, BCT5, BCT6, BCT7, S. 88th Ditch, West 3, West 4, South 1). The permit applicant is requesting a variance from this rule requirement since the volume at 14 of the discharge points match (or are lower than) the existing runoff volumes, as shown in Table 13, and that volume control to pre-settlement levels is provided for the site as a whole.

Rule Policy 2.1.1 is to preserve natural infiltration, groundwater recharge and subsurface flows that support groundwater dependent resources including lakes, streams, wetlands, plant communities, and drinking water supplies. According to the Memorandum Providing Background on and an Explanation of Amendments to the Brown's Creek Watershed District Rules (2018), among the 2016 BCWD Plan goals supported by this are to:

- Protect and maintain the quantity and quality of groundwater recharge, and
- Maintain or restore (where needed) pre-settlement recharge conditions in the watershed

These goals are met by the entire project site stormwater management plan meeting the pre-settlement standard.

The rule standard of setting peak rate and volume control at a pre-settlement level is meant to protect sensitive high-value downstream resources (BCWD Rules SONAR, 2007). The implications of increasing stormwater volume leaving a site at individual point locations are extending periods of saturation of soils along watercourses leading to erosion and sediment deposition, downcutting, disconnection from floodplain, as well as increasing flood risk to upstream and downstream resources and landowners (Rule 7.3.5). There are no watercourses being discharged to, and the ditch conveyances are fully stabilized and not susceptible to volume related erosion, therefore flood risk to upstream and downstream resources and landowners are the focuses of this variance analysis.

The applicant's variance request states that "Discharge volume increases over pre-settlement in areas where no impervious surface is proposed and volume control measures weren't feasible simply because the current landscape is not in a pre-settlement condition" and that "In drainage areas with development activity, some have increased volume and others have reduced volume depending on the suitability of the landscape for volume reduction practices." Two (2) discharge points have volumes that exceed the existing runoff volumes (BCT2, and BCT3) as outlined below.

- BCT2 - This discharge point collects drainage from three subcatchments including Area 6-1C, Area 6-1B and Area 6-1D. One of these subcatchments has new impervious coverage associated with the building pad as well as a rate control pond (Area 6-1B). A significant portion of the area is being converted to native vegetation; however, this area is downstream of the rate control pond where infiltration is infeasible due to soil conditions (Refer to Figure 3).
- BCT3 - This discharge point collects drainage from three subcatchments including Area 6-2B, 6-2C, and Area 6-2A. One of these subcatchments has new impervious coverage associated with the building pad. In addition, there are two rate control ponds in this drainage area that discharge to the native vegetation area (Refer to Figure 4).

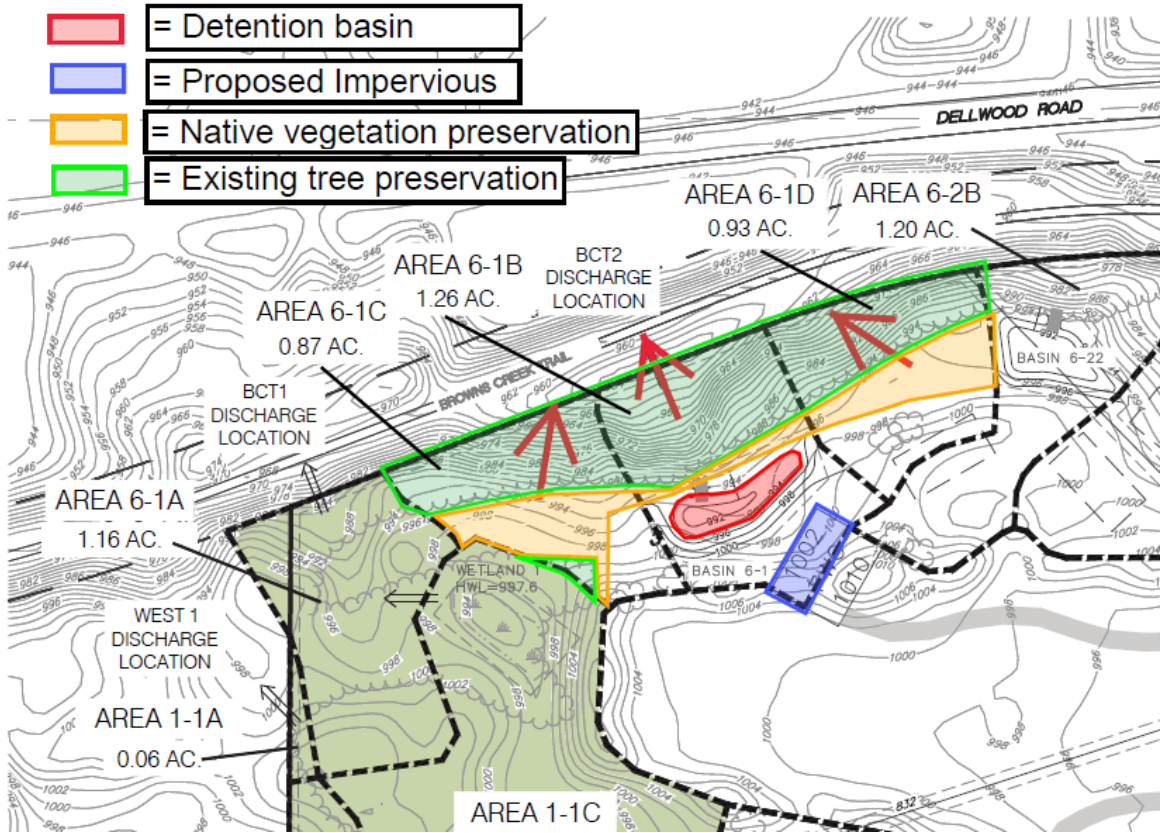


Figure 3 - Proposed discharge to BCT2

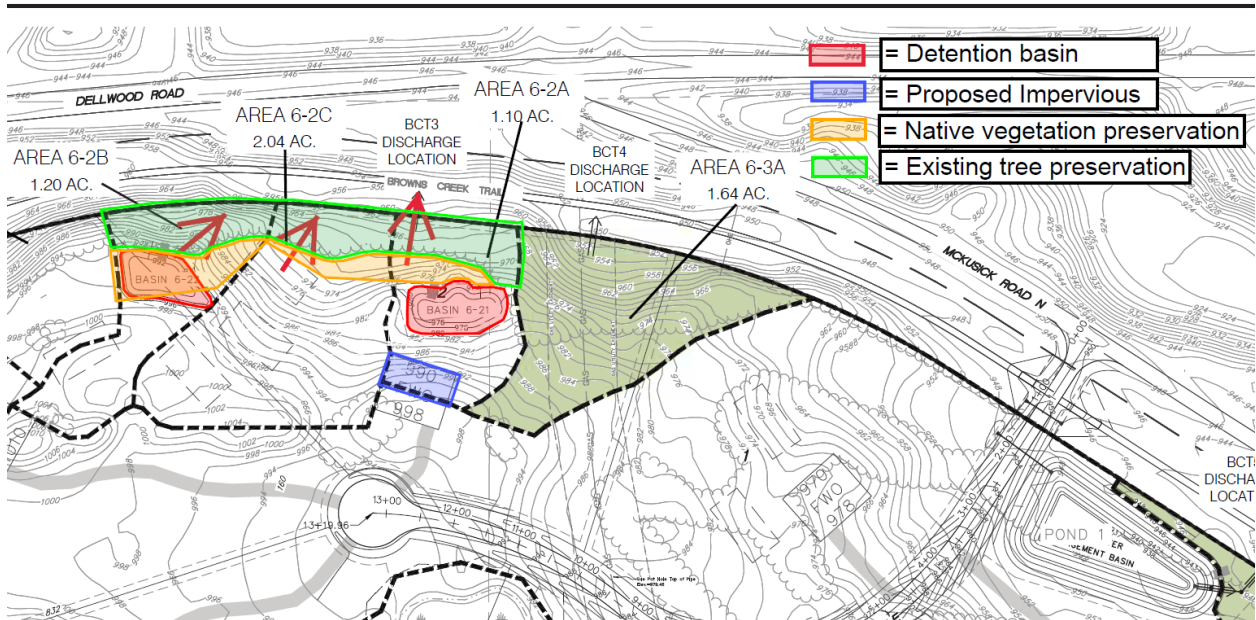


Figure 4 - Proposed discharge to the BCT3

Table 13 – Existing to Proposed 2-Year Discharge Volume Comparison

Discharge Point	Existing Runoff Volume [cf]	Proposed Runoff Volume [cf]	Difference [cf]	Volume Reduction Provided [cf]	Volume Change [cf]
West 1	155	142	-13	0	-13
West 2	799	799	0	0	0
SUB-TOTAL (discharges to private properties)			-13	0	-13
BCT1	2,574	2,574	0	1,103	-1,103
BCT2	8,079	8,481	402	0	402*
BCT3	12,455	13,658	1,203	0	1,203*
BCT4	6,221	3,891	-2,330	0	-2,330
BCT5	32,225	53,721	21,496	27,205	-5,709
BCT6	16,803	22,479	5,676	11,795	-6,119
BCT7	5,718	5,588	-130	0	-130
SUB-TOTAL (discharges to Brown's Creek Trail)			26,317	40,103	-13,786
N. 88 th Ditch	0	0	0	749	-749
S. 88 th Ditch	1,969	8,804	6,835	12,130	<u>-1,357</u>
SUB-TOTAL (discharges to south Mckusick ditch and across north to wetland complex.)			6,835	12,879	-2,106
East 1	3,891	7,906	4,015	7,906	-3,891
East 2	0	0	0	10,784	-10,784
SUB-TOTAL (discharges to private property)			4,015	18,690	-14,675
West 3	815	815	0	0	0
West 4	4,990	4,990	0	0	0
West 5	3,298	3,298	0	2,004	-2,004
SUB-TOTAL (discharges to private property)			0	2,004	-2,004
South 1	1,298	1,298	0	0	0
SUB-TOTAL (discharges to private property)			0	0	0
TOTAL FOR ENTIRE SITE			37,167	73,676	-32,584

The subtotals shown in Table 13 indicate locations of common drainage to a downstream resource, e.g., wetland or property. The BCWD engineer finds that there is sufficient data and analysis to support the board's granting the variance from the volume control requirement since the stormwater management plan demonstrates that more volume control is being provided at each of the subtotaled discharge locations than what is currently happening under existing conditions. While two of the discharge points along the vegetated swale (conveyance system) along Brown's Creek State Trail are increasing in volume from existing conditions, there are multiple discharge points along the same conveyance system that discharge less than existing conditions, so that the net discharge at the most downstream end is less than existing conditions overall by 13,786 cubic feet. Given that the net volume being discharged to the vegetated swale is less than existing conditions, there will be no impact to the vegetated swale. Additionally, there will be no impact to the downstream wetland system (as articulated under Rule 2.0). As a result of these evaluations, the BCWD engineer supports the board's granting a variance to the volume control requirement in this instance. Further, the total volume being mitigated via stormwater infiltration, stormwater reuse and evapotranspiration is greater than the volume currently leaving the site in total which also meets the District's goals for groundwater recharge and runoff reduction.

RECOMMENDED CONDITIONS OF THE PERMIT:

The following is a summary of the remaining tasks necessary to bring the project into compliance with the BCWD Rules in all respects other than where variances are requested as discussed above:

1. Demonstrate that the plan has received preliminary plat approval (BCWD Rule 1.3a).
2. Address all stormwater management conditions (Conditions 2-1 to 2-6).
3. Address all erosion control conditions (Condition 3-1).
4. Address all buffer conditions (Condition 4-1 & 4-2).
5. Address all financial assurance requirements (Condition 9-1).
6. Replenish the Permit fee deposit to \$5,100 (\$52,551.38 Review Fees to Date + \$5,100 = \$57,651.38) (BCWD Rule 8.0). If the permit fee deposit is not replenished within 60 days of receiving notice that such deposit is due, the permit application or permit shall be deemed abandoned and all prior approvals shall be revoked and collection proceedings shall begin on unpaid balances.
7. Provide the required financial assurances (BCWD Rule 9.0):
 - a. Total grading or alteration assurance 18.0 acres (\$36,000).
 - b. Stormwater management facilities assurance (\$X).

STIPULATIONS OF APPROVAL:

1. Note that the permit, if issued, will require that the applicant notify the District in writing at least three business days prior to commencing land disturbance. (BCWD Rule 3.3.1)
2. To ensure that construction is carried out according to the approved plan, provide verification that construction standards have been met for all infiltration basins and pretreatment swales. This includes but is not limited to confirmation that infiltration basin sub-cut reaches soil material reflected in the geotechnical report and that the vegetation establishment procedures have been followed per the landscaping/restoration plan. This can be achieved by scheduling a BCWD inspection during the excavation of the basins,

independent geotechnical engineer observation and note of confirmation, or well-documented photographic evidence by the onsite engineer along with collected survey elevations of the basins.

3. Provide the District with As-built record drawings showing that the completed grading and stormwater facilities conform to the grading plan.