Exhibit H: Preliminary Stormwater Report

Vehicle Storage Operation
Tualatin, Oregon

Preliminary Stormwater Report

Date:	February 2025
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Table of Contents

1.0 Purpose of Report 1
2.0 Project Location/Description 1
3.0 Regulatory Design Criteria 1
3.1 STORMWATER QUANTITY 1
3.2 HYDROMODIFICATION 2
3.3 STORMWATER QUALITY 3
4.0 Design Methodology 3
5.0 Design Parameters 4
5.1 DESIGN STORMS 4
5.2 PRE-DEVELOPED SITE CONDITIONS 4
5.2.1 Site Topography 4
5.2.2 Land Use 4
5.3 SOIL TYPE 4
5.4 POST-DEVELOPED SITE CONDITIONS 4
5.4.1 Site Topography 4
5.4.2 Land Use 5
5.4.3 Description of Off-Site Contributing Basins 5
6.0 Stormwater Analyses 5
6.1 PROPOSED STORMWATER CONDUIT SIZING 5
6.2 PROPOSED STORMWATER QUALITY CONTROL FACILITY 5
6.3 HYDROMODIFICATION 5
6.4 PROPOSED STORMWATER QUANITITY CONTROL FACILITY 6
6.5 DOWNSTREAM ANALYSIS 6
7.0 Stormwater Analyses 7

Tables

Table 5-1: Rainfall Intensities 4
Table 5-2: Hydrologic Soil Group Ratings 4
Table 6-1: Impervious Area Summary 5
Table 6-2: Impervious Area Treatment Summary 5
Table 6-3: Stormwater Runoff Flow Summary 6

Figures

FIGURE 1: PRE-DEVELOPMENT BASIN MAP
FIGURE 2: POST-DEVELOPMENT BASIN MAP
FIGURE 3: STORMWATER QUALITY CALCULATIONS

Appendices

APPENDIX A: PRE-DEVELOPED AND POST-DEVELOPED BASIN MAPS
APPENDIX B: HYDROCAD REPORTS FOR PRE-DEVELOPED CONDITION STORM EVENTS
APPENDIX C: HYDROCAD REPORTS FOR POST-DEVELOPED CONDITION STORM EVENTS
APPENDIX D: STORMWATER QUALITY CALCULATIONS
APPENDIX E: USDA-NRCS SOIL RESOURCE REPORT
APPENDIX F: TR55 RUNOFF CURVE NUMBERS

Preliminary Stormwater Report
VEHICLE STORAGE OPERATION
TUALATIN, OREGON

1.0 Purpose of Report
The purpose of this report is to analyze the effects the proposed development will have on the existing stormwater conveyance system; document the criteria, methodology, and informational sources used to design the proposed stormwater system; and present the results of the preliminary hydraulic analysis.

2.0 Project Location/Description
The proposed improvements are located at 18867 SW 128th Ave, Tualatin, OR 97062, encompassing 10.7 acres (Tax Lot 2100, Tax Map 2S.1.21A), and east of SW 128th Ave. This property is owned by Grimm's fuel company.

The proposed project will consist of constructing a new asphalt towing and vehicle storage operation. The site improvements will include the construction of new asphalt towing yard surface, employee parking, mobile office, fencing, and an aboveground stormwater facility.

3.0 Regulatory Design Criteria
3.1 STORMWATER QUANTITY
Per Clean Water Services' (CWS) *Design and Construction Standards Manual for Sanitary Sewer and Surface Water Management (R&O 19-5, as amended by R&O 19-22)*, Section 4.02.1 Mitigation Requirement, the District or City shall determine which of the following techniques may be used:

a. *Construction of permanent on-site stormwater quantity detention facilities designed in accordance with this Chapter; or*

b. *Enlargement or improvement of the downstream conveyance system in accordance with this Chapter and Chapter 5; or*

c. *Payment of a Storm and Surface Water Management System Development Charge (SWM SDC), as provided in CWS Ordinance 28, which includes a water quantity component to meet these requirements. If district or City requires that an on-site detention facility be constructed, the development shall be eligible for a credit against SWM SDC fees, as provided in District Ordinance and Rules.*

Per Clean Water Services' (CWS) *Design and Construction Standards Manual for Sanitary Sewer and Surface Water Management (R&O 19-5, as amended by R&O 19-22)*, Section 4.02.2 Criteria for Requiring On-Site Detention for Conveyance Capacity, on-site detention is required when any of the following conditions exist:

1. *There is an identified downstream deficiency and the District or City determines that detention rather than conveyance system enlargement is the more effective solution.*

2. *There is an identified regional detention site within the boundary of the development.*

3. *Water quantity facilities are required by District-adopted watershed management plans or subbasin master plans or District- approved subbasin strategy.*

3.2 HYDROMODIFICATION

Per Clean Water Services' (CWS) *Design and Construction Standards Manual for Sanitary Sewer and Surface Water Management (R&O 19-5, as amended by R&O 19-22)*, Section 4.03 Hydromodification Approach Requirements, the implementation or funding of techniques to reduce impacts to the downstream receiving water body is required when a new development, or other activities, creates or modifies 1,000 square feet or more of impervious surfaces or increases the amount or rate of surface water leaving the site. The following techniques can be implemented or funding to reduce impacts to the downstream receiving water body:

a. *Construction of permanent LIDA designed in accordance with this Chapter; or*

b. *Construction of a permanent stormwater detention facility designed in accordance with this Chapter; or*

c. *Construction or funding of a hydromodification approach that is consistent with a District-approved subbasin strategy; or*

d. *Payment of a Hydromodification Fee-In-Lieu.*

Per Section 4.03.3, the receiving reach for this project is Willow Creek. The Risk Level for the receiving reach identified for this project is Low. The Development Class was determined using the Hydromodification Map provided by CWS, the project site is classified as a Developed Area. Per section 4.03.5 *Hydromodification Approach Selection* the project site is classified as a *Medium Project: 12,000 to 80,000 square feet.* Using these input parameters, per Table 4-2 *Hydromodification Approach Project Category Table*, the project falls within Category 2. As shown below. See details in the appendices of this report for further information.

TABLE 4-2
HYDROMODIFICATION APPROACH PROJECT CATEGORY TABLE

<table>
<tr><th>Development Class/
Risk Level</th><th>Small Project
1,000 – 12,000 SF</th><th>Medium Project
>12,000 – 80,000 SF</th><th>Large Project
> 80,000 SF</th></tr>
<tr><td>Expansion/High</td><td rowspan="6">Category 1</td><td rowspan="2">Category 3</td><td rowspan="3">Category 3</td></tr>
<tr><td>Expansion/ Moderate</td></tr>
<tr><td>Expansion/ Low</td><td>Category 2</td></tr>
<tr><td>Developed/ High</td><td>Category 3</td></tr>
<tr><td>Developed/ Moderate</td><td rowspan="2">Category 2</td><td rowspan="2">Category 2</td></tr>
<tr><td>Developed/ Low</td></tr>
</table>

Per Section 4.03.5b *Hydromodfication Approach Selection – Category 2*, any of the following options may be used to address hydromodifcation:

1. *Infiltration facility, using the Standard Sizing, described in Section 4.08.5; or*

2. *Peak-Flow Matching Detention, using design criteria described in Section 4.08.6; or*

3. *Combination of Infiltration facility and Peak-Flow Matching Detention, using criteria described in Section 4.08.5 and 4.08.6; or*

4. *Any option listed in Category 3.*

3.3 STORMWATER QUALITY

Per Clean Water Services' (CWS) *Design and Construction Standards Manual for Sanitary Sewer and Surface Water Management (R&O 19-5, as amended by R&O 19-22)*, Section 4.04 Water Quality Treatment Requirements, the implementation or funding of a permanent water quality approach is required when a new development, or other activities, creates or modifies 1,000 square feet or more of impervious surfaces, or increases the amount of stormwater runoff or pollution leaving the site. Additionally, per Section 4.08 Stormwater Management Approach Sizing, stormwater management approaches are to be sized based on the following:

> *All new impervious surfaces and three times the modified impervious surface, up to the total existing impervious surface on the site. The area requiring treatment is shown in the formula below:*
>
> *Area = New Impervious + 3(Modified Impervious)*
>
> *Impervious areas shall be determined based upon building permits, construction plans, or other appropriate methods of measurement deemed reliable by District and/or City.*

Stormwater quality management for this project will be met by construction of a Dry Detention Basin.

4.0 Design Methodology

The Santa Barbara Urban Hydrograph (SBUH) Method was used to analyze stormwater runoff from the site. This method utilizes the SCS Type 1A 24-hour design storm. HydroCAD 10.00-22 computer software aided in the analysis. Representative CN numbers were obtained from the *Technical Release 55* and are included in appendices.

5.0 Design Parameters

5.1 DESIGN STORMS

Stormwater mains, inlets, and laterals for the site are placed at locations that adequately collect and convey the stormwater for the proposed improvements. Per CWS Section 5.05.2, the stormwater analysis utilized the 24-hour storm for the evaluation and design of the existing and proposed stormwater facilities. The following 24-hour rainfall Depths from CWS Standard Drawing No. 1280 was utilized as the design storm for the recurrence interval:

Table 5-1: 24-Hour Rainfall Depths

Recurrence Interval (Years)	Total Precipitation Depth (Inches)
2	2.50
5	3.10
10	3.45
25	3.90

5.2 PRE-DEVELOPED SITE CONDITIONS

5.2.1 Site Topography

Existing on-site project grades generally vary from ±3% to ±7% and drain southeast towards the existing wetlands.

5.2.2 Land Use

The existing site consists of a field area with parked vehicles, trailers, containers, and a gravel pad. However, the gravel pad has been installed without city approval and this stormwater report will treat the existing site as it was prior to the installation of the gravel pad, an undeveloped field.

5.3 SOIL TYPE

The soil beneath the project site and associated drainage basins is classified in the table below, according to the USDA Soil Survey for Washington County. The following table outlines the Hydrologic Soil Group rating for the soil type:

Table 5-2: Hydrologic Soil Group Ratings

NRCS Map Unit Identification	NRCS Soil Classification	Hydrologic Soil Group Rating
21B	Hillsboro Loam	B
37B	Quatama Loam	C
43	Wapato Silty Clay Loam	C/D

Further information on this soil type is included in the NRCS Soil Resource Report located in the appendices of this report.

5.4 POST-DEVELOPED SITE CONDITIONS

5.4.1 Site Topography

The on-site slopes will be modified with fills to direct stormwater runoff and to accommodate the construction of a stormwater facility.

5.4.2 Land Use
The site land-use will remain unchanged.

5.4.3 Description of Off-Site Contributing Basins
The surrounding properties do not direct any stormwater runoff towards the subject site.

6.0 Stormwater Analyses
6.1 PROPOSED STORMWATER CONDUIT SIZING
The proposed storm system pipes will be sized using Manning's equation to convey the peak flows from the 25-year storm event.

6.2 PROPOSED STORMWATER QUALITY CONTROL FACILITY
This project is comprised of new development and no modified or removed impervious area. Therefore, per Clean Water Services' (CWS) *Design and Construction Standards Manual for Sanitary Sewer and Surface Water Management (R&O 19-5, as amended by R&O 19-22)*, Section 4.08 Stormwater Management Approach Sizing, the impervious area requiring treatment is defined as: *Area = New Imp. + 3(Modified Imp.)*. The impervious areas are summarized in Table 6-1.

Table 6-1: Impervious Area Summary

New Impervious Area (sq. ft.)	Modified Impervious Area (sq. ft.)	Permanently Removed Impervious Area (sq. ft.)	Treatment Area Required (sq. ft.)
±83,807	0	0	±83,807

The proposed project will construct a dry detention basin to provide water quality treatment and detention, per CWS Section 4.06 and Table 4-3.

Table 6-2: Impervious Area Treatment Summary

Area to be Treated by Dry Detention Basin (sq. ft.)	Treatment Area Required by this Project (sq. ft.)	Total Area Left Untreated (sq. ft.)
±75,215	±83,807	±8,592

Due to existing infrastructure, topography, and limited vertical to the stormwater outlet onsite, not all stormwater is able to be collected and treated. Water quality treatment will be provided to the maximum extent feasible.

6.3 HYDROMODIFICATION
The proposed site improvements will reduce impacts to the downstream water body by implementing a dry detention basin design per CWS' standards. Per Section 4.03.5b *Hydromodification Approach Selection – Category 2,* hydromodification will be met by peak-flow matching detention to the best of the site's ability.

Due to existing infrastructure, topography, and limited vertical depth of the site, not all stormwater is able to be collected and detained. Collected stormwater shall be over detained to mitigate for undetained flow. Additional sizing and information on the dry detention basin design, refer to sections 6.2 and 6.4 of this report.

6.4 PROPOSED STORMWATER QUANITITY CONTROL FACILITY

The proposed on-site improvements will utilize a dry detention basin facility to provide detention for the new impervious areas per CWS' standards. Basin 1S is comprised of a new impervious area that will be collected and detained in the new facility. Basin 2S is comprised of new impervious areas that cannot be collected by the new detention system. To mitigate undetained flow from Basin 2S, Basins 1S will be detained and released to meet stormwater quantity mitigation standards per CWS section 4.0806.b. See table 6-3 for detail.

See equations 1 & 2 for additional information regarding the allowable release rate for each storm event. Equation 1 defines the allowable release rate for only 50% of the 2-year storm event analysis, while equation 2 defines the allowable release rate for the remaining storm events.

Equation 1: 50% of the 2-Year Only

$$Allowable = \frac{1X}{2}$$

$$Allowable\ (2\ Year) = \frac{(0.32)}{2} = 0.16\ cfs$$

Equation 2: 2, 5, 10, and 25-year Storm Events

$$Allowable = 1X$$

$$Allowable\ (2\ Year) = (0.32) = 0.32\ cfs$$

Pre-developed runoff rates for new impervious surfaces were calculated using curve numbers based on actual Pre-Development Site conditions, per Sections 4.08.7c of CWS' standards. Post-developed runoff rates for the 2, 5, 10, and 25-year storm events do not exceed the respective pre-developed runoff rates (50% to 2, 2 to 2, 5 to 5, 10 to 10, and 25 to 25). Refer to the HydroCAD calculations in the appendices of this report for additional information.

Table 6-3: Stormwater Runoff Flow Summary

Storm Event	Pre-Developed Flows (cfs)	Post-Developed Flows (cfs)	Difference (cfs)
50% of 2	0.16	0.16	0
2	0.32	0.16	-0.16
5	0.54	0.20	-0.34
10	0.68	0.25	-0.43
25	0.86	0.36	-0.50

6.5 DOWNSTREAM ANALYSIS

Permanent stormwater detention facilities are proposed to satisfy stormwater quantity control requirements; therefore, a downstream analysis was not necessary. See sections 6.3 and 6.4 of this report for additional information regarding the proposed stormwater facilities.

7.0 Stormwater Analyses

A stormwater management system has been designed per Clean Water Services' (CWS) Design and Construction Standards Manual for Sanitary and Surface Water Management (R&O 19-5*, as amended by R&O 19-22*) and the supporting documentation is contained in this report. Stormwater management will be provided for new impervious areas with the construction of a Dry Detention Basin Additionally, the proposed detention and water quality facilities have been designed to satisfy stormwater quality and hydromodification requirements in compliance with CWS' standards to the maximum extent possible and uncollected areas will be managed by an over detention of captured stormwater. With the improvements proposed, stormwater requirements have been met to the best of the site's ability.