Appendix A7

Draft Stormwater Pollution Prevention Plan

TDK METRO TERMINALS EXPANSION PROJECT
STORMWATER POLLUTION PREVENTION PLAN

Prepared for:

TDK LOGISTICS LTD.
480 AUDLEY BOULEVARD
DELTA, BC
CANADA, V3M 5S4

Prepared by:

HATFIELD CONSULTANTS LLP
#200 - 850 HARBOURSIDE DRIVE
NORTH VANCOUVER, BC
CANADA V7P 0A3
TEL: 1.604.926.3261 • WWW.HATFIELDGROUP.COM

JANUARY 2023

MOTT11659
VERSION 1.0

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ACRONYMS

BMPs	Best Management Practices
CEPA	*Canadian Environment Protection Act*
EMA	*Environmental Management Act*
HPA	*Hazardous Products Act*
IDF	Intensity-duration-frequency
OGS	Oil-Grit Separator
RSC	Revised Statutes of Canada
SPPP	Stormwater Pollution Prevention Plan
TEU	Twenty-foot equivalent unit
TDK	TDK Logistics Inc.
VFPA	Vancouver Fraser Port Authority

DISTRIBUTION LIST

The following individuals/firms have received this document:

Name	Firm	Hardcopies	Email	FTP
Stuart Riddick	Mott MacDonald	-	✓	✓
Andrew Wells	Mott MacDonald	-	✓	✓
Tish Kumar	TDK Logistics Ltd	-	✓	✓
Tegan Smith	Channel Consulting	-	✓	✓

AMENDMENT RECORD

This report has been issued and amended as follows:

Issue	Description	Date	Approved by	
1	First version of TDK Metro Terminals Expansion Project – Stormwater Pollution Prevention Plan	20230131		
			Stewart Wright Project Director	Lianne Leblond Project Manager

1.0 INTRODUCTION

This Stormwater Pollution Protection Plan (SPPP) has been prepared for the TDK Metro Terminals Expansion Project (the Project), which is located entirely on lands under the Vancouver Fraser Port Authority (VFPA) federal jurisdiction. This SPPP has been developed in alignment with the VFPA stormwater pollution objectives and guidance (VFPA 2015), to support the VFPA Project and Environmental Review (PER) process for the Project.

This SPPP describes potential effects of Project operations on stormwater quantity and quality and addresses the risk of stormwater pollution. It has been developed to support permanent post-development stormwater pollution prevention.

In accordance with the VFPA guidelines, this SPPP:

- Provides a site inventory, where potential pollutants are described;
- Identifies pollution risks associated with potential pollutant sources, receptors, and pathways;
- Provides a management strategy for pollution prevention, containment, and treatment; and
- Describes implementation of this SPPP, monitoring, and adaptive management.

1.1 PROJECT LOCATION AND OVERVIEW

The Project is located at 480 Audley Blvd on Annacis Island in the City Delta, British Columbia within federal lands managed by the VFPA, where TDK has operated for the last 23 years. TDK Metro Terminals provides storage for loaded and empty containers for ocean lines, leasing companies and retail customers, full-service container maintenance and repairs, and is a customs sufferance bonded container yard. In addition, TDK currently provides a Container Freight Station Warehouse and services, specialized cargo handling equipment and expertise, and bulk commodity loading and unloading.

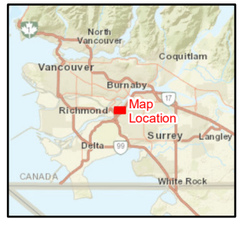
A Project Location Plan is in Figure 1.

Figure 1 Location plan.

Legend

- Project Site
- VFPA Boundary

Data Sources:
a) Proposed work limit, Mott MacDonald 2022.
b) VFPA boundary, Port of Vancouver 2018.
c) 10 cm image, 13 April 2021, Esri Online Service.



0 50 100 150 m N

Scale: 1:5,000

Projection: NAD 1983 UTM Zone 10N

Hatfield

TDK Metro Terminals Expansion Project

K:\Data\Project\MOTT11659-NV\A_MXD\MOTT11659_LocationPlan_20230130_v0_4_LC.mxd

1.2 PROJECT DESCRIPTION

TDK Logistics Inc. (TDK) is planning to expand and upgrade their existing facility at 480 Audley Boulevard on Annacis Island in Delta BC (the Project site). The proposed Project proposes upgrades to their existing container storage and transport facility to accommodate increasing market demand for goods transport and container storage including the addition of rail service and agricultural transloading to expand and intensify their operations.

The Project will expand the site's existing container yard operations which will allow the anticipated truck volume to increase from 65,000 to an estimated 80,000 annual gate transactions annual upon project completion. The expansion and addition of rail infrastructure will also allow for the addition of transload operations for agricultural products. Investing in additional infrastructure will allow for greater operational efficiency and additional services including rail. The proposed expansion project will also allow the facility to accommodate a greater number of trucks per day, increasing from 65,000 to 80,000 gate transactions per month and increase their annual throughput from 120,000 to 150,000 twenty-foot equivalent units (TEU) and 100,000 tonnes per annum t/a of agricultural product.

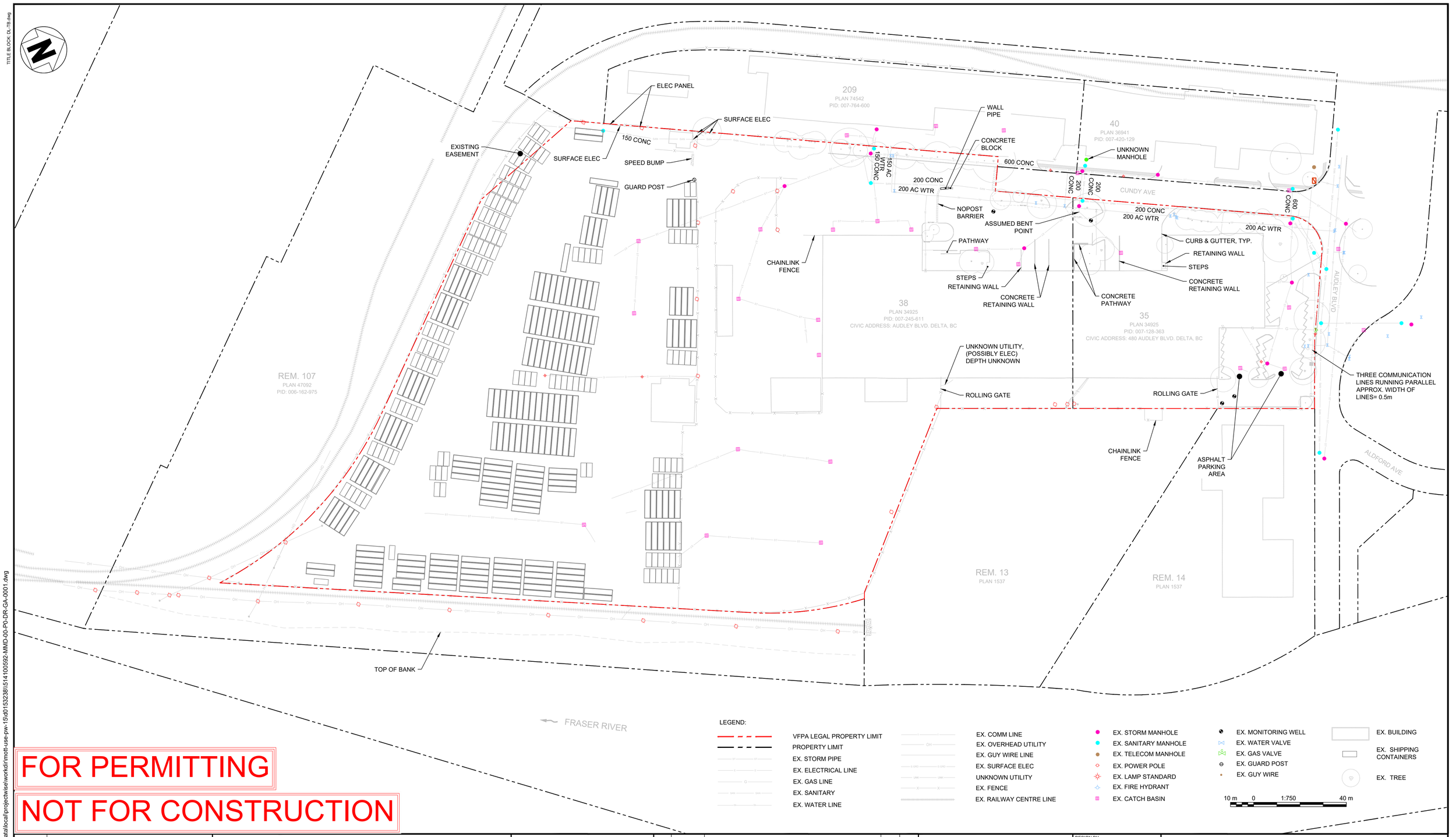
The proposed project consists of:

- The demolition of one (1) existing warehouse;
- Reconfiguration of the existing container yard and truck gate;
- Two new rail tracks to accommodate rail operations; and
- Grain transload and related infrastructure.

Once approved and constructed, this Project will allow for a more intensive use of the existing industrial site, allowing TDK to service more people and improve efficiencies.

Current hours of operation are Monday to Friday 7 am to 11 pm, and Saturday/Sunday by appointment. These will not be changing after the expansion and peak hours are anticipated to remain the same.

Figure 2 Project site plan.



FOR PERMITTING

NOT FOR CONSTRUCTION

Ref. No.	REFERENCE

MOTT MACDONALD
Suite 1888, Bentall 5
550 Burrard Street
Vancouver, BC, V6C 2B5
Canada
T 604.681.4400
W www.mottmac.com
ENGINEERS AND GEOSCIENTISTS BRITISH COLUMBIA PERMIT TO PRACTICE NUMBER: 1001591

514100592-MMD-00-P0-DR-GA-0001

No.	Date	REVISION	Dr'n	Ch'd
A	2023/01/31	ISSUED FOR PERMIT	KW	AL

PORT of vancouver
Vancouver Fraser Port Authority
ENGINEERING DEPARTMENT

DESIGN BY	A. L.
DRAWN BY	K. W.
APPROVED	A. K.
DATE	2023-JAN-31
SCALE	AS SHOWN
VFPA SITE	CNVXXX

VANCOUVER FRASER PORT AUTHORITY
TDK METRO TERMINALS EXPANSION

SITE PLAN - EXISTING CONDITION

SIZE	DWG.	SHEET	REV.
D	21-098-GA-001	1 of 1	A

TITLE BLOCK_DL-TB.dwg

DATE: 2023/01/25 - 3:59pm
PATH: C:\Users\wu97920\appdata\local\projectwise\workdir\mott-use-pw-15\d0153238\514100592-MMD-00-P0-DR-GA-0001.dwg

2.0 SITE INVENTORY

2.1 ONSITE ACTIVITIES

Activities during operations and maintenance will include:

- Storage of containers;
- Transfer of containers from trucks and trains to storage;
- Transfer of containers from storage to trucks and trains;
- Unloading of agricultural products from trains onto mobile conveyor and into stuffing container;
- Cleaning containers and equipment in wash bay;
- Equipment and machinery maintenance; and
- Equipment refuelling (outsourced to mobile diesel and propane fueling companies).

2.2 ONSITE MATERIALS (POTENTIAL POLLUTANTS)

Materials used and generated onsite during operations and maintenance that have the potential to enter stormwater include the following:

- Fuels, oils, hydraulic fluids;
- Wash water from equipment cleaning;
- Solid waste/garbage; and
- Dust from transloading of agricultural products.

TDK infrequently receives dangerous goods under hazard classes 2.1, 2.2, 2.3, 3, 4.1, 4.2, 4.3, 5.1, 5.2, 6.1, 8, and 9; however, TDK does not offer long-term storage for these goods, and they are only in transit or transloaded. Dangerous goods are not double handled i.e., they stay within their containers, and stay onsite for a maximum of 14 days.

2.3 HYDROLOGICAL ASSESSMENT

Hydrological assessment of the Project site design has been complied with the following standards:

- Project & Environmental Review Guidelines – Developing Your Stormwater Pollution;
- Prevention Plan, Vancouver Fraser Port Authority (July 2015); and
- The City of Delta Bylaw No. 7162 Schedule A – Delta Design Criteria (2018).

The hydrologic assessment presented below is for the purposes of stormwater pollution prevention and is not for the purposes of civil engineering infrastructure design.

2.3.1 Current Site Conditions

The Project site is covered with permeable and impermeable surfaces such as gravel, office buildings, storage areas, and asphalt paving. Gravel currently covers roughly 4.3 ha of the ~6 ha Project site. The existing stormwater drainage network is a combination of a catch basin, manholes, and buried pipes. The Project site is currently divided into four sub-catchments and is comprised of four sub drainage systems that are separated by the Project site's grade and the underground drainage pipe network. Catchments 1,3 & 4 which make up of about 70% of site discharge into the existing 600 mm diameter Trunk Storm Sewer at Cundy Avenue via inlet 1,3, and 4, respectively, while stormwater runoff from catchment 2 (~30% of the Project site) discharges directly into the Fraser River via an existing stormwater pipe.

The current sub-catchment configuration is shown in Figure 3.

2.3.2 Future Site Conditions

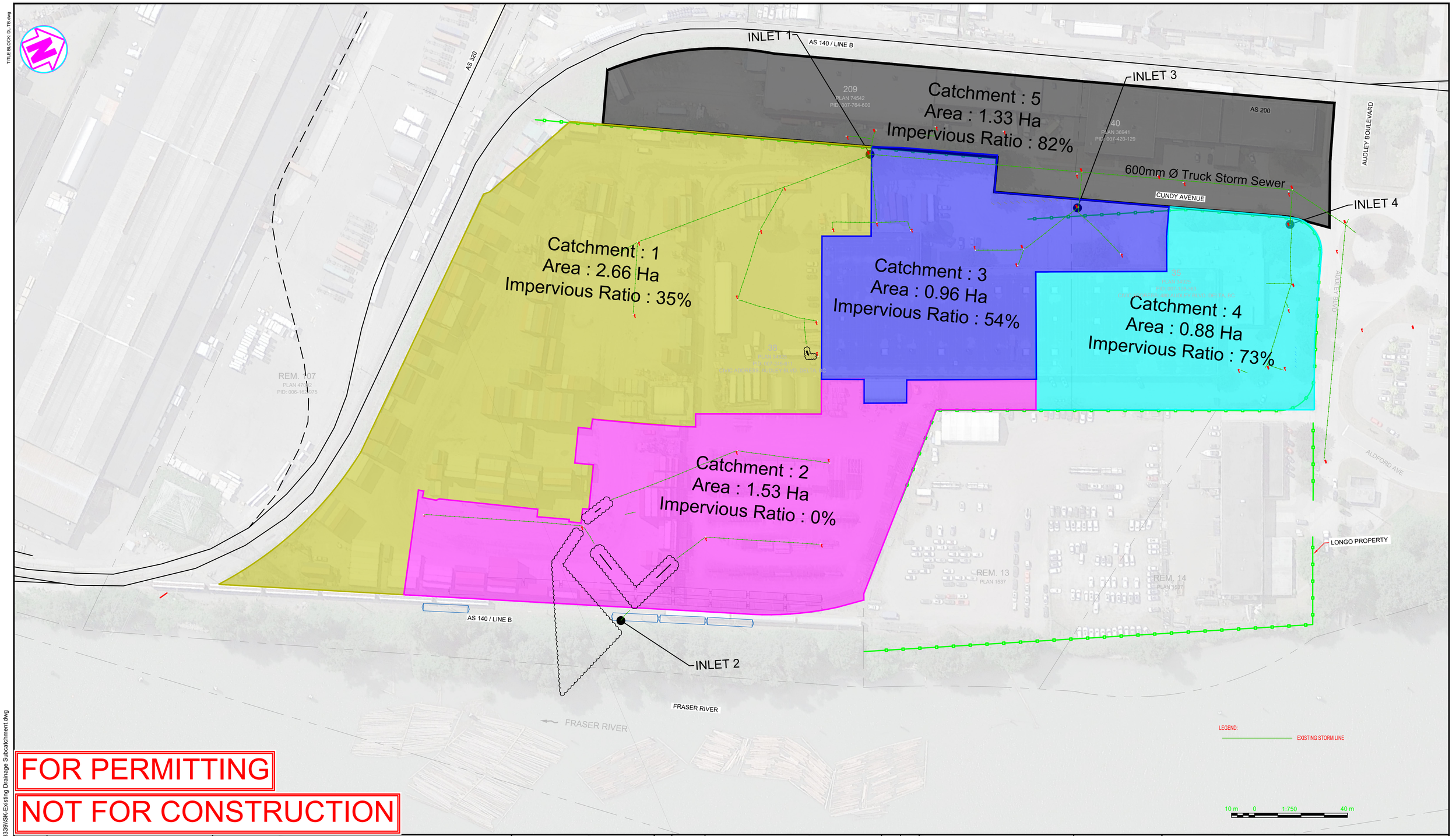
The expanded Project site design will change the grading and surface finishes within the TDK terminal and will require reconstruction of the drainage network. The expanded Project site will be asphalt paved. The Project site will be divided into 3 sub-catchments: A, B, and C.

The planned design is to grade sub-catchment A into two drainage basins where stormwater run-off will be collected through drainage grates along two drain lines. A 54 m^3 retention tank will be placed before the last drainage grate to mitigate heavy stormwater flow rates. The last drainage grates before the drain lines enter the 600 mm trunk storm main at Cundy Avenue (Inlet 1 and 4) will include oil-grit separators (OGS).

Sub-catchment C is an isolated area with its own drainage system. This area will be the truck and container washing area, and the maintenance area. An OGS will be installed in the drainage grate and the water will be discharged into the sanitary line.

The future operational design of sub-catchment areas is in Figure 4.

Figure 3 Current site sub-catchment areas.



FOR PERMITTING

NOT FOR CONSTRUCTION

Ref. No.	REFERENCE

MOTT MACDONALD
Suite 1888, Bentall 5
550 Burrard Street
Vancouver, BC, V6C 2B5
Canada
T 604.681.4400
W www.mottmac.com
ENGINEERS AND GEOSCIENTISTS BRITISH COLUMBIA
PERMIT TO PRACTICE NUMBER: 1001591
514100592-MMD-00-P0-DR-CV-XXXX

No.	Date	REVISION	Dr'n	Ch'd
A	2022/01/31	ISSUED FOR PERMIT	ML	AL

PORT of vancouver
Vancouver Fraser Port Authority
ENGINEERING DEPARTMENT

DESIGN BY	ML
DRAWN BY	ML
APPROVED	AK
DATE	2022-DEC-16
SCALE	AS SHOWN
VFPA SITE	CNVXXX

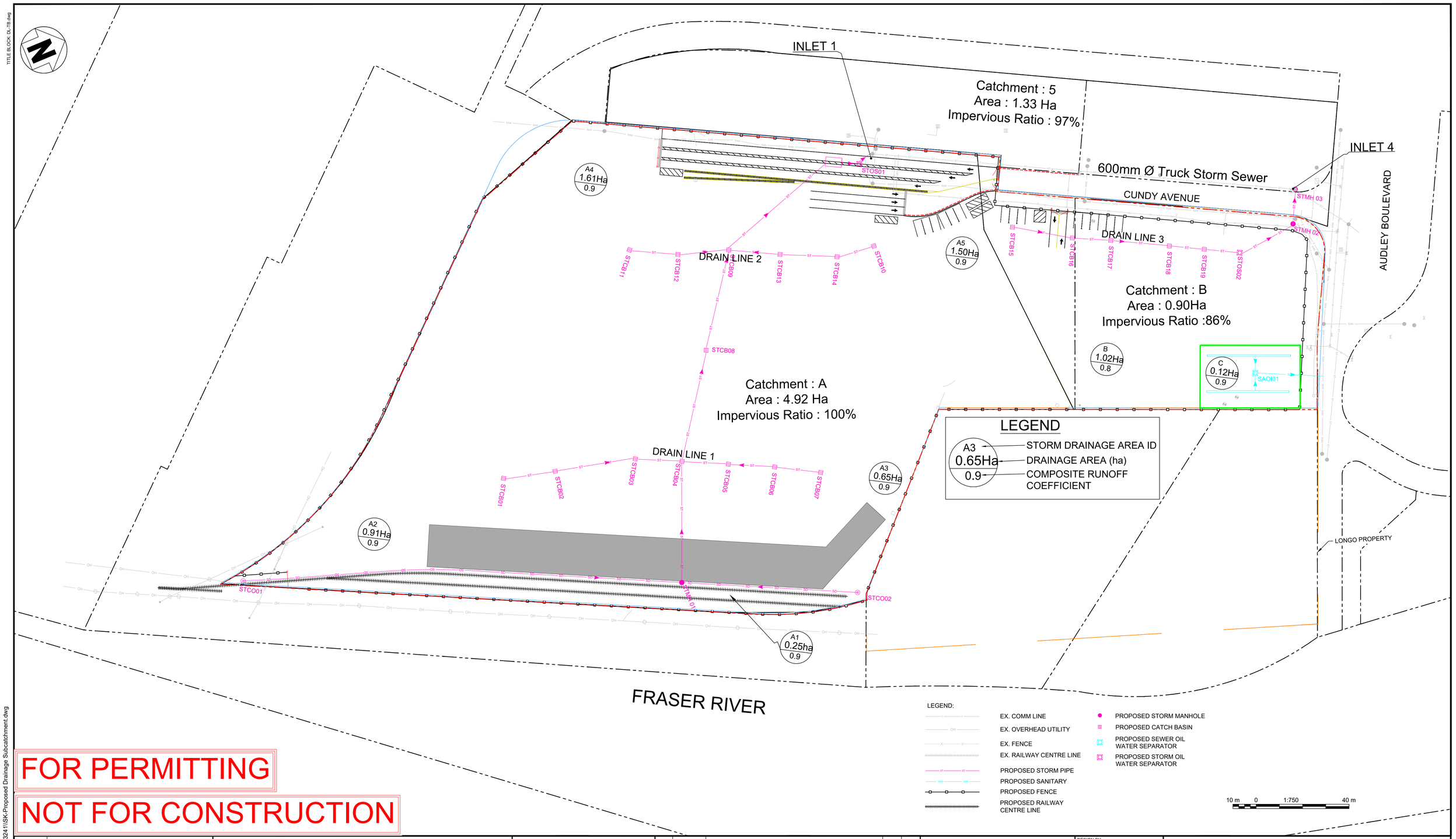
VANCOUVER FRASER PORT AUTHORITY
TDK METRO TERMINALS EXPANSION
EXISTING STORMWATER DRAINAGE CATCHMENT

SIZE	DWG.	SHEET	REV.
D	21-098-GA-001	1 of 1	A

TITLE BLOCK: DL-TB.dwg

DATE: 2023/01/30 - 10:24am
PATH: C:\users\tas98824\d0153339\SK-Existing Drainage Subcatchment.dwg

Figure 4 Future operational design of sub-catchment areas.



FOR PERMITTING

NOT FOR CONSTRUCTION

Ref. No.	REFERENCE

MOTT MACDONALD
Suite 1888, Bentall 5
550 Burrard Street
Vancouver, BC, V6C 2B5
Canada
T 604.681.4400
W www.mottmac.com
ENGINEERS AND GEOSCIENTISTS BRITISH COLUMBIA PERMIT TO PRACTICE NUMBER: 1001591

514100592-MMD-00-P0-DR-CV-0001

No.	Date	REVISION	Dr'n	Ch'd
A	2023/01/31	ISSUED FOR PERMIT	ML	AL

PORT of vancouver
Vancouver Fraser Port Authority
ENGINEERING DEPARTMENT

DESIGN BY	M. L.
DRAWN BY	M. L.
APPROVED	A. K.
DATE	2023-JAN-31
SCALE	AS SHOWN
VFPA SITE	CNVXXX

VANCOUVER FRASER PORT AUTHORITY
TDK METRO TERMINALS EXPANSION

PROPOSED STORMWATER DRAINAGE CATCHMENT

SIZE	DWG.	SHEET	REV.
D	21-098-CI-001	1 of 1	A

TITLE BLOCK: DL-TB.dwg

DATE: 2023/01/30 - 10:17am
PATH: C:\users\slas982\24\01532411\SK-Proposed Drainage Subcatchment.dwg

2.3.3 Sub-catchment Areas

The size and description of sub-catchment areas is described below in Table 1. For the purpose of the hydrological assessment, a fourth catchment area has been included in the plan as this area, labelled Catchment 5, which is outside of the TDK lease area, and includes the adjoining properties to the north, and Cundy Ave, was included for calculations as it shares the 600 mm Trunk Storm Sewer at Cundy Avenue that Catchment A and B flow into. The amount of stormwater flow being added to the Trunk Storm Sewer at Cundy Avenue from Catchment 5 will impact the carrying capacity of the sewer and how much stormwater can be added through catchment A and B. Therefore, in projected flow rate calculations Catchment 5 is included (see Table 6 and Table 7).

Table 1 Sub-catchment Area Summary Post Development.[1]

Catchment No	Area (Ha)	Impervious Area (Ha)	Pervious Area (Ha)	Slope (%)	Impervious Ratio (%)
Catchment A	4.92	4.92	0.0	≤ 1.0	100
Catchment B	1.02	0.88	0.14	≤ 1.3	86
Catchment C	0.12	0.12	0.0	≤ 1.5	100
Total TDK Catchment	6.06	5.92	0.14	≤ 1.5	98
Total Catchment: TDK + Catchment 5 (Adjoining Properties & Cundy Avenue)	7.39	7.01	0.38	-	95

2.3.4 Water Quality Event

The water quality event addresses potential water quality concerns that may arise during rainfall following dry periods when concentrations of potential contaminants are mobilized. The Project site will have a water management system that can handle stormwater volumes generated by a storm event of 1:10 year size. The Rational Method design calculations, as described in the City of Delta Schedule A for catchments with an area smaller than 20 hectares, was used for the hydrological analysis to estimate flow rates during several rainfall events for the Project site, where flow rate is calculated as follows:

$Q = (CIA)/360$

where:

Q = flow in cubic metres per second (m^3/sec)

C= run-off coefficient (dimensionless)

I = rainfall intensity in millimetres per hour (mm/hr)

A = run-off area in hectares (ha)

[1] Data provided by Mott Macdonald

The runoff coefficient is determined by the land use, average site slope, soil adjustment factor and impervious area ratio. Runoff coefficient assumptions used for the design are as shown in Table 2 below. The Project site will be comprised of almost entirely impervious surfaces including buildings, concrete, and asphalt surfaces.

Table 2 Runoff Coefficients (C) for various surfaces.[2]

Development / Surface Type Runoff Coefficients	Runoff Coefficients
Flat (<2%) Lawns, Heavy Soil	0.18
Asphalt Streets	0.83
Roof	0.85
Concrete Street	0.88
Industrial	0.90

Table 3 Return Period Rainfall Intensity (I) for the Project site.[3]

Rainfall Duration	2-year (mm/hr)	10-year (mm/hr)	100-year (mm/hr)
15 minutes	20.7	33.7	49.7
30 minutes	14.8	23.9	35.0
1 hour	10.6	16.9	24.6
2 hours	7.6	12.0	17.3
6 hours	4.5	6.9	9.9
12 hours	3.2	4.9	7.0
24 hours	2.3	3.5	4.9

A 2-year return period rainfall event was used to assess a water quality event of 50% of the flow rate for each sub-catchment area (see Table 5), as suggested by the VFPA Stormwater Pollution Prevention Plan Guidelines (VFPA 2015). Assumptions for the water quality event as listed in Table 4.

Table 4 Assumptions used to calculate a Water Quality Event.[4]

Catchment No	Area (Ha)	Runoff Coefficient	Percent Impervious (%)
A	4.6	0.9	100
B	1.02	0.8	86
C	0.12	0.9	100

[2] Data provided by Mott MacDonald

[3] Data from BCG (2009) (Zone 3, Metro Vancouver precipitation zones)

[4] Data provided by Mott MacDonald

Table 5 Peak flow estimates for a 2-year Water Quality Event by sub-catchment area.[5]

Duration	2-Year Storm (I)	Catchment A		Catchment B		Catchment C	
		Flow Rate	50% Flow Rate	Flow Rate	50% Flow Rate	Flow Rate	50% Flow Rate
(min)	(mm/hr)	(m^3/s)	(m^3/s)	(m^3/s)	(m^3/s)	(m^3/s)	(m^3/s)
5	35.3	0.406	0.203	0.127	0.064	0.011	0.005
15	20.7	0.238	0.119	0.075	0.037	0.006	0.003
30	14.8	0.170	0.085	0.053	0.027	0.004	0.002
60	10.6	0.122	0.061	0.038	0.019	0.003	0.002
120	7.6	0.087	0.044	0.027	0.014	0.002	0.001
360	4.5	0.052	0.026	0.016	0.008	0.001	0.001

2.3.5 Storm Drainage Event

A storm drainage event is used to evaluate stormwater flow and drainage requirements over a given rainfall time period to determine and prevent flooding thresholds. For the purpose of this evaluation, a 10-year return event was selected.

Metro Vancouver regional intensity-duration-frequency (IDF) curves, Metro Vancouver climate stations: Phase 1 (BGC 2009). Zone 3 was used as a source of rainfall data on the Project site as TDK is located within Zone 3 of the Metro Vancouver precipitation zones.

The design storm event utilized for calculations is a 1:10 year return period under free flow conditions for sizing drainage network within the Project site, such as catch basins, storm drains, storage units, etc. and the Cundy Avenue truck storm sewer as per the VFPA and City of Delta Design Criteria Manual. According to the City of Delta schedule A, for a developed basin, Time of Concentration of minimum of 15 minutes and maximum of 30 minutes is allowed for a development area of 4000 square meters. Rainfall intensity of the 10 years return period according to the Metro Vancouver regional IDF curves, metro Vancouver climate stations: Phase 1 (BGC 2009), Zone 3, is summarized in Table 6.

Return period of 10 years and Time of Concentration (Duration) of 15 minutes is adopted for this design, so rainfall intensity of 33.7 mm/hr was use for calculations and design.

The stormwater analysis was undertaken using Rational Method to estimate the design storm flow with an assumed coefficient of runoff from the Project site to be 0.9 (see Table 1).

The flow estimates for future operations for each sub-catchment area is in Table 6.

[5] Data provided by Mott MacDonald

Table 6 Flow estimate for future operations [6]

Catchment No	Area (Ha)	Runoff Coefficient C	Rainfall Intensity I (mm/hr)	Discharge Q (m^3/s)
Catchment A	4.92	0.90	33.7	0.415
Catchment A + Catchment 5	5.32	0.89	33.7	0.443
Catchment B	1.02	0.80	33.7	0.076
Catchment C	0.12	0.90	33.7	0.010
Total Catchment – TDK Terminal + Catchment 5	7.39	0.86	33.7	0.595

The hydrological assessment of the Project site for pre-development and post-development indicated that the capacity of Inlet 1 will be inadequate to discharge storm flow from Catchment A. The stormwater flow rates for the Project site (by sub-catchment) during a 10-year return period event for post-development was calculated. The results indicate that the Inlet 1 and existing Trunk Storm Sewer Main at Cundy Avenue Main will be overwhelmed at post-development stage due to the post-development Project site being a primarily asphalt paved surface, therefore a stormwater detention tank is proposed between the last manhole and the OGS. The proposed detention tank of $54m^3$ will be constructed with a lifting pump to regulate the storm flow rate to the possible maximum flow rate the existing truck main pipe can accommodate which is estimated to be 80% of the existing pipe capacity at 0.269 m^3/s.

A summary of the flow rates for both pre- and post-development is in Table 7.

Table 7 Comparison flow rates and the current drainage capacity.[7]

Inlet	Catchment Description	Post-development Discharge (m^3/s)	Existing Pipe Capacity (m^3/s)
1	Catchment: A + Adjoining Site Area	0.443	0.336
4	Catchment: B	0.121	0.076
Existing Trunk Storm Sewer at Cundy Avenue to the Lifting Station	Total Catchment: TDK + Catchment 5	0.595	0.622

[6] Data provided by Mott MacDonald

[7] Data provided by Mott MacDonald

3.0 ISSUES IDENTIFICATION AND RISK ANALYSIS

3.1 POTENTIAL POLLUTANT SOURCES

Terminal operation activities with the potential to introduce pollutants to stormwater are described as follows:

- Agri product dust and/or spillage during material handling and transloading;
- Fuel, oil, coolant, and lubricant spills during vehicle and equipment refueling and maintenance;
- Hydraulic oil and lubricant leaks from vehicles or equipment due to leaks or maintenance activities; and
- Wash water escaping from wash bay containment during container and equipment cleaning.

3.2 POTENTIAL SENSITIVE RECEPTORS

The principal aquatic receptor near the Project site is the Fraser River.

3.3 IDENTIFIED ISSUES

Based on the materials and activities anticipated within the Project site, as outlined in Section 2.2, stormwater pollution risks include;

- Any accidental spills or leaks could allow deleterious substances to be transported in surface water. If Best Management Pracitces (BMPs) are followed, the risk of unmitigated accidental spills reaching nearby watercourses is low; and
- Stormwater runoff from a rainfall event greater than 1:10 year has the probability of exceeding the carrying capacity of the sub-catchment areas.

A management strategy has been developed (see Section 4.2) to address and mitigate the above stormwater pollution risks. This management strategy incorporates BMPs and employs preventive, containment / reduction, or treatment approaches, in this order of priority.

3.4 IDENTIFIED POLLUTANT PATHWAYS

There are two pollutant pathways for the pre-development and post-development Project site in which sub-catchment areas 1, 3, and 4 drain into the 600 mm diameter Trunk Storm Sewer.

4.0 STORMWATER POLLUTION PREVENTION PLAN

4.1 APPLICABLE STANDARDS, ACTS AND REGULATIONS

Standards, Acts and Regulations with applicability to stormwater management at the Project site are summarised in Table 8.

Table 8 Key legislation and applicability.

Act, Regulation or Bylaw	Administering Body	Description	Applicability
Federal			
Fisheries Act (Revised Statutes of Canada (RSC) 1985, c. F-14, includes amendments up to August 28, 2019)	Fisheries and Oceans Canada	The *Fisheries Act* is the main federal legislation providing protection for fish and fish habitat in Canada. Section 36 of the FA prohibits the deposit of deleterious substances to water that may impact fish.	Contamination of stormwater could present deleterious substances with adverse effects on fish and fish habitat.
Canada Water Act (RSC 1985, c.C-11, includes amendments up to April 1, 2014)	Environment and Climate Change Canada	The CWA provides a framework for cooperation between federal and provincial management of water resources.	There are potential impacts to stormwater quality.
Canada Shipping Act (SC 2001, C.26 including amendments up to July 2017)	Transport Canada	National Spill Response Protocol governs the release of pollutants to the marine environment.	Contaminated stormwater could deposit pollutants into the marine environment.
Hazardous Products Act (HPA) (RSC 1985, c. H-3, includes amendments up to May 23, 2018)	Health Canada	The HPA regulates the use of hazardous products.	HPA regulations ensure safe handling of hazardous materials onsite to minimize the risk of stormwater contamination.
Canadian Environment Protection Act (CEPA; Environment Canada, B.C. 1999, c.33)	Environment and Climate Change Canada	CEPA manages chemical substances and contains provisions for controlling pollution, wastes and disposal at sea.	CEPA provides risk management guidelines for hazardous materials.
Provincial			
Environmental Management Act (EMA – administered by the Ministry of Environment)	Ministry of Environment and Climate Change Strategy	The regulations establish procedures for reporting the unauthorized release of substances into the environment as well as outlining details of reportable amounts for certain substances for sites having Provincial jurisdiction.	Hazardous substances (e.g., hydrocarbons) are used during port activities and spills or leaks may require reporting to the BC government.
Spill Reporting Regulations of the *Environmental Management Act* (EMA – administered by the Ministry of Environment)	Ministry of Environment and Climate Change Strategy	The regulations establish procedures for reporting the unauthorized release of substances into the environment as well as outlining details of reportable amounts for certain substances for sites having Provincial jurisdiction.	Hazardous substances (e.g., hydrocarbons) are used during port activities and spills or leaks may require reporting to the BC government.

4.2 MANAGEMENT STRATEGY

TDK will maintain adequate drainage from work areas and access roads and verify that drainages are maintained. To minimize the potential adverse effects of runoff, the following mitigation measures are recommended.

4.2.1 Prevention

The first measure to mitigate stormwater pollution is prevention. The following prevention measures are recommended for all works with the potential to result in adverse effects from stormwater runoff:

- TDK conducts monthly visual inspections of onsite storm drains and outsources annual storm drain clearing and cleaning. Training shall be provided to onsite personnel on how to avoid stormwater pollution prior to work.
- The security of the facility will be maintained by use of perimeter fencing, automated gates, a CCTV system, and a fire alarm system and monitoring. In addition, there is overnight and weekend security personnel.
- TDK employs two companies for refueling vehicles and equipment, one for diesel vehicles and one for propane vehicles, in addition to having a Spill Response Plan in place. Using specialized companies for refuelling purposes will help lower the risk of spills during refueling as workers are specialized and trained in these specific activities.

4.2.2 Containment/Reduction

Containment/reduction measures are recommended for all activities with the potential to result in adverse effects from stormwater runoff. The following containment/reduction measures are recommended:

- A wash bay will be utilized for cleaning containers and equipment to contain runoff which will be contained and discharged to sub-catchment C, which is an isolated area with its own drainage system;
- Care shall be taken to undertake the proper use, handling and storage of hazardous substances including fuels and oils, chemicals and other products as required;
- Rainfall events can result in erosion on exposed soils and runoff. The facility shall be inspected after heavy rainfall to check that drainage-related infrastructure have not been compromised;
- Spill kits shall be present onsite;
- Refueling of mobile machinery shall be conducted a minimum of 30 m from any open waterbody, on level ground;
- All maintenance activities of both mobile and stationary machinery shall be conducted on level ground and a minimum of 30 m from any open waterbody;
- Machinery shall be maintained in a leak-free state, free of excess oil and grease; and

- All accidental releases of hazardous material on land or to water shall be reported to TDK's Project Manager, and Emergency Management BC within 24 hours as applicable.

4.2.3 Treatment

Stormwater will be collected in the sub-catchment areas and processed by the OGS. If there is any perceived risk of pollution due to the release of a hazardous material, stormwater shall not be discharged from the site without prior to analytical testing and treatment, if required.

5.0 IMPLEMENTATION AND MONITORING

Operational activities with the potential to result in stormwater pollution shall be monitored to verify conformance with Project approvals and conditions, applicable legislation, BMPs, mitigation measures and the objectives of this Plan.

TDK shall be responsible for verifying that the facility is operating in compliance with VFPA Permit Conditions and shall oversee implementation of the SPPP to verify compliance with its requirements.

5.1 MONITORING

Monthly visual inspections shall be conducted of the stormwater management system to identify signs of contamination and failure, and to track the effectiveness of mitigation measures. Indicators of potential contamination or failure may include the presence of floating and suspended materials, oily sheens, discoloration, turbidity, or unusual odors.

5.2 ADAPTIVE MANAGEMENT MEASURES

The SPPP will be integrated into TDK's overall Environmental Management Program for the facility operations. Modifications or supplements to the SPPP may be made as deemed necessary to verify the ongoing compliance with environmental legislation and regulations, VFPA permitting requirements, BMPs and other Project environmental documents.

5.3 CONTINUOUS IMPROVEMENT

TDK will implement best practices to minimize potential stormwater pollution. TDK will maintain records for the inspection of site stormwater features, including OGS inspection and maintenance records. Opportunities to improve the SPPP will be assessed following the occurrence of any environmental incident reported to an environmental authority under any environmental law or permit, or if there is a change to the facility's design, operation or maintenance procedures increasing the risk of pollution discharges to the environment.

6.0 REFERENCES

BGC Engineering Inc. (BCG) 2009. Regional IDF Curves, Metro Vancouver Climate Stations: Phase 1.

[VFPA] Vancouver Fraser Port Authority. 2015. Project & Environmental Review Guidelines – Developing Your Stormwater Pollution Prevention Plan. Available at: http://www.portmetrovancouver.com/wp-content/uploads/2015/05/PER-Stormwater-Pollution-Prevention-Plan-Guidelines-Final-2015-07-09.pdf