

11th Edition

(1995-2022)

Fuel Guidelines[©]

This guide summarizes the industry standards for the safe use, storage, handling & transportation of *flammable & combustible liquids* at fuel dispensing facilities located at farms and isolated construction projects.

January 2022



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2022 Fuel Guidelines

INDUSTRIAL, COMMERCIAL & PRIVATE SECTORS USING THIS GUIDE			
MINING & EXPLORATION	GOVERNMENT AGENCIES	FUEL BULK CARRIERS	FIRE DEPARTMENTS
PIPELINE CONSTRUCTION	ENV. & ENG. CONSULTANTS	MOBILE & MECHANIC SHOPS	AIRPORTS & HELIPORTS
OIL & GAS INDUSTRY	FORESTRY CONTRACTORS	MARINE FUEL STORAGE FACILITIES	GOLF COURSES
FORESTRY SAWMILLS & WOODLANDS	CONSTRUCTION OF MAJOR PROJECTS	FIRST NATIONS GOVERNMENTS	SKI & HELI-SKIING OPERATIONS
INDUSTRIAL SUPPORT & ENDORSEMENT			
FORESTRY	MINING	COMMERCIAL SECTORS	
West Fraser Mills Ltd. Corporate	Pretivm Resources ¹	CMH Heli-Skiing ¹	
Pacific Inland Resources ¹ a Division of WFM	Skeena Resources ¹	Terus Construction ¹	
Chetwynd Forest Industries ¹ a Division of WFM	Rugged Edge Holdings ¹	Northwest Fuels ¹	
Fraser Lake Sawmills ¹ a Division of WFM	Geotech & GREGG Drilling ¹	Yellowhead Helicopters ¹	
CANFOR – Houston Division ¹	Matrix ¹	Rio Tinto @ Kemano ¹	
GOVERNMENT AGENCIES & ASSOCIATIONS REFERENCING THIS GUIDE			
FORESTRY	MINING	AGENCIES	ASSOCIATIONS
BC Timber Sales ¹	Ministry of Mines ¹	BC Oil & Gas Commission	Forest Safety Council
Ministry of Forests	Association of Mineral Exploration	BC Ministry of Environment	BC Golf Superintendents Association
Western Canada Sustainable Forest Initiative Implementation Committee (WCSIC)		Ministry of Transportation and Infrastructure	Helicopter Association of Canada & Canada West Ski Areas Association

¹ These companies & government agencies are preparing to take or have taken the *Fuel Management & TDG* training for which this guideline was developed.

2022 Fuel Guidelines

2022 Revision

The 2022 **Fuel Guidelines** (11th Edition) was prepared by NorthWest Response Ltd., Smithers, British Columbia, Canada.

This Guideline is a reference document for the *on-line* **Fuel Management Training** course available at: www.fueltraining.ca

Although the information in this Guideline is thought to be accurate and reliable, the official Statutes and Regulations should be consulted for all purposes of interpreting and applying the law.

Fuel Management Plan^{NEW}

Companies requiring a Fuel Management Plan can now obtain for site specific plan based on this guideline with references to all applicable Federal & Provincial Statutes, Industrial Codes of Practice, Engineering Standards and Best Management Practices.

Farms & Isolated Construction Projects

The Office of the Fire Commissioner considers the area beyond the *Municipal Fire Boundaries*, which includes farms and isolated construction projects, to be *outside of its jurisdiction*. Isolated construction projects include (but not limited to): agriculture farms, aquaculture farms, forestry woodlands & wildfire operations, mining & exploration, road, bridge & paving construction projects, pipeline construction projects, ski & heli-ski operations, dam construction, hunting & fishing resorts, remote camps, marine facilities and telecommunication sites. This guideline was established to outline the *industry standards* for the safe use, storage, handling & transportation of *flammable* and *combustible liquids* at fuel storage & dispensing facilities located outside the *Municipal Fire Boundaries*.

Worker Certification Training

On-Line Fuel Management Training at www.fueltraining.ca

This course complies with the training and awareness requirements outlined in:

- **Training** Requirements as *per* Provincial & National Fire Codes: All employees involved in storage and handling of *dangerous goods* shall be trained in safe handling procedures and correct responses to an emergency situations as per Division B, Part 3 - Sections 3.2.7.15 & 3.3.4.6; & Part 4 – Sections 4.5.10 & 4.6.8
- **WorkSafeBC**: OH&S Reg. S5.6 & S5.7
- **Canada OH&S Reg.** Part X-S10.1 to S10.14; Part XIV-Fueling S14.41 & Part XIX-Training S19.6.
- **Transportation of Dangerous Goods** (Part 6 - Training): **Training Certification** for TDG Class 3 *Flammable Liquids*.
- **Environmental Management Act** – Environmental Compliance and Risk Based Approach to *due diligence* as it relates to prevention.

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SMALL CONTAINERS

- TDG Regulation, Motor Vehicle Act & Standards
- ☑ BC Fire Code, CCME AST Code & Industry/ Engineering Standards
- ☐ OH&S Regulation, Env. Mgmt. Act/ Regs. & Best Management Practices

Section 1

TYPE	CONDITION, DESIGN & MAINTENANCE	STORING AND SECURING	DISPENSING	TRANSPORT
Drums & Jerricans (<230L)	<p>Condition</p> <ul style="list-style-type: none"> ■ Must be designed, constructed, filled, closed, secured & maintained so that under normal conditions of transport & handling, there will be no accidental release/ spill of the dangerous goods that could endanger public safety. ■ Jerry cans (<60L) have a lifespan of 60-months from date of manufacture but may be used for 120-months if: <ul style="list-style-type: none"> • Jerry cans are registered as a fleet with Transport Canada; • Used only for Class 3, PGII or PGIII products; • Not damaged, cracked, deformed, or leaking. ■ Drums: <220L steel or plastic are designed for one-time-use & require reconditioning prior to use <i>however</i>, these drums may be reused <u>once</u> only if: <ul style="list-style-type: none"> • reused with same product; • visually inspected - no damage; • reconditioned after reuse. ☑ Designed, constructed and maintained in good condition to securely contain product <p>Construction Standard</p> <ul style="list-style-type: none"> ■ CGSB 43.150-2020 (replaces TP14850) are <i>Small Containers</i> <450L. ■ CSA B376 (2014) are <i>Portable Containers</i> for Gasoline and Other Petroleum <25L. ■ ULC/ORD – C30 are <i>Safety Containers</i> >5L and <25L. 	<p>General requirements</p> <ul style="list-style-type: none"> ☑ Secondary containment is not required for <i>Small Containers</i> <230L, however, it may help to manage high-risk areas. ☑ Store all containers to prevent spillage. ☐ Obtain authorization prior to storing fuel in a <i>Riparian Management Area</i>. ☑ Outdoor fuel cache must be designed to accommodate a <i>credible spill</i> based on the volumetric sum of the containers when stored, moved or handled in bulk. (i.e. 4-drums/ pallet = 820L <i>maximum spill potential</i>) ☑ Outdoor container storage areas must be designed to accommodate a spill of the <i>largest container capacity</i> when containers or drums are stored, moved or handled individually (i.e. not in bulk). ☐ For indoor storage of <i>flammable and combustible liquids</i>, use only ULC Approved Storage Cabinets that are vented with a 5cm steel pipe directly outdoors. ☑ For indoor incidental use (<i>example: inside shop with no fire suppression system</i>), the max volume of <i>flammable and combustible liquids</i> allowed outside a storage cabinet is 600L of which not more than 100L shall be Class IA (gasoline). ■ Containers on a vehicle must be secured to prevent shifting, swaying, damage and/or escape. ■ Tie down straps must have safe <u>combined</u> working load rating <i>greater</i> than the load. ☐ Helicopter Operations. See Appendix G – BMP: Helicopter Field Guide. 	<p>General requirements</p> <ul style="list-style-type: none"> ☑ Only transfer fuel with a pump designed for the products being handled. ☑ Do not fill containers beyond their safe filling level (<i>approximate: 90%</i>). <p>Labeling</p> <ul style="list-style-type: none"> ☐ WHMIS Labels for Class B: <i>Flammable Liquids</i> (Div.2) & <i>Combustible Liquids</i> (Div.3) <ul style="list-style-type: none"> • Product Identifier; • Hazard Pictogram; • Precautionary Statement; • Reference to SDS. ☐ Jerry cans are exempt from additional labeling if content matches the product identifier and container color: <ul style="list-style-type: none"> • Red – Gasoline; • Yellow – Diesel; • Blue – Kerosene. <p>Recommended Standard Procedures</p> <ul style="list-style-type: none"> ☐ Store the hose above the pump to avoid siphoning. ☐ Dispense all <i>flammable and combustible liquids</i> from drums in an upright position. ☐ Avoid gravity dispensing. ☐ If a <i>horizontal drum</i> connection is required to ancillary equipment, always re-seal bung connection & check daily for leaks, drips and spills. ☐ Conduct a <i>Risk Assessment</i> and implement additional control measures in high-risk areas/operations. 	<p>Transport</p> <ul style="list-style-type: none"> ■ All <i>small containers</i> may be relocated (transported) without secondary containment. ■ When transporting <i>used motor oil</i> and/or <i>used glycol antifreeze</i>: <ul style="list-style-type: none"> • If <450L or sample results confirm no heavy metals & flash point is >60°C, then the <i>waste oil</i> and/or <i>waste antifreeze</i> is not regulated as a <u>Hazardous Material</u> under TDG and therefore, no TDG requirements; • If no sample results are available for heavy metals or flash point, treat both <i>used oil</i> and/or <i>used antifreeze</i> as a Class 9, PG III; UN3082 – Env. Haz. Substance, Liquid, N.O.S. ☐ Provincially a <u>Waste Manifest</u> is not required if shipping less than (<=) 210L (i.e. one standard drum) of <i>used oil</i> and/or <i>used antifreeze</i>, however if >210L, then a Waste Manifest is required, regardless if samples were taken. ■ If the <u>combined capacity</u> of one or multiple containers with <i>diesel fuel</i> and/or <i>gasoline fuel</i> is less than or equal to (<=) 2000L, then: <ul style="list-style-type: none"> • No <i>Documentation</i> (Shipping Document) is required; • No <i>UN Number</i> on the Placard is required; (<i>note: Safety Marks – Placards or labels & Shipping Name are still required</i>); • No TDG training Certificate is required; <p><i>Note: Despite this TDG Exemption, Transport Canada still requires workers hauling fuel to be adequately trained (by the employer) in the understand & awareness of the TDG Regulations.</i></p> <ul style="list-style-type: none"> ■ Drums must be properly arranged by: <ul style="list-style-type: none"> • Stacking in a vertical position; • Stack with dunnage protection; • Securing with sideboard frames. ■ Empty drums are exempt from TDG Regs Parts: 2-Classification, 3-Documentation, 4-D.G. Safety Marks; & 7-E.R.A.P. provided: <ul style="list-style-type: none"> • Drum <10% residue; • Transported for filling or reconditioning; • If more than 10 drums, then DANGER Placard is required on all four sides of vehicle and include a Shipping Document outlining: <ol style="list-style-type: none"> a) Primary Class; b) Number of Drums; c) "Residue" last contained. ■ Containers over 30 liters must have a visible TDG Safety Marks: <ul style="list-style-type: none"> • Label or Placard; • Shipping Name; • UN Number.

IBCs & Portable Tanks

- TDG Regulation, Motor Vehicle Act & Engineering Standards
- ☑ BC Fire Code, CCME AST Code & Industry/ Engineering Standards
- ☑ OH&S Regulation, Env. Mgmt. Act/ Regs. & Best Management Practices

Section 2

TYPE	CONDITION, DESIGN, & MAINTENANCE	STORING AND SECURING	DISPENSING	TRANSPORT
Intermediate Bulk Containers & Portable Tanks	<p>General Requirements</p> <ul style="list-style-type: none"> ■ Must be designed, constructed, filled, closed, secured and maintained so that under normal conditions of transport, including handling, there will be no accidental release of the dangerous goods that could endanger public safety. ■ Portable Tanks must be compatible with the <i>dangerous goods</i> and in good condition – not damaged, rusting, or leaking. <p>Construction Standard – SMALL MEANS OF CONTAINMENT (≤ 450L),</p> <ul style="list-style-type: none"> ■ Diesel: A spec or non-spec tank may be used. Tanks used for <i>diesel</i> are exempt from being built to an engineering standard but must not pose a danger to public safety. ■ Gasoline: An IBC Portable Tank CAN/CGSB 43.146 spec tank is <u>required</u> and must bear a visible & legible Spec Plate. <p>Construction Standard – LARGE MEANS OF CONTAINMENT (>450L) with Spec Plates</p> <ul style="list-style-type: none"> ■ UN 31A/B IBC Portable Tanks as per CAN/CGSB 43.146 (2021) <3000L for TDG Class 3, PGII (<i>Gasoline</i>); but <5000L for TDG Class 3 PGIII (<i>Diesel</i>). Can only be used for: UN1202; UN1203; UN1863; UN1223; & UN1268 products. ■ TC57 Portable Tanks as per CAN/CGSB 43.146 (2016). ■ UN Portable Tanks as per CSA B625 (2020) >450L. ■ TC44 Portable Tanks as per CSA B626 (2020) >3000L <i>can only be used for diesel</i> (UN1202). ■ ULC/ORD 142.13. ☑ For Inspection Schedules check Appendix D. <p>Construction Standard for TDG Fuel Bladders suspended from Helicopters (>450L):</p> <ul style="list-style-type: none"> ■ MIL-D-23119G (collapsible <i>drums</i>). ■ MIL-T-52983G (collapsible <i>tanks</i>). 	<p>General Requirements: Storage</p> <ul style="list-style-type: none"> ■ All IBC & Portable Tanks transporting fuel require pressure relief device in the vapor space. ☑ If a mobile tank (>230L) is removed from the vehicle and placed on the ground, then secondary containment is required as per Fire Code. ☑ Do not store fuel (cache) in Riparian Management areas without authorization. ☑ Ensure mobile fuel units are secured on a solid foundation and remains level when storing and operating. ☑ Protect the fuel tank from wear or damage. (i.e. rubber belting/ mat) <p>Securing</p> <ul style="list-style-type: none"> ■ Use a pressure relief cap that meets manufacturers design specifications. ■ Containers must be secured to prevent damage to the container & accidental release of product. ■ Containers must be appropriately secured to prevent shifting, swaying, damage or escape from the vehicle. ■ Tie down straps must have safe <u>combined</u> working load ratings <i>greater</i> than the secured load & points of attachment need to be integral with the transport unit. (i.e. truck chassis). ☑ Lock valves to prevent unauthorized access to the fuel tank, nozzle and pump. 	<p>General Requirements</p> <ul style="list-style-type: none"> ☑ Use fuel dispensing pumps designed for the products being handled. ☑ Use only ULC S612 and ULC S620 approved fuel hose and nozzle for dispensing fuel. ☑ Ensure continual bonding from tank to nozzle to address static charge. ☑ 4.5m hose or 6m with <i>retractor</i> & may be <i>longer</i> at card-locks & marine facilities. ☑ Replace worn, leaking or damaged fuel hose or nozzle. <p>Recommended Standard Procedures</p> <ul style="list-style-type: none"> ☑ Operators must stay with the nozzle <u>at all times</u> while dispensing fuel. ☑ Do not fill containers beyond their safe filling level (90%) ☑ Close valves when not dispensing and lock valves to secure unauthorized access. ☑ Gasoline dispensing - ensure there is suitable bonding between tank and vehicle to prevent static charges. ☑ Do not dispense fuel within a Riparian Management area without authorization. ☑ Secure nozzle to prevent leaks & spills. ☑ Secure fuel hose on a retractor, hose reel, coiled on a bracket, or equivalent. 	<p>Transport</p> <ul style="list-style-type: none"> ■ <i>Mobile</i> & portable tanks do not require secondary containment for transporting fuel. ■ Multiple <i>diesel</i> and/or <i>gasoline</i> portable tanks with a combined capacity that <i>exceeds</i> (>) 2000L, the operator is required to: <ul style="list-style-type: none"> • Complete and carry a Shipping Document; • Placard on all visible sides of the vehicle; • Possess a valid TDG Training Certificate. ■ Small Portable Tanks (≤) 450L are exempt from TDG Regs Parts 3, 4, 5, 6, 7 & 9 provided the container contains <i>diesel</i> (UN1202): <ul style="list-style-type: none"> • Container contains Class 3 <i>Flammable Liquids</i> with no subsidiary class; • Includes Packing Group III and a <i>flash point</i> greater than 37.8°C (i.e. <i>diesel</i>); • In one or more small means of containment (≤450L). ■ An <i>Equivalent Level of Safety Permit</i> must be obtained from Transport Canada prior to moving <i>non-spec Mobile</i> IBCs & Portable Tanks greater than (>) 450L that contain <i>dangerous goods</i> in any quantity – including “residual” tanks. <ul style="list-style-type: none"> • The <i>Equivalency Permit</i> will outline applicable use of the tank, training and inspection requirements. ■ Helicopter Transport. See Appendix G – BMP: Helicopter Field Guide. <p>Labeling</p> <ul style="list-style-type: none"> ■ All IBCs and Portable Tanks must have appropriate TDG safety marks including: <ul style="list-style-type: none"> • Label or placard; • UN Number; • Shipping Name. ■ Spec plates must identify the following: <ul style="list-style-type: none"> • Container Type & Standard; • Manufacturer & Date; • Re-certification Date & TC Registered Facility.

STATIONARY TANKS

- TDG Regulation, Motor Vehicle Act & Standards
- ☑ BC Fire Code, CCME AST Code & Industry/ Engineering Standards
- ☑ OH&S Regulation, Env. Mgmt. Act/ Regs. & Best Management Practices

Section 3

TYPE	CONDITION, DESIGN & MAINTENANCE	STORING & SECURING ASTs	DISPENSING	TRANSPORT
STATIONARY TANKS (>230L) Aboveground Storage Tanks (ASTs)	<p>General Requirements & Due Diligence</p> <ul style="list-style-type: none"> ☑ This section outlines the Industry Standards for Fire Safety, Worker Safety & Environmental Safety that should be implemented at non-public fuel storage & dispensing stations (including card-locks & key-locks) at farms & remote construction sites. <p>Construction Standard</p> <ul style="list-style-type: none"> ☑ All Tanks: used at a fuel dispensing facility must bear a visible & legible Spec Plate. <ul style="list-style-type: none"> • Individual capacity ≤ 80,000L * & an aggregate capacity ≤ 200,000L ☑ Spec Bladder Tanks: <ul style="list-style-type: none"> • CAN/CSA B837-14; • Max capacity 125,000L. ☑ Spec Steel Tanks: for the storage of <i>flammable liquids</i> and <i>combustible liquids</i> with one of the following Canadian Specifications: (<i>partial list</i>) <ul style="list-style-type: none"> • ULC-S601 Shop Fabricated AST for <i>Flammable & Combustible Liquids</i>; • ULC-S602 AST for Fuel & Lube Oil; • ULC-S630 AST Vertical Tank; • ULC-S643 AST Shop Fab. Utility Tank; • ULC-S653 AST Steel Tank Assembly; • *ULC-S655 AST Protected Tank Assembly & <i>may exceed 80,000L</i>; • ULC-S677 Fire Tested AST with a resistance rating of 2hrs. ☑ Inspection Schedules: Go to Appendix D. ☑ Ensure secondary containment conforms to a ULC specification for ASTs. ☑ Emergency valves - UCL-S651 Standard ☑ ASTs atmospheric vent pipes shall be: <ul style="list-style-type: none"> • 3.5m above ground for <i>gasoline</i> (Class I) • 2.0m above ground for <i>diesel</i> (Class II) 	<p>Site Preparation</p> <ul style="list-style-type: none"> ☑ Secondary contained <i>Spec Tanks</i> ≤50,000L meets the intent of Spill Control. (CCME) ☑ Secondary contained <i>Spec Tanks</i> ≤80,000L meets the intent of Spill Control. (Fire Code) ☑ Physical collision protection is required for AST ☑ Measures must be taken to prevent unauthorized access. ☑ Use non-combustible materials to support tank cribbing. If used for secondary containment & spill control berms, cover with fire resistant liner <p>General Requirements</p> <ul style="list-style-type: none"> ☑ All stationary tanks (>230L) must have secondary (110%) containment. Options: <ul style="list-style-type: none"> • Tank-in-tank (vacuum monitored); • Tank-in-tank (visible access port); • Tank-in-box (visible access hatch); • Tank-in-berm with enviro-liner (or <i>equivalent</i>). ☑ When transferring fuel into an AST, the owner of the AST shall ensure that overfill protection is implemented. (see <i>Dispensing</i> – Gen. Req.) ☑ Do not leave ASTs unattended in Riparian Management areas without authorization. ☑ All ASTs: Venting is open to atmosphere. ☑ Gasoline ASTs >75,000L: Pressure & Vacuum relief vents with vapour recovery & emergency venting (Reid V.P.@ 8-14 kPa; 1% benzene). ☑ Ensure all stationary tanks and piping systems are bonded & grounded. ☑ All ASTs containing <i>gasoline</i> require a vapour recovery system (BC <i>Gasoline Vapour Control Regulation</i>) unless: <ul style="list-style-type: none"> • Gasoline is delivered only by marine vessel; • Storage capacity <2000L; • A farm facility for farm vehicles & equipment • All refueled equipment is used at same location as storage & dispensing facility; • AST is <21,000L and supply tanker does not have a capacity >21,000L & notifies Director. 	<p>Site Preparation</p> <ul style="list-style-type: none"> ☑ Spills, overfills and storm water from <u>product transfer area</u> shall be contained, treated and disposed of as per provincial guidelines. (CCME) ☑ Dispensing areas shall be designed to control a spill of 1,000L. (Fire Code) <p>General Requirements</p> <ul style="list-style-type: none"> ☑ Use fuel dispensing/ transfer pumps designed for the product being handled. ☑ Overfill protection may consist of: <ul style="list-style-type: none"> • Visually supervise bulk fuel delivery operation by trained & qualified personnel; <i>and/or</i> • Equip tank with a ULC S661 overfill protection device. ☑ Equip facility with accessible <i>emergency shut-off device</i> to stop both power & flow of product. ☑ To prevent unauthorized access, close & lock valves when the facility is left unattended. ☑ Use only ULC S612 and ULC S620 approved fuel hose and nozzle for dispensing fuel. ☑ Use 4.5m hose or up to 6m with a <i>retractor</i>. <ul style="list-style-type: none"> • The hose length may exceed 6m at card-or key-activated dispensers. ☑ Assess & replace worn, leaking or damaged fuel hose, nozzle or valves. ☑ Always install flexible metallic hoses (ULC/CAN-C536) when connecting ASTs together in series. <p>Standard Operating Procedures:</p> <ul style="list-style-type: none"> ☑ Post all written SOPs. ☑ All operators of must be trained & qualified. ☑ Operators must stay with the nozzle <u>at all times</u> while dispensing fuel. ☑ Maintain record of inventory. ☑ Store & secure nozzle & hose in a safe manner to prevent damage and leaks (i.e. on a retractor, hose reel or coiled). <p>Safety</p> <ul style="list-style-type: none"> ☑ Suitable bonding required between tank and equipment to prevent static charges. ☑ Maintain a current SDS of products. 	<p>General Requirements</p> <ul style="list-style-type: none"> ■ Stationary tanks are not designed to transport fuel and must be emptied prior to moving. TC has designated the CAN/ULC-S601 as a <u>Utility Tank</u> & may be relocated (empty) with an <i>Equivalent Level of Safety Permit</i>. ■ Stationary tanks (>450L) must never be used to transport fuel. <p>TDG Transport</p> <ul style="list-style-type: none"> ■ Prior to moving an empty stationary fuel (diesel or gasoline) tank with a capacity greater than (>) 450L and less than or equal to (≤) 2000L ensure: <ul style="list-style-type: none"> • Tank is pumped empty (5% or less); • An <i>Equivalent Level of Safety Permit</i> is obtained from Transport Canada; • The AST is placarded on all four sides with: <ul style="list-style-type: none"> ○ TDG Classification; ○ Shipping Name. ■ When relocating an empty stationary AST with a total capacity greater than (>) 2000L, the following TDG Regulations must be implemented: <ul style="list-style-type: none"> • Tank must be emptied to the lesser of <5% or contain <500L; • Obtain an <i>Equivalent Level of Safety Permit</i> from TC; • A shipping document must be completed for the <i>Residue Last Contained</i>; • The hauler/operator must possess a valid TDG training Certificate; • The skid tank must be placarded on all four sides: <ul style="list-style-type: none"> ○ TDG Classification; ○ Shipping Name; and ○ UN Number.

MARINE & FORESHORE FACILITIES

- TDG Regulation, Motor Vehicle Act & Standards
- ☑ BC Fire Code, CCME AST Code & Industry/ Engineering Standards
- ☐ OH&S Regulation, Env. Mgmt. Act/ Regs. & Best Management Practices

Section 4

TYPE	GENERAL CONDITIONS & DESIGN	STORING & SECURING TANKS	DISPENSING	ADDITIONAL CONTROLS
Marine & Foreshore Facilities Storage & Dispensing	<p>Marine Facility - Definition</p> <ul style="list-style-type: none"> ☑ A land-based building or floating structure used to moor, to berth, to store or refuel a watercraft (i.e. boat, floatplane or barge) and may also be used to take a boat into or out of a <i>water body (salt water or fresh water)</i>. <p>Stationary ASTs - General</p> <ul style="list-style-type: none"> ☑ Refer to Fuel Guidelines - Section 3 for <i>tank condition, design, maintenance</i> of ASTs at Marine & Foreshore Facilities. <p>Piping System for Marine Facilities</p> <ul style="list-style-type: none"> ☑ Install protective guard devices where impact or physical damage is possible by vehicle or watercraft; ☑ A fuel line that extends between shore and/or floating structures: <ul style="list-style-type: none"> • Install a flexible metallic hose that conforms to ULC/CAN-C536. ☑ Support & elevate piping to prevent direct contact with ground & possible corrosion; ☑ Piping system must have provisions to accommodate expansion and contraction of <i>flammable & combustible liquids</i>: <ul style="list-style-type: none"> • In-line expansion chamber; • Pressure and vacuum relief vents with vapour recovery, where warranted. ☑ Piping for <i>flammable</i> and <i>combustible liquids</i> shall be clearly marked & legible and shall <i>not</i> be painted red; ☑ Emergency valves for <i>flammable</i> and <i>combustible liquids</i> dispensing and associated piping systems must conform to UCL-S651. 	<p>Stationary ASTs – General</p> <ul style="list-style-type: none"> ☑ Refer to Fuel Guidelines - Section 3 for <i>storage & securing</i> of ASTs at Marine and Foreshore Facilities. <p>AST Installation on shore</p> <ul style="list-style-type: none"> ☑ All ASTs shall be located on shore. ☑ All ASTs shall not be closer than 4.5m horizontally from normal annual highwater mark. ☑ Tanks & pumps not integral with dispensing unit must be located on shore or on a pier using solid piping system with metallic flex hoses between shore and/or floating structures. <p>AST may only be installed on a pier if:</p> <ul style="list-style-type: none"> ☑ Distance from shore AST to dispenser is excessively long; ☑ AST is ≤ 5000L aggregate capacity; ☑ AST has secondary containment the complies with the Fire Code: <ul style="list-style-type: none"> • Approved Spill Control & Secondary Containment • Applicable spacing to access ancillary equipment • Approved Piping System for Marine Dispensing Facilities. <p>Where an AST is Elevated Above Dispenser</p> <ul style="list-style-type: none"> ☑ Prevent gravity drainage of AST by: <ul style="list-style-type: none"> • Installing an automatically operated valve, designed to open only when the dispenser is operated; • Installing an anti-gravity flow valve in the event of a pipe or hose failure; • Installing an internal or external liquid tight shut-off valve located at the tank. 	<p>Stationary ASTs - General</p> <ul style="list-style-type: none"> ☑ Refer to Fuel Guidelines - Section 3 for <i>dispensing</i> of ASTs at Marine Facilities. ☑ Shut-off watercraft engine prior to refueling ☑ Remove portable containers from watercraft & use spill tray prior to filling. <p>Marine Fuel Dispensing Stations</p> <ul style="list-style-type: none"> ☑ Dispenser pumps shall be in a location that will prevent watercraft impact or other physical damage. <p>Transfer Pumps</p> <ul style="list-style-type: none"> ☑ All fuel transfer pumps must be maintained and conform to CSA B346-M. ☑ Keep transfer pumps at least 3m from property line and 1.5m from building openings. <p>Dispensing Hose</p> <ul style="list-style-type: none"> ☑ Maximum allowable length is 4.5m; ☑ Where a retracting mechanism is used, a maximum extended length of 6m shall be permitted; ☑ At <i>Marine Fuel-Dispensing Stations</i>, the maximum extended length is permitted to exceed 6m. <p>Hose Nozzle Valve/ Dispensing Nozzle</p> <ul style="list-style-type: none"> ☑ Hose nozzle valve must be maintained and conform to CAN/ULC-S620. ☑ Dispensing nozzles shall be automatic-closing <i>without</i> a hold-open latch. <p>Supply Shut-off Valve</p> <ul style="list-style-type: none"> ☑ A readily accessible & posted valve shall be provided in each pipeline at or within 7.5m of the pier to shut-off the supply from shore. 	<p>Storage & Protection</p> <ul style="list-style-type: none"> ☑ Maintain sufficient distance between fuel facility and other structures & floats to allow safe entry & exit of vessels. ☑ Maintain 7.5m perimeter around any fixed sources of ignition & other activities not associated with refueling. ☑ Assess floatation structures to ensure adequate buoyancy & stability for all environmental conditions (i.e. wind & waves) ☑ Consider a quick-release system to remove and isolate floating structures in the event of a spill or fire. ☑ Daily visual inspections & pre-work checks of fuel lines, valves & connections to assess for leaks, spills, integrity & damage. <p>Training</p> <ul style="list-style-type: none"> ☑ Training Requirements: <ul style="list-style-type: none"> • Refueling & Emergency Response Procedures & Evacuation. • Boat & Water Safety Training <p>Fire Control & Spill Response</p> <ul style="list-style-type: none"> ☑ Maintain a Fire Control Plan & Spill Response Plan on-site. ☑ Maintain two or more 80-BC fire extinguishers and additional fire mitigation equipment. ☑ Maintain containment booms and additional spill response equipment on-site based on risk assessment. ☑ Post Fire Response & Spill Response Procedures at the dispensing location.

2022 Fuel Guidelines

Compressed Gases – TDG Class 2

PROPANE/ ACETYLENE/ AIR/ OXYGEN/ CO2/ NITROGEN/ ARGON

- TDG Regulation, Motor Vehicle Act & Standards
- ☑ BC Fire Code, CCME AST Code & Industry/ Engineering Standards
- ☐ OH&S Regulation, Env. Mgmt. Act/ Regs. & Best Management Practices

Section 5

TYPE	GENERAL CONDITIONS & DESIGN	PROPANE STATIONARY TANKS	MOBILE CYLINDERS	PREPAREDNESS & PREVENTION
COMPRESSED GASES TDG Class 2	<p>General</p> <ul style="list-style-type: none"> ☑ Containers must be in good condition – not damaged, rusting or leaking ☑ Only Qualified Individuals may inspect and service a pressure tank or cylinder <p>Stationary Tanks: Construction Standard</p> <ul style="list-style-type: none"> ■ CSA B51 Boiler, Pressure Vessel & Pressure Piping Code - Propane <ul style="list-style-type: none"> • Data Tag/ Name Plate (legible) with Canadian Registration Number for use in BC • Serial # matches Operating Permit • Maximum Allowable Working Pressure clearly identified <p>Stationary Tanks: Maintenance</p> <ul style="list-style-type: none"> ☑ Up-to-date service schedule ☑ No leaking valves ☑ Cover for pressure relief valve <p>Mobile Construction Standard - Road Cylinders / Spheres / Tubes</p> <ul style="list-style-type: none"> ■ CSA B339 or 49-CFR for cylinders ■ CSA B340 & CSA B341 ■ CGSB – 43.123 for Class 2.1 & 2.2 ■ CSA B342 (for UN cylinders) <p><i>Highway tanks</i></p> <ul style="list-style-type: none"> ■ CSA B620 & CSA B622 <p><i>Portable tanks</i></p> <ul style="list-style-type: none"> ■ CSA B622 & CSA B625 <p>Mobile Cylinder: Maintenance</p> <ul style="list-style-type: none"> ■ Assess for leaks and damage ■ Cylinder retesting (date stamp on collar of tank) <ul style="list-style-type: none"> • Aluminum/ Steel: 10yrs • Fiberglass: 5yrs • Composite: 15yrs (max life) 	<p>Storage - Stationary Propane Tanks</p> <ul style="list-style-type: none"> ☑ Protect against mechanical damage ☑ Valid Operating Permit for BC required ☑ Compliance with CSA B149.2 Propane Storage & Handling Code ☑ Do not store within a secondary containment berm ☑ Separate storage area and LPG tanks from other dangerous goods by 6m ☑ Separate LPG cylinders and AST fuel tanks by 3m <p>Tank Condition</p> <ul style="list-style-type: none"> ☑ Paint coating provides full protection ☑ Not rusting and no visible corrosion ☑ Not damaged, dented or bulging ☑ No fire damage or leaks <p>Pressure Relief Valve</p> <ul style="list-style-type: none"> ☑ Present and serviceable <p>Tank Openings & Valves</p> <ul style="list-style-type: none"> ☑ Service Valve ☑ Fill Valve ☑ Liquid Transfer Valve ☑ Relief Valve <p>Filling</p> <ul style="list-style-type: none"> ☑ Supplier refills on-site ☑ Easy access with collision protection <p>Position</p> <ul style="list-style-type: none"> ☑ Solid level base made from non-combustible materials <p>Location</p> <ul style="list-style-type: none"> ☑ Adequate clearances to buildings, structures & roadways ☑ Clear of vegetative overgrowth 10m ☑ Clear any surrounding ignition sources <p>Labeling</p> <ul style="list-style-type: none"> ☐ WHMIS labels (supplier or workplace) are required on all storage tanks 	<p>General</p> <ul style="list-style-type: none"> ☐ Don't require an Operating Permit ☐ Don't have a Canadian Registration Number ☐ Does have a TC Number with date stamp on collar of tank <p>Transportation Exemptions</p> <ul style="list-style-type: none"> ■ General Exemption: TDG Part 3 & 6 do not apply to transportation on road provided: <ul style="list-style-type: none"> • Total mass of compressed gas in one or more cylinders is $\leq 500\text{kg}$ • Labels visible from outside the vehicle • Transport no more than five (5) small means of containment ■ 150kg (gross mass) Exemption: TDG Parts 3, 4, 5, 6 & 8 do not apply to the handling or transport on road provided: <ul style="list-style-type: none"> • Max capacity of each cylinder $\leq 46\text{L}$ • Total gross mass of compressed gas and cylinders is $\leq 150\text{kg}$ ■ 500kg Exemption: TDG Parts 3, 4 & 5 do not apply to the handling or transport on road provided: <ul style="list-style-type: none"> • Total mass $\leq 500\text{kg}$ of compressed gas is in one or more small means of containment that conforms to one of the Construction Standards <p>Tank Condition</p> <ul style="list-style-type: none"> ☑ Paint coating provides full protection ☑ Not rusting and no visible corrosion ☑ Not damaged, dented or bulging ☑ No fire damage or leaks <p>Secure for Transportation</p> <ul style="list-style-type: none"> ■ Tanks must be appropriately secured to prevent shifting, swaying, damage or escape 	<p>Store & Protect</p> <ul style="list-style-type: none"> ☑ Secured & protected against falling and mechanical or valve damage and storage must not interfere with operation of valve assembly ☑ Valves must remain closed when cylinder is empty or not in use ☑ Maintain 6m radius from other dangerous goods ☑ No propane 7.5m from exits. ☑ Do not store propane indoors unless storage room complies with Fire Code S3.2.8.2. <p>Training</p> <ul style="list-style-type: none"> ■ Report & respond to all gas leaks of 10kg or greater (Class 2.1 & 2.2) ☐ Training Requirements: <ul style="list-style-type: none"> • Emergency Response Procedures & Evacuation Procedures • Propane Handling & Storage. • Take precautions to prevent leaks and proper PPE <p>Fire Control and Response</p> <ul style="list-style-type: none"> ☑ Post "No Smoking" signs ☑ Conduct Fire Response Training & maintain a Fire Response Plan ☑ Maintain two or more 80-BC fire extinguishers to handle the risks ☐ Post Fire & Spill Response procedures at all storage & dispensing facilities

APPENDIX

- A** Risk Assessment Matrix
- B** Risk Management: Prevention, Preparedness & Due Diligence
- C** Site Preparation: Secondary Containment vs. Spill Control
- D** Container & Tank Inspection Matrix
- E** BMP: Treating Fuel Leaks, Drips & Non-Reportable Fuel Spills
- F** BMPs: Generators, Sea-Cans & Shops
- G** BMPs: Helicopter Field Guide

2022 Fuel Guidelines

Risk Assessment Matrix				Appendix A
For Land Based Fuel Storage & Dispensing Facilities or Caches at Remote Construction Sites				
Risk Identification	HIGH	MEDIUM	LOW	Assigned Numerical Value*
Numerical Value	3	2	1	
Environmental Factors				
Distance to nearest watercourse	< 50m	50m-100m	> 100m	
Soil characteristics around the storage area	Porous or unknown – coble/ gravel	Semi-porous – silt/ sand	Non-porous – clay/ bedrock	
Terrain slope	> 6% slope	2%-6% slope	< 2% slope	
Operational Factors				
Site description	Isolated access: – no road or poor road access; – barge only access	Remote access: – 3-5hrs from town/ highway access; – no cell phone coverage	Easy access: – within 1hr of town; – cell phone coverage	
Duration of project	> 30 days	10-30 days	< 10 days	
Volumes stored	>1000L	230L-1000L	< 230L	
Daily access	> 12x per day	6-12x per day	< 6x per day	
Personnel access	Everyone has access	Everyone with training has access	Only designated (qualified & trained) personnel have access	
Prevention & Preparedness Factors				
Site Accessibility	Requires helicopter or boat & may be weather dependent	More than a day to respond with additional equipment	Same day response time with additional equipment	
Spill Control and Additional Control Measures Implemented	No <i>spill control</i> & No additional <i>Control Measures</i> for the storage area or the dispensing area	<i>Spill control</i> implemented but no additional <i>Control Measures</i> for the storage area or the dispensing area	<i>Spill control</i> for the storage & dispensing area with additional <i>Control Measures</i>	
Preparedness and Response Training: <i>Fuel Management & Spill Response</i>	No one trained or has a valid <i>Spill Response Training</i> or <i>Fuel Management Training Certificate</i>	Only Supervisors have <i>Spill Response Training & Fuel Management Training Certificates</i>	Everyone handling fuel has a valid <i>Spill Response Certificate & Fuel Management Certificate</i>	
Risk Value	*Add the Assigned Numerical Values:			

CONTROL MEASURE RECOMMENDATIONS

Numerical Value	Risk Ranking	Control Measures
< 12	Low Risk	<ul style="list-style-type: none"> No additional measures are considered necessary
12-23	Medium Risk	<ul style="list-style-type: none"> Additional control measures should be considered to reduce the risk
> 23	High Risk	<ul style="list-style-type: none"> See Additional Control Measures for High-Risk Sites

Risk Management: Prevention, Preparedness & Due Diligence

Appendix B

Additional Control Measures	<p>Additional Control Measures for Small Containers:</p> <ul style="list-style-type: none"> - Move storage location to low-risk area; - Install additional spill control at the storage and dispensing area; - Daily visual inspection to check for leaks, drips and spills; - Regularly check and replace bung-ring gasket on drums; - Apply liquid gasket (compatible with product) on drum-bung threads; - Use non-drip spout attachments on jerricans; - Limit access and appoint a fuel storage and handling operator; - Ensure everyone who handles fuel has a valid Fuel Management training Certificate & Spill Response training Certificate; - Replace small containers that may have been compromised; - Review and update Fuel Handling Procedures and Risk Assessment Matrix on a regular basis. 	<p>Additional Control Measure for Portable & Stationary Tanks:</p> <ul style="list-style-type: none"> - Have a current Fuel Management Plan - Install spill control for fuel storage facility; - Install additional spill control for fuel transfer/ dispensing area; - Petroleum hydrocarbon sensors and alarm systems; - Anti-siphon foot valves; - Overflow protection and/or alarm system; - Spill containment fill-box; - Dry disconnect valves; - Shear valve on tank; - Breakaway valves on hose; - Hose reel or hose retractor system; - Additional site-specific awareness training in Fuel Management & Spill Response.
Fire Safety	<p>Equipment:</p> <ul style="list-style-type: none"> ☑ Maintain one or more BC-rated fire extinguisher of a suitable size(s) to handle the potential risk at small fuel caches or with portable fuel systems. ☑ Maintain two or more 80-BC rated fire extinguishers to handle the potential risks at larger fuel storage and dispensing facilities. 	<p>Fire Control and Response Plan:</p> <ul style="list-style-type: none"> ☑ Conduct Fire Response Training and maintain a Fire Response Plan. ☑ Post Fire Safety Procedures including “No Smoking” signs at stationary fuel storage and dispensing facilities.
Spill Control	<p>Spill Control for Small Containers:</p> <ul style="list-style-type: none"> ☑ Credible Spill Volume: minimum capacity is that of the largest container; however, when small containers are handled and moved in bulk, the credible spill volume is the sum of the small containers. <ul style="list-style-type: none"> ▪ Slope & grade site with geotextile liner (hydrocarbon compatible) to collect & contain a spill - away from main storage containers; ▪ Use plastic totes, collapsible containment berms or equivalent; 	<p>Spill Control for ULC Stationary Tanks <80,000L:</p> <ul style="list-style-type: none"> • Dispensing Area must have Spill Control of at least 1000L; <ul style="list-style-type: none"> ▪ Slope and grade site with geotextile liner (hydrocarbon compatible) to collect & contain a spill - away from main storage containers; ▪ Use collapsible containment berms or equivalent; ▪ Conduct a Risk Assessment to determine Significant Aspects of Operation and Implement Additional Control Measures.
Training	<ul style="list-style-type: none"> ☑ Anyone responding to a spill must have had Spill Response Training and carry a valid certificate; ☑ Anyone who handles, stores and transports flammable or combustible liquids must be adequately trained and qualified 	<ul style="list-style-type: none"> ☑ Fuel Management Training & TDG-Class 3 Certification: <ul style="list-style-type: none"> - On-Line Course: www.fueltraining.ca (now available) ☑ Spill Response Training Certification: <ul style="list-style-type: none"> - On-Line Course: www.fueltraining.ca (now available)

Continued...

Risk Management: Prevention, Preparedness & Due Diligence

Appendix B

<p>Spill Preparedness</p> <ul style="list-style-type: none"> – Risk Based Assessment – Each spill kit should reflect the risk and the potential response. Therefore, no spill kit will be the exact same – <i>Example of Equipment List for ≤ 1000L Diesel Storage for Land-based Operation</i> 	<ul style="list-style-type: none"> ◆ SPILL PLAN or Emergency Response Procedures must be with each kit or within easy access to the spill kit ◆ CONTAINMENT: <ul style="list-style-type: none"> ○ Tarp Containment™ <ul style="list-style-type: none"> - Large tarp for containment - 2x4 lumber or equivalent to use as a crossbeam ○ Culvert Block Containment™: <ul style="list-style-type: none"> - Plywood or equivalent for blocking a culvert - Small tarp for sealing culvert block ○ Underflow Containment™: <ul style="list-style-type: none"> - Sandbags for diversion or containment dam - PVC Pipes for underflow construction ○ Patch & Plug <ul style="list-style-type: none"> - Bentonite clay material or equivalent - Wooden dowels & wedges or equivalent ◆ ADVANCED WATER RESPONSE EQUIPMENT <ul style="list-style-type: none"> ○ Watergate® (MegaSecure Dam) ○ Water Barrier® (AquaDam) 	<ul style="list-style-type: none"> ◆ MOP-UP & TREATMENT <ul style="list-style-type: none"> ○ Absorbent pads (i.e. petroleum) or equivalent material (i.e. peat moss) appropriate for the type and volume of spilled product, ○ Appropriate number of absorbent booms for skimming and absorption ○ Drum liner bags or plastic pails (20L) ○ Bioremediation product to treat contaminated soil ○ Shovels, rakes or appropriate hand tools ◆ SAFETY <ul style="list-style-type: none"> ○ Fire extinguisher (BC type) ○ Traffic Control where required ◆ PPE (personal protective safety gear) <ul style="list-style-type: none"> ○ Rubber boots ○ Rubber, Nitrile or equivalent protective gloves ○ Hard Hat, Hearing & Eye Protection ○ Rain gear or chemical splash protection ◆ PPE (Advanced Equipment with Certified Training) <ul style="list-style-type: none"> ○ Respirators ○ Gas Meter (or Vapour Monitor) ○ Decontamination Unit
<p>Due Diligence</p>	<ul style="list-style-type: none"> ◆ Prevention: <ul style="list-style-type: none"> ○ <i>Due diligence is a legal argument that <u>reasonable</u> measures were taken to prevent an incident from occurring.</i> ○ This may include: <ul style="list-style-type: none"> ▪ Implement industry standards for fuel management; ▪ Implement a risk assessment approach to fuel management; ▪ Implement employee awareness and training for fuel management; ▪ Implement pre-work inspections, standard operating procedures and documentation. 	<ul style="list-style-type: none"> ◆ Response <ul style="list-style-type: none"> ○ <i>Due diligence is a legal argument that <u>reasonable</u> measures were taken to minimize the impact of the incident on the environment.</i> ○ This may include: <ul style="list-style-type: none"> ▪ Implement a risk assessment approach to understanding spill preparedness and response; ▪ Implement employee awareness and response training that reflects the operational risks; ▪ Maintain a spill response kit based on the risk.

Site Preparation: Secondary Containment vs. Spill Control

Appendix C

Fire Code: Defining Secondary Containment & Spill Control	Secondary Containment Definitions: <p>Under the National and Provincial Fire Codes, a storage tank (containing <i>flammable liquids</i> or <i>combustible liquids</i>) installed in a fixed location, is required to have secondary containment as per Section 4.3.7 <u>Secondary Containment</u> for ASTs.</p> <p><i>Note:</i> A storage tank is defined as a tank that has a volumetric capacity of more than (>) 230L.</p>	Spill Control Requirements: <p>Under the National and Provincial Fire Codes Section 4.1.6.1 (1) <u>Spill Control</u> A spill of <i>flammable liquids</i> or <i>combustible liquids</i> shall be prevented from flowing outside the spill area and from reaching waterways, sewer systems and potable water sources by:</p> <ul style="list-style-type: none"> (a) constructing a non-combustible barrier capable of containing the spill or (b) grading the site or sloping the floor to divert the spill to a drainage system.
Discussion: Complying with Secondary Containment & Spill Control	<p>QUESTION: Does a CAN/ULC-S601 double walled tank with a capacity of less than (<) 80,000L require additional Spill Control?</p> <p>The National and Provincial Fire Codes (FC) outline the following:</p> <p>FC Sentence 4.1.6.1(1) Spill Control – requires the construction of a noncombustible barrier capable of containing a spill, as per Sentence 4.1.6.1(2).</p> <p>FC Sentence 4.1.6.1(2) states: When barriers required in Sentence 4.1.6.1(1) are provided to contain accidental spillage from ASTs, they shall conform to the requirements for secondary containment in Subsection 4.3.7.</p> <p>FC Sentence 4.3.7.1 (2) Secondary Containment for Aboveground Storage Tanks (ASTs) states: When barriers described in Sentence 4.1.6.1(1) are provided to contain accidental spillage from ASTs, they shall conform to the requirements for secondary containment in this Subsection. This includes: Construction, Capacity, Clearance, Access, Emergency Venting, Leak Detection, Drainage and Use of Secondary Containment. AND...</p> <p>FC Sentence 4.3.7.1(3), which states: A storage tank conforming to Sentence 4.3.7.4(2) <u>shall be considered as conforming to this Subsection</u> provided it is used and maintained in conformance to <i>drainage</i> (Section 4.3.7.8) and <i>use of secondary containment</i> (Section 4.3.7.9).</p> <p>FC Sentence 4.3.7.4(2) states: The storage tank has a capacity of not more than (\leq) 80,000L and is constructed in accordance with a CAN/ULC Standard that incorporates secondary containment or a double walled system for the storage tank.</p> <p>ANSWER: In this example, <i>Spill Control</i> is considered to be met by conforming to the <u>Construction Standard</u> for secondary containment/double walled tank [ULC-S601 as per FC Sentence 4.3.1.2.(1)(e)] and the <u>Volume</u> (<80,000L). Therefore, no additional <i>spill control</i> is required, however this does not take into consideration the dispensing and fuel transfer areas (see below) or meeting the test of <i>due diligence</i> for a high-risk area/operation.</p>	
Fire Code: Defining Spill Control at Dispensing & Fuel Transfer Areas	Dispensing & Fuel Transfer Areas: <p>The National and Provincial Fire Codes Section 4.6.7 Spill Control is required at any premise at which <i>flammable liquids</i> or <i>combustible liquids</i> are dispensed from fixed equipment into the fuel tanks of motor vehicles (equipment);</p> <p>4.6.7.1 (1) Areas where <i>flammable liquids</i> or <i>combustible liquids</i> are dispensed shall be designed to:</p> <ul style="list-style-type: none"> (a) be able to handle accidental spillage in conformance with subsection 4.1.6 and (b) control a spill of not less than 1000L. 	

Small Container Inspection Matrix					Appendix D
Small Containers	External Inspection	Internal Inspection	Leak Testing	Pressure, Hydro or Pneumatic	General Information
<p>Jerry Cans: CGSB 43.150-2020 (replaces TP14850 Standard) ≤60L have a 60-month lifespan</p> <p>Plastic drums & jerry cans (<150L) may exceed the 60-month expiry date (but not 120-months) if:</p> <ul style="list-style-type: none"> – Container is part of a fleet of containers under the control of a single operator; – Operator conducts an External Inspection – Used for Class 3 Products; – Capacity <150L; – For a fleet of containers, the Operator is registered with the Director TC (Transport Canada). 	<p>Container shows no sign of cracking, crazing, swelling, gouging, permanent deformation, degradation or compromised integrity</p>	<p>Not required</p>	<p>Not required</p>	<p>Not required</p>	<p>Lifespan is 60-months (5-yrs) from date of manufacture.</p> <p>For containers that are used more than once, be in such condition, including closure devices and cushioning materials, that they conform to all applicable requirements of the CGSB 43.150 Standard including:</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Free of corrosion and contamination that may render the container unsafe for transport
<p>Drums: CGSB 43.150-2020 (replaces TP14850) Max capacity 450L plastic & steel drums and includes salvage drums</p> <p>A drum (≥) 150L are designed for <i>one-time</i> use only and must be reconditioned prior to reuse*.</p> <p>A drum must not be filled with dangerous goods, unless the following conditions are met:</p> <ol style="list-style-type: none"> the single packaging, the inner packaging or receptacle is compatible with the dangerous goods; the container is free from <i>corrosion, contamination or other damage</i> that may render the container unsafe for transport. Any container that shows signs of reduced strength compared with the registered design must not be used; the steel or plastic drum has been <i>reconditioned</i> in accordance with CGSB-43.126 before reuse. 	<p>Reconditioning, remanufacturing and repair of drums for TDG as per CGSB 43.126-2008 (R.2014) Section 6.2.3</p>	<p>Reconditioning, remanufacturing and repair of drums for TDG as per CGSB 43.126-2008 (R.2014) Section 6.2.2</p>	<p>Reconditioning, remanufacturing and repair of drums for TDG as per CGSB 43.126-2008 (R.2014) Section 6.2.4</p>	<p>Reconditioning, remanufacturing and repair of drums for TDG as per CGSB 43.126-2008 (R.2014) Section 6.2.4.3</p>	<p>For containers that are used more than once, be in such condition, including closure devices and cushioning materials, that they conform to all applicable requirements of the CGSB 43.150 (2020) Standard including reconditioning.</p> <p>*A drum ≤ 220L may be reused <i>once</i> prior to reconditioning, if:</p> <ul style="list-style-type: none"> ▪ Visually inspected; ▪ Refilled with same product.

IBCs, Portable Containers & Mobile Tank Inspection Matrix					Appendix D
Containers & Tanks	External Inspection	Internal Inspection	Leak Testing	Pressure, Hydro or Pneumatic	General Information
Bladder Drums & Tanks MIL-D-23119G Mobile Drums MIL-T-52983G Mobile Tanks	Bladders show no sign of leaking, chafing, cracking, crazing, swelling, gouging, permanent deformation, degradation or compromised integrity.	Not required	Not required	Not required	<ul style="list-style-type: none"> Typical lifespan according to manufacture is 7-10 years, however this is not a Standard. There is no engineering inspection schedule for bladder tanks.
Mobile IBCs - Intermediate Bulk Containers ≤3000L PGII & ≤5000L PGIII Standard: CGSB 43.146 (UN31A/B) Only for: UN1202; 1203; 1863; 1223; & 1268	60-months (5-yrs) from date of manufacture	Not required	60-months (5-yrs) from date of manufacture	Not required	A "permanently" mounted <i>Mobile</i> IBC is intended to be loaded, stored & unloaded while on a means of transport . All the openings of these IBCs are within the vapour space only.
Intermediate Bulk Containers other than Mobile IBCs (Lightweight IBC ≤1,000L) caged plastic tote Standard: CGSB 43.146 (UN31HA1)	30-months from date of manufacture <i>One-time use only. Filled once & transported for a period not exceeding 30-months.</i>	Not required	30-months from date of manufacture	Not required	These IBCs are not "permanently" mounted on a transport unit. These IBCs are transported to a facility and off-loaded for use & storage. The bottom discharge for liquids must have a secondary means of closing.
TC 44 & UN Portable Tanks (≥3000L) as per CSA B625 & B656 Standards	1-year	5-years	1-year	5-years	TC Portable Tanks must be inspected by a TC Registered Facility
TC 306/ 406 Highway Tanks As per CSA B620 Standard	1-year	5-years	1-year	5-years	TC Highway Tanks must be inspected by a TC Registered Facility

Container & Tank Inspection Matrix				Appendix D
Stationary Tanks	Daily & Weekly Inspections:	Annual Inspections:	General	
Double Walled Tank Inspections: <ol style="list-style-type: none"> BC Fire Code CCME Code of Practice for Storage Tank Systems Containing Petroleum & Allied Products; and ULC S601 as per CAN/ULC-S676-15 Standard for Refurbishing of Storage Tanks for Flammable and Combustible Liquids 	<u>Daily visual</u> in-service pre-work inspection each day the facility is in operation: <ul style="list-style-type: none"> ✓ Check for leaks, drips and spills: <ul style="list-style-type: none"> ☑ Fuel hoses and fittings; ☑ Pipe connections & flanges; ☑ Pumps & nozzles; ☑ Tank & valves. <u>Weekly in-service visual inspections:</u> <ul style="list-style-type: none"> ✓ Check vacuum monitor gauge is okay: <ul style="list-style-type: none"> ☑ Secondary Containment; ✓ Check for product or water accumulation in: <ul style="list-style-type: none"> ☑ Spill control tray & containment systems. 	Visual in-service leak-detection & monitoring will ensure the following (Document Annual Inspection): <ul style="list-style-type: none"> ✓ All access lids, caps and ports are tight and correctly sealed; ✓ Tank, supports and sump integrity have not been compromised; ✓ Secondary containment, spill control trays & sumps are clean and free of debris, liquid and ice; ✓ Piping, fittings & connections are not leaking or dripping liquid; ✓ No new stains have developed since last inspection; ✓ Sensors are functioning and confirm correct values/ reading; ✓ Visual inspection of tank wall; ✓ Overfill protection devices. 	BC Fire Code: S. 4.4 Leak Detection Double-walled storage tanks, which have an interstitial space that allows for monitoring using high-tech or low-tech methods. Note: If a leak is suspected, the AST inspection and performance testing needs to be performed by a <i>Qualified Professional</i>	
Stationary Bladder Tanks CAN/CSA-B837-14	Bladders show no sign of leaking, chafing, cracking, crazing, swelling, gouging, permanent deformation, degradation or compromised integrity. There is no engineering inspection schedule for bladder tanks.			Typical lifespan is 7-10 years however this is not a Standard

SOP: Treating Fuel Leaks, Drips and Non-Reportable Fuel Spills[©]

Appendix E

Best Management Practices* (BMP): This SOP will ensure that BMP are implemented when treating small volumes of hydrocarbon waste material.

Specifications for this SOP:

- The contamination is petroleum hydrocarbon based (synthetic oil will not bio-remediate)
- The source of the petroleum hydrocarbon contamination is from:
 - Non-reportable spills to land including: Class 3 *Spills* less than (<)100L / Leaks / Drips / Hydrocarbon Stains
 - On-site facilities including: Wash-Pad Sumps / Oil-Water Separator Sumps / Sediment & Storm Drain Sumps / Shop Sweepings
- On-going treatment is a long-term maintenance plan to reduce site contamination from increased concentrations of petroleum hydrocarbons
- Criteria for identifying contamination follow these general guidelines:
 - The depth of contamination does not exceed 0.5m below surface grade
 - The surface staining is less than 3m in diameter
 - The volume of contaminated media is less than (<) 5m³

In-situ Treatment (see Table 1)

The visible suspect/contaminated material will not be excavated or removed. All treatment will be performed within the boundaries of the stained/contaminated area.

Spill Assessment:

- Contain and remove any free product:
 - Use petroleum absorbent pads or equivalent absorption product(s) to remove free product prior to treatment

Environmental Assessment:

- Identify the characteristics of the contaminated media:
 - Clay, Silt and Mud mixtures
 - Sand and Gravel mixtures
 - Pebbles and Cobble mixtures
 - Gravel and mixed fragments
 - Fibric, Silt and Sand mixture
 - Humic, Silt and Sand mixture

Bioremediation in-situ Treatment:

- Add treatment product to contaminated area (see Table 1)
 - Dry or liquid product, depending on the media
 - Dry product: 1 bag/ 1m³ of contaminated media
 - Liquid product: 1L concentrate to 50L water or as prescribed
- Mix treatment product with contaminated media
 - Use excavator, grader or equivalent to ensure a good mix
 - On hard surfaces (i.e. asphalt or cement pads) spread product to absorb, sweep and remove
- Assess the treated area:
 - Check for petroleum hydrocarbon odors & visible staining
- Repeat *in-situ* treatment if staining or odors persist

Ex-situ Treatment (see Table 1)

- Stockpile contaminated media in a mini-biocell for treatment;
 - A small cell lined with 20mil poly and 1m soil cover, a cement pad or equivalent
- Mix treatment product with contaminated media
 - Dry product: 1 bag/ 1m³ of contaminated media (see Table 1);
 - Use excavator or equivalent to ensure a good mix
 - Aerate with excavator every two weeks
 - Leave uncovered if no precipitation is in the forecast
- Assess the treated area:
 - Check for petroleum hydrocarbon odors & visible staining
- Repeat treatment within *biocell* if petroleum hydrocarbon odors or staining persist

Disposal Options:

- Landfill intermediate cover and/or final cover material (Check *Permit* requirements)
- On-site restoration (no *off-site* media relocation permitted):
 - Construct berms, ditches & use to backfill around the site
 - On-site road surface improvements

Table 1. Remedial Options for Media Characteristics.

Remedial Options for Media Characteristics	In-situ Bioremediation Dry Product ¹	In-situ Bioremediation Liquid Product ²	Ex-situ Bioremediation Cell Dry-Product
Clay/ Silt/ Mud	YES		YES
Sand/ Gravel	YES		YES
Pebbles/ Cobble		YES	YES
Gravel/ Mixed Fragments		YES	YES
Fibric/ Silt/ Sand	YES		YES
Humic/ Silt/ Sand	YES		YES
Cement Pad/ Asphalt Road	YES	YES	
Large Rocks & Boulders		YES	

¹Oil Gator® or equivalent & ²Micro-Blaze® or equivalent

***Acknowledgement:** NWR thanks the BC Ministry of Environment for providing continual feedback on the legislative interpretation and confirming this SOP as a *Best Management Practice*. NWR also thanks West Fraser Mills Ltd. Co. for financial support in developing this SOP.

BMPs: GENERATORS, SEA-CANS & SHOPS**Appendix F**

<u>Diesel Powered Generators</u>	<u>Intermodal Shipping Containers (Sea-Cans)</u>	<u>Fuel Storage & Dispensing Inside Shops¹</u>
<p>Best Management Practices:</p> <p>Sources and Areas of Concern</p> <ul style="list-style-type: none"> Fuel filter on diesel powered generators have been the cause of some major spills: <ul style="list-style-type: none"> Faulty filter base caused ongoing leak. Over-tightened filter caused base to leak. Connections are not ULC approved or leaking. <p>Spill Control</p> <ul style="list-style-type: none"> The spill control under the diesel generator should have a containment volume equal to the day fuel supply tank or equal to a credible spill volume of the main fuel tank. Ensure that the generator facility has a containment tray or an internal perimeter lip to prevent a spill from exiting the facility. Install a hydrocarbon sensor(s) with emergency light and/or siren to alert camp maintenance staff of a potential leak within the generator unit (prior to overflowing the spill containment system) <p>Checklist</p> <ul style="list-style-type: none"> Conduct daily visual assessment and look for visual staining, leaks, drips and spills around: <ul style="list-style-type: none"> Spill control containment under gen-set, Secondary containment tray of facility, All fuel connections located inside and outside of the generator unit, Fuel filters and fuel lines inside and outside of the generator facility. If a wooden dip stick is used to check fuel levels (instead of a continual volume monitor), make sure the stick is always dried with an absorbent pad prior to storage. Do not keep waste absorbents outside. 	<p>Best Management Practices:</p> <p>Safety Concern</p> <ul style="list-style-type: none"> Storage of <i>flammable</i> and <i>combustible</i> liquids were in canisters that were not ULC approved or left open (i.e. open jars and open jerry-cans with spout attached). Sea-Cans were not properly vented and vapour accumulation inside reached lower-explosive-levels which ignited. <p>Best Management Practices</p> <ul style="list-style-type: none"> Review OH&S Hazard Alert 2012-04 for background on the risks and potential deadly scenario of not addressing the safety concerns. Intermodal Shipping Containers used to transport dangerous goods must conform to storage and separation requirements as outlined in National and Provincial Fire Codes (FC S3.3.4.8) Intermodal Shipping Containers (Sea-Cans) used to store <i>dangerous goods</i> must be vented in accordance with Occupational Health & Safety Recommendations <ul style="list-style-type: none"> Install one or more Powerless Turbo Roof Vent(s) (top of Sea-Can) with four open vents (air intake) at bottom corners of Sea-Can (or equivalent venting system). <p>Spill Control</p> <ul style="list-style-type: none"> Ensure that spill control is established for the storage of <i>flammable</i> and <i>combustible</i> liquids. The volume should be equal to the largest cannister or based on a credible spill scenario if multiple cannisters are stored in the same area. Install a containment tray or "lip" inside the Sea-Can floor to contain a spill from the storage cannisters within the unit. 	<p>Fire Code Requirements & BMPs:</p> <p>Storing & dispensing <i>flammable</i> & <i>combustible</i> liquids</p> <ul style="list-style-type: none"> When storing and dispensing up to 1500L: <ul style="list-style-type: none"> Requires a 1hr Fire Separation around the room Requires an average storage density of 100L/m² When storing and dispensing up to 10,000L: <ul style="list-style-type: none"> Requires a 2hr Fire Separation around the room Requires an average storage density of 200L/m² For maximum indoor storage quantities of <i>flammable</i> & <i>combustible</i> liquids see National or Provincial Fire Codes S4.2.7.5 Storage rooms shall be liquid-tight where the walls join the floor. (FC S4.2.9.1) Dispensing of <i>flammable</i> or <i>combustible</i> liquids from containers having a capacity of more than 30 L shall be by pumps or through self-closing valves, designed in conformance with good engineering practice. Store fuel canisters in approved ULC storage cabinets with 2hr fire resistant rating, professionally installed and vented to outdoor area. (FC 3.2.7.9) (FC 4.2.7.3) (FC 4.2.10) For indoor incidental use (<i>example: inside shop with no fire suppression system</i>), the max volume of <i>flammable</i> and <i>combustible</i> liquids allowed outside a storage cabinet is 600L of which not more than 100L shall be Class 1A (gasoline). <p>Recommendations</p> <ul style="list-style-type: none"> Install hydrocarbon sensor(s) with emergency light and/or siren to alert shop maintenance staff of a potential leak within the shop or storage room. <p>¹Fire Code Requirements. See National and Provincial Fire Code Section 4.2.7 Industrial Occupancy & Section 4.2.9 Rooms for Container Storage and Dispensing</p>

BMP: HELICOPTER FIELD GUIDE**Appendix G**

Container Type & Storage Fuel Drums, Bladder Drums, Mobile Tanks, and ASTs	Field Dispensing Remote fuel cache from portable tanks or drums	Transportation Suspended from under a helicopter
<p>Small Containers, Mobile Tanks & Stationary ASTs used for aviation fuel</p> <ul style="list-style-type: none"> Refer to Fuel Guidelines – Sections 1-3 for acceptable means of containment. Pre-work: visually assess the integrity of the storage drum/tank and dispensing equipment. Look for leaks, drips or damaged/ worn equipment. <p>Storing and Securing</p> <ul style="list-style-type: none"> Store steel drums horizontally with both bungs below the fuel to keep the bungs from being in the vapor space of the drum. If the drum is partially empty, tip it so that the bungs are not in the vapour space. Empty drums should be marked and stored a safe distance from the heli-pad. Remove all unwanted & unusable or empty drums from remote fuel caches. Check date on drum and remove any drum that is two-years old or older. <p>Spill Control</p> <ul style="list-style-type: none"> Secondary containment is not required for drums and containers with an individual capacity of less than 230L. Ensure that spill control is established when dispensing <i>flammable</i> and <i>combustible</i> liquids. The spill control volume should be equal to the largest canister or based on a credible spill scenario. A portable spill tray is acceptable. <p>AVIATION FUEL: Jet A-1 Characteristics</p> <ul style="list-style-type: none"> TDG Class 3 P.G.III <i>Flammable Liquids</i> UN 1863; Flash point of Jet A is +38°C NFPA (Fire Code) Class II Static electric charge & venting are characteristics of aviation fuel that need to be assessed and controlled. <p>Heli-pads</p> <p>Keep heli-pads free of drums. If possible, store drums adjacent or under landing pad for easy access and protection</p>	<p>Acceptable Equipment:</p> <ul style="list-style-type: none"> PPE: eye protection, Nitrile gloves; Hand-Tools: bung wrench, rubber mallet, drum marker; Fuel Transfer: fuel pump with spare parts & repair kit, filters, stand-pipe & collar to set the depth of the pipe, grounding cables; Spill Kit: absorbent pads, peat moss (i.e. Spagh Sorb), plug & patch kit (wax rings or bentonite clay), waste disposal bags with zap-straps. <p>Refueling Procedure (WorkSafeBC & Transport Canada)</p> <ul style="list-style-type: none"> Conduct pre-work assessment prior to refueling. Check that the fuel in the drum is the correct product (assess visually, check odor & weight). If in-doubt, don't refuel your helicopter & mark the drum with an "X". Ensure fuel pump is rated for aviation fuel and is intrinsically safe. Keep the stem-pipe off the bottom of the drum and tip drum so that the lowest part is furthest from the fuel in-take to avoid any possible contamination or water. Unless approved by TC-Civil Aviation in the "Air Operators Ops Manual", only the pilot and/or co-pilot may remain in the helicopter during hot-refuelling. Only trained, Certified and experienced fuel operators shall hot-fuel a helicopter. If fuel is mechanically (as opposed to manually) pumped, an emergency shut-off button shall be in the immediate area, and only dispensing nozzles equipped with automatic shut-off "dead-man" valve shall be used. If you're leaving a partially full drum, mark the date and your ID. This will allow other pilots to make a proper assessment of the drum. No smoking or spark producing activity shall be permitted within 15.2m (50') of fuel storage tanks or refuelling operations. The helicopter shall be electrically bonded to the bulk fuel tank, fuel canister, drum or vehicle. At least one 20-B:C minimum rated portable fire extinguisher shall be in the immediate area. Transferring fuel from drums into ASTs that belong to your clients: <ul style="list-style-type: none"> Pilots must be trained & qualified to transfer fuel into ASTs; The owner of the AST must supervise the delivery or equip the AST with a ULC-S661 overfill device. FC4.3.1.8 Check your insurance coverage prior to transferring fuel from a mobile tank into an AST belonging to clients. 	<p>Helicopter Pilot</p> <ul style="list-style-type: none"> The helicopter is used to transport fuel, so ensure that your pilots have a valid TDG Certificate. Ensure the means of containment is to an acceptable Standard Pilots must be Air Operator qualified for carriage of external loads & remote electric hook operation. Conduct a Risk Assessment & Safety Briefing with ground crew including radio & hand-signal communication prior to transporting fuel by longline. Only persons essential to the aerial work are permitted in the helicopter while conducting longline operation. Hover hook-ups shall only be performed by trained crew. Ground crew must wear appropriate PPE & maintain safe distances of 15m from the load, where applicable. Ground crew must have a predetermined escape route. <p>Longline Cargo Transport</p> <ul style="list-style-type: none"> Follow standard WorkSafeBC Procedures for slinging: <ul style="list-style-type: none"> Daily inspect slings, hooks, longlines & safe working load prior to fuel transport. Slings shall not be longer than 1/3 length of longline & of the type that does not allow to rebound into rotors. <p>Planning</p> <ul style="list-style-type: none"> Pickup and drop-off sites Refueling steel drums or bladder drums Procedures Prior to transferring fuel into tanks that belong to clients: <ul style="list-style-type: none"> Obtain written approval from client including a written procedures prepared by the owner of the AST; Ensure your insurance coverage includes refueling ASTs, and environmental contamination from spills. <p>Reference Materials:</p> <ul style="list-style-type: none"> Transport Canada: Fuel Drum Etiquette & TDG; BC Fire Code WorkSafeBC: Safe Work Practices for Helicopter Operations in the Forest Industry; Helicopter Association of Canada; HeliCat Canada Association.

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