

# 13<sup>th</sup> Edition

(1995-2024)

# Fuel Guidelines<sup>©</sup>

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.

## February 2024



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## 2024 Fuel Guidelines (13<sup>th</sup> Edition)

# Fuel Management & Spill Response Training

**The Fuel Guidelines was designed to be a support document for *on-line* Training**

Current List of Industrial, Commercial, Government, First Nations, Consultants, and Contractors who have completed NWR Training Courses @ Link: [www.fueltraining.ca](http://www.fueltraining.ca)

Alpine Helicopters	Cassiar Gold Corp	Galore Creek Mining	Northwest Fuels	Sun Ridge Contracting
Adventure Paving	CMH Heli-Skiing	Geotech & GREGG Drilling Services	Oil & Gas Commission	Seabridge Exploration
ABBA Reforestation	Cantex Mining Serv.	Gitxsan First Nations	Pacific Inland Resources	StarWest Petroleum
Amarc Resources	Carmacks Enterprises	Gator International		Summit Camps
APEX Geoscience Ltd	Chartwell Resource	Huu-ay-aht First Nations	Pacific Northwest Env. Monitoring Consulting	
Adapt Mountain Safety	Chieftain Energy	Hy-Tech Drilling	Summit Camps	Tolko Industries
ATCO Frontec	Clough Pacific Joint Venture	international SOS	Polar Ridge Resources	Tolko
BC Timber Sales Forestry	Compass Group Canada	ITL Drilling Ltd	Qualicum Beach Memorial Golf	Tudor Gold
Barkley Project Group	Canadian National Rail	Jim Dent Construction	Rio Tinto @ Kemano	Tahaltan First Nations
Brooks Environmental	Doubleview Gold Corp	K'awat'si Marine Services	Rugged Edge Holdings	TCLJV / Lemare
Boart Longyear Company	Driftwood Diamond Drilling Ltd.	LandSea Camp Services	RIPEM Consulting Corp	Terus Construction Ltd
Benchmark Metals	Ensero Solutions		Scarlet Security	The Last Mile
BV Nordic Ski Club	Ecofish Research Ltd	McElhanney Engineering	Shasyaz Contracting Ltd	Transport Canada
Brucejack Mine/NEWMONT	Eagle Pass Heli Ski	Matrix Aviation Mgmt.	Star West Petroleum	Wild Timber
Carmacks Enterprise	Equity Exploration	Ministry of FLNRO	Seabridge Gold at KSM	Westland Resources
Canadian National Defence	Forbidden Timber	Main Logging Ltd	Skeena Resources	Wuikinuxv First Nations
Chetwynd Forest Industry	Fairmont Hot Springs and Resort	MoE & CCS - Env Emergency Program	Sartori Environmental	Western Canadian Marine Response Corp
Coastal GasLink LNG	Fernie Nordic Society	Northern Valley Ventures	Sibola Mountain Falling	Williams Lake Lumber
CANFOR	GENCLEAN	Northern Labour Services	Sunpeaks Resort LLP	Yellowhead Helicopters

\* Alternate Link: [www.fuelmanagement.ca](http://www.fuelmanagement.ca)

# 2024 Fuel Guidelines (13<sup>th</sup> Edition)

## 2024 Revision

The 2024 **Fuel Guidelines** (13<sup>th</sup> Edition) was prepared by NorthWest Response Ltd., Smithers, British Columbia, Canada. The updated Appendices reflect the questions, concerns, feedback, and requests from you, the reader, and user of this document.

This Guideline is also a reference document for the *on-line Fuel Management Training* Link: [www.fueltraining.ca](http://www.fueltraining.ca)

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

## Fuel Management Plans

NorthWest Response can prepare a site-specific **Fuel Management 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](http://www.fueltraining.ca)

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

- **Fire Code Training** 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
<p><b>Drums &amp; Jerricans (&lt;230L)</b></p>	<p><b>Condition</b></p> <ul style="list-style-type: none"> <li>■ Must be designed, constructed, filled, closed, secured &amp; maintained so that under normal conditions of transport &amp; handling, there will be no accidental release/ spill of the dangerous goods that could endanger public safety.</li> <li>■ Jerry cans (&lt;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"> <li>• Jerry cans are registered as a fleet with Transport Canada;</li> <li>• Used only for Class 3, PGII or PGIII products;</li> <li>• Not damaged, cracked, deformed, or leaking.</li> </ul> </li> <li>■ Drums: &lt;220L steel or plastic are designed for one-time-use &amp; require reconditioning prior to use <i>however</i>, these drums may be reused <u>once</u> only if:                             <ul style="list-style-type: none"> <li>• reused with same product;</li> <li>• visually inspected - no damage;</li> <li>• reconditioned after reuse.</li> </ul> </li> <li>☑ Designed, constructed and maintained in good condition to securely contain product.</li> </ul> <p><b>Construction Standard</b></p> <ul style="list-style-type: none"> <li>■ CGSB 43.150-2020 (replaces TP14850) are <i>Small Containers</i> &lt;450L.</li> <li>■ CSA B376 (2014) are <i>Portable Containers</i> for Gasoline and Other Petroleum &lt;25L.</li> <li>■ ULC/ORD – C30 are <i>Safety Containers</i> &gt;5L and &lt;25L.</li> </ul>	<p><b>General requirements</b></p> <ul style="list-style-type: none"> <li>☑ Secondary containment is not a design specification for <i>Small Containers</i>.</li> <li>☑ Store all containers to prevent spillage.</li> <li>☐ Storing in <i>Riparian Management Area</i> is high-risk &amp; additional due diligent control measures are recommended.</li> <li>☑ 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>)</li> <li>☑ 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).</li> <li>☐ For indoor storage of <i>flammable</i> and <i>combustible liquids</i>, use only ULC Approved Storage Cabinets that are vented with a 5cm steel pipe directly outdoors.</li> <li>☑ For indoor incidental use (<i>example: inside shop with no fire suppression system</i>), the max volume of <i>flammable</i> and <i>combustible liquids</i> allowed outside a storage cabinet is 600L of which not more than 100L shall be Class IA (gasoline).</li> <li>■ Containers on a vehicle must be secured to prevent shifting, swaying, damage and/or escape.</li> <li>■ Tie down straps must have safe <u>combined</u> working load rating <i>greater</i> than the load.</li> <li>☐ Helicopter Operations. See <b>Appendix G – BMP: Helicopter Field Guide</b>.</li> </ul>	<p><b>General requirements</b></p> <ul style="list-style-type: none"> <li>☑ Only transfer fuel with a pump designed for the products being handled.</li> <li>☑ Do not fill containers beyond 90% of container capacity.</li> </ul> <p><b>Labeling</b></p> <ul style="list-style-type: none"> <li>☐ WHMIS Labels for Class B: <i>Flammable Liquids</i> (Div.2) &amp; <i>Combustible Liquids</i> (Div.3)                             <ul style="list-style-type: none"> <li>• Product Identifier;</li> <li>• Hazard Pictogram;</li> <li>• Precautionary Statement;</li> <li>• Reference to SDS.</li> </ul> </li> <li>☐ Jerry cans are exempt from additional labeling if content matches the product identifier and container color:                             <ul style="list-style-type: none"> <li>• <b>Red</b> – Gasoline;</li> <li>• <b>Yellow</b> – Diesel;</li> <li>• <b>Blue</b> – Kerosene.</li> </ul> </li> </ul> <p><b>Industry Standard Procedures/ Recommended Practices</b></p> <ul style="list-style-type: none"> <li>☑ Store the hose above the pump to avoid siphoning.</li> <li>☑ Dispense all <i>flammable</i> and <i>combustible liquids</i> from drums in an upright position.</li> <li>☑ Replace <i>open spouts</i> with <i>no-spill</i> or <i>spring-close</i> spouts on jerricans.</li> <li>☑ Avoid gravity dispensing.</li> <li>☑ Replace <i>horizontal drums</i> with double walled 230L Mobile IBCs (with bottom bung).</li> <li>☑ Use the <i>Risk Assessment Matrix</i> in high-risk areas.</li> <li>☑ Use <i>poly-overpack drums</i> when slinging full drums of fuel from a helicopter.</li> </ul>	<p><b>Transport</b></p> <ul style="list-style-type: none"> <li>■ Under TDG, all <i>small containers</i> may be transported without secondary containment or spill control. <i>Note:</i> Some company policies require small containers to be transported in a spill box.</li> <li>■ When transporting <i>used motor oil</i> and/or <i>used glycol antifreeze</i>:                             <ul style="list-style-type: none"> <li>• If &lt;450L or sample results confirm no heavy metals &amp; flash point is &gt;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;</li> <li>• 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 <b>Class 9, PG III; UN3082 – Env. Haz. Substance, Liquid, N.O.S.</b></li> </ul> </li> <li>☐ Provincially a <u>Waste Manifest</u> is not required if shipping less than (&lt;=) 210L (i.e. one standard drum) of <i>used oil</i> and/or <i>used antifreeze</i>, however if &gt;210L, then a <u>Waste Manifest</u> is required, regardless of whether samples were taken.</li> <li>■ 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 (&lt;=) 2000L, then:                             <ul style="list-style-type: none"> <li>• No <i>Documentation</i> (Shipping Document) is required;</li> <li>• No <i>UN Number</i> on the Placard is required; (<i>note:</i> Safety Marks – Placards or labels &amp; Shipping Name are still required);</li> <li>• No TDG training Certificate is required;</li> </ul> </li> </ul> <p><i>Note:</i> Despite this TDG Exemption, <i>Transport Canada</i> still requires workers hauling fuel to be adequately trained (by their employer) in safety &amp; awareness of the TDG products and the Regulations.</p> <ul style="list-style-type: none"> <li>■ Drums must be properly arranged by:                             <ul style="list-style-type: none"> <li>• Stacking in a vertical (upright) position;</li> <li>• Stack with dunnage protection between drums;</li> <li>• Installing sideboard frames on flat-decks.</li> </ul> </li> <li>■ Empty drums are exempt from TDG Regs Parts: 2-Classification, 3-Documentation, 4-D.G. Safety Marks; &amp; 7-E.R.A.P. provided:                             <ul style="list-style-type: none"> <li>• Drum contains &lt;10% residue;</li> <li>• Transported for filling or reconditioning;</li> <li>• 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"> <li>a) Primary Class;</li> <li>b) Number of Drums;</li> <li>c) "Residue" last contained.</li> </ol> </li> </ul> </li> <li>■ Containers over 30 liters must have a visible TDG Safety Marks:                             <ul style="list-style-type: none"> <li>• 1.Label or Placard; 2.Shipping Name; 3.UN Number</li> </ul> </li> </ul>



**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><b>General Requirements</b></p> <ul style="list-style-type: none"> <li>■ 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.</li> <li>■ Portable Tanks must be compatible with the <i>dangerous goods</i> and in good condition – not damaged, rusting, or leaking.</li> </ul> <p><b>Construction Standard – SMALL MEANS OF CONTAINMENT (≤ 450L),</b></p> <ul style="list-style-type: none"> <li>■ <b>Diesel:</b> 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.</li> <li>■ <b>Gasoline:</b> An IBC Portable Tank CAN/CGSB 43.146 spec tank is required and must bear a visible &amp; legible Spec Plate.</li> </ul> <p><b>Construction Standard – LARGE MEANS OF CONTAINMENT (&gt;450L) with Spec Plates</b></p> <ul style="list-style-type: none"> <li>■ UN 31A/B IBC Portable Tanks as per CAN/CGSB 43.146 (2021) &lt;3000L for TDG Class 3, PGII (<i>Gasoline</i>); but &lt;5000L for TDG Class 3 PGIII (<i>Diesel</i>). Can only be used for: UN1202; UN1203; UN1863; UN1223; &amp; UN1268 products.</li> <li>■ TC57 Portable Tanks as per CAN/CGSB 43.146 (2016).</li> <li>■ UN Portable Tanks as per CSA B625 (2020) &gt;450L.</li> <li>■ TC44 Portable Tanks as per CSA B626 (2020) &gt;3000L can only be used for <i>diesel</i> (UN1202).</li> <li>■ ULC/ORD 142.13.</li> </ul> <p>☑ For Inspection Schedules Matrix see <a href="#">Appendix D</a>.</p> <p><b>Construction Standard for TDG Fuel Bladders suspended from Helicopters (&gt;450L):</b></p> <ul style="list-style-type: none"> <li>■ MIL-D-23119G (collapsible <i>drums</i>).</li> <li>■ MIL-T-52983G (collapsible <i>tanks</i>).</li> </ul>	<p><b>General Requirements: Storage</b></p> <ul style="list-style-type: none"> <li>■ All IBCs &amp; Portable Tanks require pressure relief device in the vapor space. If leaking, the standard 2psi cap can be upgraded to a 9psi.</li> <li>☑ If a mobile tank (&gt;230L) is removed from the vehicle and placed on the ground, then secondary containment is required.</li> <li>☐ Storing tanks (&gt;230L) in a <i>Riparian Management Area</i> is high-risk &amp; additional due diligent control measures are recommended.</li> <li>☐ Ensure mobile fuel units are secured on a solid foundation and remains level when storing and operating.</li> <li>☐ Protect the fuel tank from wear or damage. (i.e. rubber belting/ mat)</li> </ul> <p><b>Securing</b></p> <ul style="list-style-type: none"> <li>■ Use a pressure relief cap (2psi to 9psi) that meets manufacturers design specifications.</li> <li>■ IBCs &amp; Portable Tanks must be secured to prevent damage &amp; accidental release of product.</li> <li>■ IBCs &amp; Portable must be appropriately secured to prevent shifting, swaying, damage or escape from the vehicle.</li> <li>■ Tie down straps must have safe <u>combined</u> working load ratings <i>greater</i> than the secured load &amp; points of attachment need to be integral with the transport unit. (i.e. truck chassis).</li> <li>☐ Lock valves to prevent unauthorized access to the fuel tank, nozzle, and pump.</li> </ul>	<p><b>General Requirements</b></p> <ul style="list-style-type: none"> <li>☐ Use fuel dispensing pumps designed for the products being handled.</li> <li>☑ Use only ULC S612 and ULC S620 approved fuel hose and nozzle for dispensing fuel.</li> <li>☑ Ensure continual bonding from tank to nozzle to address static charge.</li> <li>☑ Use 4.5m hose or 6m with <i>retractor</i>.</li> <li>☐ Replace worn, leaking or damaged fuel hose or nozzle.</li> </ul> <p><b>Industry Standard Procedures</b></p> <ul style="list-style-type: none"> <li>☑ Operators must stay with the nozzle <u>at all times</u> while dispensing fuel.</li> <li>☑ Do not fill Mobile IBCs beyond their safe filling level (90%)</li> <li>☑ Close valves when not dispensing and lock valves to secure unauthorized access.</li> <li>☑ Gasoline dispensing - ensure there is suitable bonding between tank and vehicle to prevent static charges.</li> <li>☐ Secure nozzle to prevent leaks &amp; spills.</li> <li>☑ Secure fuel hose on a retractor, hose reel, coiled on a bracket, or equivalent.</li> <li>☑ <i>Note:</i> Some <i>company policies</i> require secondary containment or spill control when transporting Mobile IBCs &amp;/or Portable Tanks.</li> </ul>	<p><b>Transport</b></p> <ul style="list-style-type: none"> <li>■ TDG does not require IBCs &amp; Portable Tanks (full or empty) to have secondary containment or spill control while in transit.</li> <li>■ Multiple <i>diesel</i> &amp;/or <i>gasoline</i> portable tanks with a combined capacity that <i>exceeds</i> (&gt;) 2000L, the operator is required to:             <ul style="list-style-type: none"> <li>• Complete and carry a <a href="#">Shipping Document</a>;</li> <li>• <a href="#">Placard</a> on all visible sides of the vehicle;</li> <li>• Possess a valid <a href="#">TDG Training Certificate</a>.</li> </ul> </li> <li>■ Small Portable Tanks (≤) 450L are exempt from TDG Regs Parts 3, 4, 5, 6, 7 &amp; 9 provided:             <ul style="list-style-type: none"> <li>• Container contains Class 3 <i>Flammable Liquids</i> with no subsidiary class;</li> <li>• Includes Packing Group III and a <i>flash point</i> greater than 37.8°C (i.e. <i>diesel</i>);</li> <li>• All the dangerous goods are in one or more small means of containment (≤450L).</li> </ul> </li> <li>■ <i>Large</i> Mobile IBCs &amp; Portable Tanks must follow the Inspection Matrix Schedule - based on the specific Construction Standard. <i>Note:</i> Transport Canada has recently <i>denied</i> an <i>Equivalent Level of Safety Permit</i> to move an empty <i>non-spec</i> Portable Tank (IBC). The operator was required to hire a TC Registered Inspector to inspect &amp; leak test the mobile tank prior to moving it.</li> <li>■ Helicopter Transport. See <a href="#">Appendix G – BMP: Helicopter Field Guide</a>.</li> </ul> <p><b>Labeling</b></p> <ul style="list-style-type: none"> <li>■ All IBCs and Portable Tanks must have appropriate TDG safety marks including:             <ul style="list-style-type: none"> <li>• Label or placard;</li> <li>• UN Number;</li> <li>• Shipping Name.</li> </ul> </li> <li>■ Spec plates must identify the following:             <ul style="list-style-type: none"> <li>• Container Type &amp; Standard;</li> <li>• Manufacturer &amp; Date;</li> <li>• Re-certification Date &amp; TC Registered Facility.</li> </ul> </li> </ul>



# 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
<b>STATIONARY TANKS (&gt;230L) Aboveground Storage Tanks (ASTs)</b>	<p><b>General Requirements &amp; Due Diligence</b></p> <ul style="list-style-type: none"> <li>☑ This section outlines the Industry Standards for Fire Safety, Worker Safety &amp; Environmental Safety that should be implemented at non-public fuel storage, &amp; dispensing stations (including card-locks &amp; key-locks), at farms, &amp; remote construction sites (forestry, mines, &amp; mine exploration).</li> </ul> <p><b>Construction Standard</b></p> <ul style="list-style-type: none"> <li>☑ <b>All Tanks:</b> used at a fuel dispensing facility must bear a visible &amp; legible Spec Plate.                             <ul style="list-style-type: none"> <li>• Individual capacity ≤ <b>80,000L</b> * &amp; an aggregate capacity ≤ 200,000L</li> </ul> </li> <li>☑ <b>Spec Bladder Tanks:</b> <ul style="list-style-type: none"> <li>• CAN/CSA B837-14;</li> <li>• Max capacity 125,000L.</li> </ul> </li> <li>☑ <b>Spec Steel Tanks:</b> 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"> <li>• ULC-S601 Shop Fabricated AST for <i>Flammable &amp; Combustible Liquids</i>;</li> <li>• ULC-S602 AST for Fuel &amp; Lube Oil;</li> <li>• ULC-S630 AST Vertical Tank;</li> <li>• ULC-S643 AST Shop Fab. Utility Tank;</li> <li>• ULC-S653 AST Steel Tank Assembly;</li> <li>• *ULC-S655 AST Protected Tank Assembly &amp; <i>may exceed 80,000L</i>;</li> <li>• ULC-S677 Fire Tested AST with a resistance rating of 2hrs.</li> </ul> </li> <li>☑ Inspection Schedules Matrix: See <b>Appendix D</b></li> <li>☑ Ensure secondary containment conforms to a ULC engineered specification for ASTs.</li> <li>☑ Emergency valves - ULC-S651 Standard</li> <li>☑ ASTs atmospheric vent pipes shall be:                             <ul style="list-style-type: none"> <li>• 3.5m above ground for <i>gasoline</i> (Class I)</li> <li>• 2.0m above ground for <i>diesel</i> (Class II)</li> <li>• <i>Note:</i> When mobile tank is used as stationary tank, replace the pressure relief cap with an atmospheric vent pipe using the appropriate height above ground.</li> </ul> </li> </ul>	<p><b>Site Preparation</b></p> <ul style="list-style-type: none"> <li>☑ Secondary contained <i>Spec Tanks</i> ≤50,000L meets the intent of Spill Control. (Federal)</li> <li>☑ Secondary contained <i>Spec Tanks</i> ≤80,000L meets the intent of Spill Control. (Provincial)</li> <li>☑ Physical collision protection is required for ASTs.</li> <li>☑ Measures must be taken to prevent unauthorized access. Lock valves, nozzles, &amp; truck access.</li> <li>☑ Use non-combustible materials for support tank cribbing. If used for secondary containment &amp; spill control berms, cover with fire resistant liner.</li> </ul> <p><b>General Requirements</b></p> <ul style="list-style-type: none"> <li>☑ All stationary tanks (&gt;230L) must have secondary (110%) containment. Options:                             <ul style="list-style-type: none"> <li>• Tank-in-tank (vacuum monitored);</li> <li>• Tank-in-tank (visible access port);</li> <li>• Tank-in-box (visible access hatch);</li> <li>• Tank-in-berm with enviro-liner (or <i>equivalent</i>).</li> </ul> </li> <li>☑ When transferring fuel into an AST, the owner of the AST shall ensure that overfill protection is implemented. (see <i>Dispensing</i> – Gen. Req.)                             <ul style="list-style-type: none"> <li>☐ Storing ASTs in a Riparian Management Area is high-risk, and additional <i>due diligent</i> spill control measures are recommended.</li> </ul> </li> <li>☑ All ASTs: Venting is open to atmosphere.</li> <li>☑ Gasoline ASTs &gt;75,000L: Pressure &amp; Vacuum relief vents with vapour recovery &amp; emergency venting (Reid V.P. @ 8-14 kPa; 1% benzene).</li> <li>☑ Ensure all stationary tanks and piping systems are bonded &amp; grounded.</li> <li>☑ All ASTs containing <i>gasoline</i> require a vapour recovery system (BC <u>Gasoline Vapour Control Regulation</u>) unless:                             <ul style="list-style-type: none"> <li>• Gasoline is delivered only by marine vessel;</li> <li>• Storage capacity &lt;2000L;</li> <li>• A farm facility for farm vehicles &amp; equipment</li> <li>• All refueled equipment is used at same location as storage &amp; dispensing facility;</li> <li>• AST is &lt;21,000L and supply tanker does not have a capacity &gt;21,000L &amp; notifies Director.</li> </ul> </li> <li>☐ <i>AST Winter Storage:</i> In high snow-pack mountain areas, remove external fittings &amp; keep volume at 75%.</li> </ul>	<p><b>Site Preparation – Spill Control</b></p> <ul style="list-style-type: none"> <li>☑ Spills, overfills, &amp; storm water from <u>product transfer area</u> shall be contained, treated, &amp;/or disposed of as per Provincial guidelines. <i>CCME</i></li> <li>☑ Dispensing &amp; Fuel Transfer areas shall be designed to control a spill of 1,000L. <i>Fire Code</i></li> </ul> <p><b>General Requirements</b></p> <ul style="list-style-type: none"> <li>☐ Fuel Dispensing &amp; Transfer Pumps must be designed for the product being handled. <i>Note:</i> Modified water pumps are not allowed, dangerous, and a WorkSafe violation.</li> <li>☑ Overfill protection may consist of:                             <ul style="list-style-type: none"> <li>• Visually supervise bulk fuel delivery operation by trained &amp; qualified personnel; <i>and/or</i></li> <li>• Equip tank with a ULC S661 overfill protection device.</li> </ul> </li> <li>☑ Equip facility with accessible <i>emergency shut-off device</i> to stop both power &amp; flow of product.</li> <li>☑ To prevent unauthorized access, close &amp; lock valves when the facility is left unattended.</li> <li>☑ Use only ULC S612 and ULC S620 approved fuel hose and nozzle for dispensing fuel.</li> <li>☑ Use 4.5m hose or up to 6m with a <i>retractor</i>.                             <ul style="list-style-type: none"> <li>• The hose length may exceed 6m at card- or key-activated dispensers.</li> </ul> </li> <li>☑ Assess &amp; replace worn, leaking or damaged fuel hose, nozzle or valves.</li> <li>☑ Always install flexible hoses with metallic braided protection (ULC/CAN-C536) when connecting ASTs together in series.</li> </ul> <p><b>Standard Operating Procedures:</b></p> <ul style="list-style-type: none"> <li>☑ Post all written SOPs.</li> <li>☑ All operators of must be trained &amp; qualified.</li> <li>☑ Operators must stay with the nozzle <u>at all times</u> while dispensing fuel.</li> <li>☑ Maintain record of inventory.</li> <li>☑ Store hose (off the ground) &amp; secure nozzle in a safe manner to prevent damage and leaks. (On a retractor, hose reel, or coiled).</li> </ul> <p><b>Safety</b></p> <ul style="list-style-type: none"> <li>☑ Suitable bonding required between tank and equipment to prevent static charges.</li> <li>☑ Maintain a current SDS of products.</li> </ul>	<p><b>General Requirements</b></p> <ul style="list-style-type: none"> <li>■ Stationary tanks are not designed to transport fuel and must be emptied prior to moving. TC has designated the CAN/ULC-S601 as a <i>Utility Tank</i> &amp; may be relocated (empty) with an <i>Equivalent Level of Safety Permit</i>.</li> <li>■ Stationary tanks must never be used to transport fuel.</li> </ul> <p><b>TDG Transport</b></p> <ul style="list-style-type: none"> <li>■ Prior to moving an empty stationary fuel tank (<i>diesel</i> or <i>gasoline</i>) with a capacity greater than (&gt;) 450L and less than or equal to (≤) 2000L:                             <ul style="list-style-type: none"> <li>• Tank is pumped empty (5% or less);</li> <li>• An <i>Equivalent Level of Safety Permit</i> is obtained from Transport Canada;</li> <li>• Replace atmospheric vent pipe with pressure relief cap;</li> <li>• Placard all four sides of AST with:                                     <ul style="list-style-type: none"> <li>○ TDG Classification, &amp;</li> <li>○ Shipping Name.</li> </ul> </li> </ul> </li> <li>■ When relocating an empty stationary AST with a total capacity greater than (&gt;) 2000L, the following TDG Regulations must be implemented:                             <ul style="list-style-type: none"> <li>• Tank must be emptied to the lesser of &lt;5% or contain &lt;500L;</li> <li>• Replace atmospheric vent pipe with pressure relief cap;</li> <li>• Obtain an <i>Equivalent Level of Safety Permit</i> from TC;</li> <li>• A Shipping Document must be completed for the <i>Residue Last Contained</i>;</li> <li>• The hauler/operator must possess a valid TDG Training Certificate;</li> <li>• The skid tank must be placarded on all four sides:                                     <ul style="list-style-type: none"> <li>○ TDG Classification;</li> <li>○ Shipping Name; and</li> <li>○ UN Number.</li> </ul> </li> </ul> </li> </ul>

## 2024 Fuel Guidelines (13<sup>th</sup> Edition)

# 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><b>Marine Facility - Definition</b></p> <ul style="list-style-type: none"> <li>☑ 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>.</li> </ul> <p><b>Stationary ASTs - General</b></p> <ul style="list-style-type: none"> <li>☑ Refer to <a href="#">Fuel Guidelines - Section 3</a> for <i>tank condition, design, maintenance</i> of ASTs at Marine &amp; Foreshore Facilities.</li> </ul> <p><b>Piping System for Marine Facilities</b></p> <ul style="list-style-type: none"> <li>☑ Install protective guard devices where impact or physical damage is possible by vehicle or watercraft;</li> <li>☑ A fuel line that extends between shore and/or floating structures:                             <ul style="list-style-type: none"> <li>• Install a flexible metallic hose that conforms to ULC/CAN-C536.</li> </ul> </li> <li>☑ Support &amp; elevate piping to prevent direct contact with ground &amp; possible corrosion;</li> <li>☑ Piping system must have provisions to accommodate expansion and contraction of <i>flammable &amp; combustible liquids</i>:                             <ul style="list-style-type: none"> <li>• In-line expansion chamber;</li> <li>• Pressure and vacuum relief vents with vapour recovery, where warranted.</li> </ul> </li> <li>☑ Piping for <i>flammable and combustible liquids</i> shall be clearly marked &amp; legible and shall <i>not</i> be painted red;</li> <li>☑ Emergency valves for <i>flammable and combustible liquids</i> dispensing and associated piping systems must conform to UCL-S651.</li> </ul>	<p><b>Stationary ASTs – General</b></p> <ul style="list-style-type: none"> <li>☑ Refer to <a href="#">Fuel Guidelines - Section 3</a> for <i>storage &amp; securing</i> of ASTs at Marine and Foreshore Facilities.</li> </ul> <p><b>AST Installation on shore</b></p> <ul style="list-style-type: none"> <li>☑ All ASTs shall be located on shore.</li> <li>☑ All ASTs shall not be closer than 4.5m horizontally from normal annual highwater mark.</li> <li>☑ Tanks &amp; 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.</li> </ul> <p><b>AST may only be installed on a pier if:</b></p> <ul style="list-style-type: none"> <li>☑ Distance from shore AST to dispenser is excessively long (<i>not defined</i>);</li> <li>☑ AST is ≤ 5000L aggregate capacity;</li> <li>☑ AST has secondary containment that complies with the Fire Code:                             <ul style="list-style-type: none"> <li>• Approved Spill Control &amp; Secondary Containment;</li> <li>• Applicable spacing to access ancillary equipment (<i>not defined - usually 1m</i>);</li> <li>• Approved Piping System for Marine Dispensing Facilities.</li> </ul> </li> </ul> <p><b>Where an AST is Elevated Above Dispenser</b></p> <ul style="list-style-type: none"> <li>☑ Prevent gravity drainage of AST by:                             <ul style="list-style-type: none"> <li>• Installing an automatically operated valve, designed to open only when the dispenser is operated;</li> <li>• Installing an anti-gravity flow valve in the event of a pipe or hose failure;</li> <li>• Installing an internal or external liquid tight shut-off valve located at the tank.</li> </ul> </li> </ul>	<p><b>Stationary ASTs - General</b></p> <ul style="list-style-type: none"> <li>☑ Refer to <a href="#">Fuel Guidelines - Section 3</a> for <i>dispensing</i> of ASTs at Marine Facilities.</li> <li>☑ Shut-off watercraft engine <i>prior</i> to refuelling.</li> <li>☑ Remove portable containers from watercraft &amp; use spill tray while filling.</li> </ul> <p><b>Marine Fuel Dispensing Stations</b></p> <ul style="list-style-type: none"> <li>☑ Dispenser pumps shall be in a location that will prevent watercraft impact or other physical damage.</li> </ul> <p><b>Transfer Pumps</b></p> <ul style="list-style-type: none"> <li>☑ All fuel transfer pumps must be maintained and conform to CSA B346-M.</li> <li>☑ Keep transfer pumps at least 3m from property line and 1.5m from building openings.</li> </ul> <p><b>Dispensing Hose</b></p> <ul style="list-style-type: none"> <li>☑ Maximum allowable length is 4.5m;</li> <li>☑ Where a retracting mechanism is used, a maximum extended length of 6m shall be permitted;</li> <li>☑ At <i>Marine Fuel-Dispensing Stations</i>, the maximum extended length is permitted to exceed 6m (<i>with hose reel retractor</i>).</li> </ul> <p><b>Hose Nozzle Valve/ Dispensing Nozzle</b></p> <ul style="list-style-type: none"> <li>☑ Hose nozzle valve must be maintained and conform to CAN/ULC-S620.</li> <li>☑ Dispensing nozzles shall be automatic-closing <i>without</i> a hold-open latch.</li> </ul> <p><b>Supply Shut-off Valve</b></p> <ul style="list-style-type: none"> <li>☑ A readily accessible &amp; posted shut-off valve shall be provided in each pipeline at or within 7.5m of the pier to shut-off the supply from shore.</li> </ul>	<p><b>Storage &amp; Protection</b></p> <ul style="list-style-type: none"> <li>☐ Maintain sufficient distance between fuel facility and other structures &amp; floats to allow safe entry &amp; exit of vessels.</li> <li>☐ Maintain 7.5m perimeter around any fixed sources of ignition &amp; other activities not associated with refueling.</li> <li>☐ Assess floatation structures to ensure adequate buoyancy &amp; stability for all environmental conditions (i.e. tidal currents, wind, &amp; waves)</li> <li>☐ Consider a quick-release system to remove and isolate floating structures in the event of a spill or fire.</li> <li>☑ Daily visual inspections &amp; pre-work checks of fuel lines, valves &amp; connections to assess for leaks, spills, integrity, &amp; damage.</li> </ul> <p><b>Training</b></p> <ul style="list-style-type: none"> <li>☐ Training Requirements:                             <ul style="list-style-type: none"> <li>• Refueling &amp; Emergency Response Procedures &amp; Evacuation.</li> <li>• Boat &amp; Water Safety Training</li> </ul> </li> </ul> <p><b>Fire Control &amp; Spill Response</b></p> <ul style="list-style-type: none"> <li>☑ Maintain a Fire Control Plan &amp; Spill Response Plan on-site.</li> <li>☑ Maintain two or more 80-BC fire extinguishers and additional fire mitigation equipment.</li> <li>☑ Maintain containment booms and additional spill response equipment on-site based on risk assessment.</li> <li>☐ Post Fire Response &amp; Spill Response Procedures at the dispensing location.</li> </ul>

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### 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><b>General</b></p> <ul style="list-style-type: none"> <li>☑ Cylinders must be in good condition – not damaged, leaking, or outdated retesting criteria.</li> <li>☑ Only Qualified Individuals may inspect and service a pressure tank or cylinder.</li> </ul> <p><b>Stationary Tanks: Construction Standard</b></p> <ul style="list-style-type: none"> <li>■ CSA B51 Boiler, Pressure Vessel &amp; Pressure Piping Code - Propane                             <ul style="list-style-type: none"> <li>• Data Tag/ Name Plate (legible) with Canadian Registration Number</li> <li>• Serial # matches Operating Permit</li> <li>• Maximum Allowable Working Pressure clearly identified.</li> </ul> </li> </ul> <p><b>Stationary Tanks: Maintenance</b></p> <ul style="list-style-type: none"> <li>☑ Up-to-date service schedule</li> <li>☑ No leaking valves</li> <li>☑ Cover for pressure relief valve</li> </ul> <p><b>Mobile Construction Standard - Road Cylinders / Spheres / Tubes</b></p> <ul style="list-style-type: none"> <li>■ CSA B339 or 49-CFR for cylinders</li> <li>■ CSA B340 &amp; CSA B341</li> <li>■ CGSB – 43.123 for Class 2.1 &amp; 2.2</li> <li>■ CSA B342 (for UN cylinders)</li> </ul> <p><i>Highway tanks</i></p> <ul style="list-style-type: none"> <li>■ CSA B620 &amp; CSA B622</li> </ul> <p><i>Portable tanks</i></p> <ul style="list-style-type: none"> <li>■ CSA B622 &amp; CSA B625</li> </ul> <p><b>Mobile Cylinder: Maintenance</b></p> <ul style="list-style-type: none"> <li>■ Pre-work assessment: check for damage, leaks &amp; manufacture date stamp on valve collar</li> <li>■ Cylinder retesting – date stamp:                             <ul style="list-style-type: none"> <li>• Aluminum/ Steel: 10yrs</li> <li>• Fiberglass: 5yrs</li> <li>• Composite: 15yrs (max life)</li> </ul> </li> </ul>	<p><b>Storage - Stationary Propane Tanks</b></p> <ul style="list-style-type: none"> <li>☑ Protect against mechanical damage.</li> <li>☑ Valid Operating Permit for BC required.</li> <li>☑ Compliance with CSA B149.2 Propane Storage &amp; Handling Code.</li> <li>☑ <i>Do not store</i> within a secondary containment berm.</li> <li>☑ Separate storage area and LPG <u>tanks</u> from other dangerous goods by 6m</li> <li>☑ Separate LPG <u>cylinders</u> and AST fuel tanks by 3m</li> </ul> <p><b>Tank Condition</b></p> <ul style="list-style-type: none"> <li>☑ Paint coating provides full protection.</li> <li>☑ Not rusting and no visible corrosion.</li> <li>☑ Not damaged, dented, or bulging.</li> <li>☑ No fire damage or leaks.</li> </ul> <p><b>Pressure Relief Valve</b></p> <ul style="list-style-type: none"> <li>☑ Present and serviceable</li> </ul> <p><b>Tank Openings &amp; Valves</b></p> <ul style="list-style-type: none"> <li>☑ Service Valve</li> <li>☑ Fill Valve</li> <li>☑ Liquid Transfer Valve</li> <li>☑ Relief Valve</li> </ul> <p><b>Filling</b></p> <ul style="list-style-type: none"> <li>☑ Supplier refills on-site</li> <li>☑ Easy access with collision protection</li> </ul> <p><b>Position</b></p> <ul style="list-style-type: none"> <li>☑ Solid level base made from non-combustible materials (steel/ cement).</li> </ul> <p><b>Location</b></p> <ul style="list-style-type: none"> <li>☑ Adequate clearances to buildings, structures, &amp; roadways.</li> <li>☑ Clear of vegetative overgrowth 10m.</li> <li>☑ Clear any surrounding ignition sources.</li> </ul> <p><b>Labeling</b></p> <ul style="list-style-type: none"> <li>☐ WHMIS labels (supplier or workplace) are required on all storage tanks.</li> </ul>	<p><b>General</b></p> <ul style="list-style-type: none"> <li>☐ Don't require an Operating Permit</li> <li>☐ Don't have a Canadian Registration Number</li> <li>☐ Does have a TC Number with date stamp on valve collar of cylinder.</li> </ul> <p><b>Transportation Exemptions</b></p> <ul style="list-style-type: none"> <li>■ <b>General Exemption:</b> TDG Part 3 &amp; 6 do not apply to transportation on road provided:                             <ul style="list-style-type: none"> <li>• Total mass of compressed gas in one or more cylinders is ≤ 500kg;</li> <li>• Labels visible from outside the vehicle;</li> <li>• Transport less than five (5x) <i>small means of containment</i> (&lt;450L) cylinders.</li> </ul> </li> <li>■ <b>150kg (gross mass) Exemption:</b> TDG Parts 3, 4, 5, 6 &amp; 8 do not apply to the handling or transport on road provided:                             <ul style="list-style-type: none"> <li>• Max capacity of each cylinder ≤ 46L.</li> <li>• Total gross mass of compressed gas and cylinders is ≤ 150kg.</li> </ul> </li> <li>■ <b>500kg Exemption:</b> TDG Parts 3, 4 &amp; 5 do not apply to the handling or transport on road provided:                             <ul style="list-style-type: none"> <li>• Total mass ≤ 500kg of compressed gas is in one or more small means of containment that conforms to one of the Construction Standards.</li> </ul> </li> </ul> <p><b>Tank Condition</b></p> <ul style="list-style-type: none"> <li>☑ Paint coating provides full protection</li> <li>☑ Not rusting and no visible corrosion</li> <li>☑ Not damaged, dented or bulging</li> <li>☑ No fire damage or leaks</li> </ul> <p><b>Secure for Transportation</b></p> <ul style="list-style-type: none"> <li>■ Tanks must be appropriately secured to prevent shifting, swaying, damage or escape</li> </ul>	<p><b>Store &amp; Protect</b></p> <ul style="list-style-type: none"> <li>☑ Secured &amp; protected against falling and mechanical/ valve damage, &amp; storage must not interfere with operation of valve assembly.</li> <li>☑ Valves must remain closed when cylinder is empty or not in use.</li> <li>☑ Maintain 6m radius from other <i>dangerous goods</i>.</li> <li>☑ No propane within 7.5m of any exit.</li> <li>☑ Do not store propane indoors unless storage room complies with Fire Code S3.2.8.2.</li> </ul> <p><b>Training</b></p> <ul style="list-style-type: none"> <li>■ Report &amp; respond to all gas leaks of 10kg or greater (Class 2.1 &amp; 2.2)</li> <li>☐ Training Requirements:                             <ul style="list-style-type: none"> <li>• Emergency Response Procedures &amp; Evacuation Procedures</li> <li>• Propane Handling &amp; Storage.</li> <li>• Take precautions to prevent leaks and use proper PPE.</li> </ul> </li> </ul> <p><b>Fire Control and Response</b></p> <ul style="list-style-type: none"> <li>☑ Post "No Smoking" signs</li> <li>☑ Conduct Fire Response Training &amp; maintain a Fire Response Plan</li> <li>☑ Maintain two or more 80-BC fire extinguishers to handle the risks.</li> <li>☐ Post Fire &amp; Spill Response procedures at all storage &amp; dispensing facilities.</li> </ul>

## **APPENDICES**

- A** Risk Assessment Matrix: *Fuel Storage & Handling*
- B** Inspection Matrix: *Fuel Storage Containers & Tanks*
- C** BMP: *Treating Fuel Leaks, Drips & Non-Reportable Spills*
- D** BMP: *Generators, Sea-Cans & Mobile Shops*
- E** BMP: *Helicopter Field Guide*
- F** BMP: *Spill Response - Risk Manage a Successful Response*
- G** BMP: *Spill Response Plan - Implementation*
- H** BMP: *Spill Kits - Containment Equipment*
- I** BMP: *Spill Kits - Common Spill Response Products*

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Risk Assessment Matrix: <i>Fuel Storage and Handling</i>				Appendix A
For Land Based Fuel Storage & Dispensing Facilities or Caches at Remote Construction Sites				
Risk Identification	HIGH RISK	MEDIUM RISK	LOW RISK	Assigned Numerical Value*
Numerical Value	3	2	1	
<b>Environmental Factors</b>				
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	
<b>Operational Factors</b>				
Site description	Isolated access: – no road access: <i>fly-in</i> only; – barge only access	Remote access: – 3-5hrs from town/ Hwy 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	
<b>Prevention &amp; Preparedness Factors</b>				
Distance or access to the respond to an incident	Requires helicopter & weather dependent	More than a day to respond with additional equipment	Same day response time with additional equipment	
Additional <i>Spill Control measures implemented</i>	– No <i>Spill Control</i> for the storage area or the dispensing area – No Oil/Water Separator	– <i>Spill Control</i> (<1000L) for the Dispensing area only – Use Activated Carbon O/W Separator Disposable Filters	– <i>Spill Control</i> (>1000L) for the Storage & Dispensing areas – 1000L O/W Separator with Coalescing Plates	
Preparedness and Response Training: <i>Fuel Management &amp; Spill Response</i>	No one has a <i>Spill Response</i> or <i>Fuel Management</i> Training Certificate	No one has a <u>valid</u> <i>Spill Response</i> or <i>Fuel Management</i> Training Certificate	Everyone who handles fuel has a <u>valid</u> <i>Spill Response &amp; Fuel Management</i> Training Certificate	
<b>Risk Value</b>	<b>*Add the Assigned Numerical Values:</b>			

### CONTROL MEASURE RECOMMENDATIONS

Numerical Value	Risk Ranking	Control Measures
> 18	High Risk	<ul style="list-style-type: none"> <li><i>Immediately</i> Identify &amp; Implement Additional Control Measures to Reduce/ Manage the <i>High-Risk</i> Aspects Identified</li> </ul>
12-18	Medium Risk	<ul style="list-style-type: none"> <li><i>Consider</i> Additional Control Measures to Reduce the <i>Medium Risk</i> Aspects. Reassess the <i>High-Risk</i> Aspects Identified</li> </ul>
< 12	Low Risk	<ul style="list-style-type: none"> <li><i>Due Diligence</i> Achieved - No Additional Control Measures are Warranted Based on <i>Low-Risk</i> Assessment</li> </ul>

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

Continued...

## 2024 Fuel Guidelines (13<sup>th</sup> Edition)

<b>Inspection Matrix: IBCs, Portable Containers &amp; Mobile Tank</b>					Appendix B
<b>Containers &amp; Tanks</b>	<b>External Inspection</b>	<b>Internal Inspection</b>	<b>Leak Testing</b>	<b>Pressure, Hydro or Pneumatic</b>	<b>General Information</b>
<b>Bladder Drums &amp; Tanks</b> 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"> <li>Typical lifespan according to manufacture is 7-10 years, however this is not a Standard.</li> <li>There is no engineering inspection schedule for bladder tanks.</li> </ul>
<b>Mobile IBCs - Intermediate Bulk Containers</b> ≤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 <b>on a means of transport</b> . All the openings of these IBCs are within the vapour space only.
<b>Intermediate Bulk Containers other than Mobile IBCs</b> (Lightweight IBC ≤1,000L) <b>caged plastic tote</b> Standard: CGSB 43.146 (UN31HA1)	30-months from date of manufacture <i>One-time use only. Filled once &amp; 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.
<b>TC 44 &amp; UN Portable Tanks</b> (>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
<b>TC 306/ 406 Highway Tanks</b> As per CSA B620 Standard	1-year	5-years	1-year	5-years	TC Highway Tanks must be inspected by a TC Registered Facility

<b>Inspection Matrix: ASTs &amp; Bladder Tanks</b>			Appendix B
<b>Stationary Tanks</b>	<b>Daily &amp; Weekly Inspections:</b>	<b>Annual Inspections:</b>	<b>General</b>
<b>Double Walled Tank Inspections:</b> a. BC Fire Code b. CCME Code of Practice for Storage Tank Systems Containing Petroleum & Allied Products; and c. 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: ✓ Check for leaks, drips and spills: <input checked="" type="checkbox"/> Fuel hoses and fittings; <input checked="" type="checkbox"/> Pipe connections & flanges; <input checked="" type="checkbox"/> Pumps & nozzles; <input checked="" type="checkbox"/> Tank & valves.  <u>Weekly in-service visual inspections:</u> ✓ Check vacuum monitor gauge is okay: <input checked="" type="checkbox"/> Secondary Containment; ✓ Check for product or water accumulation in: <input checked="" type="checkbox"/> Spill control tray & containment systems.	Visual in-service leak-detection & monitoring will ensure the following (Document Annual Inspection): ✓ 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.	<b>BC Fire Code:</b> <b>S. 4.4 Leak Detection</b> Double-walled storage tanks, which have an interstitial space that allows for monitoring using high-tech or low-tech methods.  <i>Note: If a leak is suspected, the AST inspection and performance testing needs to be performed by a Qualified Professional</i>
<b>Stationary Bladder Tanks</b> 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

**BMP: Treating Fuel Leaks, Drips & Non-Reportable Spills<sup>©</sup>**

**Appendix C**

**Best Management Practices\* (BMP):** Outlines the procedures for treating small volumes of hydrocarbon waste material.

**Specifications for this BMP:**

- The contamination is petroleum hydrocarbon based (synthetic oil will not bio-remediate)
- The source of the petroleum hydrocarbon contamination is from:
  1. Non-reportable spills to land including: Class 3 *Spills* less than (<)100L / Leaks / Drips / Hydrocarbon Stains
  2. 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:
  1. The depth of contamination does not exceed 0.5m below surface grade
  2. The surface staining is less than 3m in diameter
  3. The volume of contaminated media is less than (<) 5m<sup>3</sup>

**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/ 1m<sup>3</sup> 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/ 1m<sup>3</sup> 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	<i>In-situ</i> Bioremediation Dry Product <sup>1</sup>	<i>In-situ</i> Bioremediation Liquid Product <sup>2</sup>	<i>Ex-situ</i> 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	

<sup>1</sup>Oil Gator® or equivalent & <sup>2</sup>Micro-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.

**BMP: Generators, Sea-Cans & Mobile Shops**

**Appendix D**

<u>Diesel Powered Generators</u>	<u>Intermodal Shipping Containers (Sea-Cans)</u>	<u>Fuel Storage &amp; Dispensing Inside Shops<sup>1</sup></u>
<p><b>Best Management Practices:</b></p> <p><b>Sources and Areas of Concern</b></p> <ul style="list-style-type: none"> <li>Fuel filter on diesel powered generators have been the cause of some major spills:                             <ul style="list-style-type: none"> <li>Faulty filter base caused ongoing leak.</li> <li>Over-tightened filter caused base to leak.</li> <li>Connections are not ULC approved or leaking.</li> </ul> </li> </ul> <p><b>Spill Control</b></p> <ul style="list-style-type: none"> <li>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.</li> <li>Ensure that the generator facility has a containment tray or an internal perimeter lip to prevent a spill from exiting the facility.</li> <li>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)</li> </ul> <p><b>Checklist</b></p> <ul style="list-style-type: none"> <li>Conduct daily visual assessment and look for visual staining, leaks, drips and spills around:                             <ul style="list-style-type: none"> <li>Spill control containment under gen-set,</li> <li>Secondary containment tray of facility,</li> <li>All fuel connections located inside and outside of the generator unit,</li> <li>Fuel filters and fuel lines inside and outside of the generator facility.</li> </ul> </li> <li>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.</li> </ul>	<p><b>Best Management Practices:</b></p> <p><b>Safety Concern</b></p> <ul style="list-style-type: none"> <li>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).</li> <li>Sea-Cans were not properly vented and vapour accumulation inside reached lower-explosive-levels which ignited.</li> </ul> <p><b>Best Management Practices</b></p> <ul style="list-style-type: none"> <li>Review OH&amp;S <a href="#">Hazard Alert 2012-04</a> for background on the risks and potential deadly scenario of not addressing the safety concerns.</li> <li>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)</li> <li>Intermodal Shipping Containers (Sea-Cans) used to store <i>dangerous goods</i> <u>must</u> be vented in accordance with Occupational Health &amp; Safety Recommendations                             <ul style="list-style-type: none"> <li>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).</li> </ul> </li> </ul> <p><b>Spill Control</b></p> <ul style="list-style-type: none"> <li>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.</li> <li>Install a containment tray or “lip” inside the Sea-Can floor to contain a spill from the storage cannisters within the unit.</li> </ul>	<p><b>Fire Code Requirements &amp; BMPs:</b></p> <p><b>Storing &amp; dispensing <i>flammable</i> &amp; <i>combustible</i> liquids</b></p> <ul style="list-style-type: none"> <li>When storing and dispensing up to 1500L:                             <ul style="list-style-type: none"> <li>Requires a 1hr Fire Separation around the room</li> <li>Requires an average storage density of 100L/m<sup>2</sup></li> </ul> </li> <li>When storing and dispensing up to 10,000L:                             <ul style="list-style-type: none"> <li>Requires a 2hr Fire Separation around the room</li> <li>Requires an average storage density of 200L/m<sup>2</sup></li> </ul> </li> <li>For maximum indoor storage quantities of <i>flammable</i> &amp; <i>combustible</i> liquids see National or Provincial Fire Codes S4.2.7.5</li> <li>Storage rooms shall be liquid-tight where the walls join the floor. (FC S4.2.9.1)</li> <li>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.</li> <li>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)</li> <li>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 IA (gasoline).</li> </ul> <p><b>Recommendations</b></p> <ul style="list-style-type: none"> <li>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.</li> </ul> <p><sup>1</sup>Fire Code Requirements. See National and Provincial Fire Code Section 4.2.7 Industrial Occupancy &amp; Section 4.2.9 Rooms for Container Storage and Dispensing</p>

**Best Management Practices: Helicopter Field Guide** **Appendix E**

<u>Container Type &amp; Storage</u> Drums, Bladders, Mobile Tanks, & ASTs	<u>Field Dispensing</u> Remote fuel cache from portable tanks or drums	<u>Transportation</u> Suspended from under a helicopter
<p><b>Small Containers, Mobile Tanks &amp; Stationary ASTs used for aviation fuel</b></p> <ul style="list-style-type: none"> <li>Refer to Fuel Guidelines – Sections 1-3 for acceptable means of containment.</li> <li>Pre-work: visually assess the integrity of the storage drum/tank and dispensing equipment. Look for leaks, drips or damaged/ worn equipment.</li> </ul> <p><b>Storing and Securing</b></p> <ul style="list-style-type: none"> <li>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.</li> <li>Empty drums should be marked and stored a safe distance from the heli-pad. Remove all unwanted &amp; unusable or empty drums from remote fuel caches. Check date on drum and remove any drum that is two-years old or older.</li> </ul> <p><b>Spill Control</b></p> <ul style="list-style-type: none"> <li>Secondary containment is not required for drums and containers with an individual capacity of less than 230L.</li> <li>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.</li> </ul> <p><b>AVIATION FUEL: Jet A-1 Characteristics</b></p> <ul style="list-style-type: none"> <li>TDG Class 3 P.G.III <i>Flammable Liquids</i></li> <li>UN 1863; Flash point of Jet A is +38°C</li> <li>NFPA (Fire Code) Class II</li> <li>Static electric charge &amp; venting are characteristics of aviation fuel that need to be assessed and controlled.</li> </ul> <p><b>Heli-pads</b> Keep heli-pads free of drums. If possible, store drums adjacent or under landing pad for easy access and protection</p>	<p><b>Acceptable Equipment:</b></p> <ul style="list-style-type: none"> <li><b>PPE:</b> eye protection, Nitrile gloves; <b>Hand-Tools:</b> bung wrench, rubber mallet, drum marker; <b>Fuel Transfer:</b> fuel pump with spare parts &amp; repair kit, filters, stand-pipe &amp; collar to set the depth of the pipe, grounding cables; <b>Spill Kit:</b> absorbent pads, peat moss (i.e. Sphag Sorb), plug &amp; patch kit (wax rings or bentonite clay), waste disposal bags with zap-straps, portable spill trays (200L capacity).</li> </ul> <p><b>Refueling Procedure</b> (WorkSafeBC &amp; Transport Canada)</p> <ul style="list-style-type: none"> <li>Conduct pre-work assessment prior to refueling. Check that the fuel in the drum is the correct product (assess visually, check odor &amp; weight).</li> <li>If in-doubt, don't refuel your helicopter &amp; mark the drum with an "X".</li> <li>Ensure fuel pump is rated for aviation fuel and is intrinsically safe.</li> <li>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.</li> <li>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.</li> <li>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.</li> <li>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.</li> <li>No smoking or spark producing activity shall be permitted within 15.2m (50') of fuel storage tanks or refuelling operations.</li> <li>The helicopter shall be electrically bonded to the bulk fuel tank, fuel canister, drum or vehicle.</li> <li>At least one 20-B:C minimum rated portable fire extinguisher shall be in the immediate area.</li> <li>Transferring fuel from drums into ASTs that belong to your clients:             <ul style="list-style-type: none"> <li>Pilots must be trained &amp; qualified to transfer fuel into ASTs;</li> <li>The owner of the AST must supervise the delivery or equip the AST with a ULC-S661 overfill devise. FC4.3.1.8</li> <li>Check your insurance coverage prior to transferring fuel from a mobile tank into an AST belonging to clients.</li> </ul> </li> </ul>	<p><b>Helicopter Pilot</b></p> <ul style="list-style-type: none"> <li>The helicopter is used to transport fuel, so ensure that your pilots have a valid TDG Certificate.</li> <li>Ensure the means of containment is to an acceptable Standard</li> <li>Pilots must be Air Operator qualified for carriage of external loads &amp; remote electric hook operation.</li> <li>Conduct a Risk Assessment &amp; Safety Briefing with ground crew including radio &amp; hand-signal communication prior to transporting fuel by longline.</li> <li>Only persons essential to the aerial work are permitted in the helicopter while conducting longline operation.</li> <li>Hover hook-ups shall only be performed by trained crew.</li> <li>Ground crew must wear appropriate PPE &amp; maintain safe distances of 15m from the load, where applicable.</li> <li>Ground crew must have a predetermined escape route.</li> </ul> <p><b>Longline Cargo Transport</b></p> <ul style="list-style-type: none"> <li>Follow standard WorkSafeBC Procedures for slinging:             <ul style="list-style-type: none"> <li>Daily inspect slings, hooks, longlines &amp; safe working load prior to fuel transport.</li> <li>Slings shall not be longer than 1/3 length of longline &amp; of the type that does not allow to rebound into rotors.</li> <li><i>Recommended Practice</i> – Due Diligence Approach: Use poly over-pack drums when slinging full drums of fuel.</li> </ul> </li> </ul> <p><b>Planning</b></p> <ul style="list-style-type: none"> <li>Pickup and drop-off sites</li> <li>Refueling steel drums or bladder drums Procedures</li> <li>Prior to transferring fuel into tanks that belong to clients:             <ul style="list-style-type: none"> <li>Obtain written approval from client including a written procedures prepared by the owner of the AST;</li> <li>Ensure your insurance coverage includes refueling ASTs, and environmental contamination from spills.</li> </ul> </li> </ul> <p><u>Reference Materials:</u></p> <ul style="list-style-type: none"> <li>Transport Canada: Fuel Drum Etiquette &amp; TDG;</li> <li>BC Fire Code</li> <li>WorkSafeBC: Safe Work Practices for Helicopter Operations in the Forest Industry;</li> <li>Helicopter Association of Canada;</li> <li>HeliCat Canada Association.</li> </ul>

## 2024 Fuel Guidelines (13<sup>th</sup> Edition)

<b>Best Management Practices: Risk Manage A Successful Response</b>			<b>Appendix F</b>
<b>Spill Assessment</b>	<b>HIGH RISK</b>	<b>MEDIUM RISK</b>	<b>LOW RISK</b>
<b>Product Identification</b> – Shipping Name; UN #, TDG Class	Mixed Load of TDG Products; Large Means of Containment (>450L)	Single TDG Product; Small Means of Containment (≤ 450L)	Non TDG Product (Not Specified) Non-Deleterious Product
<b>Reported Volume</b> – Estimated volume of spill?	– TDG Reportable Quantity – Entered or may enter a water course	– TDG Reportable Quantity – Did not enter a water course but has the potential to enter a water course	– Not a TDG Reportable Quantity – Did not enter a water course and is not likely to enter a water course
<b>Maximum Potential Volume</b> – Capacity of container or tank?	Greater than (>) 4500L	Less than (<) 4500L	Less than (<) 100L
<b>Migratory Pathway &amp; Impact</b> – Where is the spill going? – What are the potential impacts?	– Migrating towards a water course – Is having an adverse impact on the environment	– Migrating away from water course – Has the potential to create an adverse impact on the environment	– Contained and not migrating – Has no adverse impact on the environment
<b>Environmental Assessment – LAND</b>	<b>HIGH RISK</b>	<b>MEDIUM RISK</b>	<b>LOW RISK</b>
<b>Land Use</b>	Agriculture/ Residential	Park/ Crown Land/ Wildlands	Commercial/ Industrial
<b>Soil characteristics</b>	Porous or unknown – coble/ gravel	Semi-porous – silt/ sand	Non-porous – clay/ bedrock
<b>Terrain slope</b>	> 6% slope	2%-6% slope	< 2% slope
<b>Environmental Assessment – WATER</b>	<b>HIGH RISK</b>	<b>MEDIUM RISK</b>	<b>LOW RISK</b>
<b>Water Courses/ Receiving Environment</b>	Drinking Water/ Aquatic Life	Irrigation/ Livestock	Non-Classified Drainage System
<b>Aquatic Environment</b>	– Open Water Course – Flowing – Groundwater – Flowing	– Confined Water Course – Flowing – Groundwater – Not Flowing	– Confined Water Course – <i>Not</i> Flowing – Ephemeral Pond
<b>Riparian Stream Classification</b>	A Fish Bearing Stream; or In a Community Watershed: – Stream width >20m = <b>S1</b> – Stream width >5m-20m = <b>S2</b>	Fish Bearing Stream; or In a Community Watershed: – Stream width 1.5-5m = <b>S3</b> – Stream width <1.5m = <b>S4</b>	Not Fish Bearing Stream; or Not in a Community Watershed – Stream width >3m = <b>S5</b> – Stream width <3m = <b>S6</b>
<b>Safety Assessment</b>	<b>HIGH RISK</b>	<b>MEDIUM RISK</b>	<b>LOW RISK</b>
<b>Chemical Vapours &amp; Flashpoints Involving Any of the Nine Classes of TDG Products</b>	– Chemical Vapours – <i>Any</i> or <i>Unknown</i> Flashpoint – ER Haz-Mat Required to Respond	– Limited Chemical Exposure – Flashpoint < 23°C – Flashpoint 23°C to 60°C	– No Chemical Products Involved – Flashpoint > 60°C
<b>Physical Impacts</b>	– Incident Not Stable – JHA for Unknown Conditions	– Incident Stable – JHA for Responding	– No Physical Stable Issues – Standard JHA established
<b>Environmental Conditions Impacting the Response</b>	– Seasonal Condition Impacting Response – Terrain & Water Safety Concerns	– Possible Seasonal Condition, Terrain, or Water Safety Concerns Impacting Response: <i>Requires Re-Assessment</i>	– <i>No</i> Seasonal Condition, Terrain, or Water Safety Concerns Impacting Response
<b>Community &amp; Cultural Impacts: Site Security, Controlled Access, &amp; Communication</b>	– <i>Imminent</i> Risk to Public Safety &/or Cultural Values – Daily Progress Reports <i>Required</i>	– <i>Potential</i> Risk: Public Safety or Cultural Values – Daily Progress Reports <i>Recommended</i>	– <i>No</i> Risk to Public Safety or Cultural Values – Daily Progress Reports not required

## Best Management Practices: *Implementing a Spill Response Plan\**

## Appendix G

### Assessment

**Spill Assessment:** Product ID; Spilled Volume; Potential Volume; Migratory Pathways

**Safety Assessment:** Chemical Characteristics; Physical Aspects; Environment (Field & Indoor); Human Health & Safety

**Environmental Assessment:** Aquatic Habitat; Terrestrial Habitat, Flora; Fauna; Land Use & Infrastructure; Human Health & Community Impact

### Plan & Mobile

**Response Plan:** Land Based Spills; Confined & Unconfined Water Based Spills; Spills to Infrastructure

**Safety Plan:** Job Hazard Assessments: Chemical Hazards; Physical Hazards; Work Environment Hazards; and Human Health & Safety

**Environmental Plan:** Characterize & Prioritize the Environment - Aquatic & Terrestrial Habitats; Land Use & Infrastructure; Human & Cultural

**Attention:** Make sure all applicable Permits, Approvals, or Exemptions have been obtained prior to doing any in-stream work, including foreshore removal of contamination.

### Response Action

**Spill – Action (LAND):** Recovery Trench; Interceptor Trench; Diversion Trench

**Spill – Action (WATER):** Tarp Containment™; Culvert Block Containment™; Underflow Containment™; Watergate® (MegaSecure); Water Barrier® (AquaDam)

**Safety - Action:** Assess Risks; Review & Implement Safety Plan; Review Roles & Responsibilities; Site Security; Safety Checklist

**Environment - Action:** Soil, Surface Water, & Groundwater Sampling; Archeological & Cultural Impacts; Restoration Options

### End-of-Spill Closure

**Closure Objectives:** Outline Goals & Parameters to Establish & Meet End-of-Spill Objectives

**Daily Progress Reports:** Daily Summary of Goals, Objectives, & Progress; Photo Documentation; Summary of Sample Results; Safety Summary

**Closure Report:** Summary of Spill Incident, Environmental Impacts, Consultation & Objectives, Response Actions, Clean up, and Restoration. Where applicable: Lessons Learned, Risk Management Objectives, Preparedness & Prevention Measures.

\*2021 Spill Response Guidelines (1<sup>st</sup> Edition): [www.fueltraining.ca/guidelines](http://www.fueltraining.ca/guidelines)

**Best Management Practices: Spill Containment Equipment - LAND**

**Appendix H**

**Recovery-Interceptor-Diversion TRENCHES™**

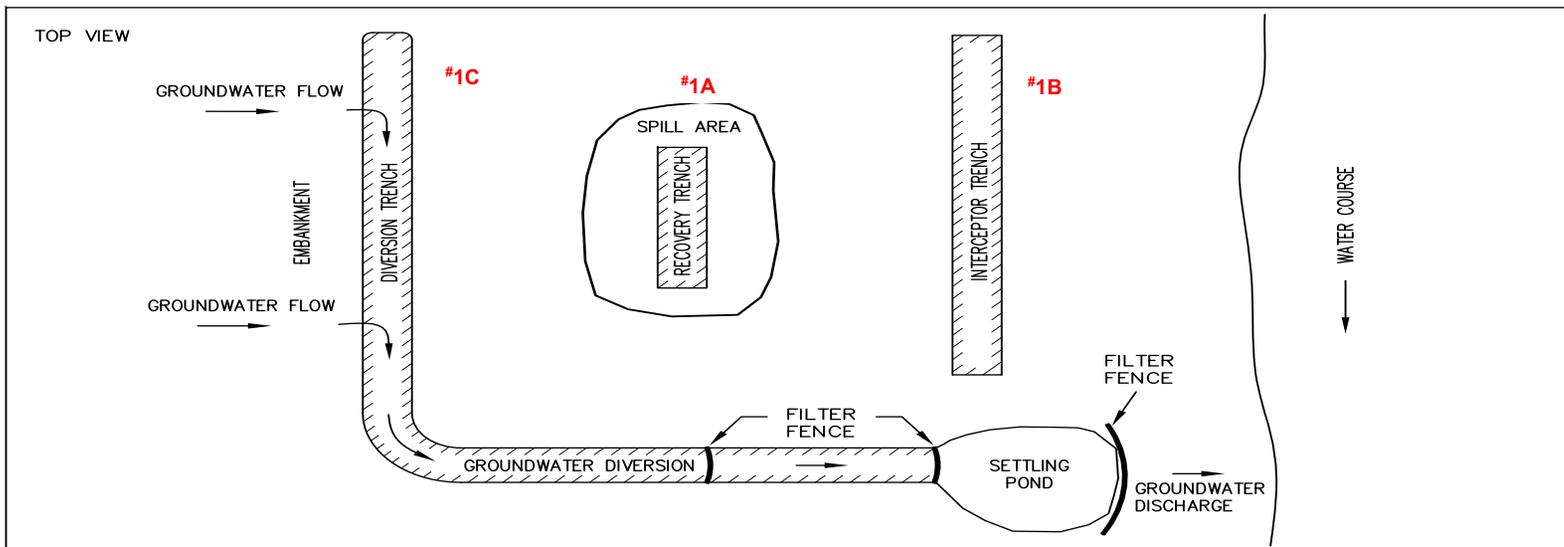
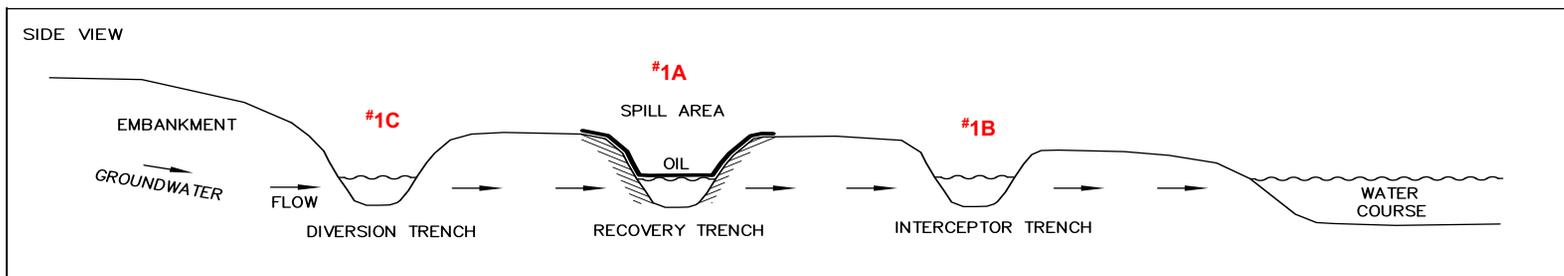
**Objective:** Containment of a spill on land.

**Equipment:** An excavator required to dig trenches. Consider using a vac-truck to continually pump the product and contaminated groundwater from the recovery trench. This will remove the contamination but also lower the water table within the trench and mitigate further migration from source.

**Method:** **#1A.** Begin at the spill area. Dig a recovery trench or pit through the centre of the spill and allow product to accumulate within the excavation.

**#1B.** To ensure that the spill does not migrate into a water course, dig an interceptor trench downgradient of the recovery trench or spill area. This will be your monitoring point to confirm that product has not migrating beyond the spill area.

**#1C.** If groundwater movement is evident and product is found in the interceptor trench, consider digging a diversion trench to divert clean groundwater around the spill area.



**Best Management Practices: Spill Containment Equipment - WATER Appendix H**

**Tarp Containment™**

**Objective:** Surface water control within a confined water course with low flows. Stream width typically less than (<) 5m.

**Materials:** A tarp that is large enough to span the width of the water course. A crossbeam that is long enough to span water course (i.e. 2x4 lumber). Have enough tarps and lumber to install at least three tarp-containments in series.

**Method:** Lay the tarp out and wrap it around the crossbeam (i.e. 2x4 lumber). Place the crossbeam and tarp across the water course. Keep the tail-end of tarp above the water to keep it from filling and sinking.

Place the crossbeam at 90° to the water course and high enough up the embankment so water cannot overflow the crossbeam (at least 2').

Sink the tarp and place a few rocks along the leading edge.

Monitor and recover product within the containment.

As surface water control is achieved, the surface product will disperse upstream.

Use an absorbent boom to sweep and corral the spill within the containment.

**Culvert Block™**

**Objective:** Containment & recover a spill before it goes through the culvert. Surface water control on the upstream side of the culvert. This containment will also prevent the culvert from getting contaminated with hydrocarbons.

**Materials:** A piece of plywood large enough to cover the front of the culvert. The larger the culvert diameter (typically 1' to 3'), the thicker the plywood (typically 1/2" to 1"). Use a tarp or poly to help seal the plywood & culvert.

**Method:** **Attention: In high-flow waters culverts can be extremely dangerous. Always assess the risk before attempting to block a culvert!** Remove any large rocks that might prevent the plywood from being flush with the culvert. Place the plywood in front of the culvert so that it seals the entire culvert, then place the tarp over the front of the plywood to seal any gaps.

Once surface water control is obtained use a sandbag to hold the plywood in place. If water level rises too high, adjust the tarp and plywood to allow subsurface water to enter the culvert.

Place a deflection (2x4 lumber) across the water course and line with absorbent booms. Use additional absorbent booms to sweep and corral the oil for recovery.

**Underflow Containment™**

**Objective:** To control the surface water flow while allowing subsurface flow through a series of PVC pipes. Primarily used in surface water drainage ditches along roads, that are not fish-bearing.

**Materials:** 4" PVC pipes with elbows or T attachments; Sandbags filled with pea-gravel and a roll of poly or a tarp.

**Method:** Place the sandbags end-to-end the width of the drainage ditch. Place PVC pipes and cover with another row of sandbags.

Place elbows or T attachments onto end-of-pipe (upstream end) to ensure that the subsurface water enters the pipe and not the oil.

If more than two layers of sandbags are required, consider a base with two side-by-side sandbags.

**Long-Term Use:** Consider placing a tarp or poly down and folding it over each layer to seal the sandbags and minimize the leakage. Use Gorilla Tape® to seal the tarp to the PVC pipe.

If the ditch is shallow with little or no gradient, consider digging a sump on the upstream side (not shown). This will allow the pipe to extend down into the sump.

**Best Management Practices: Spill Containment Equipment**

**Appendix H**

**Watergate®** (MegaSecur)

**Objective:** To control the surface water flow while allowing subsurface flow through an engineered barrier system with below-water flap-valves.

**Materials:** Self-contained structure with an integrated baffle system that allow the barrier to maintain its shape while creating a dam to contain the flow in a stream.

**Optimum Use:** The Watergate® is most effective in streams that are between 5m and 20m in width. If the stream width is <5m consider using a Tarp Containment™.

**Sizing:** The Watergate® comes in several different lengths and multiple height options. Conduct an assessment of the streams in your area prior to purchasing a Watergate® to ensure that you have a large enough size that will be effective in containing the stream flow. The Watergate® has Velcro “tongue-and-groove” connections at either ends so that multiple units (of the same height) can be added together.

**Deployment Method:** The Watergate® is relatively straight forward to deploy. Place the rolled-up barrier so that the diagram displayed lines-up with the up-stream/ down-stream flow of the stream. Unroll the barrier so that the ends of the barrier go up both embankments. Stand on the upstream base of the barrier while raising the upper leading edge. Water will immediately fill the barrier and control the flow. Open bottom Velcro flap-valves to allow subsurface water to flow through the barrier.

**AquaDam®** (Layfield) **or** **Coffer Dam®** (MegaSecur)

**Objective:** To create a barrier between the contaminated spilled product along the foreshore of a water course.

**Materials:** Self-contained tubular structure that is filled with water. The tubular structure is typically 30m-40m long and 2m-3m in width.

**Optimum Use:** The dam can be deployed so that water flow of the stream is not interrupted, while containing the contaminant within the dam structure.

**Method:** The dam is usually rolled out along the foreshore and secured. The dam is filled with uncontaminated water from the upstream location. The weight of the water within the dam “seals” the dam to the substrate. This creates an effective barrier between the foreshore contamination and the water course on the other side of the barrier. Ensure applicable Permits, Approvals, or Exemptions have been obtained and WQ monitoring has been addressed prior to conducting any foreshore clean-up, excavation, and/or restoration.

**Best Management Practices: Common Spill Response Products**

**Appendix I**

**Sphag Sorb®**

**Spills:** Diesel, Gasoline, Solvents, Antifreeze, and all types of Oils (including waste oils, and hydrocarbon/ synthetic oils),  
**Effective On:** Surface Water, Ponds, & Puddles. Also effective in absorbing free product.  
**Product Characteristics:** This product is a kiln-dried organic peat moss, consists of microscopic holes in the peat that create a “capillary action”, allowing the liquid product to absorb into the peat. Once absorbed, it will not “leach” back out of the peat.  
**Use:** Direct contact with the spilled product or surface sheen. Allow 5-10 minutes for absorption. Agitate or flip the peat over to ensure the peat is in direct contact with the spilled product.  
**Clean up:** On water – corral with booms and remove with snow shovel. On land – use a coarse broom and snow-shovel.  
**Disposal:** Can be mixed with hydrocarbon contaminated soil bin. *Note:* sphagnum peat does not burn.  
**Avoid:** Strong acids & oxidizers - like battery acid or organic peroxide as these products may react with the organic peat moss.

**Micro-Blaze®**

**Spills:** Related to petroleum hydrocarbon products only.  
**Effective On:** Cleaning and removing hydrocarbon sheen off equipment, spill trays, tanks, large rocks, and cement pads.  
**Characteristics:** Micro-Blaze is a diluted “microbial soap” or surfactant, that breaks down hydrocarbons into a dissolved form.  
**Use:** Spray diluted Micro-Blaze (10% concentrate mixed with 90% water) directly on the sheen & wait 5 min. then wipe clean.  
**Clean up:** Use a universal/ synthetic spill pad (as the hydrocarbon has been diluted with 90% water) to clean surfaces.  
**Disposal:** Contaminated pads can be disposed of with hydrocarbon contaminated solids bin.  
**Avoid:** Micro-Blaze is a deleterious substance and should not be used around water courses. Do not use in oil/water separators. *Note:* Micro-Blaze also produces a *non-deleterious* product.

**Oil Gator®**

**Spills:** Related to petroleum hydrocarbon contaminated soils.  
**Effective In:** Treating hydrocarbon contaminated soil either *in-situ* or *ex-situ*.  
**Characteristics:** *Oil Gator* contains a high concentration of plant-based bacteria that consume hydrocarbons as a “food” source.  
**Use:** Mix *Oil Gator* directly with hydrocarbon contaminated soil. The bacteria require oxygen, so aeration may be required for depths greater than 0.3m. Treatment usually takes 12-weeks and may require a second application during that period.  
**Clean up:** Once the hydrocarbons have been consumed, the bacteria are replaced with other natural occurring soil bacteria.  
**Disposal:** No disposal required. Small stains will disappear. Larger stockpiles can be used for landfill cover or reclamation.  
**Avoid:** *Oil Gator* is not very effective on water or in highly water saturated soil.

*Continued...*

**Best Management Practices: Common Spill Response Products****Appendix I****Spill Pads for Absorbing Oil**

**Spills:** Only used for petroleum hydrocarbon spills. Typical oil pad colors include: white, blue, or green.

**Effective On:** Free product and must be at least as thick as the thickness of a spill pad or thicker.

**Characteristics:** Most hydrocarbon spill pads are made from polypropylene – an oil-based product.

**Use:** Only use when there is enough pure product to absorb into the pad – *product must be at least the thickness of the pad.*

**Clean up:** On water or land – corral the spill using sorbent booms so it's at least the thickness of the pad prior to using the pad.

**Storage & Disposal:** Saturated pads can be heavy and produce a lot of vapours. Double bag in heavy poly bags, remove all air and zap-strap. Place in lined waste bins.

**Avoid:** Synthetic products and chemicals. Oil pads cannot remove a hydrocarbon sheen on water! Use Sphag Sorb instead.

**Spill Pads for Absorbing Chemicals**

**Spills:** Used to absorb common chemical products like: antifreeze, battery acid, solvents, and contaminated water. Typical chemical pad colors include: black/grey, yellow, or red/pink.

**Effective On:** Chemical spills with enough free-product to absorb into the pad. As a general rule, only use chemical pads when there is free product that can be absorbed into the pad. Once a chemical spill is dissolved in the water or mixed in soil, chemical pads are no longer effective.

**Characteristics:** Made from a synthetic material that will absorb most chemicals including water soluble products.

**Use:** Place spill pads on the free products to allow the chemical to absorb into the pad. The pads can also be used to wipe down equipment and spill trays that were sprayed with *Micro-Blaze*.

**Clean up:** Chemical pads are used to absorb free-product or use with *Micro-Blaze* to wipe down dissolved hydrocarbon stains.

**Disposal:** Should be placed in a plastic lined waste bin with compatible products.

**Avoid:** Do not use chemical pads on hydrocarbon spills and spills to a water course.

**Absorbent Booms for Skimming Oil**

**Spills:** Related to petroleum hydrocarbons on surface water.

**Effective In:** Skimming and corralling the hydrocarbons within a containment boom system or confined water course.

**Characteristics:** Most hydrocarbon absorbent booms are made from polypropylene – an oil-based product.

**Use:** Place the absorbent boom within the containment boom and slowly skim the surface oil together by pulling the boom towards the foreshore. The objective is to skim the oil until the product is at least the thickness of an oil absorbent pad.

**Clean up:** Once the oil slick is the thickness of an oil pad, use oil pads to absorb and remove the free product.

**Storage & Disposal:** Saturated booms can be heavy and produce a lot of vapours. Double bag in heavy poly bags, remove all air and zap-strap. Place in lined waste bins.

**Avoid:** Synthetic products and chemicals. Oil booms cannot remove a hydrocarbon sheen on water! Use Sphag Sorb instead.

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