

**MONITORING and LEAK DETECTION  
of STORAGE TANK SYSTEMS  
for Petroleum Products and Allied Petroleum Products  
for Aboveground Storage Tank Systems 5000 Litres or Larger  
and Underground Storage Tank Systems**

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**Requirement**

For petroleum storage facilities with aboveground tanks 5000L or greater, and/or petroleum storage facilities with underground tanks, Manitoba Environment, Climate and Parks requires that all existing and newly construct aboveground and underground storage tank systems be *monitored and tested* in accordance with the tables provided as appropriate for each type of system.

In addition, records shall be maintained and stored in accordance with Part 6 of Manitoba Regulation MR 188/2001 *Storage and Handling of Petroleum Products and Allied Products Regulation* (Petroleum Storage Regulation) and Section 8.11 of *CCME Environmental Code of Practice for Aboveground and Underground Storage Tank Systems Containing Petroleum and Allied Petroleum Products, 2003* (CCME Code of Practice).

**Definition**

*Leak detection* means a device or method that is capable of detecting *leaks* in a *storage tank system*.

**Background**

Manitoba Regulation MR 188/2001 *Storage and Handling of Petroleum Products and Allied Products Regulation* (Petroleum Storage Regulation) pursuant to *The Dangerous Goods Handling and Transportation Act* specifies standards for *monitoring and leak detection* of storage tank systems in accordance with *CCME Environmental Code of Practice for Aboveground and Underground Storage Tank Systems Containing Petroleum and Allied Petroleum Products, 2003* (CCME Code of Practice):

- **For existing petroleum storage facilities** a schedule of *leak detection and monitoring methods* are tabled in the following pages to assist facility owners and licensed petroleum technicians in determining appropriate in-service monitoring methods and periodic leak detection tests.
- **For new petroleum storage facilities** a schedule of *final installation leak detection* are tabled in the following pages. Please note that if the field under 'Final Installation Leak Detection' is blank, new installations of this type of containment are not permitted.

### **Additional Information and Reporting**

A person who is responsible for or who has custody and control of a contaminant involved in an environmental accident shall immediately after the occurrence of the environmental accident report the accident by calling 204-944-4888.

In the event a leak is discovered, Manitoba Environment, Climate and Parks must be notified immediately, in accordance with Section 38 Part 7 of the Petroleum Storage Regulation, and Sentences 8.3.4(1) and 8.3.4(2) of the CCME Code of Practice.

The contents of this document summarize leak detection requirements set out in M.R.188/2001 and the codes and standards adopted therein. Should any discrepancy between the requirements of this document and the requirements in M.R.188/2001 be found, the requirements of M.R.188/2001 shall prevail.

### **Useful Links**

Manitoba Environment, Climate and Parks - Petroleum Storage Program:

<http://www.gov.mb.ca/sd/envprograms/psp/index.html>

Manitoba Environment, Climate and Parks - Emergency Response Program:

[https://www.gov.mb.ca/sd/environment\\_and\\_biodiversity/petroleum\\_storage/emergency\\_response.html](https://www.gov.mb.ca/sd/environment_and_biodiversity/petroleum_storage/emergency_response.html)

Canadian Council of the Ministers of the Environment:

<http://www.ccme.ca/publications/>

### **For more information, please contact:**

#### **Manitoba Environment, Climate and Parks**

Environmental Compliance and Enforcement

Petroleum Storage Program

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# LEAK DETECTION MONITORING REQUIREMENTS

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**Leak Detection and Monitoring Methods Abbreviation Descriptions..... 4**

**Aboveground Storage Tanks ..... 5**

- Single-Wall, Horizontal Tanks with Aboveground Piping..... 5
- Single-Wall, Vertical Tanks with Aboveground Piping ..... 5
- Double-Wall (Horizontal or Vertical Tanks) with Aboveground Piping..... 6
- Single-Wall, Horizontal Tanks with Underground Piping ..... 7
- Single-Wall, Vertical Tanks with Underground Piping..... 8
- Double-wall (Horizontal or Vertical Tanks) with Underground Piping ..... 9
- API Standard 650-98 with Aboveground Piping..... 10
- API Standard 650-98 with Underground Piping ..... 11

**Underground Storage Tanks .....12**

- Double-Wall Tanks with Underground Piping..... 12
- Existing Single-Wall Tanks with Underground Piping ..... 13

## Leak Detection and Monitoring Methods Abbreviation Descriptions

Abbreviation	Leak Detection and Monitoring Methods Descriptions
ATG	Automatic tank gauge with monthly precision leak detection test (PLDT)
CITLD	Continuous in-tank leak detection system with monthly leak detection test (results are limited to an evaluation of the <u>storage tank only</u> )
CITLDS	Continuous in-tank leak detection system with monthly leak detection test (results provide an evaluation of the <u>storage tank and piping system</u> )
ELLD	Electronic line leak detection device
HPVLDT	High-pressure inert gas or vacuum leak detection test
HTSCM	High-technology secondary containment monitoring
IR	Manual dip and inventory reconciliation; or
	electronic dip and electronic inventory reconciliation; or
	electronic dip and manual inventory reconciliation
LPVLDT	Low-pressure inert gas or vacuum leak detection test
MLLD	Mechanical line leak detection device
OWM	Observation well vapour or groundwater monitoring (monthly)
PLDT	Precision leak detection test of a storage tank <sup>1</sup>
PLMLDT	Pressure liquid media leak detection test
SIR	Statistical inventory reconciliation (monthly reporting)
SLMLDT	Static liquid media leak detection test
SVCV	Single, vertical check valve
VLD	Visual leak detection (weekly)

<sup>1</sup> A Licensed Petroleum Technician must be used for this type of test. A list of licensed Precision Leak Detection Testers is available from the Manitoba Conservation website or by contacting your local Environment Officer.

**Aboveground Storage Tanks**

**Single-Wall, Horizontal Tanks with Aboveground Piping**

Containment	Final installation Leak Detection	In-service Monitoring	Periodic Leak Detection	Leak Suspected
<b>Horizontal tanks</b>	VLD	IR or VLD	Not Required	VLD <sup>1</sup> ; or PLDT
<b>Aboveground piping (all types)</b>	PLMLDT; or HPVLDT	VLD	Not Required	PLMLDT; or HPVLDT

<sup>1</sup> Where entire system including piping is visible

**Single-Wall, Vertical Tanks with Aboveground Piping**

Containment	Final installation Leak Detection	In-service Monitoring	Periodic Leak Detection	Leak Suspected
<b>Vertical tanks (within approved secondary containment)</b>	VLD	IR and VLD; or HTSCM	API Std 653-01	PLDT; or API Std 653-01
<b>Vertical tanks (within non-approved secondary containment)</b>		IR and VLD	API Std 653-01; or PLDT (annually)	PLDT; or API Std 653-01
<b>Aboveground piping (all types)</b>	PLMLDT; or HPVLDT	VLD	Not Required	PLMLDT; or HPVLDT

<b>Double-Wall (Horizontal or Vertical Tanks) with Aboveground Piping</b>				
<b>Containment</b>	<b>Final installation Leak Detection</b>	<b>In-service Monitoring</b>	<b>Periodic Leak Detection</b>	<b>Leak Suspected</b>
<b>Double-walled tanks</b>	VLD	HTSCM; or VLD	Not required	VLD <sup>1</sup> ; or PLDT; or LPVLDT <sup>1</sup>
<b>Aboveground piping</b> (all types)	PLMLDT; or HPVLDT	VLD	Not Required	PLMLDT; or HPVLDT

<sup>1</sup> On the interstice only

Single-Wall, Horizontal Tanks with Underground Piping				
Containment	Final installation Leak Detection	In-service Monitoring	Periodic Leak Detection	Leak Suspected
<b>Horizontal tanks</b>	VLD	IR and VLD	Not Required	VLD <sup>1</sup> ; or PLDT
<b>Piping:</b>				
▶ Single Wall (Greater than 75mm)	PLMLDT; or HPVLDT	OWM	PLMLDT; or HPVLDT (every year)	PLMLDT; or HPVLDT
		CITLDS or ELLD	Not Required	
▶ Double-wall	PLMLDT; or HPVLDT and LPVLDT	ELLD; Sensor; CITLDS; or SVCV <sup>2</sup>	Not Required	PLMLDT; or HPVLDT
<b>Existing Single-Wall Piping:</b>				
▶ Steel without CP <sup>3</sup>		IR and OWM; or SIR	PLMDT; or HPVLDT (annually)	PLMDT; or HPVLDT
▶ Steel with CP <sup>3</sup> ; plastic; or FRP <sup>4</sup>		IR and OWM; or SIR	PLMDT; or HPVLDT (every 2 years)	PLMDT; or HPVLDT
		CITLDS; or OWM and SIR	Not required	
		SVCV <sup>2</sup> ; or ELLD <sup>5</sup>	Not required	
<b>Turbine and Transition Sumps</b>	SLMLDT		VLD (annually) <sup>6</sup>	SLMLDT
<b>Dispenser Sumps</b>	SLMLDT	HTSCM; or VLD	Not required	SLMLDT

<sup>1</sup> Where entire system including piping is visible

<sup>2</sup> Suction style systems only

<sup>3</sup> CP - cathodic protection

<sup>4</sup> FRP – Fiberglass-reinforced-plastic

<sup>5</sup> Pressure piping

<sup>6</sup> Inspection and performance testing in conformance with the manufacturer's requirements and procedures

Single-Wall, Vertical Tanks with Underground Piping				
Containment	Final installation Leak Detection	In-service Monitoring	Periodic Leak Detection	Leak Suspected
<b>Vertical tanks</b> (within approved secondary containment)	VLD	IR and VLD; or HTSCM	API Std 653-01	PLDT; or API Std 653-01
<b>Vertical tanks</b> (within non-approved secondary containment)		IR and VLD	API Std 653-01; or PLDT (annually)	PLDT; or API Std 653-01
<b>Piping:</b>				
▶ Single Wall (Greater than 75mm)	PLMLDT; or HPVLDT	OWM	PLMLDT; or HPVLDT (every year)	PLMLDT; or HPVLDT
		CITLDS or ELLD	Not Required	
▶ Double-wall	PLMLDT; or HPVLDT and LPVLDT	ELLD; Sensor; CITLDS; or SVCV <sup>1</sup>	Not Required	PLMLDT; or HPVLDT
<b>Existing Single-Wall Piping:</b>				
▶ Steel without CP <sup>2</sup>		IR and OWM; or SIR	PLMDT; or HPVLDT (annually)	PLMDT; or HPVLDT
▶ Steel with CP <sup>2</sup> ; plastic; or FRP <sup>3</sup>		IR and OWM; or SIR	PLMDT; or HPVLDT (every 2 years)	PLMDT; or HPVLDT
		CITLDS; or OWM and SIR	Not required	
		SVCV <sup>1</sup> ; or ELLD <sup>4</sup>	Not required	
<b>Turbine and Transition Sumps</b>	SLMLDT		VLD (annually) <sup>6</sup>	SLMLDT
<b>Dispenser Sumps</b>	SLMLDT	HTSCM; or VLD	Not required	SLMLDT

1 Suction style system only

2 CP – Cathodic protection

3 FRP – Fiberglass reinforced plastic

4 Pressure piping

5 Inspections and performance testing in conformance with the manufacturer's requirements and procedures



Double-wall (Horizontal or Vertical Tanks) with Underground Piping				
Containment	Final installation Leak Detection	In-service Monitoring	Periodic Leak Detection	Leak Suspected
<b>Double-walled tanks</b>	VLD	HTSCM; or VLD	Not required	VLD <sup>1</sup> ; or PLDT; or LPVLDT <sup>1</sup>
<b>Piping:</b>				
▶ Single Wall (Greater than 75 mm)	PLMLDT; or HPVLDT	OWM	PLMLDT; or HPVLDT (every year)	PLMLDT; or HPVLDT
		CITLDS or ELLD	Not Required	
▶ Double-wall	PLMLDT; or HPVLDT and LPVLDT	ELLD; Sensor; CITLDS; or SVCV <sup>2</sup>	Not Required	PLMLDT; or HPVLDT
<b>Existing Single-Walled Piping:</b>				
▶ Steel without CP <sup>4</sup>		IR and OWM; or SIR	PLMDT; or HPVLDT (annually)	PLMDT; or HPVLDT
▶ Steel with CP <sup>4</sup> ; plastic; or FRP <sup>5</sup>		IR and OWM; or SIR	PLMDT; or HPVLDT (every 2 years)	PLMDT; or HPVLDT
		CITLDS; or OWM and SIR	Not required	
		SVCV <sup>2</sup> ; or ELLD <sup>6</sup>	Not required	
<b>Turbine and Transition Sumps</b>	SLMLDT		VLD (annually) <sup>3</sup>	SLMLDT
<b>Dispenser Sumps</b>	SLMLDT	HTSCM; or VLD	Not required	SLMLDT

<sup>1</sup> On the interstice only

<sup>2</sup> Suction style system only

<sup>3</sup> Inspection and performance testing in conformance with the manufacturer's requirements and procedures

<sup>4</sup> CP – Cathodic Protection

<sup>5</sup> FRP – Fiberglass-reinforced-plastic

<sup>6</sup> Pressure piping

API Standard 650-98 with Aboveground Piping				
Containment	Final installation Leak Detection	In-service Monitoring	Periodic Leak Detection	Leak Suspected
<b>API Std 650-98</b> (within approved secondary containment)	API 650 standard	IR and VLD; or HTSCM	API 653	PLDT; or API 653
<b>API Std 650-98</b> (within non-approved secondary containment)		IR and VLD	API Std 653-01; or PLDT (annually)	PLDT; or API Std 653-01
<b>Aboveground piping</b> (all types)	PLMLDT; or HPVLDT	VLD	Not Required	PLMLDT; or HPVLDT

API Standard 650-98 with Underground Piping				
Containment	Final installation Leak Detection	In-service Monitoring	Periodic Leak Detection	Leak Suspected
<b>API Std 650-98</b> (within approved secondary containment)	As per API 650 standard	IR and VLD; or HTSCM	API 653	PLDT; or API 653
<b>API Std 650-98</b> (within non-approved secondary containment)		IR and VLD	API Std 653-01; or PLDT (annually)	PLDT; or API Std 653-01
<b>Piping:</b>				
▶ Single Wall (Greater than 75 mm)	PLMLDT; or HPVLDT	OWM	PLMLDT; or HPVLDT (every year)	PLMLDT; or HPVLDT
		CITLDS; or ELLD	Not Required	
▶ Double-wall	PLMLDT; or HPVLDT and LPVLDT	ELLD; Sensor; CITLDS; or SVCV <sup>1</sup>	Not Required	PLMLDT; or HPVLDT
<b>Existing single-walled piping:</b>				
▶ Steel without CP <sup>2</sup>		IR and OWM; or SIR	PLMDT; or HPVLDT (annually)	PLMDT; or HPVLDT
▶ Steel with CP <sup>2</sup> ; plastic; or FRP <sup>3</sup>		IR and OWM; or SIR	PLMDT; or HPVLDT (every 2 years)	PLMDT; or HPVLDT
		CITLDS; or OWM and SIR	Not required	
		SVCV <sup>1</sup> ; or ELLD <sup>4</sup>	Not required	

<sup>1</sup> Suction style system only

<sup>2</sup> CP – Cathodic protection

<sup>3</sup> FRP – Fiberglass reinforced plastic

<sup>4</sup> Pressure piping

## Underground Storage Tanks

Double-Wall Tanks with Underground Piping				
Containment	Final installation Leak Detection	In-service Monitoring	Periodic Leak Detection	Leak Suspected
<b>Double-walled tanks</b>	PLDT	SIR; VLD; ATG; HTSCM; CITLDS; or CITLD	Not required	PLDT
<b>Piping:</b>				
▶ Single Wall (Greater than 75 mm)	PLMLDT; or HPVLDT	OWM	PLMLDT; or HPVLDT (every year)	PLMLDT; or HPVLDT
		CITLDS or ELLD	Not Required	
▶ Double-wall	PLMLDT; or HPVLDT and LPVLDT	ELLD; Sensor; CITLDS; or SVCV <sup>1</sup>	Not Required	PLMLDT; or HPVLDT
<b>Existing single-wall piping:</b>				
▶ Steel without CP <sup>2</sup>		IR and OWM; or SIR	PLMDT; or HPVLDT (annually)	PLMDT; or HPVLDT
▶ Steel with CP <sup>2</sup> , plastic or FRP <sup>3</sup>		IR and OWM; or SIR	PLMDT; or HPVLDT (every 2 years)	PLMDT; or HPVLDT
		CITLDS; or OWM and SIR	Not required	
		SVCV <sup>1</sup> ; or ELLD <sup>4</sup>	Not required	
<b>Turbine and Transition Sumps</b>	SLMLDT		VLD (annually) <sup>5</sup>	SLMLDT
<b>Dispenser Sumps</b>	SLMLDT	HTSCM; or VLD	Not required	SLMLDT

1 Suction style system only

2 CP – Cathodic Protection

3 FRP – Fiberglass reinforced plastic

4 Pressure piping

5 Inspection and performance testing in conformance with the manufacturer's requirements and procedures

Existing Single-Wall Tanks with Underground Piping				
Containment	Final installation Leak Detection	In-service Monitoring	Periodic Leak Detection	Leak Suspected
<b>Steel tank without CP<sup>1</sup></b>		IR and OWM; or SIR	PLDT (annually)	PLDT
<b>Steel tank with CP<sup>1</sup>; or FRP<sup>2</sup></b>		IR	PLDT (every 2 years)	PLDT
		IR and OWM; or SIR	PLDT (every 5 years)	
		ATG; or CITLDS	Not required	
		OWM and SIR	Not required	
<b>Piping:</b>				
▶ Single Wall (Greater than 75mm)	PLMLDT; or HPVLDT	OWM	PLMLDT; or HPVLDT (every year)	PLMLDT; or HPVLDT
		CITLDS or ELLD	Not Required	
▶ Double-wall	PLMDT; or HPVLDT and LPVLDT	ELLD; Sensor; CITLDS; or SVCV <sup>3</sup>		
<b>Existing Single-Wall Piping:</b>				
▶ Steel without CP <sup>1</sup>		IR and OWM; or SIR	PLMDT; or HDPLDT (annually)	PLMDT; or HPVLDT
▶ Steel with CP <sup>1</sup> ; plastic, or FRP <sup>2</sup>		IR and OWM; or SIR	PLMDT; or HDPLDT (every 2 years)	PLMDT; or HPVLDT
		CITLDS; or OWM and SIR	Not required	
		SVCV <sup>3</sup> ; or ELLD <sup>5</sup>	Not Required	
<b>Turbine and Transition Sumps</b>	SLMLDT		VLD (annually) <sup>4</sup>	SLMLDT
<b>Dispenser Sumps</b>	SLMLDT	HTSCM; or VLD	Not required	SLMLDT

<sup>1</sup> CP - Cathodic protection

<sup>2</sup> FRP – Fibreglass reinforced plastic

<sup>3</sup> Suction style system only

<sup>4</sup> Inspection and performance testing in conformance with the manufacturer's requirements and procedures

<sup>5</sup> Pressure piping