DEPARTMENT OF ECOLOGY
State of Washington

IMPRESSED CURRENT CATHODIC PROTECTION EVALUATION CHECKLIST

FOR UNDERGROUND STORAGE TANKS

This checklist certifies that cathodic protection testing activities were performed and conducted in accordance with Chapter 173-360A WAC.

I. UST FACILITY	II. CERTIFIED CATHODIC PROTECTION TESTER
Facility Compliance Tag #:	Service Provider Name:
UST ID #:	Company Name:
Site Name:	Address:
Site Address:	City: State: Zip:
City:	Phone: Email:
County:	Certification Type:
Phone:	Certification Number: Exp. Date:

III. RESULTS OF EVALUATION (which include results of both continuity and system surveys)

☐ **PASS**
☐ **FAIL**

The criteria, used to evaluate whether cathodic protection is adequate, were in accordance with a code of practice developed by a nationally recognized association (e.g. NACE), as required by the Washington State Underground Storage Tank Regulations.

Date CP Evaluation Performed:

IV. CRITERIA APPLICABLE TO EVALUATION

Continuity Survey	☐ **PASS** ☐ **FAIL**					USTs must show continuity using an approved testing method.
System Survey		**# TANKS**	**# PIPE RUNS**	**# STP SFCs[1]**	**# DISP. SFCs[2]**	
Neg. 850 mV Instant Off	☐ **PASS**					A negative polarized potential of at least 850 mV relative to a saturated copper-copper sulfate reference electrode ("Instant Off" Potential).
	☐ **FAIL**					
100 mV Polarization	☐ **PASS**					A minimum of 100 mV of cathodic polarization between the structure surface and a stable reference electrode contacting the electrolyte.
	☐ **FAIL**					

V. ACTION REQUIRED AS A RESULT OF THIS EVALUATION (check one box and explain further in comment box below)

☐ NONE	The cathodic protection system is adequately providing protection. No further action is necessary at this time. System must be tested in three years unless more immediate attention is required.
☐ RETEST	The cathodic protection system may not be adequately protecting steel from corrosion. Retesting is necessary.
☐ RETROFIT/REPAIR	The cathodic protection system is not adequately providing protection. Retrofitting or repairing is necessary.
☐ RETEST AFTER RETROFIT/REPAIR	The cathodic protection system has been retrofitted or repaired and tested at time of the retrofit/repair. A re-test is required within one to six months of retrofit or repair.

Comments (include type of testing gear used, steel components tested, etc.:

1. If no submersible turbine pump (STP) is present, these steel flex connectors (SFC) are on the tank end of piping.
2. If no dispenser is installed, these SFCs are on the non-tank end of piping.

VI. IMPRESSED CURRENT RECTIFIER DATA			
Rectifier Manufacturer:			Rectifier Serial Number:
Rectifier Model Number:			Rated DC Output:
Rectifier "As Found" Data			
AC Input Voltage:			DC Voltage on Panel Meter:
AC Step-Down Voltage:			DC Voltage on Rectifier Output Terminal:
Tap Settings: Coarse:		Fine:	DC Amps on Panel Meter:
Cycles	Secondary Taps Hz		Shunt Rating:
	DC Output Hz		Shunt Measurement:
			DC Amps from Shunt Reading:
Rectifier "As Left" Data			
AC Input Voltage:			DC Voltage on Panel Meter:
AC Step-Down Voltage:			DC Voltage on Rectifier Output Terminal:
Tap Settings: Coarse:		Fine:	DC Amps on Panel Meter:
Cycles	Secondary Taps Hz		Shunt Rating:
	DC Output Hz		Shunt Measurement:
			DC Amps from Shunt Reading:

VII. INDIVIDUAL ANODE DATA (complete only if anode measurements can be taken independently)

"As Found" Data

Anode #	1	2	3	4	5	6	7	8	9	10
Volts										
Amps										

"As Left" Data

Anode #	1	2	3	4	5	6	7	8	9	10
Volts										
Amps										

VIII. REMARKS (describe any modifications made to the CP system)

IX. Continuity Survey

Structure "A"	Structure "B"	Point "A" to Point "B" or Fixed Cell Location >30'	Structure "A" Fixed Voltage >30'	Structure "B" Fixed Voltage >30'	Point-to-Point or Fixed Voltage Difference	PASS	FAIL	Method and Standards Used (e.g. RP-0285, R051)
						☐	☐	
						☐	☐	
						☐	☐	
						☐	☐	
						☐	☐	
						☐	☐	
						☐	☐	
						☐	☐	
						☐	☐	
						☐	☐	
						☐	☐	
						☐	☐	

X. System Survey

Structure	Contact Point	Half Cell Location	Local Voltage "ON"	Local Voltage "Instant Off"	Local Voltage (Depolarized)	Voltage Change	PASS	FAIL	Method and Standard Used
							☐	☐	
							☐	☐	
							☐	☐	
							☐	☐	
							☐	☐	
							☐	☐	
							☐	☐	
							☐	☐	
							☐	☐	
							☐	☐	
							☐	☐	
							☐	☐	
							☐	☐	

XI. UST Site Plan

Diagram the UST System, including tanks, piping, and dispenser locations, approximate scale, and any other notable structures/physical features. Indicate north with arrow. On the map below, include the half cell locations used during testing. All test points must be easily identifiable, so that testing can be reproduced and your results verified.

XII. 60-DAY RECORD OF RECTIFIER OPERATION

(a copy of this page must be provided to Ecology and the owner)

UST Owner/Operator	UST Facility
Name:	Name:
Phone:	Address:
Email:	City:

Rectifier Information

Rectifier Manufacturer:	Rectifier Model Number:
Rated DC Output:	Rectifier Serial Number:

Recommended Ranges

(if amps or volts are zero or readings fall outside these ranges, contact the testing company immediately)

Volts: to	Amps: to

Record of Inspections at least every 60 days

(be sure to document any problems observed or when service provider is contacted)

Date Inspected	Rectifier Turned On?	Tap Settings		Volts	Amps	Hour Meter (if present)	Operator Initials	Comments
		COURSE	FINE					

XIII. RETROFIT OR REPAIR DESIGN (if applicable)

All retrofitting or repairs to CP systems shall be designed by a Corrosion Expert. I certify that I am a Corrosion Expert qualified to engage in the practice of corrosion control on buried or submerged metal piping systems and metal tanks. I have attached copies of the retrofit/repair design and of the Underground Storage Tank Retrofit and Repair Checklist.

Corrosion Expert's Name:	National Recognized Organization:
Company's Name:	Certification Number:
Corrosion Expert's Signature:	***Date:***

XIV. REQUIRED SIGNATURES

The service provider certifies the criteria used to evaluate whether cathodic protection is adequate were in accordance with a code of practice developed by a nationally recognized association (e.g. NACE), as required by the Washington State Underground Storage Tank Regulations.

Date	Signature of Certified Cathodic Protection Tester	Print or Type Name
Date	Signature of Tank Owner or Authorized Representative	Print or Type Name

IMPRESSED CURRENT CATHODIC PROTECTION EVALUATION CHECKLIST

FOR UNDERGROUND STORAGE TANKS

INSTRUCTIONS

This form must be submitted **within thirty days of completing** impressed current cathodic protection testing activities to the following address:

Dept. of Ecology
UST Section
PO Box 47655
Olympia, WA 98504-7655

- The attached Underground Storage Tank (UST) checklist is required for the activity above. Completing this checklist documents and certifies cathodic protection testing activities were performed and conducted in accordance with Chapter 173-360A WAC.

- This checklist must be filled out completely by a certified cathodic protection tester, such as a corrosion expert with at least a NACE CP3 certification or a tester holding a U4 Cathodic Protection ICC certification.

- A copy of the completed form must be provided to the tank system owner/operator.

- The owner/operator is responsible for submitting a copy to Ecology within 30 days of test date.

I. **UST Facility:** Complete this section about the facility where the cathodic protection system is being tested. If the UST ID number is not known, include the facility compliance tag number.

II. **Certified Cathodic Protection Tester:** Complete this section about the UST service provider and service provider company.

III. **Results of Evaluation:** The pass or fail refers to the overall evaluation of the cathodic protection system for the entire UST system, including tanks, piping, and all steel flex connectors. Testing criteria shall be in accordance with a code of practice developed by a nationally recognized association (e.g. NACE).

IV. **Criteria Applicable to Evaluation**: Choose criteria used to meet cathodic protection requirements by filling in the number of tanks, piping runs, and steel flex connectors meeting (or failing) the specific criteria (note: the standard chosen to meet the criteria shall be documented in the survey portions of this checklist).

a. Continuity Test: All impressed current UST systems (including associated piping and steel flex connectors) shall be continuous to meet criteria to pass the continuity test.

b. -850 "Instant Off": this can only be used if the current can be interrupted.

c. 100 mV Polarization: this can only be used if the current can be interrupted.

V. **Action Required as a Result of this Evaluation:**

a. None: The cathodic protection system is adequately providing protection. No further action is necessary at this time. System must be tested in three years unless more immediate attention is required.

b. Retest: The cathodic protection system may not be adequately protecting steel from corroding. Retesting is necessary.

c. Retrofit/Repair: The cathodic protection system is not adequately providing protection. Retrofitting or repairing is necessary.

d. Retest after Retrofit/Repair: The cathodic protection system has been retrofitted or repaired and tested at time of the retrofit/repair. Testing is required again within one to six months after the retrofit/repair.

VI. Impressed Current Rectifier Data: Fill in all applicable information about the rectifier as first found and as last left.

a. "As Found" Data: All readings and measurements are to be completed **prior to making any rectifier adjustments** or prior to testing the cathodic protection system. This section should be completely filled in by the tester.

b. "As Left" Data: All readings and measurements are to be completed **after making any rectifier adjustments** or at the completion of testing the cathodic protection system. This section should be completely filled in by the tester.

VII. Individual Anode Data: Complete this section only if anode measurements can be taken independently. Certified.

VIII. Remarks: Describe any modifications that were made to the cathodic protection system.

IX. Continuity Survey: This survey is necessary to show the impressed current system is protecting structures that are intended to be protected.

a. Compare various structures within the UST system (e.g. structures "A" and "B") using a "fixed cell" or "point to point" technique, depending on the standard used. NACE recommends "fixed cell", STI recommends either "fixed cell" or "point-to-point".

b. If the voltage difference between Structure "A" and "B" is less than 10 mV, structures are likely continuous.

Example:

Structure "A"	Structure "B"	Point "A" to Point "B" or Fixed Cell Location >30'	Structure "A" Fixed Voltage >30'	Structure "B" Fixed Voltage >30'	Point-to-Point or Fixed Voltage Difference	PASS	FAIL	Method and Standards Used (e.g. RP-0285, R051)
Tank bottom	**Vapor recovery**	**NE Corner (30')**	**-876 mV**	**-843 mV**	**33 mV**	☐	☒	**"Fixed" R051**

X. System Survey: This includes readings of the structure's potentials. Example on Page 9.

a. Structure: Description of structure (e.g. Tank #1)

b. Contact Point: Description of contact point (e.g. Tank Bottom)

c. Half Cell Location: Location of where the half cell was placed.

d. Local Voltage "On": Voltage measured as current is impressed on system.

e. Local Voltage "Instant Off": Voltage measured during interruption cycle.

f. Local Voltage (Depolarized): Voltage measured after structure has depolarized.

g. Voltage Change: "Instant Off" subtracted from the Depolarized Potential (100 mV polarization criteria).

h. Pass or Fail: Documentation of whether or not the structure passes.

i. Method and Standard Used: Document which criteria and standard were used.

Example:

Structure	Contact Point	Half Cell Location	Local Voltage "ON"	Local Voltage "Instant Off"	Local Voltage (Depolarized)	Voltage Change	PASS	FAIL	Method and Standard Used
UST #1	**Tank bottom**	**Crack in NE corner of tank nest**	**1020 mV**	**-920 mV**			☒	☐	**-850 I/O RP-0285**
UST #2	**Tank bottom**	**Crack in NE corner of tank nest**	**-948 mV**	**-800 mV**	**-680 mV**	**120 mV**	☒	☐	**100 mV Pol. RP-0285**

XI. **UST Site Plan:** Diagram the UST System, including tanks, piping, and dispenser locations, approximate scale, and any other notable structures/physical features. Indicate north with arrow. Include the cathodic protection test locations used during this testing. The test points must be easily identifiable, so that testing can be reproduced and your results verified.

XII. **60-Day Record of Rectifier Operation:** This page must be included in the report submitted to Ecology but a copy must also be left with the owner for documenting rectifier inspections every 60 days.

a. Fill out UST owner and UST facility information**.**

b. Fill out rectifier manufacturer, model and serial number and rated DC output.

c. Provide most recently recommended ranges for volts and amps.

d. At least every 60 days, the owner/operator is responsible for inspecting the rectifier to make sure the cathodic protection system is operating properly. Include the date of inspection, whether rectifier is turned on at the time of inspection, the coarse and fine tap settings, volts, amps, hour meter reading (if available) and operator initials. Be sure to note any unusual operating conditions, calls to the service provider, etc. in the comments box.

XIII. **Retrofit or Repair Design**: All retrofitting or repairs to cathodic protection systems shall be designed by a Corrosion Expert. Attach both a copy of the design of the retrofit or repair and a copy of the *UST Retrofit/Repair Checklist.* The Corrosion Expert must fill out this section, including signature and date.

XIV. **Required Signatures**: The certified cathodic protection tester must sign the form. This checklist must also be signed and submitted by the owner/operator.

Further questions? *Please contact your regional office below and ask for a tank inspector to assist you.*

Regional Office	**Counties Served**
Central (509) 575-2490	Benton, Chelan, Douglas, Kittitas, Klickitat, Okanogan, Yakima
Eastern (509) 329-3400	Adams, Asotin, Columbia, Ferry, Franklin, Garfield, Grant, Lincoln, Pend Oreille, Spokane, Stevens, Walla Walla, Whitman
HQ (360) 407-7170	Federal facilities in Western Washington
Northwest (425) 649-7000	Island, King, Kitsap, San Juan, Skagit, Snohomish, Whatcom
Southwest (360) 407-6300	Clallam, Clark, Cowlitz, Grays Harbor, Jefferson, Lewis, Mason, Pacific, Pierce, Skamania, Thurston, Wahkiakum

or find a complete list of UST inspectors at:

www.ecy.wa.gov/programs/tcp/ust-lust/people.html

To request materials in a format for the visually impaired, call Ecology at 360-407-7170, Relay Service 711, or TTY 877-833-6341