ALASKA DEPARTMENT OF ENVIRONMENTAL CONSERVATION
IMPRESSED CURRENT CATHODIC PROTECTION SYSTEM EVALUATION (APPENDIX M)

- Use this form when evaluating underground storage tank (UST) cathodic protection systems in the State of Alaska.
- Access to the soil directly over the cathodically protected structure being evaluated must be provided.
- Complete a site sketch (Appendix L) of the UST and cathodic protection systems, including reference electrode placements.

I. UST OWNER

NAME:	
ADDRESS:	
CITY:	STATE/ZIP:

II. UST FACILITY

NAME:	FAC #
ADDRESS:	
CITY:	CONTACT PHONE:

III. CP TESTER

CP TESTER'S NAME:
COMPANY NAME:
EMAIL:
CONTACT PHONE:

IV. CPTESTER'S QUALIFICATIONS

ADEC UST CP-TESTER LICENSE NUMBER:
NACE INTERNATIONAL CERTIFICATION NUMBER:
OR STEEL TANK INSTITUTE NUMBER:
OR OTHER (EXPLAIN):

V. REASON SURVEY WAS CONDUCTED (mark only one)

☐ Routine 3-year test ☐ Survey after fix/upgrade, within six months ☐ Routine - 6 months after install ☐ 60-day resurvey after fail

Date of the next required cathodic protection survey: _____ (required within six months of installation and every three years thereafter).

VI. CATHODIC PROTECTION TESTER'S EVALUATION (mark only one)

☐ PASS	All protected structures at this facility pass the cathodic protection survey and it is judged that adequate cathodic protection is provided to the UST system (complete Section VIII).
☐ FAIL	One or more protected structures at this facility fail the cathodic protection survey and adequate cathodic protection has not been provided to the UST system (complete Section IX).
☐ INCONCLUSIVE	If the remote and the local do not both indicate the same test result on all protected structures (both pass or both fail), inconclusive is indicated and the survey must be evaluated and/or conducted by a corrosion expert (complete Section VII).

CP TESTER'S SIGNATURE:	DATE CP SURVEY PERFORMED:

VII. CORROSION EXPERT'S EVALUATION (mark only one)

The survey must be conducted and/or evaluated by a corrosion expert *(18 AAC 78.995(40))* when: an inconclusive is indicated for any protected structure; repairs or upgrades to galvanized or uncoated steel piping are done; supplemental anodes are added to the tanks and/or piping.

☐ PASS	All protected structures at this facility pass the cathodic protection survey and it is judged that adequate cathodic protection has been provided to the UST system (indicate all criteria applicable by completion of Section VIII).
☐ FAIL	One or more protected structures at this facility fail the cathodic protection survey and it is judged that adequate cathodic protection has not been provided to the UST system (indicate what action is necessary by completion of Section IX).

CORROSION EXPERT'S NAME:	COMPANY NAME:
NACE INTERNATIONAL CERTIFICATION LEVEL:	NACE INTERNATIONAL CERTIFICATION NUMBER:
CORROSION EXPERT'S SIGNATURE:	DATE:

VIII. CRITERIA APPLICABLE TO EVALUATION (mark all that apply)

☐ -850 mV OFF	Structure-to-soil potential more negative than –850 mV with respect to a $Cu/CuSO_4$ reference electrode with protective current temporarily interrupted (Instant Off).
☐ 100 mV POLARIZATION	Structure tested exhibits at least 100 mV of cathodic polarization.

IX. ACTION REQUIRED AS A RESULT OF THIS EVALUATION (mark only one)

☐ NONE	Cathodic protection is adequate. No further action is necessary at this time. Test again within three years (see Section V).
☐ RETEST	Cathodic protection may not be adequate. Retest during the next 60 days to determine if passing results can be achieved.
☐ FIX/UPGRADE & TEST	Cathodic protection is not adequate. Required to upgrade, replace or fix within 60 days unless ADEC approves written request for an extension *(18 AAC 78.017(k))*.

X. UST FACILITY SITE SKETCH *(Use Appendix L)*

ALASKA DEPARTMENT OF ENVIRONMENTAL CONSERVATION
555 CORDOVA STREET ANCHORAGE, ALASKA 99501-2617
UNDERGROUND STORAGE TANKS OFFICE
PHONE 907-269-7679 FAX 269-7600 www.dec.alaska.gov

XI. DESCRIPTION OF UST SYSTEMS

ADEC #	PRODUCT	VOLUME (gal)	TANK MATERIAL	PIPING MATERIAL	FLEX CONNECTORS
1					
2					
3					
4					
5					
6					

XII. IMPRESSED CURRENT RECTIFIER DATA (complete all applicable)

In order to conduct an effective evaluation of the cathodic protection system, a complete evaluation of rectifier operation is necessary.

RECTIFIER MANUFACTURER: | RATED DC OUTPUT: _____VOLTS _____AMPS

RECTIFIER MODEL: | RECTIFIER SERIAL NUMBER:

RECTIFIER OUTPUT AS INITIALLY DESIGNED OR LASTLY RECOMMENDED (if available): _____VOLTS _____AMPS

EVENT	DATE	TAP SETTINGS		DC OUTPUT		HOUR METER	COMMENTS
		COARSE	FINE	VOLTS	AMPS		
"AS FOUND"							
"AS LEFT"							

XIII. IMPRESSED CURRENT POSITIVE & NEGATIVE CIRCUIT MEASUREMENTS (output amperage)

Complete if the system is designed to allow such measurements (i.e. individual lead wires for each anode are installed and measurement shunts are present).

CIRCUIT	1	2	3	4	5	6	7	8	9	10	TOTAL
ANODE (+)											
TANK (-)											

XIV. UPGRADE, RECONFIGURE OR REPAIR OF THE CATHODIC PROTECTION SYSTEM

- ☐ Install additional anodes on the impressed current system (attach corrosion expert's design).
- ☐ Upgrade, fix, or replace rectifer (explain).
- ☐ Replace, upgrade, or fix anode header cables (explain).
- ☐ Impressed current-protected tanks and/or piping are not electrically continuous (explain).

XV. IMPRESSED CURRENT - CONTINUITY SURVEY

- Use this section to conduct measurements of continuity on underground storage tanks that are protected by cathodic protection systems.
- When conducting a fixed cell-moving ground survey, the reference electrode must be placed in the soil at a remote location (>30') and left undisturbed.
- Conduct point-to-point test between any two structures for which the fixed cell - moving ground survey is inconclusive or indicates possible isolation.
- For impressed current systems, the protected structure must be <u>continuous</u> with all other protected structures in order to ***pass*** the continuity survey.

LOCATION OF "FIXED REMOTE" REFERENCE ELECTRODE:

STRUCTURE A [1]	STRUCTURE B [2]	STRUCTURE "A" [3] FIXED REMOTE INSTANT OFF VOLTAGE	STRUCTURE "B" [4] FIXED REMOTE INSTANT OFF VOLTAGE	POINT-TO-POINT [5] VOLTAGE DIFFERENCE	ISOLATED/ CONTINUOUS/ INCONCLUSIVE [6]
(example) PLUS TANK BOTTOM	(example) PLUS STEEL PRODUCT LINE @ STP	(example) -915 mV	(example) -908 mV	-------	(example) INCONCLUSIVE
(example) PLUS TANK BOTTOM	(example) PLUS STEEL PRODUCT LINE @ STP	(example) -875 mV	(example) -876 mV	(example) 1 mV	(example) CONTINUOUS

1 Describe the protected structure {"A"} that you are attempting to demonstrate is continuous (e.g., plus tank bottom).
2 Describe the "other" protected structure {"B"} that you are attempting to demonstrate is continuous (e.g., plus steel product line @ STP).
3 Record the fixed-remote instant off structure-to-soil potential of the protected structure {"A"} in millivolts (e.g., –915 mV).
4 Record the fixed-remote instant off structure-to-soil potential of the "other" protected structure {"B"} in millivolts (e.g., –908 mV).
5 Record the voltage difference observed between structures "A" and "B" when conducting "point-to-point" testing (e.g., 1mV).
6 Document whether the test (fixed cell and/or point to point) indicated the protected structure was isolated, continuous or inconclusive.

XVI. IMPRESSED CURRENT CATHODIC PROTECTION SYSTEM SURVEY

- This section may be utilized to conduct a survey of an impressed current cathodic protection system by obtaining structure-to-soil potential measurements.
- The reference electrode must be placed in the soil directly above the structure that is being tested and as far away from any active anode as practical to obtain a valid structure-to-soil potential (refer to the ADEC cathodic protection evaluation guidance document for detailed discussion of electrode placement).
- Both on and instant off potentials must be measured for each structure that is intended to be under cathodic protection.
- The instant off potential must be -850 mV or more negative or the 100 mV polarization criterion must be satisfied in order to pass.

LOCATION CODE [1]	STRUCTURE [2]	CONTACT POINT [3]	REFERENCE CELL PLACEMENT [4]	ON VOLTAGE [5]	INSTANT OFF VOLTAGE [6]	100 mV POLARIZATION		PASS/ FAIL [9]
						ENDING VOLTAGE [7]	VOLTAGE CHANGE [8]	
(example) T-1	(example) PLUS TANK	(example) TANK BOTTOM	(example) SOIL @ REG. TANK STP MANWAY	(example) -1070mV	(example) -875 mV			(example) PASS
(example) P-2	(example) DIESEL PIPE	(example) DISPENSER 7/8	(example) SOIL @ DIESEL TANK STP MANWAY	(example) -810 mV	(example) -680 mV	(example) -575 mV	(example) 105 mV	(example) PASS

COMMENTS:

1 Designate numerically or by code on the site drawing each local reference electrode placement (e.g.,1, 2, 3…, T-1, T-2, P-1, P-2…etc.).

2 Describe the structure that is being tested (e.g., plus tank; diesel piping; flex connector, etc.).

3 Describe where the structure being tested is contacted by the test lead (e.g., plus tank bottom; diesel piping @ dispenser 7/8; etc.).

4 Describe the exact location where the reference electrode is placed for each measurement (e.g., soil @ regular tank STP manway; soil @ dispenser 2, etc.)

5 {Applies to all tests} Record the structure-to-soil potential (voltage) observed with the current applied (e.g., –1070 mV).

6 {Applies to all tests} Record the structure to soil potential (voltage) observed when the current is interrupted (e.g., 680 mV).

7 {Applies to 100 mV polarization test only} Record the voltage observed at the end of the test period (e.g., 575 mV).

8 {Applies to 100 mV polarization test only} Subtract the final voltage from the instant off voltage (e.g., -680 mV minus -575 mV equals -105 mV).

9 Indicate if the tested structure passed or failed one of the two acceptable criteria (-850mV Instant Off or 100 mV polarization) based on your interpretation of data.