New Mexico NMED

Cathodic Protection System Evaluation Form

CPTF - 11/19/2018

- This form may be utilized to evaluate and report the results of testing cathodic protection systems in the State of New Mexico.
- Access to the soil directly over the cathodically protected structure that is being evaluated must be provided.
- A site drawing depicting the cathodic protection system and all reference electrode placements must be completed.

☐ Evaluation of Impressed Current System	☐ Evaluation of Galvanic (Sacrificial) Anodes	Date Test Conducted:

I. Facility Information.

Name:		**Facility ID#:**
Address:	City:	Zip Code:
County	Phone Number	Email:

II. Owner Information.

Name:		**Owner ID#:**
Address:	City:	State:
Zip Code:	Phone Number	Email:

III. Reason Evaluation was Conducted (mark only one)

☐ Routine - 3 year ☐ Routine - within 6 months of installation ☐ 90 days after fail ☐ After Repair/Modification

Date next evaluation must be conducted:	(within 6 months of installation/repair & every 3 years thereafter)

IV. Description of Storage Tank System(s)

Tank #	Product	Capacity	Tank Material	Piping Material	Flex Connectors
1					
2					
3					
4					
5					
6					
7					
8					

V. Cathodic Protection Tester's Evaluation (mark only one)

☐	**PASS**	All protected structures at this facility pass the cathodic protection evaluation and it is judged that adequate cathodic protection has been provided to the storage tank system (indicate all criteria applicable by completion of Section VII).
☐	**FAIL**	One or more protected structures at the facility fail the cathodic protection evaluation and it is judged that adequate cathodic protection has not been provided to the storage tank system (complete Sections IX and XII).
☐	**Inconclusive**	If the remote and local do not have the same test results on all protected structures (both pass or both fail); inconclusive must be checked off and evaluation must be either evaluated or conducted by corrosion expert.

Tester's Name:		Company Name:
Address:	City:	State:
Zip Code:	Phone Number	Email:

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Certification Source:	Certification Level:	Certification Number:

Certification Expiration Date	CP Tester's Signature	Date Signed by Tester

VI. Corrosion Expert's Evaluation (mark only one)

The evaluation must be conducted and /or evaluated by a **Corrosion Expert** when: a) supplemental anodes or other changes in the construction of the cathodic protection system are made; b) stray current may be affecting buried metal structures, or c) an inconclusive result was written in Section VI. (except for under STI-R972 - "Recommended Practice for the Addition of Supplemental Anodes to Sti-P3 USTs")

☐	**PASS**	All protected structures at this facility pass the cathodic protection evaluation and it is judged that adequate cathodic protection has been provided to the storage tank system (indicate all criteria applicable by completion of Section VII).
☐	**FAIL**	One or more protected structures at the facility fail the cathodic protection evaluation and it is judged that adequate cathodic protection has not been provided to the storage tank system (complete Sections IX and XII).

Corrosion Expert's Name:		Company Name:	
Address:		City:	State:
Zip Code:	Phone Number	Email:	
Certification Source:	Certification Level:	Certification Number:	
Certification Expiration Date:			

Corrosion Expert's Signature	Date Signed

VII. Criteria Applicable to Evaluation (mark only one)

☐	**- 850mV ON / (Instant) OFF** (circle "ON" or "OFF" to Specify)	Structure-to-soil potential more negative than -850mV with respect to Cu/CuSO4 reference electrode. This criterion is applicable to any galvanically protected structure" for the -850mV "ON". This criterion is applicable to galvanic systems where the anodes can be temporarily disconnected for the -850mV "OFF".
☐	**100mV Polarization**	Structures(s) exhibit at least 100mV of cathodic polarization. This criteria is applicable to galvanic systems where the anodes can be temporarily disconnected for the 100mV polarization.
☐	**Inconclusive**	The results of either the instant-off test or polarization shift are inconclusive as to whether the structures are protected.

VIII. Evaluation of Flex Connectors and Buried Metal Risers

☐	**PASS**	All flex connectors and buried metal risers in contact with an electrolyte such as but not limited to soil or water are protected from corrosion by the installation of galvanic anodes that meet the requirements in Section VII.
☐	**FAIL**	One or more protected flex connectors or buried metal risers fail the cathodic protection evaluation and it is judged that adequate cathodic protection has not been provided (complete Sections IX and XII).
☐	**Isolated**	Flex connectors and buried metal risers are isolated from electrolytes and cathodic protection is not required.

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 no later than (see Section III).
☐	**RETEST**	Cathodic protection may not be adequate. Retest during the next 90 days to determine if passing results can be achieved.
☐	**REPAIR & RETEST**	Cathodic protection is not adequate. Repair / modification is necessary as soon as practical but within the next 90 days.

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X. Impressed Current Rectifier Data (complete all applicable)

In order to conduct a 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 ro last recommended (if available); volts:	amps:	

Event	Date	Tap Settings		DC Output		Hour Meter	Comments
		Coarse	Fine	Volts	Amps		
"As Found"							
"As Left"							

XI. 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 Amps
Anode (+)											
Tank (-)											

XII. Description of Cathodic Protection System Repairs and/or Modifications

☐	Additional anodes for an impressed current system (attach corrosion expert's design) .
☐	Supplemental anodes for a STI-P3 tank or metallic pipe (attach corrosion expert's design or documentation industry standard was followed).
☐	Repairs or replacement of rectifier (explain in "Remarks/Other" below).
☐	Anode header cables repaired and/or replaced(explain in "Remarks/Other" below).
☐	Impressed current protected tanks/piping not electrically continuous (explain in "Remarks/Other" below).
☐	Galvanically protected tanks/piping NOT electrically isolated (explain in "Remarks/Other" below).

Remarks and/or Comments on Repairs or Modifications.

XIII. Cathodic Protection System Continuity Survey

1) This section is utilized to conduct measurements of continuity on storage tank systems that are protected by cathodic protection systems.
2) When conducting a fixed cell - moving ground survey, the reference electrode must be placed in the soil at a remote location and left undisturbed.
3) Conduct point-to-point test between any two structures for which the fixed cell-moving ground survey is inconclusive or indicates possible isolation.
4) For impressed current systems, the protected structure must be continuous with all other protected structures in order to pass the continuity survey.
5) For galvanic systems, the structure that is to be protected must be isolated from any metallic structure in order to pass the continuity survey.

Describe location of "fixed remote" reference electrode placement:

Structure "A" (1)	**Structure "B"** (2)	**Structure "A" Fixed Voltage (mV)** (3)	**Structure "B" Fixed Voltage (mV)** (4)	**Point-to-Point Voltage Difference** (5)	**Isolated / Continuous** (6)

(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 structure "A" and structure "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.

XIV. Cathodic Protection System Survey

(1) **For Impressed Current (IC) systems**: the reference electrode must be placed (minimum of three locations) 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.
(2) Both "on" and "instant off" potentials must be measured for each structure that is intended to be under cathodic protection.
(3) The "instant off" potential must be -850 mV DC or more negative or the 100 mV DC polarization criterion must be satisfied in order to pass.

(1) **For Galvanic (G) systems**: the reference electrode must be placed (minimum of three locations) with at least one local and at least one placed remotely 25-100 feet away from the structure.
(2) Both the local and remote voltage must be –850 mV DC or more negative, in order for the structure to pass.
(3) Inconclusive is indicated when both the local and remote structure-to-soil potentials do not result in the same outcome (both must "pass" or both must "fail").
(4) As a place to record the "galvanic CP system voltage", use the "On Voltage" fifth column below; and, in cases with supplemental anodes use the "Instant Off" column six.

Location Code (1)	Structure (2)	Contact Point (3)	Reference Cell Placement (4)	On Voltage (5)	Instant Off Voltage (6)	End Voltage (7)	Voltage Change (8)	**Pass / Fail (9)**

1. Designate numerically or by code on the site drawing each local reference electrode placement (e.g. R1-IC, R2-G, R3-IC…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 – 575 mV = 105 mV.)
9. Indicate if the tested structure passed or failed one of the two acceptable criteria (850 instant off or 100 mV polarization) based on your interpretation of data.

XV. Facility Site Drawing

Attach detailed drawing of the storage tank systems and cathodic protection systems. Sufficient detail must be given in order to clearly indicate where the reference electrode was placed for each structure-to-soil potential that is recorded on the survey forms. Any pertinent data must also be included. At a minimum indicate the following: all tanks, piping and dispensers; all buildings and streets; all anodes and wires; location of CP test stations; and, each reference electrode placement must be indicated by a code followed by a “IC” or “G” to indicate the type of CP system (e.g., R1-IC, R2-G, etc.) corresponding with the appropriate line number in Section XIV of this form.

AN EVALUATION OF THE CATHODIC PROTECTION SYSTEM IS NOT COMPLETE WITHOUT AN ACCEPTABLE SITE DRAWING.