# Checklist of Requirements of Former ASTM ES 40 and Current ASTM G 158

This checklist is intended to be a companion to ASTM G 158-98 (valid 9/10/98), to help regulators and UST owners and operators to ensure that integrity assessments actually meet the standard. It lists the requirements of the standard in highlight fashion. It does not list all the details of the requirements, nor does it include important information that is not a requirement. Thus, this checklist cannot be used as a substitute for the standard. The standard is available from ASTM, at (610)832-9585 or www.astm.org. For those familar with the former ASTM ES 40-94 (which expired 11/15/96) its requirements are provided so that the main differences in the requirements of the two documents can be seen.

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| **General Requirements** | Required permits were obtained. (5.1)<br><br>Work was performed under the responsible supervision of a corrosion expert. (6.1)<br><br>Corrosion expert certified to the tank O/O that the personnel performing the assessment work on the tank were knowledgeable of all the applicable procedures. (6.2)<br><br>Corrosion expert certified to the tank O/O that all work was performed in strict accordance with this emergency practice. (6.3)<br><br>All applicable federal, state, and local health and safety codes and regulations were complied with. (7.1) | Method A (section 9), B (section 10), or C (section 11) was used to assess the tank's condition. A preliminary site survey was performed per Section 8. The tank was tightness tested per 5.2 and established as not leaking. (1.4)<br><br>Necessary authorities were consulted to obtain required permits. (5.1)<br><br>The corrosion assessment work was performed under the responsible direction of a corrosion specialist/cathodic protection specialist. (6.1)<br><br>The corrosion specialist/cathodic protection specialist certified to tank O/O that the personnel performing the assessment work on the tank were knowledgeable of all the applicable procedures in this guide. (6.2)<br><br>Corrosion specialist/cathodic protection specialist certified to tank O/O that all work was performed in strict accordance with this guide. (6.3)<br><br>All applicable federal, state, and local health and safety codes and regulations were complied with. (7.1) |

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| **Determining the Leak Status of the Tank** | Tanks were assessed using practice E 1430 or a method that had been certified in accordance with Federal EPA requirements to establish that the tanks were not leaking before evaluating the suitability for upgrading. (8.1) | Tanks were assessed by a leak detection system to establish that they were not leaking. (5.2.1)<br><br>A tightness test or another release detection system in accordance with NFPA 329 was used. Any release detection must have been capable of detecting a leak from any portion of the tank that routinely contains product and have been independently evaluated and certified in accordance with ASTM E 1526 or the equivalent. Leak detection results were provided to the corrosion specialist/cathodic protection specialist. (5.2.2)<br><br>Release detection testing was accomplished within 6 months prior to performing any of the assessment procedures. (5.2.3) |
| **Preliminary Site Survey** | Site specific information was obtained by a corrosion tester who was under the direction of the corrosion expert. (8.2) | Site specific information was obtained by a corrosion technician who was under the responsible direction of the corrosion specialist/cathodic protection specialist. (8.1)<br><br>A preliminary site survey was performed pursuant to section 8 and a tightness test was performed pursuant to 5.2 to establish the fact that the tank was not leaking. (8.2) |
| **Non-invasive (statistical modeling only)** | Tests were conducted by or under the responsible supervision of a corrosion expert. (9.1.2)<br><br>Stray currents were tested. (9.1.3.1)<br><br>Tank locations, materials of construction, capacity, and dimensions were confirmed and a detailed site sketch produced. (9.1.3.2)<br><br>The presence & extent of corrosion immediately below fill riser was determined using a test probe equipped with a mechanical sensor tip. (9.1.3.2)<br><br>Borehole tests were conducted. (9.1.3.3) | Tests were conducted by or as directed by a corrosion specialist or cathodic protection specialist. (9.1.1)<br><br>A test for stray currents was done per certain specifications. (9.1.2.1)<br><br>All tanks were located and materials of construction, age, capacity, and dimensions were confirmed. Detailed site sketches were produced. (9.1.2.2)<br><br>The presence & extent of corrosion immediately below fill riser was determined. Any corrosion > 50% of tank wall thickness failed the tank. (9.1.2.2) |

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| | Corrosion expert considered additional tests (current requirement, coating resistance, and coating efficiency). (9.1.3.4)<br><br>Soil samples were sent to a qualified soil lab and tested in accordance with recognized industry test methods. At minimum, soil resistivity/conductivity, moisture content, soil pH, chloride ion concentration, and sulfide ion concentration data were obtained. (9.1.4)<br><br>Corrosion expert considered performing and evaluating the following tests: hydrocarbon concentration, redox potential, sulfate ion concentration. (9.1.5)<br><br>1 soil sample of every 10 was subjected to independent QC analysis. All samples were reanalyzed since the last successful QC analysis if QC analysis failed. (9.1.6)<br><br>The basis for analysis was followed. (9.2.1) | Electrical continuity of tanks and piping was determined. (9.1.2.2)<br><br>Borehole tests were conducted per certain specifications. (9.1.2.3)<br><br>Soil samples were sent to a qualified soil lab and tested in accordance with EPA SW 846, ASTM E 1323, or other recognized industry test methods. At minimum, soil resistivity/ conductivity, moisture content, soil pH, soluble chloride ion concentration, and sulfide ion concentration data were obtained. The report included the results of all test methods used in the evaluation. (9.1.3)<br><br>Corrosion specialist/cathodic protection specialist considered performing tests & evaluating redox potential, sulfate ion concentration, and any other test required by the external corrosion rate analysis model. The report included all test methods used in the evaluation. (9.1.4)<br><br>1 soil sample of every 10 was subjected to independent QC analysis. All samples were reanalyzed since the last successful QC analysis if QC analysis failed. (9.1.5)<br><br>The statistical analysis model reached a confidence level of 0.99. (9.2.1) |
| | Procedure was based on an evaluation of all data gathered. (9.2.2.1)<br><br>Mathematical formulation conformed to accepted physical and electrochemical characteristics of tank corrosion process. (9.2.2.2)<br><br>Parameter estimates were based on minimum of 100 sites and 200 tanks which were excavated and evaluated by a qualified corrosion expert. A procedure that met standards of statistical /electrochemical admissibility was used. Data were representative of leaking and nonleaking tanks. (9.2.2.3)<br><br>Standard deviation of predicted time to corrosion failure was not > | Procedure was based on an evaluation of all data gathered. (9.2.2.1)<br><br>Mathematical formulation conformed to accepted physical and electrochemical characteristics of tank corrosion process. Independent professional validation was completed. (9.2.2.2)<br><br>Parameter estimates were based on minimum of 100 sites and 200 tanks which were excavated and evaluated by a qualified corrosion specialist/cathodic protection specialist. Procedure that meets standards of statistical /electrochemical admissibility was used. Data were representative of leaking and nonleaking tanks. (9.2.2.3) |

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| | 1.5 years. Model generated a probability of corrosion failure based on a comparison of actual tank age to expected leak-free life. (9.2.2.4)<br><br>Models proposed were specific to soil type & incorporated GW depth & rainfall experienced in the immediate geographical area where testing occurred. (9.2.2.5)<br><br>Report conclusions were based on the expected leak-free life of a tank at a specific site as determined by analysis of the data necessary to determine which tanks were suitable for upgrading with CP. (9.2.3.1)<br><br>Report provided the expected leak-free life and present and future probabilities of corrosion failure for all tanks investigated. (9.2.3.2)<br><br>Report included a listing of tanks whose age was < the expected leak-free life where the probability of corrosion perforation was < 0.05. (9.2.3.3)<br><br>Probability of corrosion failure was < 0.05. (9.2.3.4 and 9.2.3.5)<br><br>For tanks 10 years old and older, the leak detection test that was performed before the tank was assessed was repeated approximately 6 months after cathodic protection was added to ensure its continued leak-free condition. (9.2.3.5) | Models proposed were specific to soil type & incorporated GW depth & rainfall experienced in the immediate geographical area where testing occurred. (9.2.2.5)<br><br>Standard deviation of predicted time to corrosion failure was not > 1.5 years. Model generated an unconditional probability of corrosion failure. based on a comparison of tank age to expected leak-free life. (9.2.2.5)<br><br>Report conclusions were based on the expected leak-free life of a tank at a specific site as determined by analysis of the data necessary to determine which tanks were suitable for upgrading with CP. (9.2.3.1)<br><br>Report provided the expected leak-free life and present and future probabilities of corrosion failure for all tanks investigated. (9.2.3.2)<br><br>Report included a listing of tanks whose age was < the expected leak-free life and where the probability of corrosion perforation was < 0.05. (9.2.3.3)<br><br>Tank was leak free. (9.3.1)<br><br>Tank age was less than the expected leak free life. (9.3.2)<br><br>Probability of corrosion perforation of the tank was < 0.05 (9.3.3)<br><br>Tank tightness test was conducted 3 to 6 months after CP was added or monthly monitoring with another leak detection system was implemented within 1 month after CP was added. Leak detection system met section 5.2.2. (9.3.4)<br><br>Authenticated vendor-provided information was reported using the form in the Annex. (9.4) |

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| **Invasive Ultrasonic Thickness Testing with External Corrosion Evaluation** | Tests were conducted by or under the responsible supervision of a corrosion expert. (10.1.3)<br><br>Stray current corrosion/interference was tested for. (10.1.4)<br><br>Soil resistivity was measured according to Wenner 4 pin method or NACE RP-0285. (10.1.5)<br><br>Structure-to-soil potentials were measured according to RP-0285 with at least 1 potential measurement was made over each tank at the midpoint or end of all metallic components connected to the tank. (10.1.6)<br><br>Soil pH was measured. (10.1.7)<br><br>Electrical continuity/isolation tests were conducted (NACE RP-0187). (10.1.8)<br><br>Additional tests were considered by the corrosion expert. (10.1.9)<br><br>Tanks ten years old or older successfully passed the tests provided for in sections 8 and 10. (10.1.10)<br><br>Corrosion tester performing robotic tests was properly certified. (10.2.1)<br><br>Interior surface of tank was uniform and free of loose scale, paint, dirt, and other deposits that affect examination (according to ASTM E 114). (10.2.3)<br><br>Thickness measurement sensor was calibrated (using ASTM E 797). (10.2.4)<br><br>Couplant used was stored product or compatible with product stored & was appropriate for the surface finish of the examined material. Surface finish/ couplant was acoustically similar to those of the tank & couplant therein. (10.2.5) | Tests were conducted by or as directed by the corrosion specialist/cathodic protection specialist. (10.1.2)<br><br>Stray currents were tested for as specified in 9.1.2.1. (10.1.3.1)<br><br>Soil resistivity was measured in accordance with ASTM G 57. (10.1.3.2)<br><br>Structure-to-soil potentials were made using NACE RP-0285, with at least 5 such measurements spaced uniformly about each tank excavation zone. (10.1.3.3)<br><br>Soil pH according to ASTM G 51 and soil chlorides & sulfides according to EPA SW 846 were uniformly gathered from 3 locations about each tank excavation zone. (10.1.3.4)<br><br>Electrical continuity/isolation tests were conducted according to NACE RP-0285 at each UST. (10.1.3.5)<br><br>Corrosion technician that performed robotic tests met certain certification and qualification requirements. (10.2.2)<br><br>Interior surface of tank was uniform and free of loose scale, paint, dirt, and other deposits that affect examination (according to ASTM E 114). (10.2.3)<br><br>Thickness measurement sensor was calibrated (using practice ASTM E 797). (10.2.4)<br><br>Couplant used was stored product or compatible with product stored & was appropriate for the surface finish of the examined material. Surface finish/ couplant was acoustically similar to those of the tank & couplant therein. (10.2.5)<br><br>Wall thickness measurements were made on at least 15% of the tank interior surface (excluding access ways). Thickness measurements were uniformly distributed over the surface of the |

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| | Discrete, located measurements were taken on at least 15 % of the entire tank interior surface (excluding access ways). Additional measurements were made in areas where corrosion was more severe. (10.2.6.1) | tank. (10.2.6.1)<br><br>Equipment was capable of accessing at least 95% of the interior surface area. Additional measurements were made (as determined by corrosion specialist/cathodic protection specialist) in areas where corrosion was more severe. (10.2.6.1)<br><br>The maximum allowable position error in each wall thickness measurement position location coordinate was 5% of the maximum tank dimension. (10.2.6.3) |
| | The following data were recorded: operator name and certification level, instrument description (make, model, S/N, and setup couplant), instrument calibration certification (including date performed), cable type and length, scanning mode, search unit description, reference standards, location data for thickness measurement points. (10.2.7)<br><br>Robotic inspection device was capable of entering tank through an existing entry and was versatile enough to traverse 95% of the tank interior (excluding access ways). (10.2.8.1)<br><br>For automated scanning, the search unit was held by a suitable fixed device while the search unit moved mechanically along a predetermined path within the tank in accordance with ASTM E 114. (10.2.8.2)<br><br>The robotic inspection device was able to free the interior surface of rust, loose scale, paint, and other deposits to ensure a clean surface for ultrasonic inspection. (10.2.8.3)<br><br>The robotic inspection system was safe for operation and compatible with the stored product. (10.2.9)<br><br>A prediction model which used thickness measurement test data and soil chemistry data was used to forecast when each tank was | The following data were recorded: operator name and certification level, instrument description (make, model, S/N, and setup couplant), instrument calibration certification (including date performed), cable type and length, scanning mode, search unit description, reference standards, location data for thickness measurement points. (10.2.7)<br><br>The user of this standard established appropriate safety and health practices and determined the applicability or regulatory limitations prior to use. (10.2.8)<br><br>A prediction model was used to determine the probability of an individual tank leak due to corrosion. The model yielded the years of leak-free life remaining and the probability of a potential leak of the tank in a specific soil condition. It was based on tank inspection data collected and included all of the site specific parameters in sections 10.1.3.1 through 10.1.3.5 along with any tests performed in 10.1.4. The mathematical formulation was based on accepted physical/electrochemical characteristics of tank corrosion process. (10.3.2.1)<br><br>There was no measured pitting which perforated the tank wall. 98% of all thickness measurements were > or equal to 50% of the minimum recommended wall thickness as provided in UL 58 or the |

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| | expected to leak. The prediction model yielded the years of leak-free life remaining and the probability of a potential leak of the tank in a specific soil condition. The model was based on tank inspection data and included all of the data listed in 10.1.3 through 10.1.8 and any tests performed in 10.1.9. The mathematical formulation was based on accepted physical and electrochemical characteristics of the tank corrosion process. (10.3.2.1)<br><br>There was no pitting greater than 50% of the minimum recommended wall thickness. The average wall thickness of each square meter was > 85% of the original wall thickness. The results of the prediction model, as determined by the corrosion expert, supported that CP was both reasonable and viable. (10.3.2.2)<br><br>The inspection report summarized all tank data collected from the inspection and provided results from the prediction model for each tank, including recommendations w.r.t. the tank's suitability for upgrading with CP. The corrosion expert was responsible for all data analysis and recommendations. (10.3.3) | documented original wall thickness. The average metal wall thickness of each square meter was >85% of the original wall thickness. The prediction model results, as determined by the corrosion specialist/cathodic protection specialist, supported that CP was both reasonable and viable. (10.3.2.2)<br><br>The inspection report summarized all tank data collected from the inspection and provided results from the prediction model for each tank, including recommendations w.r.t. the tank's suitability for upgrading with CP. The corrosion specialist/cathodic protection specialist was responsible for all data analysis and recommendations. (10.3.3)<br><br>The tank passed all requirements defined in 10.3.2.2. (10.4.1)<br><br>Tank tightness test was conducted 3 to 6 months after CP was added or monthly monitoring with another leak detection system was implemented within 1 month after CP was added. Leak detection system met section 5.2.2. (10.4.2)<br><br>Authenticated vendor-provided information was reported using the form in the Annex. (10.5) |
| **Invasive permanently recorded visual inspection and evaluation including external corrosion assessment** | Tests were conducted by or under the responsible supervision of a corrosion expert. (10.1.3)<br><br>Stray current corrosion/interference was tested for. (10.1.4)<br><br>Soil resistivity was measured according to Wenner 4 pin method or NACE RP-0285. (10.1.5)<br><br>Structure-to-soil potentials were measured according to RP-0285 with at least 1 potential measurement made over each tank at the midpoint or end of all metallic components connected to the tank. (10.1.6) | Tests were conducted by or as directed by the corrosion specialist/cathodic protection specialist. (11.1.2)<br><br>Stray currents were tested as specified in 9.1.2.1. (11.1.3.1)<br><br>Soil resistivity was performed in accordance with ASTM G 57 at certain depths. (11.1.3.2)<br><br>Structure to soil potentials were made using NACE RP-0285 with at least 5 such measurements spaced uniformly about each tank excavation zone. (11.1.3.3)<br><br>Soil pH according to ASTM G 51 and soil chlorides and sulfides |

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| | Soil pH was measured. (10.1.7)<br><br>Electrical continuity/isolation tests were conducted (NACE RP-0187). (10.1.8)<br><br>Additional tests were considered by the corrosion expert. (10.1.9)<br><br>Tanks ten years old or older successfully passed the tests provided for in sections 8 and 10. (10.1.10)<br><br>The person performing the inspection was a corrosion tester. The analysis of any suspect corrosion activity that may fail a tank was conducted by a corrosion expert. (10.4.3)<br><br>Field and laboratory testing was completed either prior to or in conjunction with performing internal video tank inspection. If the field and lab testing revealed any indication of structural or electrochemical characteristics that were incompatible with the effective use of CP, then the tank was failed and internal inspection aborted. (10.4.4)<br><br>The tank was emptied, cleaned, and purged prior to conducting the internal video inspection. (10.4.5 - 10.4.8.1) | according to EPA SW846 and ASTM E 1323 were uniformly gathered from 3 locations about each tank excavation zone. (11.1.3.4)<br><br>Electrical continuity/isolation tests were conducted according to NACE RP-0285 at each UST being evaluated. (11.1.3.5)<br><br>The person performing the inspection was a corrosion technician. The corrosion specialist/cathodic protection specialist conducted an analysis of any suspect corrosion activity that may have failed the tank. (11.2.3)<br><br>The field and laboratory testing was completed either prior to or in conjunction with performing the internal visual inspection. If these tests revealed any indication of structural or electrochemical characteristics that were incompatible with the effective use of CP, the tank was failed and the internal visual inspection was aborted. (11.2.4)<br><br>Prior to conducting the internal visual inspection, the tank was emptied, cleaned, if necessary, and purged. (11.2.5 - 11.2.8.1)<br><br>The "in-tank" visual recording system had lighting capable of adequately illuminating the interior steel surfaces so the defect sizes defined in 11.2.10.1 could be visually observed and permanently recorded. (11.2.9) |
| | The lighting equipment was capable of illuminating interior steel surfaces having an area of 12 sq ft at 30 ft from the camera. The intensity of the lighting was adjustable to accommodate the visual/video inspection within 2.5 ft of the camera. The lighting system had a minimum rating of 900 candle power. (10.4.9)<br><br>Video camera has interchangeable lenses or zoom lens capable of focusing on surfaces from 2.5 through 30 ft away from the camera. | The visual inspection method identified and permanently recorded the presence of all detectable pits or corrosion by-products tubercles while observing and permanently recording the condition of at least 98% of the tank's interior surfaces. (10.2.10.1)<br><br>The minimum resolution of the visual recording system was capable of identifying the location and degree of corrosion activity as listed in 11.2.10.1. The system permanently embedded the time, |

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| | The camera/lens/video system had sufficient viewing clarity at the maximum tank-surface-to-lens distance to identify pits or corrosion by-product tubercles having a diameter of 1/8 inch or more. The typical minimum viewing fields were 11 inches horizontal by 8 inches vertical at a distance of 5 ft and 22 inches horizontal by 18 inches vertical at 30 ft. (10.4.10.2)<br><br>The video camera/system had certain minimum specified properties. (10.4.10.2)<br><br>Camera focusing and light intensity were controlled remotely. The controls were capable of focusing and lighting to produce a clear sharp monitor image with sufficient contrast to identify (and tape) suspected corrosion activity throughout interior surfaces of the tank. (10.4.10.3)<br><br>The remote-control drive mechanism was capable of the following: raising/lowering within 95% of the tank diameter, rotating right/left 360 degrees, rotating the camera tilt angularly up/down from direct down view to 135 degrees up from vertical, and identifying the direction of view. (10.4.11)<br><br>The video monitor had (at minimum): a high-resolution industrial-grade color monitor with 9 inch diagonal color screen, resolution and clarity to be compatible with the video camera, and capability of identifying corrosion activity listed in the emergency standard. The unit included a high-resolution industrial-grade video recording system with audio microphone and audio tract capabilities. The recording system had standard video recording controls, including programmable clock/timer and an integrated video typewriter with memory. The system had the capability of superimposing both voice override and typed text on the video tape. (10.4.12)<br><br>All interior tank surfaces were scanned with a medium-focal-length | structure site, UST location and date of the visual examination in the visual record. It provided for permanently recording the observation comments of the visual inspector. (11.2.11)<br><br>The inspection was made by a qualified technician working under the supervision of the responsible corrosion specialist/cathodic protection specialist according the following minimum requirements. (11.2.12)<br><br>All interior surfaces were scanned to assess the general inspection conditions and to ensure the tank was sufficiently clean to permit effective visual inspection. (11.2.12.1)<br><br>Date, time, and all necessary tank identification data (including company/ address, project ID, tank size, age, and ID number, and corrosion technician's name) were recorded at the start of the recording process. (11.2.12.2)<br><br>The visual corrosion condition on at least 98% of the internal tank surfaces was systematically performed. (11.2.12.3)<br><br>All pertinent or unique observations, corrosion activity or damage, and location relative to the internal tank surface observed by the corrosion technician were permanently recorded. (11.2.12.4)<br><br>A commentary summation of the corrosion technician was permanently recorded. (11.2.12.5)<br><br>The corrosion technician identified any evidence of corrosion. (11.2.13)<br><br>The report indicated if no corrosion or deterioration was evident. (11.3.1)<br><br>The corrosion specialist/cathodic protection specialist viewed the visual permanent record and made final determination on the |

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| | lens/zoom to assess the general inspection conditions and ensure the tank was sufficiently clean to permit effective video inspection. (10.4.13.1) | suitability of each tank tested for upgrading. (11.3.2)<br><br>A report was prepared and submitted to the O/O by the corrosion specialist/cathodic protection specialist after review of the permanent visual record. The report contained the upgrading suitability determination made for each tank. The report was kept on file by the O/O as part of required documentation. (11.3.3) |
| | The following were both typed in and recorded verbally at the start of the recording: date, time, and all necessary tank ID data (including company name/address, project ID number, tank size, age, and ID number, and technician's name). (10.4.13.2)<br><br>The camera was moved systematically to record visual inspection of the internal tank surfaces. Zoom-in (or appropriate lenses) was employed to explore any suspected corrosion sites. (10.4.13.3)<br><br>Voice override and text input was used for notations on any unique observation, corrosion activity, or damage along with the location relative to the internal tank surface. (10.4.13.4)<br><br>Summation commentary and recommendations noting "end" of inspection using both voice and text input were added. (10.4.13.5)<br><br>Corrosion tester identified any evidence of corrosion. (10.4.14)<br><br>The report indicated if no corrosion or deterioration was evident. (10.5.1)<br><br>The corrosion expert reviewed the video record and made a final suitability determination of each tank tested for upgrading. (10.5.2)<br><br>The corrosion expert submitted a report to the O/O after reviewing the video record (including both typed-in and voice override notations and comments) which included the upgrading suitability determination made for each tank. The video record and report | Any evidence of perforation or significant corrosion was confirmed by the corrosion specialist/cathodic protection specialist or by her or his analysis of the site corrosion data which indicated the tank was not a candidate for upgrading by CP alone. (11.3.4)<br><br>(1) A prediction model was used to determine the probability of an individual tank leak due to corrosion. The model yielded the years of leak-free life remaining and the probability of a potential leak of the tank in a specific soil condition. It was based on tank inspection data collected and included all of the site specific parameters in 11.1.3 through 11.1.3.5 along with any tests performed in 11.1.4. The mathematical formulation was based on accepted physical/electrochemical characteristics of tank corrosion process. (10.3.5.1) The tank was considered suitable for upgrading if: the results of the prediction model, as determined by the corrosion specialist/cathodic protection specialist, supported that CP was both reasonable and viable (11.3.5.1)<br><br>or<br><br>(2) If a statistical prediction model was not used, tanks were not considered suitable for upgrade with CP if any of the following values were as follows: soil resistivity at the average tank depth < 700 ohm-cm, soil pH < 4.0, soluble chloride ion concentration > 500 ppm, positive sulfide test indicating the presence of sulfate-reducing bacteria according to EPA SW 846, average tank-to-soil potential on the UST is more positive than minus 300 mV with |

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| | were kept on file by the O/O as part of the required documentation. (10.5.3)<br><br>If significant evidence of a perforation or corrosion was confirmed by the corrosion expert or if the corrosion expert's analysis of the site environmental data indicated the tank was not a candidate for cathodic protection, the O/O was advised that the tank was not acceptable for upgrading by CP and that other options should be considered, such as repair, replacement, additional tests/inspections, or closure. (10.5.4)<br><br>For tanks 10 yrs old or older, CP was applied only after testing in accordance with sections 8 and 10 with the tank found to be leak free. The leak detection test was performed again approximately 6 months after adding CP for tanks that were 10 yrs old or older to ensure the tank's continued leak-free condition. (10.5.5) | respect to a saturated copper/copper sulfate electrode. (11.3.5.2)<br><br>Tanks tested and found to be leak free and found acceptable for upgrading according to sections 8 and 11 and meeting the criteria defined in section 11.3.4 together with either section 11.3.5.1 or 11.3.5.2 could be upgraded with cathodic protection (11.4.1)<br><br>Tank tightness test was conducted 3-6 months after CP was added or monthly monitoring with another leak detection system was implemented within 1 month after CP was added. Leak detection system met section 5.2.2. (10.4.2)<br><br>Authenticated vendor-provided information was reported using the form in the Annex. (10.5) |