

2014

Regulation for the Control of Underground Storage Tanks



EQB
ENVIRONMENTAL QUALITY BOARD

Commonwealth of Puerto Rico

Water Quality Area



TABLE OF CONTENTS

	Page
PART I. PROGRAM SCOPE AND INTERIM PROHIBITION	9
Rule 801. Program Scope	9
Rule 802. Purpose	9
Rule 803. Applicability	9
Rule 804. Interim Prohibition for Deferred UST Systems	11
Rule 805. Definitions and Abbreviations	11
Rule 806. RESERVED	24
PARTE II. UST SYSTEMS: DESIGN, CONSTRUCTION, INSTALLATION AND NOTIFICATION	25
Rule 807. Performance Standards for New UST Systems	25
A. Tanks	25
B. Piping	26
C. Spill and Overfill Prevention Equipment	27
D. Installation	28
E. Certification of Installation	28
F. Dispenser Systems	28
Rule 808. Upgrading or reconditioning of Existing UST System.	28
A. Permitted alternative	28
B. Tank Upgrading Requirement	28
C. Piping Upgrading Requirements	29
D. Spill and Overfill Prevention Equipment	29
E. Upgrade Requirements for Previously Deferred UST Systems	30
Rule 809. Register Requirements	30
Rule 810. Permits for UST Systems	31
A. Installation, Operation, Modification, and Closure Permits	31
B. UST Installation Permit	32
C. Operation Permit	37
D. Closure Permit	40
E. Action Regarding an Application or an Administrative Determination	41
F. Duration of Permits	42
G. Permit Suspension or Revocation	42
Rule 811. Quality Assurance Project Plan	43
A. General Requirements	43
B. Corrective Action Requirement	43
Rule 812. RESERVED	44
PART III. GENERAL OPERATING REQUIREMENTS	45
Rule 813. Spill and Overfill Control	45
Rule 814. Operation and Maintenance of Corrosion Protection	45
Rule 815. Compatibility	46
Rule 816. Repairs Allowed	46
Rule 817. Reporting and Recordkeeping	47

A. Reporting	47
B. Recordkeeping	47
C. Availability and Maintenance of Records	48
Rule 818. Periodic Testing of Spill and Overfill Prevention Equipment	48
Rule 819. Periodic Testing of Secondary Containment	49
Rule 820. Periodic Operation and Maintenance Walkthrough Inspections	50
Rule 821. RESERVED	51
Rule 822. RESERVED	51
Rule 823. RESERVED	51
Rule 824. RESERVED	52
Rule 825. RESERVED	52
Rule 826. RESERVED	52
Rule 827. RESERVED	52
PART IV. RELEASE DETECTION	53
Rule 828. General Requirements for All UST System	53
Rule 829. Requirements for Petroleum UST Systems.	54
A. Tanks	54
B. Piping	55
Rule 830. Requirements for Hazardous Substance UST Systems	56
Rule 831. Methods of Release Detection for Tanks	56
A. Methods to discontinue	56
B. Inventory Control	57
C. Vapor Monitoring	57
D. Groundwater Monitoring	58
E. Manual Tank Gauging	58
F. Tank Tightness Testing	59
G. Automatic Tank Gauging	59
H. Interstitial Monitoring	59
I. Statistical Inventory Reconciliation	60
J. Other Methods	61
Rule 832. Methods of Release Detection for Piping	61
A. Automatic Line Leak Detectors	61
B. Line Tightness Testing	61
C. Applicable Tank Methods	61
Rule 833. Release Detection Recordkeeping	61
Rule 834. Alternative Methods of Release Detection for Field-Constructed Tanks	62
Rule 835. Alternative Methods of Release Detection for Bulk Piping	62
Rule 836. RESERVED	63
PART V. RELEASE REPORTING, INVESTIGATION AND CONFIRMATION	64
Rule 837. Reporting of Suspected Releases	64
Rule 838. Investigation Due to Off-Site Impacts	64
Rule 839. Release Investigation and Confirmation Steps	64
A. System Test	64

B. Site Check	65
Rule 840. Reporting and Cleanup of Spills and Overfills	65
Rule 841. RESERVED	66

PART VI. RELEASE RESPONSE AND CORRECTIVE ACTION FOR UST SYSTEMS CONTAINING PETROLEUM OR HAZARDOUS SUBSTANCES	67
Rule 842. General	67
Rule 843. Initial Response	67
Rule 844. Initial Abatement Measures, Site Check, and Free Product Removal	67
Rule 845. Site Investigation Plan for Soil and Groundwater Cleanup	68
Rule 846. Corrective Action Plan	69
Rule 847. Public Participation	70
Rule 848. Risk Based Corrective Action	70
Rule 849. RESERVED	70

PART VII. OUT OF SERVICE UST SYSTEM AND CLOSURE	71
Rule 850. Temporary Closure of UST System	71
Rule 851. Permanent Closure and Changes in Service	71
Rule 852. Assessing the Site at Closure or Change in Service	72
Rule 853. Applicability to Previously Closed UST Systems	72
Rule 854. Closure Records	72
Rule 855. RESERVED	73

PART VIII. REGISTER REQUIREMENTS AND PROCEDURES	74
Rule 856. Register of UST System	74
Rule 857. Register Requirements	74
Rule 858. Registration Responsibility	74
Rule 859. Certificate of Registration and UST Facility Identification Number	74
Rule 860. Changes to Facility Data	75
Rule 861. RESERVED	75
Rule 862. RESERVED	75

PART IX. FINANCIAL RESPONSIBILITY	76
Rule 863. Responsibility and exemptions	76
Rule 864. Compliance Dates	76
Rule 865. Amount and Scope of Required Financial Responsibility	76
Rule 866. Allowable Mechanisms and Combinations of Mechanisms	77
Rule 867. Financial Test of Self-Insurance	77
Rule 868. Corporate Guarantee	79
Rule 869. Insurance and Risk Retention Group Coverage	80
Rule 870. Surety Bond	80
Rule 871. Letter of Credit	81
Rule 872. Trust Fund	81
Rule 873. Standby Trust Fund	82
Rule 874. Substitution of Financial Assurance Mechanisms by Owner or Operator	82

Rule 875. Cancellation or Nonrenewal by Provider of Financial Assurance	83
Rule 876. Reporting by Owner and Operator	83
Rule 877. Recordkeeping	84
Rule 878. Drawing on Financial Assurance Mechanisms	84
Rule 879. Release from the Requirements	85
Rule 880. Bankruptcy or Other Incapacity of Owner and Operator or Provider of Financial Assurance	85
Rule 881. Replenishment of Guarantees, Letters of Credit, or Surety Bonds	86
Rule 882. RESERVED	86
Rule 883. RESERVED	86
Rule 884. RESERVED	86
Rule 885. RESERVED	86
Rule 886. RESERVED	86
Rule 887. RESERVED	86
PART X. GENERAL OPERATING REQUIREMENTS	87
Rule 888. General Requirement for All UST Systems	87
Rule 889. Designation of Operators	87
Rule 890. Requirements for Operator Training	87
A. Class A Operators	87
B. Class B Operators	88
C. Class C Operators	88
Rule 891. Actualization of Operator Training	89
Rule 892. Documentation	89
Rule 893. RESERVED	90
Rule 894. RESERVED	90
PART XI. ACREDITATION OF TRAINING PROGRAMS	91
Rule 895. Operators Training Program	91
Rule 896. Accreditation of Training Programs	91
Rule 897. Accreditation requirements	91
A. Entity	91
B. Training School Administrator	91
C. Principal and Guest Instructor	91
D. Training courses	92
E. Theoretical and Practical Curriculum	92
F. System evaluation	94
G. Operator’s certification	95
Rule 898. Quality Plan	95
Rule 899. Accreditation Process	96
A. Application	96
B. Accreditation Fees	98
C. Evaluation of the accreditation application	98
D. Accreditation Certification	98
Rule 900. UST Systems Operator Certification Reciprocity of Another State, Tribe or Territory of the United States	98
Rule 901. People Certified before the Enactment of this Regulation.	99

Rule 902. Suspension, Revocation and Modification of a UST Systems Operator Certification.	99
Rule 903. Notification Requirements for Training Program, Records and Registration.	100
Rule 904. Training Programs Audit.	101
Rule 905. Minimum Requirements for Renewal of Training Programs Accreditation.	102
Rule 906. Reciprocity of a Training Program.	102
Rule 907. Suspension, Revocation and Amendment of the Accreditation Trainings.	102
Rule 908. RESERVED	103
Rule 909. RESERVED	103
PART XII. GENERAL PROVISIONS	104
Rule 910. Monitoring, Recordkeeping, Reporting, Sampling and Testing Methods	104
A. Monitoring, Recordkeeping, and Reporting	104
B. Sample Collection and Analysis	104
C. Certification of Records and Reports	104
D. Certification Oath	104
Rule 911. Equipment Malfunction Reporting	105
Rule 912. Confidentiality of Information	105
Rule 913. Right of Entry to Inspect	105
Rule 914. Public Notice and Public Hearings	105
A. Public Notice	105
B. Public Hearings	105
Rule 915. Field Citation Expedited Enforcement Procedures	106
Rule 916. Notice of Violation and Compliance Order	106
Rule 917. Closure of a Facility or an UST System	107
Rule 918. Penalties and Authorization Revocation	107
A. Penalties	107
B. Contumacy	107
C. Criminal Sanctions	107
D. Recovery Actions	107
Rule 919. Penalties and revocation of authorization	108
Rule 920. Inconsistent or contradictory Provisions	108
Rule 921. Derogation	108
Rule 922. Separability Clause	108
Rule 923. Effectiveness	108
Rule 924. Public Record	108
Rule 925. Adopted language to this Regulation	108
Rule 926. Amendments to the Regulations	108
PART XIII. GENERAL PROHIBITIONS	109
Rule 927. General Prohibition Against Surface and Coastal Waters Pollution	109
Rule 928. General Prohibition Against Groundwater Pollution	109
Rule 929. General Requirement for Compliance with Regulations	109

Rule 930. General Prohibition on Handling of Regulated Substances	109
Rule 931. General Prohibition Against Illegal Operation of an UST System	109
Rule 932. General Prohibition Against Floodplain UST System Siting	109
Rule 933. Prohibitions for the Operation of Retail Gasoline Service Stations, Gasoline Service Stations that Supply Government Vehicles, Private Organizations of Different Nature and Motor Vehicle Dealers	109
Rule 934. Prohibition of Field Constructed Tanks	110
Rule 935. Fuel Product Delivery Prohibition (Red Tag)	110
Rule 936. RESERVED	112
PART XIV. FEES	113
Rule 937. Application Processing Fees	113
Rule 938. Initial registration, permits, renewal and amendments to permits fees	113
Rule 939. Report and Plan Evaluation Fees	113
Rule 940. Fees for Copies of Records	114
Rule 941. Exemptions from Fees	114
Rule 942. Testing and analysis fees	114
Rule 943. Fee Payment	114
Rule 944. RESERVED	114

LIST OF TABLES

	Page
Table 1. Compliance schedule for previously deferred UST systems installed before the effective date of this Regulation.	9
Table 2. Cleaning Levels of groundwater and soil contaminated with Hydrocarbons Oil Products	43
Table 3. Progressive dates for release detection system compliance.	54
Table 4. Weekly or Monthly Standards and Difference Between Initial and Final Readings According to the Nominal Capacity of the Tank.	59
Table 5. Maximum Detectable Leak Rate per Volume of the Section evaluated.	63
Table 6. Initial registration, permits, renewal and amendments to permits fees	113

LIST OF APPENDIX

- Appendix I.** Procedure Actions and Requirements for Permanent Closure of Underground Storage Tanks” (PARPCUST).
- Appendix II** Codes of practice that can be used as a guide to meet a few sections of this Regulation
- Appendix III** List of substances identified as hazardous under the Federal Rules (40 CFR Part 302) Section 101(4) of the CERCLA Act.

PART I. PROGRAM SCOPE AND INTERIM PROHIBITION

Rule 801. Program Scope

These set of rules are known as the Regulation for the Control of Underground Storage Tanks, is promulgated in accordance with Act No. 416 of September 22, 2004, as amended, and constitute the rules of the Environmental Quality Board (EQB) of the Commonwealth of Puerto Rico, for installations with Underground Storage Tank Systems (UST Systems).

Rule 802. Purpose

A. This Regulation is promulgated to comply with the following purposes:

1. To establish the Board's Underground Storage Tank Systems Control Division (USTCD);
2. To promote the necessary compliance of facilities with UST Systems;
3. To implement a notification system with requirements for installation, operation and closure of facilities with UST Systems. Finally; also
4. To protect the human and environmental health of Puerto Rico, by ensuring a sound management of the UST Systems, preventing, controlling, remedying and mitigation abating existing or potential soil, surface water and ground water contamination.

Rule 803. Applicability

A. The requirements of this Regulation apply to all owners and operators of a UST Systems. The UST Systems, previously deferred, must comply to the requirements of this Part, as follows:

1. UST Systems installed on or before the effective date of this Regulation, must meet the following time table:

Type of UST System	Part or Rule	Effective Date
UST System that store fuel solely for use in emergency power generators.	IV	One (1) year after effective date of this Regulation.
Airport hydrant fuel distribution systems; UST System with field-constructed tanks; and wastewater treatment tank systems under section 402 or 307 (b) of CWA, related to controlled substances under this Regulation.	II (except Rule 809) and III	Three (3) years after effective date of this Regulation.
	IV	See the phase in schedule in Rule 828.C
	Rule 809, V, VI, VII, VIII, IX, X, XI, XII, XIII and XIV	Effective date of this Regulation

Table 1. Compliance schedule for previously deferred UST systems installed before the effective date of this Regulation.

2. Installed after these Regulation come into effect must meet all requirements at installation.

B. The following UST System are excluded from the requirements of this Regulation:

1. Any UST System holding hazardous wastes listed or identified under RCRA, or a mixture of such hazardous waste and other regulated substances.
2. Any wastewater treatment tank system that is part of a wastewater facility regulated under Section 402 or 307(b) of the Clean Water Act.
3. Equipment or machinery that contains regulated substances for operational purposes such as hydraulic lift tanks and electrical equipment tanks.
4. Any UST System whose capacity is 110 gallons or less.
5. Any UST System that contains *de minimus* concentration of a regulated substance.
6. Any emergency spill or overflow containment UST System that is expeditiously emptied after use.
7. Tank and piping volume beneath the surface of the ground is less than ten percent (10%) (For example, an aboveground tank).
8. Any UST System that stores any petroleum fraction which is not liquid at standard conditions of temperature and pressure (e.g. liquefied gas). The standard conditions are 60 degrees Fahrenheit and 14.7 pounds per square inch absolute.
9. Fuel storage tanks used to power motors or generators in agricultural production, whose capacity is less than or equal to 1,100 gallons for non-commercial purposes.
10. Septic tanks.
11. Installing pipes or pipelines (including gatherer lines) that are regulated under 49 USC Chapters 603, and which the Secretary of Transportation has determined that are connected to a pipeline, or are operated or intended to operate pipeline pressure or as an integral part of a pipeline.
12. Surface impoundment, cavity or depression in the ground, pond or lagoon.
13. Runoff collection systems.
14. Tanks continuous flow process.
15. Liquid traps or associated gathering lines directly related to production operations and

oil and gas gathering.

16. Storage tanks located in underground area (such as a basement, cellar, mine, underground gallery, pit, or tunnel), if the underground tank is located in or on the soil surface of the underground area.
17. Any UST System containing radioactive material regulated under the Atomic Energy Act of 1954 (42 USC 2011 et seq.).
18. Any UST System that is part of an emergency generator system at nuclear power generation facilities regulated by the Nuclear Regulatory Commission under 10 CFR Part 50.

Rule 804. Interim Prohibition for Deferred UST System

No person may install an UST System listed in Rule 803.B for the purpose of storing regulated substances under this Regulation.

Rule 805. Definitions and Abbreviations

A. This Rule provides definitions of words and phrases applicable to this Regulation.

1. **Abandoned UST System:** A UST System for which the owner has left or ceased to operate. This includes UST System that are registered with the Board, but which are no longer being used or for which the owner is not working to permanently close the UST System.
2. **Aboveground release:** Any release to ground surface or surface water body. This includes, but is not limited to, releases from the aboveground portion of an underground storage tank system and releases associated with overfills and transfer operations as the regulated substance moves to or from an UST System.
3. **Accreditation:** The certificate issued by the EQB as an Operator Training School meets the requirements of this Regulation as a provider of an Operator Training Program UST System.
4. **Accredited Training Program:** Training Program has been accredited by EQB under this Regulation, to provide training to people engaged in activities related to the operation of UST System.
5. **Accredited Training program:** Training Program that has been accredited by the Board in accordance with this Regulation, to provide training to persons engaged in activities related to operation of UST Systems.
6. **AEA:** Refers to Federal Law, “Atomic Energy Act of 1946”, as amended (42 USC § 2011 et seq.).

7. **Airport hydrant fuel distribution system:** An UST System that is a combination of one or more tanks directly connected to underground hydrant piping used to fuel aircraft. These systems do not have a dispenser at the end of the piping run, but rather have a hydrant (fill stand). If an aboveground storage tank (AST) is feeding an intermediary tank or tanks, this definition does not include the AST, but does include all underground piping entering and leaving the intermediary tank(s) and the intermediary tank(s). Intermediary tanks are those tanks directly connected to the hydrant piping.
8. **Ancillary equipment:** Any devices including, but not limited to, such devices as pipelines, fittings, flanges, valves, and pumps, used to distribute, measure, or control the flow of regulated substances to and from an underground storage tank.
9. **API:** Refers to the American Petroleum Institute.
10. **Architect:** Any natural person authorized to practice the profession of architecture in the Commonwealth of Puerto Rico.
11. **ASTM:** Refers to the American Society for Testing Materials.
12. **Belowground release:** Any release of regulated substance to the subsurface of the land and to groundwater. This includes, but is not limited to, release from the belowground portions of an underground storage tank system and releases associated with overfills and transfer operations as the regulated substance moves to or from an underground storage tank.
13. **Beneath the surface of the ground:** Beneath the ground surface or otherwise covered with earthen materials.
14. **Board or EQB:** Refers to the Environmental Quality Board of Puerto Rico.
15. **Bodily harm:** Action or omission against a person which suffers physical damage or injury, either because of someone else, or force majeure.
16. **Cathodic protection tester:** Person who can demonstrate an understanding of the principles and measurements of all common types of cathodic protection systems as applied to bury or submerged metal pipelines and tank systems. At a minimum, such persons must have education and experience in soil resistivity, stray current, structure-to-soil potential, and component electrical isolation measurements of buried metal pipelines and tank systems.
17. **Cathodic protection:** A technique to prevent corrosion of a metal surface by making that surface the cathode of an electrochemical cell. For example, a tank system can be cathodically protected through the application of either galvanic anodes or an impressed current.
18. **CERCLA:** Refer to the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended.

19. **Certificate of Registration:** Document issued by the Board in which the corresponding identification number is assigned to the registered facility.
20. **Certification Exam:** Written or computerized evaluation of a person, in a particular discipline, recognized by EQB and administered by an accredited training school.
21. **Certification:** When the professional, who designed or will perform the specialized activity or action, establishes before the Board that the plans and other documents officially submitted are in compliance with the established laws, regulations and specifications.
22. **CFR:** Refers to the Code of Federal Regulations.
23. **Charitable institutions:** Any non-governmental, non-profit organization established under the laws of Puerto Rico for a public purpose.
24. **Class A Operator:** Individual who has primary responsibility to operate and maintain the UST System, in accordance with applicable requirements established by the EQB. The Class A Operator typically manages resources and personnel, such as establishing work assignments, to achieve and maintain compliance with regulatory requirements.
25. **Class B Operator:** Individual who has day-to-day responsibility, for implementing applicable UST regulatory requirements established by the EQB. The Class B Operator typically implements in-field aspects of operations, maintenance, and associated recordkeeping for the UST System.
26. **Class C Operator:** Employee responsible for initially addressing emergencies presented by a spill or release from an UST System. The Class C Operator typically controls or monitors the dispensing or sale of regulated substances.
27. **Community water system (CWS):** A public water system which serves at least 15 service connections used by year-round residents or regularly serves at least 25 year round residents. This definition is taken from the federal drinking water regulations at 40 CFR.
28. **Companies for marketing petroleum:** All companies owning facilities that store and distribute oil for sale.
29. **Compatible:** Ability of two (2) or more substances to maintain their respective physical and chemical properties upon contact with one (1) another for the design life of the tank system under conditions likely to be encountered in the underground storage tank.
30. **Connected piping:** All underground pipelines including valves, elbows, joints, flanges, and flexible connectors attached to a tank system through which regulated substances flow. For the purpose of determining how much piping is connected to any individual UST System, the pipeline that joins the two (2) UST Systems should

be allocated equally between them.

31. **Containment sump:** A liquid-tight container intended to prevent leaks and spills of regulated substances from piping, dispensers, pumps, and related components from entering the environment. Containment sumps are typically used underneath product dispensers and for enclosing the submersible turbine pump and piping connections at the top of an underground storage tank.
32. **Controlling Interest:** Direct ownership of at least fifty (50) percent of the voting stock of another entity that owns or operates a facility; the owner or operator entity shall be considered as a subsidiary of the Controlling Interest.
33. **Corrosion expert:** Person who, by means of thorough knowledge of the physical sciences and the principles of engineering and mathematics, acquired by a professional education and related practical experience, is qualified to engage in the practice of corrosion control on buried or submerged metal pipelines systems and metal tanks. Such a person must be certified as being qualified by the National Association of Corrosion Engineers (NACE) or be a registered professional engineer who has certification or licensing that includes education and experience in corrosion control of buried or submerged metal pipelines systems and metal tanks.
34. **Cost of legal defense:** Any expenditure which an owner or operator incurs in defending against claims or actions brought by EPA, by EQB to require corrective action or to recover the costs of corrective actions; on behalf of a third party for bodily injury or property damages caused by an accidental release; by any person to enforce the terms of a financial assurance mechanism.
35. **Course Agenda:** Outline of the main topics to be covered during the training course, including the time allotted to teach each topic.
36. **Course Review:** Evaluation of the overall effectiveness of the training, which will test the trainees knowledge of the topics covered in the course.
37. **CWA:** Refers to the Federal "Clean Water Act of 1977" as amended (33 USC § 251 et seq.).
38. **Damage to property:** Detriment or damage to property resulting from the act or omission of a person, and that affects the rights or proprietary interests.
39. **De Minimus:** A very low concentration such that tanks with *de minimus* concentrations pose a negligible risk to human health and the environment. Examples of tanks which may qualify for the *de minimus* exclusion include tanks used to treat storm water and municipal wastewater and tanks that store potable water which has been disinfected with chlorine.
40. **Dielectric material:** Material that does not conduct direct electrical current. Dielectric coatings are used to electrically isolate UST System from the surrounding soils. Dielectric bushings are used to electrically isolate portions of the UST System

(e.g., tank from pipelines).

41. **Discharge** - see **Release**
42. **Dispenser system:** Equipment located aboveground that meters the amount of regulated substances transferred to a point of use outside the UST system, such as a motor vehicle. This system includes the equipment necessary to connect the dispenser to the UST System.
43. **Electrical equipment:** Underground equipment that contains dielectric fluid which is necessary for the operation of equipment such as transformers and buried electrical cable.
44. **Emergency:** Any determination made by EQB Executive Director or by Resolution of the Governing Board, before a particular event, any situation or series of situations that endanger actual or imminent threat to any person, property or resource, and which requires immediate attention. Emergency shall also be understood, any abnormality caused by a natural or technological event such as: a hurricane, tornado, storm, flood, earthquake, tsunami, landslide, drought, fire, explosion, accident or hazardous materials, among others; any serious public nuisance or a dangerous enemy force by sabotage or by the use of bombs, artillery or explosives of any kind or by atomic, radiological, chemical or bacteriological, as well as, any other means used by the enemy in any part of Puerto Rico and that deserves to be mobilized and used extraordinary human and economic resources from state and municipal level, to remedy or prevent damage which may arise in those circumstance or to prevent or lessen the threat of emergence to become a disaster.
45. **Energy Policy Act of 2005:** Refers to legislation enacted in 2005 that includes the addition of UST provisions to Subtitle I of the Solid Waste Disposal Act, including, but not limited to, operator training, secondary containment, public record, and delivery prohibition.
46. **Engineer:** Any natural person authorized to practice the profession of engineering in Puerto Rico.
47. **Environmental Public Policy Act:** Refers to Puerto Rico Law 416 of September 22, 2004, as amended.
48. **EPA:** Refers to the U.S. Environmental Protection Agency.
49. **Exam:** Test performed by an Administrator of an Accredited Training School to corroborate the knowledge of a person as an Operator of a UST System. This Exam must, at least, evaluate the knowledge of Class A, Class B and Class C Operators, in accordance with the requirements of this Regulation.
50. **Excavation zone:** Volume containing the tank system and backfill material bounded by the ground surface, walls, and floor of the pit and trenches into which the UST System is placed at the time of installation.

51. **Executive Director of the Board:** Highest ranking official of the Board responsible for carrying out the EPA approved UST Program.
52. **Existing tank system:** Tank system used to contain an accumulation of regulated substances that was operating or for which an installation had commenced before the effective date of this Regulation.
53. **Existing:** An underground tank, piping, motor fuel dispensing system, facility, community water system, or potable drinking water well is in place.
54. **Facility:** Single property or contiguous or adjacent properties used for a common purpose, that are owned or operated by the same person, and on or in which are or were located one (1) or more UST.
55. **Farm tank:** A tank located on a tract of land devoted to the production of crops, or raising animals, including fish, and associated residences and improvements. *Farm* includes fish hatcheries, rangeland and nurseries with growing operations.
56. **Field constructed tank:** A tank which is not factory assembled, and which is principally constructed, fabricated, or assembled at the same facility where the tank is subsequently placed into service.
57. **Financial Reporting Year:** Most recent 12 consecutive month's period for which it is prepared a report, which could be used to support a financial test. The year of the financial report may include a period of fiscal or calendar year.
58. **Financial Security Provider:** An entity that provides financial assurance to an owner and operator of a UST System through one of the mechanisms listed in this Regulation, including a guarantor, an insurer, a group that provides risk retention a guarantor, an entity that issues a letter of credit or an entity that issues a mechanism required by the Commonwealth of Puerto Rico.
59. **Flow-through process tank:** Tank that forms an integral part of a production process through which there is a steady, variable, recurring, or intermittent flow of materials during the operation of the process. Flow-through process tanks do not include tanks used for the storage of materials prior to their introduction into the production process or for the storage of finished products or by-products from the production process.
60. **Force Majeure:** Any event arising from causes beyond the control of the owner and operator or any entity controlled by the owner and operator, including but not limited to, contractors and subcontractors of the owner or operator, that delays or prevents the execution of any obligation, despite the best efforts of the owner and operator to meet the obligation. The "best efforts to fulfill the obligation" of the owner and operator include best efforts to anticipate any potential event, and best efforts to deal with the effects of any potential event (1) while it is occurring and (2) after the event, so that the delay is minimized to the greatest extent possible. Includes extreme weather conditions that make the scheduled excavation of tanks and pipes impossible or a major event, such as: floods or earthquakes which interrupts regular trading. It

does not constitute force majeure, financial inability to perform the required actions and unanticipated costs or expenses associated with or incremental execution.

61. **Free product:** A regulated substance that is present as a non-aqueous phase liquid (e.g., liquid not dissolved in water).
62. **Gasoline distributor:** Owner of the product or who buys product (gasoline and other fuels) for resale, or the operator or owner of a tank truck who distributes the product to retail gasoline service stations.
63. **Gathering lines:** Any pipeline, equipment, facility, or building used in the transportation of oil or gas during oil or gas production or gathering operations.
64. **Geologist:** Any natural person authorized to practice the profession of geology in Puerto Rico.
65. **Governing Board:** Senior Authority and highest authority of the Environmental Quality Board consisting of three (3) members, one (1) Chairman, one (1) Vice President and one (1) associate member, appointed by the Governor with the consent of the Senate of the Commonwealth of Puerto Rico.
66. **Guest Instructor:** Person who has been appointed to teach one or more specific areas as agreed with the Principal Instructor or a Training School Administrator.
67. **Hazardous Substance:** Any substance identified as hazardous under CERCLA and the Federal Regulations (40 CFR Part 302).
68. **Hazardous Waste:** Any waste identified as a hazardous under RCRA and the Federal Regulations (40 CFR Part 261.3).
69. **Heating oil:** Petroleum that is No. 1, No. 2, No. 4 – light, No. 4 – heavy, No. 5 – light, No. 5 – heavy, and No. 6 technical grades of fuel oil; other residual fuel oil (including Navy Special Fuel Oil and Bunker C); and other fuels when used as substitutes for one of these fuels oils. Heating oil is typically used in the operation of heating equipment, boilers, or furnaces.
70. **Hydraulic lift tank:** Tank holding hydraulic fluid for a closed-loop mechanical system that uses compressed air or hydraulic fluid to operate lifts, elevators, and other similar devices.
71. **Incident:** Release of a controlled substance from a UST System accident, including continuous or repeated exposure to conditions resulting from the release.
72. **Independent Laboratory:** Location provided with the means to conduct research, experiments and works of a scientific or technical, that is autonomous and self-employed, that does not have by itself or its employees, conflicts of interest with the installation that has UST Systems, regulated under this Regulation.
73. **Injection well:** A well for the underground injection of fluids, including all

equipment and necessary accessories for the operation of the well.

74. **Interstitial space:** Area between the primary and secondary containment of a double-walled tank, double-walled piping, or other double-walled component. This area is designed to contain a leak from the primary containment and can be tested for a breach of integrity.
75. **Liquid trap:** Sumps, well cellars, and other traps used in association with oil and gas production, gathering, and extraction operations (including gas production plants), for the purpose of collecting oil, water, and other liquids. These liquid traps may temporarily collect liquids for subsequent disposition or reinjection into a production or pipeline stream, or may collect and separate liquids from a gas stream.
76. **Local Government:** A term that is generally intended to include municipalities created by law in Commonwealth of Puerto Rico.
77. **LPAU:** Refer to Puerto Rico Law 170 of August 12, 1988, as amended, Uniform Administrative Procedures Act.
78. **LUST:** Refer to Leaking Underground Storage Tank".
79. **Maintenance:** Normal operational upkeep to prevent an UST System from releasing product.
80. **Modify or Modification:** Revision, update, adjustment, correction or change in any information included in a facility's notification material, permit application, permit, investigation plan or corrective action plan.
81. **Monitoring System:** System capable of detecting leaks or discharge, or both, other than an inventory control system, used in conjunction with an underground storage tank.
82. **Motor fuel:** Petroleum or a petroleum-based substance that is typically used in the operation of a motor engine, such as motor gasoline, aviation gasoline, No. 1 or No. 2 diesel fuel, or any blend containing one or more of these substances (e.g., motor gasoline blended with alcohol).
83. **NACE:** Refers to the National Association of Corrosion Engineers.
84. **Net tangible assets:** What remain after deducting liabilities; does not include intangibles such as good faith of customers to the company, or patent rights or royalties.
85. **New UST System:** A UST System that will be used to contain an accumulation of regulated substances and for which installation has commenced after the effective date of this Regulation.
86. **NFPA:** Refers to the National Fire Protection Association, Inc.

87. **Non-commercial purposes:** With respect to motor fuel means not for resale.
88. **Non-compliance:** Failure to comply with any requirement of this Regulation, or failure to implement or achieve conditions or actions required under this Regulation.
89. **Notified existing tank system:** Refers to a tank system used to contain an accumulation of regulated substances that was operating, or for which installation had commenced on or before the effective date this Regulation, and the Owner and Operator had obtained all the Board's permits.
90. **Operational life:** Period beginning when installation of the tank system has commenced until the time the tank system is properly closed under Part VII.
91. **Operator:** Any person in control of, or having responsibility for, the daily operation of the UST System.
92. **Overfill release:** Release that occurs when a tank is filled beyond its capacity, resulting in a discharge of the regulated substance to the environment.
93. **Owner:** Person that possess a UST System used to storage or dispense regulated substances, or that possessed such UST System immediately, before the discontinuance of its use.
94. **PARPCUST:** Refers to the document "Procedure Actions and Requirements for Permanent Closure of Underground Storage Tanks" (Appendix I).
95. **PDF:** Refers to "portable document format", which is a portable document format or a format for storing digital documents independent of software or hardware platforms.
96. **Permit:** Authorization, license, or equivalent control document issued by the Board to implement the requirements of this Regulation.
97. **Person:** Individual, trust, firm, joint-stock company, federal agency, corporation, municipality, and a commission. Person, also, includes a consortium, a joint venture, a commercial entity, the United States Government, and the Puerto Rico Government.
98. **Petroleum UST System:** An UST System that contains petroleum or a mixture of petroleum with *minimus* quantities of other regulated substances. Such systems include those containing motor fuels, jet fuels, distillate fuel oils, residual fuel oils, lubricants, petroleum solvents, and used oils.
99. **Pipe or Piping:** Hollow cylinder or the tubular conduit constructed of non-earthen materials that routinely contains and conveys regulated substances from the underground tank(s) to the dispenser(s) or other end-use equipment. Such piping includes any elbows, couplings, unions, valves, or other in-line fixtures that contain and convey regulated substances from the underground tank(s) to the dispenser(s). This definition does not include vent, vapor recovery, or fill lines.
100. **Pipeline facilities (including gathering lines):** Are new and existing pipe rights-of-

way and any associated equipment, facilities, or buildings.

- 101. Post-Secondary Institution:** Educative institution, public or private, composed by one or more institutional units, demanding as a requirement for admission the certificate or high school diploma or its equivalent and which academic offers conducts to at least an associate's degree; or in any way declare, promise, announce or express the intention of granting grades, diplomas, certificates, titles or other academic acknowledgement for higher education.
- 102. Potable drinking water well:** Any hole (dug, driven, drilled, or bored) that extends into the earth until it meets groundwater which supplies water for a non-community public water system, or otherwise supplies water for household use (consisting of drinking, bathing, and cooking, or other similar uses). Such wells may provide water to entities such as a single-family residence, group of residences, businesses, schools, parks, campgrounds, and other permanent or seasonal communities.
- 103. Previously deferred UST Systems:** UST System that were exempt from complying with the Regulation for the Control of Underground Storage Tanks, No. 4362 of November 14, 1990, which are: fuel distribution systems by hydrants located in airports, UST System built on the ground, Tank Systems Wastewater Treatment unregulated under section 402 or 307 (b) of CWA and dealing with controlled substances under this Regulation, UST System that store fuel to be used only in emergency power generators in nuclear power generating facilities and UST Systems containing radioactive material.
- 104. Principal Instructor:** Person who has primary responsibility for organizing and teaching a particular training.
- 105. Public water system (PWS):** A system for the provision to the public of water for human consumption through pipes or, after August 5, 1998, other constructed conveyances, if such system has at least fifteen (15) service connections or regularly serves an average of at least twenty five (25) individuals daily at least sixty (60) days out of the year. Such term includes: any collection, treatment, storage, and distribution facilities under control of the operator of such system and used primarily in connection with such system; and, any collection or pretreatment storage facilities not under such control which are used primarily in connection with such system. Such term does not include any "special irrigation district." A public water system is either a "community water system" or a "non-community water system."
- 106. Puerto Rico's Water Law:** Refer to Law No. 136 of June 3, 1976, as amended, Conservation, Development and Use of Water Resources Act.
- 107. Quality Assurance Project Plan:** Written document that describes in detail the necessary technical activities for quality control and assurance that must be implemented to ensure the compliance of generated and processed results with the data quality objectives required by the Board.
- 108. RBCA:** Refer to Risk Based Corrective Action.

109. **RCHSW:** Refer to Regulations for the Control of Hazardous Solid Waste, Regulation No. 2863 of March 5, 1982, as amended.
110. **RCRA:** Refers to the Federal Law "Resources Conservation and Recovery Act 1976" as amended (42 USC § 6901 et seq.).
111. **Recognized Association:** An outstanding Legal Entity, in a specific field, formed by a group of associates or partners, for the pursuit of an end. Perform business and educational activities, or any other related activities regarding its end.
112. **Red tag:** A tag, device, or mechanism on the tank's fill pipes that clearly identifies an underground storage tank as ineligible for product delivery. The tag or device is easily visible to the product deliverer and clearly states and conveys that it is unlawful to deliver to, deposit into, or accept product into the ineligible UST. The tag, device, or mechanism is generally tamper resistant.
113. **Registration:** Inscription of a UST System to the Board as set out in this Regulation.
114. **Regulated substance:** Petroleum and petroleum-based substances comprised of a complex blend of hydrocarbons, such as motor fuels, jet fuel, distillate fuel oils, residual fuel oils, lubricants, petroleum solvents, and used oils and any substance defined in CERCLA; and petroleum, including crude oil or any fraction thereof which is liquid at standard conditions of temperature and pressure, 60 degrees Fahrenheit and 14.7 pounds per square inch absolute.
115. **Release detection:** Determining whether a release of a regulated substance has occurred from the UST System into the environment or into the interstitial space between the UST System and its secondary barrier or secondary containment around it.
116. **Release:** Any spilling, leaking, emitting, discharging, escaping, leaching or disposing from an UST System into groundwater, surface water or subsurface soils.
117. **Repair:** Restore a tank, pipe, spill prevention equipment, and overflow prevention equipment, corrosion protection equipment, release detection equipment, or other UST System component that has caused a release or a suspected release of product from the UST System or has failed to function properly.
118. **Replaced:** For a tank: remove a tank and install another tank. For piping: remove fifty (50) percent or more of piping and install other piping, excluding connectors, connected to a single tank. For tanks with multiple piping runs, this definition applies independently to each piping run.
119. **Residential tank:** Tank located on property used primarily for dwelling purposes.
120. **Retail gasoline service station:** Establishment destined to the sale of retail gasoline and other fuels for motor vehicles.
121. **RMNHSW:** Regulations for the Management of Non-Hazardous Solid Waste,

Regulation No. 5717 of November 14, 1997, as amended.

122. **RWQS:** Regulation of Water Quality Standards for the Environmental Quality Board, No. 7837 of March 31, 2010, as amended.
123. **SARA:** Refer to Superfund Amendments and Reauthorization Act of 1986, as amended.
124. **School (public or private):** All structures, including their annexes, gardens, recreational area and the parking lot, used as a learning site regardless of the educative level of it or that a group of students from more than one educative level meet in one learning site.
125. **School hours:** The ones established in each educational institution according to the type of organization with which it works.
126. **Secondary containment or secondarily contained:** A release prevention and release detection system for a tank and/or piping. These systems have an inner and outer barrier with an interstitial space that is monitored for leaks.
127. **Sensitive geologic areas:** Any of the following: (1) significant aquifers; (2) primary sand and gravel recharge areas; or (3) locations within a radius of 500 feet (152.40 m) of a public or private drinking water supply and sinkholes.
128. **Septic tank:** Water-tight, covered receptacle designed to receive or process, through liquid separation or biological digestion, the sewage discharged from a building sewer. The effluent from such receptacle is distributed for disposal through the soil and settled solids and scum from the tank are pumped out periodically and hauled to a treatment facility.
129. **Significant aquifer:** Porous formation, identified by the current U.S. Geological Survey maps, that contains significant recoverable quantities of water which may or does provide drinking water supplies.
130. **Significant non-compliance:** Refers to non-compliance associate with any part of this Regulation related to the requirements established under the Energy Policy Act of 2005, applicable to UST Systems.
131. **Spill:** See **Release**
132. **Storm water or wastewater collection system:** Piping, pumps, conduits, and any other equipment necessary to collect and transport the flow of surface water run-off resulting from precipitation or domestic, commercial, or industrial wastewater to and from retention areas or any areas where treatment is designed to occur. The collection of storm water and wastewater does not include treatment except where incidental to conveyance.
133. **Substantial Business Relationship:** Degree of a business relationship necessary, under applicable laws of the Commonwealth of Puerto Rico, to make a guarantee

contract issued concomitant to that relationship to be valid and be enforceable. A guarantee contract is issued "concomitant to that relationship", if it arises from and depends on existing economic transactions between the guarantor and the owner and operator.

134. **Substantial Governmental Relationship:** Extent of a governmental relationship necessary under applicable state law, to make an added guarantee contract issued incident to that relationship valid and enforceable. A guarantee contract is issued "incident to that relationship", if it arises from a clear commonality of interest in the event of an UST release such as: coterminous boundaries, overlapping constituencies, common ground-water aquifer, or other relationship, other than monetary compensation that provides a motivation for the guarantor to provide a guarantee.
135. **Surface impoundment:** Natural topographic depression, man-made excavation, or diked area formed primarily of earthen materials (although it may be lined with man-made materials) that is not an injection well and uses the surface where it rests as a structural support to maintain its integrity and content.
136. **Tank:** A stationary device designed to contain or store a controlled substance accumulation and which is constructed of materials that are non-earth, such as: concrete, steel and plastic, which provide structural support.
137. **Training Course Curriculum:** Sets of subjects established for a particular course, where depending on the category subjects are taught related to the operation of UST Systems.
138. **Training Program:** Set of training courses, accredited by the Board, in any of the following categories of UST Systems Operator: Class A Operator, Class B Operator and Class C Operator, offered by a Training School.
139. **Training School:** An entity that provides initial training and refresher courses in Spanish and English, training in any of the following categories of UST Systems Operator: Class A Operator, Class B Operator and Class C Operator.
140. **Training School Administrator:** Person responsible for running an Accredited Training Program and monitoring the performance of the Principal and Guest Instructors.
141. **Transfer of ownership:** A change in owner of a facility.
142. **UL:** Refers to the Underwriters Laboratories, Inc.
143. **Underground area:** An underground area, such as a basement, cellar, shaft or vault, providing enough space for physical inspection of the exterior of the tank situated on or above the surface of the floor.
144. **Underground source of drinking water:** An aquifer or a portion which supplies any public or private water supply system; or which contains sufficient quantity of

- groundwater to supply to a public water system and currently supplies or could supply drinking water for human consumption; or contains less than 10,000 mg/l total dissolved solids; and is not an exempted aquifer, according to Puerto Rico's Underground Injection Control Regulation, No. 3029 of September 14, 1983 as amended.
- 145. Underground Storage Tank or UST:** A tank or a combination of tanks, including underground pipes and equipment connected, used to contain an accumulation of regulated substances, and the volume of which, including the volume of underground pipes connected, is 10 percent or more beneath the surface of the ground.
 - 146. UST System Closure Permit:** The legally enforceable authorization issued by the USTCD to perform the closure activities in accordance with this Regulation.
 - 147. UST System Installation Permit:** The legally enforceable authorization issued by the USTCD to perform installation activities in accordance with this Regulation.
 - 148. UST System Operation Permit:** The legally enforceable document that EQB issues to a UST facility after the source has been installed. The document is designed to minimize land and water contamination by ensuring that UST facility owners achieve and maintain compliance with applicable regulations, and that they cease operation if compliance cannot be maintained.
 - 149. Underground Storage Tanks Control Division (USTCD):** Entity that belongs to the Water Quality Area of EQB, responsible for oversight and implementation of environmental regulations on the Control of Underground Storage Tanks in Commonwealth of Puerto Rico.
 - 150. Unsaturated zone:** Is the subsurface containing water under pressure less than that of the atmosphere, including water held by capillary forces within the soil and containing air or gases generally under atmospheric pressure. This zone is limited above by the ground surface and below by the upper surface of the zone of saturation (the water table).
 - 151. Upgrade:** Addition or retrofit of some systems such as cathodic protection, lining, or spill and overflow controls to improve the ability of an underground storage tank system to prevent the release of product.
 - 152. USGS:** Refers to the United States Geological Survey.
 - 153. UST System for hazardous substances:** A UST System that contains a hazardous substance defined in CERCLA, does not include: any substance regulated as a hazardous waste under RCRA or any mixture of such substances and petroleum.
 - 154. UST System or Tank System:** One or more underground storage tanks, connected underground pipes, auxiliary equipment and containment system, among others.
 - 155. Violation:** Non-compliance or significant non-compliance with any requirement or

condition established under this Regulation and Section 1527 of the Federal Energy Policy Act of 2005 (the Underground Storage Tank Compliance Act of 2005) amending Subtitle I of the Solid Waste Disposal Act.

- 156. Wastewater treatment tank:** A tank that is designed to receive and treat an influent wastewater through physical, chemical, or biological methods.
- 157. Well:** Any perforation, excavation or drilled hole, which depth is greater than the surface dimension, includes all septic systems, underground storage tanks, sinkholes and natural drainage cavities.

Rule 806. RESERVED

PART II. UST SYSTEMS: DESIGN, CONSTRUCTION, INSTALLATION AND NOTIFICATION

Rule 807. Performance Standards for New UST Systems

All owners and operators, in order to prevent releases due to structural failure, corrosion, or spills and overfills, must meet the following requirements:

A. Tanks. Each tank must be properly designed and constructed, and any portion underground that routinely contains product must be protected from corrosion, in accordance with a code of practice developed by a nationally recognized association or independent testing laboratory as specified in this Rule. In addition, all new or replaced tanks where installation began after the effective date of this Regulation, must be secondarily contained:

1. The tank is constructed of fiberglass-reinforced plastic; or
2. The tank is constructed of steel and is cathodically protected in the following manner:
 - a. The tank is coated with suitable dielectric material;
 - b. Field-installed cathodic protection systems are designed by a corrosion expert;
 - c. Impressed current systems are designed to allow determination of current operating status, as required in Part III of this Regulation; and
 - d. Cathodic protection systems are operated and maintained in accordance with Part III of this Regulation.
3. The tank is constructed of steel and is coated or jacketed with non-corrosive material; or
4. The tank is constructed of metal without additional corrosion protection measures provided that:
 - a. The tank is installed at a site that is determined by a corrosion expert not to be corrosive enough to cause it to have a release, due to corrosion during its operating life; and
 - b. Owners and operators maintain records that demonstrate compliance, for the remaining life of the tank; or
5. The tank construction and corrosion protection are determined by the Board to be designed to prevent the release or threatened release of any stored regulated substance, in a manner that is no less protective of human health and the environment than this Rule; or
6. The tank is secondarily contained. Secondary containment must be, periodically, tested in accordance with Part III of this Regulation. Secondarily contained tanks must meet the following:

- a. Be able to contain regulated substances leaked from the primary containment until they are detected and removed; and
- b. Be able to prevent the release of regulated substances to the environment, at any time during the operational life of the UST System.

B. Piping. The piping that routinely contains regulated substances and is in contact with the ground must be properly designed, constructed, and protected from corrosion, in accordance with a code of practice developed by a nationally recognized association or independent laboratory that performs these tests. Also all new or replaced piping where installation began after effective date of this Regulation, must be secondarily contained, in accordance with this Rule. The entire piping run must be replaced totally when fifty (50) percent or more of a piping run is replaced.

1. The piping is constructed of non-corrodible material; or
2. The piping is constructed of steel and cathodically protected in the following manner:
 - a. The piping is coated with a suitable dielectric material;
 - b. Field-installed cathodic protection systems are designed by a corrosion expert;
 - c. Applied current systems are designed in such a way that let you check the current status of system operation as required by Part III, and
 - d. Cathodic protection systems are operated and maintained in accordance with Part III of this Regulation.
3. The piping is constructed of metal without additional corrosion protection measures provided that:
 - a. The piping is installed at a site that is determined by a corrosion expert to not be corrosive enough to cause it to have a release due to corrosion during its operating life; and
 - b. Owners and operators maintain records that demonstrate compliance for the remaining life of the piping.
4. The piping construction and corrosion protection are determined by the Board to be designed to prevent the release or threatened release of any stored regulated substance in a manner that is no less protective of human health and the environment than the requirements in this Rule; or
5. The piping is secondarily contained. Secondary containment must be periodically tested in accordance with Part III this Regulation. Secondarily contained piping must meet the following:

- a. Be able to contain regulated substances leaked from the primary containment until they are detected and removed; and
- b. Be able to prevent the release of regulated substances to the environment, at any time during the operational life of the UST System.

C. Spill and Overfill Prevention Equipment

1. To prevent spill and overfill associated with the regulated substance transfer to the UST System, owners and operators must use the following spill and overfill prevention equipment:
 - a. Spill prevention equipment that will prevent release of the regulated substance to the environment, when the transfer hose is detached from the fill pipe (e.g., a spill catchment basin); and
 - b. Overfill prevention equipment that will:
 - i. Automatically shut-off the flow into the tank when the tank is no more than ninety five (95) percent full.
 - ii. Alert the transfer operator when the tank is no more than ninety (90) percent full by restricting the flow into the tank or triggering a high-level alarm.
 - iii. Restrict flow thirty (30) minutes prior to overfilling; alert the transfer operator with a high-level alarm one (1) minute before overfilling, or automatically shutoff flow into the tank, so that none of the fittings located on top of the tank are exposed to product line due to overfilling.
2. Owners and operators are not required to use the spill and overfill prevention equipment specified in this Rule, if:
 - a. The Board determines that the alternative equipment used provide equal or higher human health and environment protection, than the equipment specified in this Rule; or
 - b. The UST System is filled by transfers of no more than twenty five (25) gallons at one time.
3. Flow restrictors used in vent lines may not be used to comply with this Rule, when overfill prevention equipment has been installed or replaced after effective date of this Regulation.
4. Spill and overfill prevention equipment must be, periodically, tested in accordance with Part III of this Regulation.

D. Installation

1. No person can install a UST System without an installation permit issued by the Board in accordance with Part II. The installation application must be completed in accordance with the forms to be adopted by the Board.
2. All UST System must be properly installed in accordance with a code of practice developed by a nationally recognized association or independent testing laboratory and in accordance with the manufacturer's instructions.

E. Certification of Installation. All owners and operators must ensure that the installation of UST System has been inspected and certified by a licensed professional engineer with experience in installation of UST System, and certified by the tank and piping manufacturers, in order to demonstrate compliance with this Rule.

F. Dispenser Systems. Beginning on after effective date of this Regulation, each UST System must be equipped with under-dispenser containment for any new dispenser system installed.

1. A dispenser system is considered new when both the dispenser and the equipment needed to connect the dispenser to the UST System are installed on a facility. The equipment necessary to connect the dispenser to the UST System includes check valves, shear valves, unburied risers or flexible connectors, or other transitional components that are beneath the dispenser and connect the dispenser to the underground piping.
2. Under-dispenser containment must be liquid-tight on its sides, bottom, and at any penetrations. Under-dispenser containment must allow for visual inspection and access to the components in the containment system or be continuously monitored for leaks from the dispenser system.

Rule 808. Upgrading or reconditioning of Existing UST System.

A. Permitted alternative. In accordance with Part VII of this Regulation, owners and operators must permanently close any UST System that does not meet the new UST System performance standards or has not been upgraded in accordance with this Rule.

B. Tank Upgrading Requirements. Steel tanks must be upgraded to meet one of the following requirements in accordance with a code of practice developed by a nationally recognized association or independent testing laboratory:

1. **Interior Lining.** Tanks upgraded by internal lining must meet the following:
 - a. The lining was installed in accordance with the requirements of Part III of this Regulation, and
 - b. Within ten (10) years after lining, and every five (5) years thereafter, the lined tank is

internally inspected and found to be structurally sound with the lining still performing in accordance with original design specifications. If the internal lining is no longer performing in accordance with original design specifications and cannot be repaired in accordance with a code of practice developed by a nationally recognized association or independent laboratory that performs tests, then the lined tank must be permanently closed in accordance with Part VII of this Regulation.

2. **Cathodic Protection.** Tanks upgraded by cathodic protection must meet the requirements of Part II of this Regulation, and the integrity of the tank must have been ensured using one of the following methods:

- a. The tank was inspected internally and evaluated before the installation of the cathodic protection system to assure that the tank is structurally sound and free of perforations caused by corrosion; or
- b. The tank had been installed for a period less than ten (10) years and is monitored monthly to verify releases, in accordance with Part IV of this Regulation; or
- c. The tank had been installed for a period less than ten (10) years and has been tested to detect perforations caused by corrosion, performing two (2) integrity tests that meet the requirements of Part IV. The first integrity test must be performed before installing the cathodic protection system. The second test must be performed within three (3) and six (6) months, after the first operation of the cathodic protection system; or
- d. The tank was evaluated to detect perforations caused by corrosion using a method that the Board determines prevents releases, in a manner that provides equal or higher protection to human health and the environment than that provided in this Rule.

3. **Internal Lining combined with Cathodic Protection:** Tanks upgraded by cathodic protection and internal lining must meet the following:

- a. Internal lining was installed in accordance with the requirements of Part II of this Regulation; and
- b. The cathodic protection system meets the requirements of Part II.

C. Piping Upgrading Requirements. Metal piping that routinely contains regulated substances and is in contact with the ground must be cathodically protected, in accordance with the corresponding codes of practice established by a nationally recognized association or an independent laboratory that performs tests and must meet the requirements of Part II.

D. Spill and Overfill Prevention Equipment. To prevent spilling and overfilling associated with product transfer to the UST System, all existing UST System must comply with new UST System spill and overfill prevention equipment requirements specified in Part II.

E. Upgrade Requirements for Previously Deferred UST Systems. The fuel distribution system for hydrants located in airports, UST systems built on the ground, Tank Systems Wastewater Treatment unregulated under section 402 or 307 (b) of CWA; previously deferred whose installation began before effective date of this Regulation, shall meet the following requirements in accordance with the dates set out in Part I of this Regulation or shall be permanently closed in accordance with Part VII of this Regulation.

1. **Corrosion protection.** UST System components in contact with the ground that routinely contain regulated substances must meet one of the following requirements:
 - a. The new UST System performance standards for tanks and for piping at Part II; or
 - b. Be constructed of metal and cathodically protected according to a code of practice developed by a nationally recognized association or independent laboratory that performs tests, must meets the following:
 - i. Cathodic protection must meet the requirements of Part II, for tanks and for piping.
 - ii. Tanks greater than ten (10) years old without cathodic protection must be assessed, to ensure the tank is structurally sound and free of corrosion holes prior to adding cathodic protection. The assessment must be by internal inspection or another method determined by the Board to adequately assess the tank for structural soundness and corrosion holes.
2. **Spill and overfill prevention equipment.** To prevent spilling and overfilling associated with product transfer to the UST System, all previously deferred UST Systems must comply with new UST System spill and overfill prevention equipment requirements specified for Part II of this Regulation.

Rule 809. Registration Requirements

- A. An owner and operator must submit a registration application to the Board to legalize an existing UST System or within ten (10) days after completing installation of a new UST System activities, for which the registration application must be submitted with the installation report. The registration application must be in accordance with the forms to be adopted by the Board.
- B. The person who acquires ownership of a UST System within thirty (30) days of purchase, must submit to the Board a change of ownership application, in accordance with the forms to be adopted by the Board.
- C. Owners and operators must submit a registration application for each tank they own. Owners or operators may provide registration application for several tanks using one registration application, but owners or operators who own tanks located at more than one place of

operation, must file a separate registration application for each separate place of operation.

- D.** All owners and operators of new UST Systems must certify in the registration application that the methods used comply with the following requirements:
1. Installation of tanks and pipelines under Part II of this Regulation;
 2. Cathodic Protection of steel tanks and piping under Part II of this Regulation (if applies);
 3. Financial responsibility under Part IX of this Regulation; and
 4. Release detection under Part IV of this Regulation.
- E.** All owners and operators of new UST System must assure that the installer certifies in the registration application that the methods used to install the tanks and piping complies with the requirements of Part II of this Regulation.
- F.** Any person who sells a tank intended to be used as an UST and that is regulated under this Regulation, must inform the purchaser of the obligation to register with the Board, in accordance with this Regulation.
- G.** Any person who sells a tank intended to be used as an UST and that is regulated under this Regulation, must include the following language on its “Statement for Shipping Tickets and Invoices”:
- “The Resource Conservation and Recovery Act (RCRA), as amended requires owners of certain underground storage tanks to notify the corresponding agencies of the existence of their tanks by May 8, 1986. In Puerto Rico, notifications through registration are to be provided to the Water Quality Area of the Environmental Quality Board. Refer to EPA’s regulations, issued on November 8, 1985 (40 CFR Part 280) to determine if you are affected by this law”.
- H.** The owners and operators of UST Systems previously deferred, shall submit to the Board a registration application, according to the forms to be adopted by the Board within thirty (30) days after the effective date of this Regulation.

Rule 810. Permits for UST Systems

A. Installation, Operation, Modification, and Closure Permits

1. No person shall install, modify, operate, close, or remove an UST System without obtaining prior permit from the Board.
2. Installation and Closure Permits may be extended if the owner requests such an extension in writing, at least sixty (60) days before the existing permit expires. The Board could extend these permits, for a period not exceeding one (1) year after the

original expiration date of the permit. This extension must be requested according to the forms to be adopted by the Board.

3. The Operation Permit renewal application shall be submitted sixty (60) days before the existing permit expires. If the renewal application is submitted in the established period, the existing operation permit must be extended until the EQB confirms that the facility is in compliance with this Regulation and issues the new permit. This renewal must be requested according to the forms to be adopted by the Board.
4. A copy of the permit and all conditions and attachments, including monitoring records, release detection report and maintenance records, certificate of registration, and evidence of compliance with state and federal financial responsibility, shall be retained in the facility where the UST System is located.

B. UST Installation Permit

1. **Application.** All Installation Permit applications must be submitted to the Board using the forms adopted by the Board. An incomplete application will not be accepted. The application will include the following documents:
 - a. The name, physical, postal and electronic address, phone numbers and fax of the person who owns the UST System.
 - b. The name, physical, postal and electronic address, phone numbers and fax where UST System is physically located, and the related business, if any.
 - c. The name, physical, postal and electronic address, phone numbers and fax the UST System operator and the person to contact in case of emergency twenty four (24) hours a day.
 - d. The name, physical, postal and electronic address, phone numbers and fax of the person preparing the application.
 - e. Evidence that the project is in compliance with the Environmental Public Policy Act.
 - f. Construction plans, including the location of underground storage tanks, pipeline, gas pumps, release detection systems, overflow release prevention systems, among others; properly sealed and signed by an engineer or architect licensed to practice their profession in Commonwealth of Puerto Rico.
 - i. The professional seal and signature of the engineer or architect must appear in all sheets of construction drawings. It allows the engineer or architect sign and seal only the first page of each set of documents if the first page specifies the total number of pages.
 - ii. Engineers or architects licensed to practice their profession in the Commonwealth of Puerto Rico must provide a copy of their professional license.

- g. A copy of the technical specifications that complement the construction plans. These should be detailed and with specific instructions about any construction method, materials, and equipment to be used in such manner to guarantee optimum structural development.
- h. Details about the structural elements, indicating position, size, effort and anchoring ground. The plans will indicate the design criteria.
- i. Description of the spill and overflow release prevention system.
- j. Description of performance standards for new UST systems required in this Regulation.
- k. Description of construction material of the tanks and piping.
- l. Description of the release detection system.
- m. Certification of compatibility of the UST System material with the substance to be stored in it.
- n. A 1:2,400 scale map (one inch equals to 200 feet) covering a radius of 1000 feet (304.8 mts) indicating the location of the project and of the following activities or resources:
 - Main recharge areas
 - Public drinking water supplies (wells, surface water bodies)
 - Surface water drains or natural drainage cavities
 - Marshes and mangroves
 - Monitoring practice stations water quality (surface and groundwater)
 - Injection wells
 - Injection or extraction wells abandoned
 - Water treatment plants and wastewater potable (private, public)
 - Springs
 - Coastal areas
 - Landfills (municipal, private)
 - Mining (surface and underground)
 - Quarries
 - Gravel extraction pit or sand
 - Public Buildings
 - Gas stations
 - Residences
 - Highways
 - Rural route
 - Power lines
 - Pipelines
 - Schools (public and private)
 - Institutions of higher education
- o. A 1:20,000 scale topographic map indicating the exact project location and indicating the existing and proposed elevations of the ground, including project location, certifying and demonstrating it is not a floodplain, and indicating the maximum flooding level for that area.

- p. General description of the predominant soil type in the area where the UST will be located, including but not limited to the following parameters found in the USDA Soil Conservation Service:
- expansion potential (plasticity)
 - drainage
 - erosion potential
 - permeability
 - available water capacity
- q. Description of the predominant geology in the area where the UST will be located, including but not limited to the formations and structures shown in the maps published by the USGS.
- r. Hydrologic description of the area where the UST will be located, including but not limited to the following parameters:
- Underground waters (water table or potentiometric surface, saturated zone, non-saturated zone (vadoze zone) flow direction and/or hydraulic gradient.
 - Hydrologic formations (texture, porosity, permeability and condition)
- s. The permit application shall be signed by:
- i. The owner and operator of the UST System, the facility owner or operator of the facility, or a duly authorized representative; or
 - ii. If the UST System or facility is owned by a corporation, partnership, or public agency, the application shall be signed by:
 - A) A chief executive officer, vice president or an authorized representative; or
 - B) A partner generally own; or
 - C) A chief executive officer, chief elected official, or authorized representative of a public agency.
2. When a new UST System will be installed in the same excavation, where there was an existing UST System:
- a. If the existing UST System was closed permanently:
 - i. To obtain the Installation Permit for a new UST System, the owner and operator must submit evidence that obtained release letter from the Board.
 - ii. In case that release letter has not been obtained, must comply with subsection c) of this Rule.
 - b. If the existing UST System has not been permanently closed, must follow the procedures set out in this Regulation for closure of an UST System and obtain a

release letter or comply with subsection c) of this Rule.

- c. When the existing UST System was closed permanently and additional measures are required as: Site Investigation, Contamination Extension Determination and Corrective Actions, the Board may allow the owner and operator to carry out the installation activities of the new UST System, simultaneously to the additional measures required by the project, as long as the owner and operator obtain approval of the Board.
 - i. The owner and operator must submit to the Board the Plan, in accordance with the additional measures required for the project, which should be subject to the provisions of Part VI of this Regulation and according to the forms to be adopted by the Board.
 - ii. The owner and operator must include the authorization of additional measures required for the project issued by the Board, as part of the documents attached in the Installation Permit application for the new UST System. The Board may issue the respective Installation Permit conditioned to the compliance with the approved additional measures.

C. Operation Permit

1. **Application.** All operation permit applications will be submitted to the Board using the forms adopted by the Board. An incomplete application will not be accepted. The application will include the following information and documents:
 - a. The name, physical, postal and electronic address, phone numbers and fax of the person who owns the UST System.
 - b. The name, physical, postal and electronic address, phone numbers and fax where UST System is physically located, and the related business, if any.
 - c. The name, physical, postal and electronic address, phone numbers and fax the UST System operator and the person to contact in case of emergency twenty four (24) hours a day.
 - d. The name, physical, postal and electronic address, phone numbers and fax of the person preparing the application.
 - e. Evidence that the project complies with the Environmental Public Policy Act or submit Affidavit that the project needs not to comply with this.
 - f. A description of the UST System, manufacturer, date of installation, tank capacity and others.
 - g. Construction details of the UST System and any auxiliary equipment including, type of primary containment, type of secondary containment (if applicable), spill and

overflow prevention equipment, interior lining, and corrosion protection (if applicable), among others.

- h. A description of the piping including, type of piping system, construction, material, corrosion protection, and leak detection among others.
- i. As built plans, including the location of underground storage tanks, pipeline, gas pumps, release detection systems, overflow release prevention systems, among others; properly sealed and signed by an engineer or architect licensed to practice their profession in Commonwealth of Puerto Rico.

The professional seal and signature of the engineer or architect must appear in all sheets of construction drawings. It allows the engineer or architect sign and seal only the first page of each set of documents if the first page specifies the total number of pages.

Engineers or architects licensed to practice their profession in the Commonwealth of Puerto Rico must provide a copy of their professional license.

- j. A 1:20,000 scale topographic map indicating the exact project location
- k. An actualized 1:2,400 scale map (one inch equals to 200 feet) covering a radius of 1000 feet (304.8 mts) indicating the location of the project and of the following activities or resources:
 - Main recharge areas
 - Public drinking water supplies (wells, surface water bodies)
 - Surface water drains or natural drainage cavities
 - Marshes and mangroves
 - Monitoring practice stations water quality (surface and groundwater)
 - Injection wells
 - Injection or extraction wells abandoned
 - Water treatment plants and wastewater potable (private, public)
 - Springs
 - Coastal areas
 - Landfills (municipal, private)
 - Mining (surface and underground)
 - Quarries
 - Gravel extraction pit or sand
 - Public Buildings
 - Gas stations
 - Residences
 - Highways
 - Rural route
 - Power lines
 - Pipelines
 - Schools (public and private)
 - Institutions of higher education

- l. The description of the monitoring program including, the following:
 - Visual inspection procedures
 - Spill and overflow release prevention system
 - UST release detection methods or inspection procedures
 - Inventory reconciliation including gauging and reconciliation methods
 - Piping leak detection methods

- Vadose zone sampling locations, and methods and analysis procedures
 - Ground water well(s) locations, construction and development methods, sampling, and analysis procedures
- m. Lists of all the substances which have been, are currently, or are proposed to be stored in the UST System.
 - n. Current Certificate of Registration issued by EQB.
 - o. Evidence of any suspect and confirmed releases and evidence of any corrective action conducted at the facility in the last three (3) years.
 - p. Evidence of written statements on performance, related to release detection systems and calibration and maintenance of these systems for the last three (3) years.
 - q. Evidence of written monitoring and maintenance records for the last three (3) years.
 - r. Evidence of cathodic protection maintenance record for the last three (3) years (if applicable).
 - s. Evidence of record of repair, lining, and upgrades for the last three (3) years.
 - t. Evidence of written periodic testing of secondary containment for the last three (3) years.
 - u. Evidence of written periodic walkthrough, operation, and maintenance inspections for the last three (3) years.
 - v. If the facility is in the LUST List, submit evidence of any corrective action and progress reports conducted in the last three (3) years.
 - w. Documentation to show compliance with state and federal financial responsibility requirements applicable to UST Systems under this Regulation.
 - x. The permit application shall be signed by:
 - i. The owner and operator of the UST System, the facility owner or operator of the facility, or a duly authorized representative; or
 - ii. If the UST System or facility is owned by a corporation, partnership, or public agency, the application shall be signed by:
 - A.) A chief executive officer, vice president or an authorized representative; o
 - B.) A partner generally own; or
 - C.) A chief executive officer, chief elected official, or authorized representative

of a public agency.

- y. Evidence of Operator Training Certificate of all persons involved in the operation of UST System, Class A Operator, Class B Operator and Class C Operator of the facility.

D. Closure Permit

1. **Application.** All closure permit applications will be presented to the Board using the forms adopted by the Board. For the UST System closure, the owner and operator must comply with the dispositions of Part VII of this Regulation and PARPCUST. An incomplete application will not be accepted. The application shall include the following information and documents:
 - a. The name, physical, postal and electronic address, phone numbers and fax of the person who owns the UST System.
 - b. The name, physical, postal and electronic address, phone numbers and fax where UST System is physically located, and the related business, if any.
 - c. The name, physical, postal and electronic address, phone numbers and fax the UST System operator and the person to contact in case of emergency twenty four (24) hours a day.
 - d. The name, physical, postal and electronic address, phone numbers and fax of the person preparing the application.
 - e. A description of the UST System including, but not limited to manufacturer, date of installation and tank capacity.
 - f. Evidence that the project complies with the Environmental Public Policy Act or submit Affidavit that the project need not comply with this.
 - g. As built plans, including the location of UST, pipeline, gas pumps, release detection systems, overfill release prevention systems, among others; properly sealed and signed by an engineer or architect licensed to practice their profession in Commonwealth of Puerto Rico.
 - h. The professional seal and signature of the engineer or architect must appear in all sheets of construction drawings. It allows the engineer or architect sign and seal only the first page of each set of documents if the first page specifies the total number of pages.
 - i. Engineers or architects licensed to practice their profession in the Commonwealth of Puerto Rico must provide a copy of their professional licenses.
 - j. History of the installation from the beginning, which should include:

- i. Changes and data owners along all the time who have used the UST
 - ii. Spills history (if any)
 - iii. Documentation evidencing that corrective actions were implemented to control spills
 - iv. Indicate if the facility is in the LUST list
 - v. Narrative of why the UST will be remove
 - vi. Other that the petitioner deems pertinent
- k. Two (2) copies (8.5" x11") of 1:20,000 scale topographic map indicating the exact location of the installation. One must present by a circle the exact location of the facility and indicate by marks with a legend nearby activities and resources.
 - l. Evidence of operation and maintenance of leak detection system, wells monitoring practice, recent tests of integrity, cathodic protection testing, etc.
 - m. Current Endorsement of Puerto Rico Fire Corps of the facility (In case the UST System is operating at the time of presenting the Permit Closure application).
 - n. Other Works General Permit approved by the appropriate state or municipal agency. This should include waste disposal permit, if it is expected to have to remove and dispose contaminated soil and water, this in accordance with Regulations RCHSW and RMNHSW.
 - o. Evidence of current Operating Permit issued by the Board. In case of a registered existing UST System before the effective date of this Regulation, submit evidence of current registration certificate and current financial insurance policy responsibility.
 - p. Certifications PARPCUST use (ACA 1A and ACA 2A duly completed).
 - q. Description of the notification process and actions to take in case of finding free product in soil or groundwater, either as a liquid or vapor, during the activities to be performed (Part VI of this Regulation).
 - r. Itinerary with dates of the tasks to be performed on the project for UST System closure.

E. Action Regarding an Application or an Administrative Determination

- 1. **Installation and Closure Permit.** The Board will notify the project owner about the administrative decision made on an installation and closure permit application, within thirty (30) days after the application has been submitted. For purposes of this Rule, a submitted application is one that meets all the requirements established in this Regulation. A permit application with incomplete information will not be accepted until all required documents are submitted.

2. Operation Permit

- a. Before EQB issues a new permit or renewal to operate an UST System, EQB shall inspect the UST System and determine that it complies with the provisions of this Regulation.
- b. The EQB shall not renew a UST System Operation Permit, unless the UST System has been inspected by the EQB within the last twelve (12) months, previous to the expiration date of the Permit, and the inspection verified that the UST System complied with all the provisions of this Regulation. If the inspection indicated noncompliance, then EQB shall verify, by a follow-up inspection, that all required corrections have been implemented before renewing the Permit.
- i. The Board will notify the owner of the project on the administrative decision on the application for new Operating Permit, within thirty (30) days after the application was filed and that the inspection verified that the UST System all the requirements of this Regulation. For purposes of this Rule, an application is one that meets all the requirements of this Regulation at the time of filing it with the Board. A Permit Application with incomplete information will not be accepted until all required documents or information have been submitted.

F. Duration of Permits

1. Installation and Closure Permit

The duration of installation and closure permits issued in accordance with this Regulation will be one (1) year. If the owner or operator requests an extension of the permit sixty (60) days before the existing permit expires the Board shall extend this permit for a period, not exceeding one (1) year, after the original expiration date of the permit. This Permit Extension Request shall be submitted using the forms to be adopted by the Board.

2. Operation Permit

The duration of the operation permit issued in accordance with this Regulation will be three (3) years. All permit renewal applications will be submitted to the Board at least sixty (60) days before the expiration date of the permit. The Board will extend the existing Operation Permit until EQB confirms, with an inspection, that the facility is in compliance with this Regulation and issues the renewal of the Operation Permit. The permit renewal application will be presented in the forms adopted by the Board.

G. Permit Suspension or Revocation

1. The Board may revoke any permit issued according with the provisions of this Regulation. The Board may issue Administrative Orders to request cease of operations and activities on the project site. Also, can demand through an Administrative Order to correct, remedy or prevent any adverse impact to the environment.

2. The Board may, in accordance with the provisions of this Regulation, suspend the effectiveness of a Permit. Such permit may be re-established when a request is received and environmental compliance has been verified.

Rule 811. Quality Assurance Project Plan

A. General Requirements

1. Any person who performs sampling activities and sample analysis must comply with the procedure established in the PARPCUST (Appendix I).
2. Ninety (90) days after the closure date, a Final Closure Report must be submitted to the Board as required the PARPCUST. This report will be submitted using the forms to be adopted by the Board.
3. All analyses must be performed using the methods approved by the EPA. Table 1 and Table 2 of the PARPCUST present the methods that can be used.

B. Corrective Action Requirements

1. The corrective actions to be implemented must be approved by the Board and must follow the procedure established in Appendix I. Corrective action will be required when the results of sample analyses during a site assessment, closure, or release investigation of a UST system indicates levels that exceed any of the action levels established in the Table 2.
2. EQB may also consider other mechanisms of Corrective Action such as Risk Based Corrective Action (RBCA). The requirements for these other mechanisms will be included in the guidelines developed or adopted by the Board concerning this matter.
3. Clean-up levels to be used in corrective actions are those shown in the Table 2 or the levels developed or adopted by the Board for other Corrective Actions Mechanisms such as Risk Based Corrective Action (RBCA). [Please note that the water and soil numbers are presumptive numbers. The Board reserves the right to revise these numbers so that they are no less stringent than federal standards.]
4. EQB reserves the right to require the analyses of other parameters of concern, in addition to the parameters included in Table 2, if deemed necessary.

Parameter	Clean-up Levels	
	Water	Soil
Benzene	0.005 ppm ^c	5 ppm
Ethyl benzene	0.7 ppm ^c	10 ppm
Toluene	1 ppm ^c	10 ppm
Xylene and Isomers	10 ppm ^a	10 ppm
Total Petroleum Hydrocarbons (gasoline)	50 ppm	100 ppm
Total Petroleum Hydrocarbons (diesel)	50 ppm	100 ppm
Total Petroleum Hydrocarbons (oil)	50 ppm	100 ppm
Methyl Tertiary Butyl Ether (MTBE)	0.012 ppm ^b	39 ppm ^b
Total Lead Concentration	0.015 ppm ^{a, c}	50 ppm ^a

Table 2. Cleaning Levels of Groundwater and Soil Contaminated with Hydrocarbons Oil Products

Notes:

- a. Maximum contaminant level - RWQS.
- b. PARPCUST.
- c. RWQS.

Rule 812. RESERVED

PART III. GENERAL OPERATING REQUIREMENTS

Rule 813. Spill and Overfill Control

- A.** Owners and operators must ensure that releases due to spills or overfills do not occur. The owners and operators must ensure that the volume available in the tank is greater than the volume of product to be transferred to the tank, before the transfer is made and that the transfer operation is monitored constantly, to prevent overfilling and spilling.
- B.** The owners and operators must report, investigate, and clean up any spill and overfill in accordance with Part V of this Regulation.

Rule 814. Operation and Maintenance of Corrosion Protection

All owners and operators of metal UST Systems with corrosion protection must comply with the following requirements, to ensure that releases due to corrosion are prevented until the UST Systems is permanently closed or undergoes a change-in-service, pursuant to Part VII of this Regulation:

- A.** All corrosion protection systems must be operated and maintained, to continuously provide corrosion protection to the metal components of that portion of the tank and piping that routinely contain regulated substances and are in contact with the ground.
- B.** All UST Systems equipped with cathodic protection systems must be inspected and certified for proper operation, by a qualified cathodic protection tester in accordance with the following requirements:
 - 1. **Frequency.** All cathodic protection systems must be tested within six (6) months of installation and, at least, every three (3) years thereafter;
 - 2. **Inspection Criteria.** The criteria that are used to determine that the cathodic protection is adequate, as required by this Rule, must be in accordance with a code of practice developed by a nationally recognized association.
- C.** UST Systems with impressed current cathodic protection systems must be inspected, in conformity with this Rule, every sixty (60) days to ensure that the equipment is running properly.
- D.** For UST Systems using cathodic protection, records of the operation of the cathodic protection must be maintained, in accordance with Part III this Regulation, to demonstrate compliance with the performance standards in this Rule. These records must provide the following:
 - 1. The certified results of all the inspections required in this Rule; and
 - 2. The results of all testing required in this Rule.

Rule 815. Compatibility

- A. Owners and operators must use an UST Systems, made of or lined with materials that are compatible with the substance stored in the UST System.
- B. Owners and operators storing any regulated substance containing greater than ten (10) percent ethanol or greater than twenty (20) percent biodiesel, or any other regulated substance identified by the Board, must use one or more of the following methods to demonstrate UST System compatibility with these regulated substances:
 - 1. Certification or listing of UST Systems components by a nationally recognized, independent testing laboratory, for use with the regulated substance stored;
 - 2. Equipment or component manufacturer approval. The manufacturer's approval must be in writing, indicate an affirmative statement of compatibility, specify the range of biofuel blends the component is compatible with, and be from the equipment or component manufacturer; or
 - 3. Another method determined by the Board to be no less protective of human health and the environment than the methods listed in paragraphs B.1 or B.2 of this Rule.

Rule 816. Repairs Allowed

Owners and operators must ensure that repairs will prevent release due to structural failure or corrosion as long as the UST Systems is used to store regulated substances. The repairs must meet the following requirements:

- A. Repairs to UST Systems must be properly conducted in accordance with a code of practice developed by a nationally recognized association or an independent testing laboratory that performs these repairs.
- B. Repairs to fiberglass-reinforced plastic tanks may be made by the manufacturer's authorized representatives or in accordance with a code of practice developed by a nationally recognized association or an independent testing laboratory that performs this type of work.
- C. Metal pipe sections and fittings that have released product as a result of corrosion or other damage must be replaced. Non-corrodible pipes and fittings must be repaired in accordance with the manufacturer's specifications.
- D. Repaired tanks and piping must be tightness-tested in accordance with Part IV within thirty (30) days following the date of the completion of the repair, except as provided below. The certified results of the mechanical integrity tests must be submitted to the Board within twenty (20) calendar days after the test date.
 - 1. The repaired tank is internally inspected in accordance with a code of practice developed by a nationally recognized association or an independent testing laboratory;

2. The repaired portion of the UST Systems is monitored monthly for releases in accordance with a method specified in Part III;
 3. UST Systems with secondary containment must be tested as specified in Part III within thirty (30) days following the completion of any repair. Tanks using interstitial sensors must be tested using a vacuum, pressure, or liquid method in accordance with one of the criteria listed in this Part following any repair; or
 4. Another test method is used that is determined by the Board to be no less protective of human health and the environment than those listed above.
- E. Within six (6) months following the repair of any cathodically protected UST System, the cathodic protection system must be tested in accordance with Part III, to ensure that it is operating properly.
- F. Within thirty (30) days following any repair to spill or overfill prevention equipment, the repaired spill or overfill prevention equipment must be tested in accordance with Part III, to ensure it is operating properly.

Rule 817. Reporting and Recordkeeping

Owners and operators of UST Systems shall allow Board personnel, advisors and representatives to perform inspections, monitoring, and testing and must cooperate with requests for document submission of the monitoring and testing required of the owner or operator pursuant to Puerto Rico Environmental Public Policy Act and this Regulation.

A. Reporting. Owners and operators must submit the following information to the Board:

1. Notification for all UST Systems, which includes certification of installation for new UST Systems and notification when any person assumes ownership of an UST Systems (Part II);
2. Reports of all releases including suspected releases (Part V), spills and overfills (Part V), and confirmed releases (Part VI);
3. Corrective actions planned or taken including initial abatement measures , free product removal, investigation of soil and groundwater cleanup, corrective action plan (Part VI);

B. Recordkeeping. Owners and operators must maintain the following information:

1. A corrosion expert's analysis of site corrosion potential if corrosion protection equipment is not used (Part II);
2. Documentation on the operation of corrosion protection equipment (Part III);
3. Documentation of compatibility for UST Systems (Parte III); owners and operators must

maintain records of each repair until the UST system is permanently closed or undergoes a change-in-service pursuant to this Regulation.

4. Records for all UST System equipment installed or replaced after the effective date of this Regulation (Parte III);
5. Documentation on UST System repairs (Part III); including records of all equipment or components installed or replaced after effective date of this regulation. At a minimum, each record must include the date of installation or replacement, manufacturer, and model.
6. Documentation of compliance for spill and overfill prevention equipment (Part III);
7. Documentation of compliance for tanks, piping, and containment sumps using interstitial monitoring (Part III);
8. Documentation of periodic walkthrough inspections (Part III);
9. Recent compliance with release detection requirements (Part IV);
10. Results of the site evaluation conducted at a permanent closure (Part VII); and
11. Documentation of operator training (Part III).

C. Availability and Maintenance of Records. Owners and operators must keep required records available for inspection by Board representatives, as required:

1. At the facilities where the UST System is located or
2. At a readily available alternate site.
3. In the case of permanent closure records required under Part VII, owners and operators are also provided with the additional alternative of mailing closure records to the Board if they cannot be kept at the site or an alternative site as indicated above. All documents must be submitted to the Board in Portable Document Format (PDF).

Rule 818. Periodic Testing of Spill and Overfill Prevention Equipment

A. Owners and operators of UST Systems with spill and overfill prevention equipment must meet the following requirements to ensure the equipment is operating properly and will prevent releases to the environment:

1. Spill prevention equipment (such as a catchment basin, spill bucket, or other spill containment device) must prevent releases to the environment by meeting one of the following:
 - a. The spill prevention equipment has two (2) walls and the space between the walls is monitored continuously to ensure the integrity of the inner and outer walls is

maintained; or

- b. The spill prevention equipment is tested at installation and at least once every twelve (12) months to ensure the spill prevention equipment is liquid tight by using vacuum, pressure, or liquid testing in accordance with one of the following criteria:
 - i. Requirements developed by the manufacturer (Owners and operators may use this option only if the manufacturer has developed testing requirements);
 - ii. Code of practice developed by a nationally recognized association or independent testing laboratory; or

2. Overfill prevention equipment must be tested at installation and at least once every three years. At a minimum, testing must ensure that overfill prevention equipment is set to activate at the correct level specified in Part II and will activate when regulated substance reaches that level. Testing must be conducted in accordance with one of the criteria in this Rule.

B. Owners and operators must maintain the following records in accordance with Part II, for spill and overfill prevention equipment:

1. All records of spill prevention equipment testing and overfill prevention equipment testing must be maintained for three (3) years; and
2. For spill prevention equipment not tested every twelve (12) months, documentation showing that the spill prevention equipment has two walls and is monitored continuously. Owners and operators must maintain this documentation for as long as the spill prevention equipment is monitored continuously, and for three (3) additional years after continuous monitoring ends.

Rule 819. Periodic Testing of Secondary Containment

A. Owners and operators of UST Systems with secondary containment using interstitial monitoring must ensure the integrity of all interstitial areas (including all containment sumps used for interstitial monitoring).

1. Tanks must meet one (1) of the following:

- a. The interstitial space is continuously monitored; or
- b. The interstitial space is not continuously monitored and the integrity of the interstitial space is ensured at least once every three (3) years by using vacuum, pressure, or liquid testing in accordance with one of the following criteria:
 - i. Requirements developed by the manufacturer (Owners and operators may use this option only if the manufacturer has developed integrity testing requirements);

- ii. Code of practice developed by a nationally recognized association or independent testing laboratory; or
- iii. Requirements determined by the Board to be no less protective of human health and the environment than the requirements listed in this Rule;

2. Piping must meet one (1) of the following:

- a. The interstitial space is continuously monitored using vacuum, pressure, or a liquid-filled interstitial space; or
- b. The interstitial space is monitored using an interstitial monitoring method not listed in this Rule and the integrity of the interstitial space is ensured at least once every three years by using vacuum, pressure, or liquid testing in accordance with one (1) of the criteria listed in this Rule; and

3. Containment sumps must meet one of the following:

- a. The containment sump has two walls and the space between the walls is continuously monitored; or
- b. The containment sump is tested at least every three (3) years to ensure the containment sump is liquid tight by using vacuum, pressure, or liquid testing in accordance with one of the criteria listed in this Rule.

B. Owners and operators of UST Systems using interstitial monitoring must begin meeting this requirement on the effective date of this Regulation. .

C. Owners and operators must maintain the following records in accordance with Part III, for the time frames indicated for each tank, piping, and containment sump that uses interstitial monitoring:

- 1. Records of interstitial space testing must be maintained for three (3) years; or
- 2. As applied, records demonstrating: the tank is using continuous interstitial monitoring; the piping is using continuous interstitial monitoring with vacuum, pressure, liquid-filled interstitial space; and the containment sump has two (2) walls and uses continuous interstitial monitoring. Owners and operators must maintain these records for as long as the tank, piping, or containment sump uses one of these continuous methods of interstitial monitoring, and for three (3) additional years after continuous monitoring ends.

Rule 820. Periodic Operation and Maintenance Walkthrough Inspections

A. To properly operate and maintain UST Systems, owners and operators must meet with all of the following:

1. Conduct a walkthrough inspection at least once every thirty (30) days that, at a minimum and as appropriate to the facility, checks the following equipment as specified:
 - a. Spill prevention equipment - open and visually check for any damage; remove any liquid or debris; check each fill cap to make sure it is securely on the fill pipe; and for spill prevention equipment with continuous interstitial monitoring, check for a leak in the interstitial area;
 - b. Sumps - open and visually check for any damage, leaks to the containment area, or releases to the environment; remove any liquid (in contained sumps) or debris; and for sumps with continuous interstitial monitoring, check for a leak in the interstitial area;
 - c. Dispenser cabinets - open and visually check for any damage, leaks to the containment area, or releases to the environment; remove any liquid (in dispensers with under-dispenser containment) or debris; and for under-dispenser containment with continuous interstitial monitoring, check for a leak in the interstitial area;
 - d. Monitoring/observation wells - check covers to make sure they are secured;
 - e. Cathodic protection - check to make sure impressed current cathodic protection rectifiers are on and operating; and ensure records of three (3) year cathodic protection testing and sixty (60) day impressed current system inspections are reviewed and current; and
 - f. Release detection systems - check to make sure the release detection system is on and operating with no alarms or other unusual operating conditions present; check any devices such as tank gauge sticks, groundwater bailers, and hand-held vapor monitoring devices for operability and serviceability; and ensure records of release detection testing are reviewed monthly and current; or
2. Conduct operation and maintenance walkthrough inspections according to a standard code of practice developed by a nationally recognized association or independent testing laboratory that are comparable to this Rule.

B. Owners and operators must maintain records in accordance with Part III of this Regulation, operation and maintenance walkthrough inspections for three (3) years. The record must include a listing of each area checked, whether each area checked was acceptable or needed to have any action taken, and a description of any actions taken to correct an issue. Operating and maintenance walkthrough inspection should be made using the forms to be adopted by the Board.

Rule 821. RESERVED

Rule 822. RESERVED

Rule 823. RESERVED

Rule 824. RESERVED

Rule 825. RESERVED

Rule 826. RESERVED

Rule 827. RESERVED

PART IV. RELEASE DETECTION

Rule 828. General Requirements for All UST System

- A.** Owners and operators of UST Systems must provide a method or combination of methods, of release detection that:
1. Can detect a release from any portion of the tank and the connected underground piping that routinely contain product;
 2. Are installed and calibrated in accordance with the manufacturer's instructions;
 3. At the effective date of this Regulation, be operated and maintained, and electronic and mechanical components be tested for proper operation, in accordance with one of the following criteria: manufacturer's instructions; a code of practice developed by a nationally recognized association or independent testing laboratory. A test will be performed, annually, to check for proper operation, which evidence must be presented to the Board as an attachment to the Operating Permit renewal application.
 4. The test must meet the following criteria:
 - a. Automatic tank gauge and other controllers: test alarm; verify system configuration; test battery backup;
 - b. Probes and sensors: inspect for residual buildup, ensure floats move freely; ensure shaft is not damaged; ensure cables are free of kinks, bends, and breaks; test alarm operability and communication with controller;
 - c. Line leak detector: test operation to meet criteria in this Part by simulating a leak; inspect leak sensing O-ring; and
 - d. Vacuum pumps and pressure gauges: ensure proper communication with sensors and controller.
 5. Meets the performance requirements in this Part, as applicable, with any performance claims and their manner of determination described in writing by the equipment manufacturer or installer. In addition, the methods listed in this Part, must be capable of detecting the leak rate or quantity specified for that method in the corresponding Rule with a probability of detection of 0.95 and a probability of false alarm of 0.05.
- B.** When a release detection method operated in accordance with the performance standards in this Part indicates a release may have occurred, owners and operators must notify the Board in accordance with Part V.
- C.** Owners and operators of airport hydrant fuel distribution systems, UST Systems with field-constructed tanks, and Tank Systems Wastewater Treatment unregulated under section 402 or 307 (b) of CWA and that process regulated substances under this Regulation, shall meet the

leak detection requirements of this Part in accordance with the following table:

Type of UST System	Time Frame after effective date of this Regulation	Description of Requirement
Bulk piping associated with airport hydrant fuel distribution systems and field constructed tanks using Part IV for piping release detection	Within three (3) years.....	Conduct one (1) bulk piping tightness test according to Part IV using the maximum detectable leak rates for semiannual testing. For bulk piping segments not capable of meeting the 3.0 gallon per hour leak rate, owners and operators may use a leak rate of up to 6.0 gallons per hour.
	Between six (6) years and seven (7) years.....	Conduct one (1) bulk piping tightness test according to Part IV using the maximum detectable leak rates for semiannual testing.
	After seven (7).....	Conduct bulk piping tightness testing according to Part IV.
Bulk piping associated with airport hydrant fuel distribution systems and field constructed tanks not using Part IV for piping release detection	Within three (3) years.....	Perform release detection according to this Part.
Underground tanks associated with hydrant fuel distribution systems and field constructed tanks	Within three (3) years.....	Perform release detection according to this Part.
Tank Systems Wastewater Treatment unregulated under section 402 or 307 (b) of CWA and process controlled substances under this Regulation.	Within three (3) years.....	Perform release detection according to this Part.

Table 3. Progressive Dates for Release Detection System Compliance.

D. Any UST System that cannot meet the requirements of this Part, shall complete permanent closure procedures described in Part VII.

Rule 829. Requirements for Petroleum UST Systems.

Owners and operators of petroleum UST Systems must provide release detection for tanks and piping as follows:

A. Tanks. Tanks must be monitored for releases as follows:

1. Tanks installed on or before effective date of this Regulation, must be monitored for releases at least every thirty (30) days, using one of the allowable methods listed in Part IV, except that:
 - a. UST Systems that meet the performance standards in Part II, and the monthly inventory control requirements in Part IV, may use tank tightness testing (conducted in accordance with Part IV) at least every five (5) years until ten (10) years after the tank was installed or upgraded under Part II, whichever is later;
 - b. Tanks with capacity of 550 gallons or less and tanks with a capacity of 551 to 1,000 gallons that meet the tank diameter criteria in Part IV may use manual tank gauging (performed in accordance with Part IV).
 - c. Field constructed tanks greater than 50,000 gallons may use the alternative release detection requirements in Part IV; and
 - d. Tanks using Part IV to monitor for releases, must begin using one of the methods listed in Part IV not later than the effective date of this Regulation.
2. Tanks installed after the effective date of this Regulation must be monitored for releases using interstitial monitoring at least every thirty (30) days in accordance with Part IV.

B. Piping. Underground piping that routinely contains regulated substances must be monitored for releases in compliance with one of the following requirements:

1. Piping installed on or before the effective date of this Regulation must meet one of the following:
 - a. Pressurized Piping. Underground piping that conveys regulated substances under pressure must:
 - i. Be equipped with an automatic line leak detector installed in accordance with Part IV; and
 - ii. Have an annual line tightness test or have monthly monitoring performed in accordance with Part IV.
 - b. Suction Piping: Underground piping that conveys regulated substances under suction must either have a line tightness test conducted at least every three (3) years and in accordance with Part IV, or use a monthly monitoring method conducted in accordance with Part IV. No release detection is required for suction piping that is designed and constructed to meet the following standards:
 - i. The below grade piping operates at less than atmospheric pressure;

- ii. The below grade piping is sloped so that the contents of the pipe will drain back into the storage tanks if the suction is released;
 - iii. Only one check valve is included in each suction line;
 - iv. The check valve is located directly below and as close as practical to the suction pump; and
 - v. A method is provided that allows compliance with paragraphs B.1.b.ii-iv of this Rule to be readily determined.
- c. Bulk piping. Underground piping associated with airport hydrant fuel distribution systems and field constructed tanks must meet one of the following release detection requirements:
- i. The requirements in this Rule; or
 - ii. The alternative release detection requirements in this Part.
2. Piping installed or replaced after the effective date of this Regulation must meet one of the following:
- a. Pressurized piping must be monitored for releases using interstitial monitoring at least every thirty (30) days in accordance with Part IV and be equipped with an automatic line leak detector in accordance with Part IV.
 - b. Suction piping must be monitored for releases using interstitial monitoring at least every thirty (30) days in accordance with Part IV. No release detection is required for suction piping that meets in this Rule.
 - c. Underground bulk piping associated with airport hydrant fuel distribution systems and field constructed tanks must meet the requirements in this Rule.

Rule 830. Requirements for Hazardous Substance UST Systems

The owners and operators of UST System that store hazardous substances must comply with all requirements of UST System that store oil and oil derived substances.

Rule 831. Methods of Release Detection for Tanks

Each release detection method for tanks used to meet the requirements of Part IV, except field constructed tanks installed on or before the effective date of this Regulation with capacities greater than 50,000 gallons that meet Part IV, must be conducted in accordance with the following:

A. Methods to discontinue: The methods mentioned in the Rule 831 B – D, must be discontinued within three (3) years of the effective date of this Regulation and an alternate

method from 831 E – J implemented.

B. Inventory Control. Product inventory control (or another test of equivalent performance) must be performed monthly to detect a release of at least 1.0 percent of flow-through plus one hundred thirty (130) gallons on a monthly basis in the following manner:

1. Inventory volume measurements for regulated substance inputs, withdrawals, and the amount still remaining in the tank must be recorded each operating day;
2. The equipment used is capable of measuring the level of product over the full range of the tank's height to the nearest one eighth (1/8) of an inch;
3. The regulated substance inputs are reconciled with delivery receipts by measurement of the tank inventory volume before and after delivery;
4. Deliveries are made through a drop tube that extends to within one foot of the tank bottom;
5. Product dispensing is metered and recorded within the local standards for meter calibration or an accuracy of six (6) cubic inches for every five (5) gallons of product withdrawn; and
6. The measurement of any water level in the bottom of the tank is made to the nearest one eighth (1/8) of an inch at least once a month.

C. Vapor Monitoring. Testing or monitoring for vapors within the soil excavation must meet the following requirements:

1. The materials used as backfill must be sufficiently porous (e.g., gravel, sand, crushed rock) to readily allow diffusion of vapors from releases into the excavation zone;
2. The stored regulated substance, or a tracer compound placed in the UST System, must be sufficiently volatile (e. g., gasoline) to result in vapor level that is detectable by the monitoring devices located in the excavation zone in the event of a release from the tank;
3. The measurement of vapors by the monitoring device is not rendered inoperative by the groundwater, rainfall, or soil moisture or other known interference, so that a release could go undetected for more than thirty (30) days;
4. The level of background contamination in the excavation zone will not interfere with the method used to detected releases from the tank;
5. The vapor monitors are designed and operated to detect any significant increase in concentration above background of the regulated substances stored in the UST System, a component or components of that substance, or any tracer compound placed in the tank system;

6. The UST excavation zone must be assessed to ensure compliance with the requirements in paragraphs E.1 through E.4 of this Rule; and
7. Monitoring wells are properly and clearly identified and secured to prevent unauthorized access and tampering.

D. Groundwater Monitoring. Testing or monitoring for liquids in the groundwater must meet the following requirements:

1. The regulated substance stored is immiscible in water and has a specific gravity of less than one (1);
2. Groundwater is never more than twenty (20) feet from the ground surface and the hydraulic conductivity of the soil(s) between the UST System and the monitoring wells or devices is not less than 0.01 cm/sec (e.g., the soil should consist of gravel, coarse to medium sands, coarse silts or other permeable materials);
3. The slotted portions of the monitoring well casing must be designed to prevent the migration of natural soils or filter pack into the well and to allow entry of regulated substances on the water table into the well under both high and low groundwater conditions.
4. Monitoring wells shall be sealed from the ground surface to the top of the filter pack;
5. Monitoring wells or devices should intercept the excavation area or be as close to it as is technically feasible;
6. The continuous monitoring devices or manual methods used should detect the presence of at least one-eighth (1/8) of an inch of free product on top of the groundwater in the monitoring wells;
7. Within and immediately below the UST System excavation zone, the site is assessed to ensure compliance with the requirements in this Rule and to establish the number and positioning of monitoring wells or devices that will detect releases from any portion of the tank that routinely stores product; and
8. Monitoring wells are to be properly and clearly marked and secured to avoid unauthorized access and tampering.

E. Manual Tank Gauging. Manual tank gauging must meet the following requirements:

1. Tank liquid level measurements are taken at the beginning and ending of a period of at least thirty six (36) hours during which no liquid is added to or removed from the tank;
2. Level measurements are based on an average of two (2) consecutive stick readings at both the beginning and ending of the period;

3. The equipment used is capable of measuring the level of product over the full range of the tank's height to the nearest one eighth (1/8) of an inch;
4. A release is suspected and subject to the requirements of Part V if the variation between beginning and ending measurements exceeds the weekly or monthly standards shown in the following table:

Nominal Tank Capacity	Minimum Duration Of Test	Weekly Standard (One Test)	Monthly Standard (Four Test Average)
550 gallons or less	36 hours	10 gallons	5 gallons
551-1,000 gallons (when tank diameter is 64")	44 hours	9 gallons	4 gallons
551-1,000 gallons (when tank diameter is 48")	58 hours	12 gallons	6 gallons

Table 4. Weekly or Monthly Standards and Difference between Initial and Final Readings According to the Nominal Capacity of the Tank.

5. Tanks of 550 gallons or less nominal capacity and tanks with a nominal capacity of 551 to 1,000 gallons that meet the tank diameter criteria in the table in this Rule may use this as the sole method of release detection. Tanks of nominal capacity greater than 550 gallons, that not meet the tank diameter criteria in the table in this Rule, may not use this method to meet the requirements of this Part.

F. Tank Tightness Testing. Tank tightness testing (or another test of equivalent performance) must be capable of detecting a leak rate of 0.1 gallon per hour from any portion of the tank that routinely contains product while accounting for the effects of thermal expansion or contraction of product, vapor pockets, tank deformation, evaporation or condensation, and the location of the water table.

G. Automatic Tank Gauging. Equipment for automatic tank gauging to test for the loss of product and conduct inventory control must meet the following requirements:

1. The automatic product level monitor test can detect a 0.2 gallon per hour leak rate from any portion of the tank that routinely contains product; and
2. The test must be performed with the system operating in one (1) of the following modes:
 - a. In tank static testing conducted on a periodic basis; or
 - b. Continuous in tank leak detection operating on an uninterrupted basis or operating within a process that allows the system to gather incremental measurements to determine the leak status of the tank at least once every thirty (30) days.

H. Interstitial Monitoring. Interstitial monitoring between the UST System and a secondary barrier immediately around or beneath it may be used, but only if the system is designed, constructed and installed to detect a leak from any portion of the tank that routinely contains

the regulated substance and meets one (1) of the following requirements:

1. For double walled UST System, the sampling or testing method can detect releases through the inner wall in any portion of the tank that routinely contains the regulated substance;
2. For UST System with a secondary barrier within the excavation zone, the sampling or testing method used can detect a release between the UST System and the secondary barrier;
 - a. The secondary barrier around or beneath the UST System consists of artificially constructed material that is sufficiently thick and impermeable to direct a release to the monitoring point and allow its detection;
 - b. The barrier is compatible with the regulated substance stored so that a release from the UST System will not cause a deterioration of the barrier allowing a release to pass through undetected;
 - c. For cathodically protected tanks, the secondary barrier must be installed so that it does not interfere with the proper operation of the cathodic protection system;
 - d. The groundwater, soil moisture, or rainfall will not render the testing or sampling method used inoperative so that a release could go undetected for more than thirty (30) days;
 - e. The site is assessed to ensure that the secondary barrier is always above the groundwater and not in flood plain, unless the barrier and monitoring system are designed for use under such conditions;
 - f. Monitoring wells are properly and clearly marked and secured to avoid unauthorized access and tampering.
3. For tanks with an internally fitted liner, an automated device can detect a release between the inner wall of the tank and the liner, and the liner is compatible with the substance stored.
4. For UST System using continuous vacuum, pressure, or liquid-filled methods of interstitial monitoring, the method must be capable of detecting a breach in both the inner and outer walls of the tank and piping.

I. Statistical Inventory Reconciliation. Statistically based testing or monitoring methods must meet the following requirements:

1. Report a quantitative result with a calculated leak rate;
2. Be capable of detecting a leak rate of 0.2 gallon per hour; and

3. Use a threshold that does not exceed one-half the minimum detectible leak rate.

J. Other Methods. Any other type of release detection method, or combination of methods, can be used if:

1. It can detect a leak rate of 0.2 gallon per hour or a release of one hundred fifty (150) gallons within a month with a probability of detection of 0.95 and a probability of false alarm of 0.05; or
2. The Board may approve another method if the owner and operator can demonstrate to the Board's satisfaction that the method can detect a release as effectively as any of the methods allowed in this Rule. In comparing methods, the Board shall consider the volume of the release that the method can detect and the frequency and reliability with which it can be detected. If the method is approved, the owner and operator must comply with any conditions imposed by the Board on its use to ensure the protection of human health and the environment.

Rule 832. Methods of Release Detection for Piping

Each method of release detection for piping used to meet the requirements in this Part, except bulk piping that meets Part IV, must be conducted in accordance with the following:

A. Automatic Line Leak Detectors. Methods which alert the operator to the presence of a leak by restricting or shutting off the flow of regulated substances through piping or triggering audible or visual alarms may be used only if they detect leaks of three (3) gallons per hour at ten (10) pounds per square inch line pressure within one (1) hour. An annual test of the operation of the leak detector must be conducted in accordance with this Part.

B. Line Tightness Testing. A periodic test of piping may be conducted only if it can detect a 0.1 gallon per hour leak rate at one and one-half (1 ½) times the operating pressure.

C. Applicable Tank Methods. The methods in Rule 831.E-J may be used if they are designed to detect a release from any portion of the underground pipelines that routinely contains regulated substances. Except as described in Rule 829 A.

Rule 833. Release Detection Recordkeeping

All UST System owners and operators must maintain records in accordance with Part III to demonstrate compliance with all applicable requirements of this Part. These records must include the following:

A. All written performance claims pertaining to any release detection system used, and the manner in which these claims have been justified or tested by the equipment manufacturer or installer. This documents must be maintained for at least three (3) years after the date of installation;

B. The results of any sampling, testing or monitoring must be maintained for at least three (3)

years, or for another reasonable period of time determined by the Board, except as follows:

1. The results of annual operation tests conducted in accordance with Part IV must be maintained for three (3) years. At a minimum, the results must list each component tested, indicate whether each component tested meets criteria in Part IV or needs to have action taken, and describe any action taken to correct an issue; and
 2. The results of tank tightness testing or bulk tank tightness testing conducted in accordance with Part IV must be submitted to the Board with the Operation Permit.
- C. All written documentation of calibrations, maintenance and repair of releases detection equipment permanently located onsite must be maintained for at least one (1) year after the servicing work is completed. Any schedules of required calibration and maintenance provided by the release detection equipment manufacturer must be retained for at least five (5) years from the date of installation.

Rule 834. Alternative Methods of Release Detection for Field Constructed Tanks

Owners and operators of field constructed tanks with a capacity greater than 50,000 gallons may use one or a combination of the following alternative methods of release detection:

- A. Conduct an annual bulk tank tightness test that can detect a 0.5 gallon per hour leak rate;
- B. Use an automatic tank gauging system to perform release detection at least every thirty (30) days that can detect a leak rate less than or equal to one gallon per hour. This method must be combined with a bulk tank tightness test that can detect a 0.2 gallon per hour leak rate performed at least every three (3) years;
- C. Use an automatic tank gauging system to perform release detection at least every thirty (30) days that can detect a leak rate less than or equal to two (2) gallons per hour. This method must be combined with a bulk tank tightness test that can detect a 0.2 gallon per hour leak rate performed at least every two (2) years; or
- D. Another method approved by the Board if the owner and operator can demonstrate that the method can detect a release as effectively as any of the methods allowed in this Rule. In comparing methods, the Board shall consider the size of release that the method can detect and the frequency and reliability of detection. If the method is approved, the owner and operator must comply with any conditions imposed by the Board on its use.

Rule 835. Alternative Methods of Release Detection for Bulk Piping

Owners and operators of underground piping associated with airport hydrant fuel distribution systems and field constructed tanks may use one or a combination of the following alternative methods of release detection:

- A. Perform a semiannual or annual bulk line tightness test at or above operating pressure in accordance with the table below. Bulk piping segments \geq 100,000 gallons not capable of

meeting the maximum three (3.0) gallon per hour leak rate for the semiannual test may be tested at a leak rate up to six (6.0) gallons per hour according to the schedule in Part IV:

Test Section Volume (Gallons)	Semiannual Test Maximum Detectable Leak Rate (Gallons Per Hour)	Annual Test Maximum Detectable Leak Rate (Gallons Per Hour)
< 50,000	1.0	0.5
≥ 50,000 to < 75,000	1.5	0.75
≥ 75,000 to < 100,000	2.0	1.0
≥ 100,000	3.0	1.5

Table 5. Maximum Detectable Leak Rate per Volume of the Section evaluated.

- B.** Perform continuous interstitial monitoring designed to detect a release from any portion of the underground piping that routinely contains product in accordance with Part IV;
- C.** Use an automatic line leak detector that alerts the operator to the presence of a leak by restricting or shutting off flow of regulated substances through piping or triggering an audible or visual alarm. This method may be used only if it can detect a leak of three (3) gallons per hour at ten (10) pounds per square inch line pressure within one (1) hour or equivalent. When using this method, the following must also be met:
 - 1. Perform interstitial monitoring, designed to detect a release from any portion of the underground piping that routinely contains product, in accordance with Part IV at least every three (3) months; and
 - 2. Conduct an annual test of the operation of the leak detector in accordance with Part IV; or
- D.** Another method approved by the Board if the owner and operator can demonstrate that the method can detect a release as effectively as any of the methods allowed in this Rule. In comparing methods, the Board shall consider the size of release that the method can detect and the frequency and reliability of detection. If the method is approved, the owner and operator must comply with any conditions imposed by the Board on its use.

Rule 836. RESERVED

PART V. RELEASE REPORTING, INVESTIGATION AND CONFIRMATION

Rule 837. Reporting of Suspected Releases

Owners and operators of UST Systems must report to the Board within twenty four (24) hours and follow procedures in Part V for any of the following conditions:

- A.** The discovery by owners and operators or anyone else of released regulated substances at the UST site or in the surrounding area (such as the presence of free product or vapors in soils, basements, sewer and utility lines, and nearby surface waters or monitoring wells).
- B.** Unusual operating conditions observed by owners and operators (such as erratic operation of product dispensing equipment, sudden loss of product from the UST System, an unexplained presence of water in the tank, or water or product in the interstitial space of secondarily contained systems), unless system equipment is found to be defective but not leaking, and is immediately repaired or replaced, in which case the Board should be notified of the situation within no more than five (5) days from the date when the condition was detected.
- C.** Monitoring results, including alarms, from a release detection method required under Part IV, which indicate a release may have occurred unless:
 - 1. The monitoring device is found to be defective, and is immediately repaired, recalibrated or replaced, and additional monitoring does not confirm the initial result; or
 - 2. In the case of inventory control, a second month of data does not confirm the initial result.
- D.** In both cases C.1 and C.2, that the release be confirmed, should be notified to the Board of the situation within five (5) days from the date when the condition was found.

Rule 838. Investigation Due to Off Site Impacts

When required by the Board, owners and operators of UST System must follow the procedures in Part V to determine if the UST System is the source of off-site impacts. These impacts include the discovery of regulated substances (such as the presence of free product or vapors in soils, basements, sewer and utility lines, nearby surface and drinking waters, and monitoring wells) that has been observed by the Board or brought to its attention by another party.

Rule 839. Release Investigation and Confirmation Steps

Unless Corrective Actions is initiated in accordance with Part VI of this Regulation, owners and operators must immediately investigate and if is confirmed all suspected releases of regulated substances, must report it according with Part V, immediately by writing to WQA to the Board, using either the following steps or another procedure approved by the Board.

- A. System Test.** Owners and operators must conduct tests, according to the requirements for tightness testing in Part IV, or for UST System with secondary containment and interstitial

monitoring, the integrity testing specified in Part III that determine whether a leak exists in that portion of the tank that routinely contains the regulated substance, the attached delivery piping, or a breach of the interstitial space.

1. If the system test confirms a leak, owners and operators must repair, replace, upgrade, or close the UST System. In addition, owners and operations must begin Corrective Action in accordance with Part VI of this Regulation if the test results for the system, tank, or delivery piping indicate that a release exists.
2. Further investigation is not required if the test results for the systems, tank, and delivery piping do not indicate that a release exists and if environmental contamination is not the basis for suspecting a release.
3. Owners and operators must conduct a site check as described in this Rule if the test results for the system, tank, and delivery piping do not indicate that a release exists but environmental contamination is the basis for suspecting a release.

B. Site Check. Owners and operators must sample, in accordance with Part II of this Regulation, for the presence of a release where contamination is most likely to be present at the UST site, in accordance with this Rule. In selecting sample types, sample locations, and measurement methods, owners and operators must consider the nature of the stored substance, the type of initial alarm or cause for suspicion, the type of backfill, the depth to groundwater, and other factors appropriate for identifying the presence and source of the release.

1. If the test results for the excavation zone or the UST site indicate that a release has occurred, owners and operators must begin corrective action in accordance with Part VI;
2. If the test results for the excavation zone or the UST site do not indicate that a release has occurred, further investigation is not required.

Rule 840. Reporting and Cleanup of Spills and Overfills

A. Owners and operators of UST System must contain and immediately clean up a spill or overfill and report to the Board within twenty four (24) hours, and begin corrective action in accordance with Part VI of this Regulation in the following cases:

1. Spill or overfill of petroleum and its derivatives that result in a release to the environment that exceeds twenty five (25) gallons, or that causes a violation to the general standards for oil and grease established by the RWQS, as amended, on nearby surface water; and
2. Spill or overfill of a hazardous substance that result in a release to the environment that equals or exceeds its reportable quantity under CERCLA.

B. Owners and operators of UST System must contain and immediately clean up a spill or overfill of petroleum that is less than twenty five (25) gallons, and a spill or overfill of a hazardous substance that is less than the reportable quantity. If cleanup cannot be accomplished within twenty four (24) hours, owners and operators must immediately notify

the Board.

Note: Pursuant to 40 CFR 302.6 and 355.40, a release of a hazardous substance equal to or in excess of its reportable quantity must also be reported immediately (rather than within 24 hours) to the National Response Center under sections 102 and 103 of the CERCLA, and to the Board and any other local authorities under Title III of the SARA.

Rule 841. RESERVED

PART VI. RELEASE RESPONSE AND CORRECTIVE ACTION FOR UST SYSTEMS CONTAINING PETROLEUM OR HAZARDOUS SUBSTANCES

Rule 842. General

The owners and operators of UST System that store petroleum or hazardous substances shall, in response to a leak confirmed a UST System, meet the requirements of this Part.

Rule 843. Initial Response

Upon confirmation of a release in accordance with Part V or after a release from the UST System is identified, owners and operators must perform the following initial response actions within twenty four (24) hours of a release.

- A. Report the release to the Board.
- B. Take immediate action to prevent any further release of the regulated substance into the environment; and
- C. Identify and mitigate fire, explosion, and vapor hazards.

Rule 844. Initial Abatement Measures, Site Check, and Free Product Removal

- A. Unless directed to do otherwise by the Board, owners and operators must perform the following abatement measures:
 - 1. Remove as much of the regulated substance from the UST System as is necessary to prevent further release to the environment;
 - 2. Visually inspect any aboveground releases or exposed underground releases and prevent further migration of the released substance into surrounding soils and groundwater;
 - 3. Continue to monitor and mitigate any additional fire and safety hazards posed by vapors or free product that have migrated from the UST excavation zone and entered into subsurface structures (such as sewers or basements);
 - 4. Remedy hazards posed by contaminated soils that are excavated or exposed as a result of release confirmation, site investigation, abatement, or Corrective Action activities. If these remedies include treatment or disposal of soils, the owner and operator must comply with all applicable Board and other local and federal agencies' requirements; and
 - 5. Investigate to determine the possible presence of free product, and start free product removal as soon as possible in accordance with this Rule.
- B. Within twenty (20) days after release confirmation, owners and operators must submit to the Board a report summarizing the initial abatement steps taken and any other information or data resulting from this activity. At sites where investigations under this Part indicate the

presence of free product, owners and operators must remove free product. To comply with the requirements of this Rule, owners and operators must:

1. Conduct free product removal in a manner that minimizes the spread of contamination into uncontaminated zones, by using recovery and disposal techniques appropriate to the hydrogeological conditions at the site, and that properly treats, discharges, or disposes of recovery byproducts in compliance with applicable Puerto Rico and federal regulations. If these activities include groundwater monitoring and extraction wells, the owners or operators must comply with the procedures established by Law No. 136, as amended, Water Law of Puerto Rico.
 2. Use abatement of free product migration as a secondary objective in designing the free product removal system; and
 3. Handle any flammable product in a safe and competent manner to prevent fires or explosions.
- C. Within forty five (45) days after release confirmation, or in accordance with a reasonable schedule established by the Board, owners and operators must submit to the Board a report summarizing the initial abatement steps taken under this Rule, free product removal action, and any other information or data resulting from this activity. The report must include the following information regarding the free product removal action:
1. The name of the person's responsible for implementing the free product removal measures;
 2. Estimated quantity, type, and thickness of free product observed or measured in wells, boreholes, and excavations;
 3. Type of free product recovery system used;
 4. Whether any discharge will take place on site or off site during the recovery operation and where this discharge will be located;
 5. Type of treatment applied to, and the effluent quality expected from, any discharge;
 6. Steps that have been or are being taken to obtain necessary permits for drilling and installation of groundwater monitoring and extraction wells, and for any discharge; and
 7. Disposal of the recovered free product.

Rule 845. Site Investigation Plan for Soil and Groundwater Cleanup

- A. The Board may require owners and operators to submit a Site Investigation Plan in order to determine the full extent and location of soils contaminated by the release and the presence and concentrations of dissolved product contamination in the groundwater. Owners and operators must submit a Site Investigation Plan for the Board's approval in accordance with

PARPCUST and the forms to be adopted by the Board. The plan will include a description of work to be done at the site and the surrounding areas possibly affected by the release, if any of the following conditions exists:

1. There is evidence that groundwater wells have been affected by the release (e.g., as found during releases confirmation or previous corrective action measures);
 2. Free product found needs recovery action in compliance with this Part;
 3. There is evidence that contaminated soils may be in contact with groundwater (e.g., if evidence is found while conducting initial response measurements or investigations required under this Part); and
 4. The Board requests an investigation, based on the potential effects of contaminated soil or groundwater on nearby surface waters and groundwater resources.
 5. The Board requests an investigation, based on the results of Part VIII.
- B.** Upon approval of the site investigation plan or as directed by the Board, owners and operators must implement the plan, including modifications to the plan made by the Board. They must sample, evaluate, and report the results of implementing the plan in accordance with a schedule and in a format approved by the Board and the forms to be adopted by the Board.

Rule 846. Corrective Action Plan

- A.** The Board may require owners and operators to submit additional information or to develop and submit a Corrective Action Plan for responding to contaminated soils and groundwater. If a Plan is required, owners and operators must submit the plan according to a schedule and format established in PARPCUST by the Board.
- B.** The Board will approve the Corrective Action Plan only after ensuring that implementation of the plan will adequately protect human health, safety, and the environment. In making this determination, the Board will consider the following factors as appropriate:
1. The physical and chemical characteristics of the regulated substance, including its toxicity, persistence, and potential for migration;
 2. The hydrogeological characteristics of the facility and the surrounding area;
 3. The proximity, quality, and current and future uses of nearby surface water and groundwater;
 4. The potential effects of residual contamination of nearby surface water and groundwater;
 5. An exposure assessment; and
 6. Any information assembled in compliance with this Part.

C. As soon as Corrective Action Plan is approved by the Board, owners and operators shall implement the Plan, including any amendments thereto. Must take samples, evaluate and report the results of the implementation of the Plan in accordance with the EQB authorization EQB and according to the forms adopted by the Board.

Rule 847. Public Participation

A. For each confirmed release that requires a Corrective Action Plan, the Board must provide notice to the public by means designed to reach those members of the public directly affected by the release and the planned Corrective Action. This notice may include, but is not limited to, public notice in local newspapers, public service announcements, letters to individual households, or personal contacts by field staff.

B. The Board must ensure that site release information and decisions concerning the Corrective Action Plan are made available to the public for inspection.

C. The Board must notify the affected community if implementation of an approved Corrective Action Plan does not achieve the established cleanup levels in the Plan and if termination of that Plan is under consideration by the Board. This notification may be through public notice in local newspapers, public service announcements, letters to the residents, or personal contacts by field staff.

Rule 848. Risk Based Corrective Action.

The Board shall require Corrective Action when the results of the analysis of samples taken during an investigation of a UST System escape indicating the levels exceeding any corrective action levels established in Table 2 of this Regulation. EQB may also consider other mechanisms of Corrective Action such as Risk Based Corrective Action (RBCA). The requirements for these other mechanisms will be included in the guidelines developed or adopted by the Board concerning this matter.

Rule 849. RESERVED

PART VII. OUT OF SERVICE UST SYSTEM AND CLOSURE

Rule 850. Temporary Closure of UST System

- A.** The owners and operators when a UST System is temporarily closed, it must be empty, must continue operation and maintenance of corrosion protection in accordance with Part III , and any releases detection in accordance with Part IV. In addition, Parts V and Part VI must be complied with if a release is suspected or confirmed. However, release detection is not required as long as the UST System is empty. The UST System is empty when all materials have been removed using commonly employed practices so that no more than 2.5 centimeters (one inch) of residue, or 0.3 percent by weight of the total capacity of the UST System, remain in the system.

- B.** The owners and operators when an UST System is temporarily closed for three (3) months or more, must also comply with the following requirements:
 - 1. Leave vent lines open and functioning; and
 - 2. Cap and secure all other lines, pumps, man ways, and ancillary equipment.

- C.** The owners and operators when an UST System is temporarily closed for more than twelve (12) months, must permanently close the UST system if it does not meet either performance standards in Part II for new UST System or the upgrading requirements in Part II , except that the spill and overfill equipment requirements do not have to be met. Owners and operators must permanently close the substandard UST System at the end of this twelve (12) month period in accordance with Part VII, unless the Board provides an extension of twelve (12) month temporary closure period. Owners and operators must complete a site assessment in accordance with this Part before such an extension can be applied for.

Rule 851. Permanent Closure and Changes in Service

- A.** The owners and operators before any permanent closure activities or changes in service, must apply for and obtain a Closure Permit from the Board in accordance with Part II of this Regulation. In addition, they must comply with the requirements established in this Rule. The excavation area evaluation required under this Rule must be performed after obtaining the Closure Permit.

- B.** The owners and operators to permanently close a tank, must empty and clean it by removing all liquids and accumulated sludge. All tanks taken out of service permanently must be removed from the ground.
 - 1. The Board will evaluate any closure in place petition made by the owner on a case by case basis. The petitions must provide a justification for the closure in place and submit all relevant information as an attachment to the Closure Permit Application. To make the determination, the Board will consider the following factors:
 - a. The UST System is under or beneath structures and the removal of the UST System can

compromise the stability of a structure.

- b. The removal of the UST System can compromise human health or the environment.
- C. The owners and operators before a change-in-service, must empty and clean the tank by removing all liquid and accumulated sludge and conduct a site investigation and corrective action in accordance with Part VI. If the UST System is removed, it must be disposed in accordance with PARPCUST.

Rule 852. Assessing the Site at Closure or Change in Service

- A. The owners and operators before permanent closure or a change in service is completed, must perform the corresponding sampling procedure in accordance with PARPCUST. In selecting sample types, samples locations, and sampling methods, owners and operators must consider the method of closure, the nature of the stored substance, the type of backfill, the depth to groundwater, and other factors appropriate for identifying the presence of a release. The requirements of this Rule are satisfied if one (1) of the external release detection methods allowed, it is operating in accordance with the requirements in Part IV at the time of closure, and indicates no release has occurred.
- B. If contaminated soils, contaminated groundwater, or free product as a liquid or vapor is discovered in accordance with paragraph A of this Rule, owners and operators must begin corrective action in accordance with Part VI of this Regulation.

Rule 853. Applicability to Previously Closed UST Systems

The owners and operators of a UST System that was permanently closed without obtaining the permission of the Board before the effective date of this Regulation, shall assess the area where the UST System stood requesting Closure Permit in accordance with Part VII of this Regulation.

Rule 854. Closure Records

- A. Owners and operators must maintain closure records, in accordance with Part III, that are capable of demonstrating compliance with closure requirements under this Part. The results also must be maintained for at least three (3) years after completion of permanent closure or change in service in one (1) of the following alternatives:
 - 1. By the owners and operators who responsible for closure of the UST System.
 - 2. By the current owners and operators of the UST System site.
 - 3. By mailing these records in PDF format to the Board if they cannot be maintained at the facility.
- B. The results of all activities conducted during the closure must be submitted through the Closing Final Report, which must be submitted to the Board in accordance with the provisions PARPCUST and the forms to be adopted by the Board.

RULE 855. RESERVED

PART VIII. REGISTER REQUIREMENTS AND PROCEDURES

Rule 856. Register of UST System

- A.** Anyone who owns an UST System subject to this Regulation in accordance with Part I must notify the Board of the existence of the tank system using the Registration Application form to be adopted by the Board.
- B.** The owners and operators who are required to submit Registration Application under paragraph A of this Rule, must provide the Board with a Registration Application for each tank they possess. Owners and operators may provide Registration Application for several tanks using only one (1) form if such tanks are located in the same facility. Owners and operators who possess tanks located in more than one (1) operational site must complete a separate Registration Application forms.
- C.** The Registration Application must submit the information on the owner and operator of the facility, the name, postal, physical and electronic address, phone, cellular and fax. A registration Application that is incomplete will not be accepted.
- D.** When an emergency situation occurs, the time requirement of Part II may be waived by the Board upon petition of an UST registrant if: (1) the petitioner can demonstrate to the Board that an emergency situation exists: and (2) the Fire Department has been notified by the petitioner that the UST is being installed without the ten (10) day notice due to an emergency situation.

Rule 857. Register Requirements

- A.** Each time when the UST owner or operator changes, the new UST owner or operator must submit a Registration Application form, ownership change in the forms to be adopted by EQB. The Board will issue a new Registration Certificate, modified, expressing the new owner or new operator of the facility.
- B.** Any change to the UST System that affects the initial condition submitted in the Registration application must be presented through a Permit Modification, according with the forms to be adopted by the Board.

Rule 858. Registration Responsibility

It is the responsibility of the owner and operator of the UST System to register these systems before the Board. When the Board is unable to determine who the owner of a UST System is or this matter is in legal dispute, it will be the responsibility of the owner of the land where UST System is located to register at the Board all UST Systems located in the installation.

Rule 859. Certificate of Registration and UST Facility Identification Number

The Board will issue a Certificate of Registration assigning an identification number to each registered facility and owner. The registration number must be used in all permit applications,

permit modifications, and in all written or verbal communications concerning the facility. The owner or operator must post the Certificate of Registration issued by the Board in a visible place at the facility.

Rule 860. Changes to Facility Data

- A. The owner and operator of a UST System must inform to the Board, through a Permit Modification form to be adopted by the Board, of any change of owner or operator at the facility within thirty (30) days after the date of the signing of the sale or lease contract. The new owner shall, within the same time, be responsible to request to the Board a Permit Operation Modification, using the form to be adopted by the Board.
- B. The Board will issue to the new owner or operator a new Certificate of Registration indicating all changes.
- C. Modifications to the information previously provided relating to the use and operation of the UST System must be notified to the Board throughout a Permit Modification form by the owner or operator within thirty (30) days before implementing such changes in the facility using the form to be adopted by the Board.

Rule 861. RESERVED

Rule 862. RESERVED

PART IX. FINANCIAL RESPONSIBILITY

Rule 863. Applicability

- A.** This Part applies to owners and operators of all petroleum or petroleum derived products UST System installed in Puerto Rico, except as otherwise provided in this Rule. If the owner and operator of a UST System are separate persons, only one person is required to demonstrate financial responsibility; however, both parties are liable in the event of noncompliance.
- B.** Owners and operators of UST System that store petroleum or petroleum derived products are subject to these requirements in accordance with Rule 863.
- C.** State and federal government entities whose debts and liabilities are the debts and liabilities of the Commonwealth of Puerto Rico or the United States of America are exempt from the requirements of this Part.
- D.** The requirements of this Part do not apply to owners and operators of any UST System described in Rule 803.B.
- E.** The information required in this Part shall be submitted using forms approved by the EPA that comply with the laws and regulations of the Commonwealth of Puerto Rico or those adopted by the Board.

Rule 864. Compliance Dates

The owners and operators of UST System that store regulated substances shall meet the requirements of this part at the time of the effective date of this Regulation.

Rule 865. Amount and Scope of Required Financial Responsibility

- A.** Owners or operators of petroleum underground storage tanks must demonstrate financial responsibility for taking corrective action and for compensating third parties for bodily injury and property damage caused by accidental releases arising from the operation of petroleum UST.
- B.** Owners or operators of petroleum underground storage tanks must demonstrate financial responsibility for taking corrective action and for compensating third parties for bodily injury and property damage caused by accidental releases arising from the operation of petroleum underground storage tanks in at least the following annual aggregate amounts:
 - 1. For owners or operators of 1 to 100 petroleum UST, \$1.5 million; and
 - 2. For owners or operators of 101 or more petroleum UST: \$2.5 million.
- C.** If an owner and operator uses separate mechanisms or separate combinations of mechanisms to demonstrate financial responsibility for different UST System that store petroleum or petroleum products, the total annual amount required will be based on the number of tanks

covered by each of the separate mechanisms or by a combination thereof.

- D.** If the owner or operator uses separate mechanisms or separate combinations of mechanisms to demonstrate financial responsibility for:
1. Taking corrective action;
 2. Compensating third parties for bodily injury and property damage caused by sudden accidental releases; or
 3. Compensating third parties for bodily injury and property damage caused by nonsudden accidental releases, the amount of assurance provided by each mechanism or combination of mechanisms must be in the full amount specified in this Rule.
- E.** The owners and operators should review the total security amount that the policy provides, whenever they purchase or install additional underground tanks to store petroleum or petroleum products.
- F.** The amounts of financial liability coverage required for incident and for each total by year, do not limit, in any way, the personal liability of the owner and operator.

Rule 866. Allowable Mechanisms and Combinations of Mechanisms

- A.** The owner and operator, may use one (1) or any combination of the mechanisms listed in this Part, to demonstrate financial responsibility for one (1) or more underground storage tanks.
- B.** An owner and operator may use a guarantee or surety bond to establish financial responsibility, only if complies with the legislation of the Commonwealth of Puerto Rico.
- C.** An owner and operator may use self-insurance in combination with a guarantee only if, for the purpose of meeting the requirements of the financial test under this Part, the financial statements of the owner or operator are not consolidated with the financial statements of the guarantor.

Rule 867. Financial Test of Self Insurance

- A.** An owner and operator may satisfy the requirements of this part by presenting the financial evidence, based on the financial statements of the last three (3) accounting years.
- B.** The financial statements submitted by the owner and operator must demonstrate tangible net worth of at least ten (10) times ten (10) million dollars or more;
1. The total sum of the applicable amount required by this Part, based on the number of underground storage tanks for which a financial test is used to demonstrate financial

responsibility to EPA or the Board, under this Part.

2. The sum of the estimated cost of the corrective action, the current estimated cost of closure and post-closure activities and the covered an amount for liability, for which a financial test is used to demonstrate financial responsibility to EPA in accordance with 40 CFR Parts 264.101 , 264.143 , 264.145 , 265.143 , 265.145 , 264.147 and 265.147 or to the Board.
 3. The owner and operator must have a letter signed by the chief financial officer.
 4. The owner and operator must annually submit to the Board copies of the financial documents filed with the Securities and Exchange Commission of the United States, the Administration on Energy Information or the Rural Electrification Service; or what annually reported about to tangible net worth to a bonds accrediting company, which shall assign a financial rating of 4A or 5A
 5. The financial end year accounting report, should be audited by an independent auditor and may not include an adverse opinion of the auditor, release of liability or a reservation on business continuity.
- C. The owner or operator shall meet the financial test requirements of 40 CFR 264 147 (f) (1) by substituting the appropriate amounts specified in this Part by the amount of liability coverage whenever specified in this Part.
1. Financial end year accounting report of the owner and operator shall be audited by an independent certified public accountant and must be accompanied by the certified public accountant 's report that the audit .
 2. Company's financial end year accounting report may not include auditor's adverse opinion, release of liability or a reservation on business continuity.
 3. The owner and operator must submit a letter signed by the financial officer chief, drafted in accordance with the laws and regulations of the Commonwealth of Puerto Rico.
 4. If the financial reports of the owner and operator are presented annually with the Securities and Exchange Commission of the United States, the Administration Energy Information or Service Rural Electrification, the owner and operator must obtain a special report by an independent certified public accountant that states the following:
 - i. The accountant has compared the data provided in the letter from the Chief Financial Officer of the company, which specified that they were derived from the financial statement to the most recent accounting year of the owner or operator , with the amounts shown in such financial statement , and
 - ii. In connection with this comparison, one issue arose not make him believe that the data specified in the letter alluded should be adjusted.

- D. To demonstrate that they meet the financial test requirements of this Rule, the finance director of the owner and operator must sign within one hundred twenty (120) days of the close of each financial year, defined as the period of twelve (12) months for which they were prepared financial reports used to support the financial test, a letter written in accordance with the laws and regulations of the Commonwealth of Puerto Rico.
- E. If the owner and operator using the test to provide financial assurance finds that he no longer meets the requirements of the financial test based on the financial reporting year end, the owner and operator must obtain an alternate cover within one hundred fifty (150) days prior to the end of the year for which the financial reports have been prepared.
- F. The Chairman of the Board may require the owner and operator reports financial condition at any time it deems appropriate. If the Chairman of the Board is based on such reports or other information that the owner or operator and guarantor no longer meets the financial test requirements of this Part , the owner or operator must obtain an alternate cover within thirty (30) days after being notified by registered mail of such finding.
- G. If the owner and operator fails to obtain alternate assurance within one hundred fifty (150) days after found that he or she no longer meets the financial test requirements based on the financial reporting year end, or within thirty (30) days of the President of the Board will be notified that he or she no longer meets the requirements of the financial test, the owner or operator shall notify the Chairman of the Board of such failure within a period of ten (10) days.

Rule 868. Corporate Guarantee

- A. An owner or operator may satisfy the requirements of this Part by obtaining a guarantee that conforms to the requirements of this Rule. The guarantor must be:
 - 1. A firm that:
 - a. Possesses a controlling interest in the owner or operator;
 - b. Is controlled through stock ownership by a common parent firm that possesses a controlling interest in the owner or operator
 - 2. A firm engaged in a substantial business relationship with the owner or operator and issuing the guarantee as an act incident to that business relationship.
- B. Within one hundred twenty (120) days of the close of each financial reporting year the guarantor must demonstrate that it meets the financial test criteria of Rule 867 based on year-end financial statements for the latest completed financial reporting year by completing the letter from the chief financial officer described in Rule 867.D and must forward the letter to the owner or operator. If the guarantor fails to meet the requirements of the financial test at the end of any financial reporting year, within one hundred twenty (120) days of the end of that financial reporting year, the guarantor shall send by certified mail and, before cancellation or nonrenewal of the guarantee or notice to the owner or operator. If the

President of the Board notifies the guarantor that they no longer meets the requirements of the financial test of Rule 867.B or C and D, the guarantor must notify the owner or operator within ten (10) days of receiving such notification from the Board. In both cases, the guarantee will terminate one hundred twenty (120) days after the date the owner or operator receives the notification, as evidenced by the return receipt. The owner or operator must obtain alternate coverage.

- C. The guarantee must be drafted in accordance with the laws and regulations of the Commonwealth of Puerto Rico.
- D. An owner and operator who uses a guarantee to satisfy the requirements of Rule 865 must establish a stand by trust fund when the guarantee is obtained. Under the terms of the guarantee, all amounts paid by the guarantor under the guarantee will be deposited directly into the stand by trust fund in accordance with instructions from the Executive Director of the Board under Rule 878. This stand by trust fund must meet the requirements specified in Rule 873.

Rule 869. Insurance and Risk Retention Group Coverage

- A. An owner and operator may satisfy the requirements of Rule 865 by obtaining liability insurance, from a qualified insurer or risk retention group that conforms to the requirements of this Rule. Such insurance should be in the form of a separate insurance policy or an endorsement to an existing insurance policy.
- B. Each insurance policy must be amended with an endorsement or evidenced by a certificate of insurance, they should be drafted in accordance with the laws and regulations of the Commonwealth of Puerto Rico.
- C. Each insurance policy must be issued by an insurer or risk retention group that, at least, is authorized to conduct transactions in the field of insurance or eligible to provide insurance as an excess insurer or surplus lines in one or more states.

Rule 870. Surety Bond

- A. An owner and operator may satisfy the requirements of Rule 865 by obtaining a surety bond that conforms to the requirements of this Rule. The Surety Company issuing the bond must be among those listed as acceptable sureties on federal bonds latest issued of the U.S. Department of the Treasury.
- B. The bond shall be drafted in accordance with the laws and regulations of the Commonwealth of Puerto Rico.
- C. Under the terms of the bond, the surety will become liable on the bond obligation when the owner or operator fails to perform as guaranteed by the bond. In all cases, the surety's liability is limited per occurrence and annual aggregate penalty sums.
- D. The owner and operator who uses a surety bond to satisfy the requirements of Rule 865 must

establish a stand by trust fund when the surety bond is acquired. Under the terms of the bond, all amounts paid by the surety under the bond will be deposited directly into the stand by trust fund in accordance with instructions from the Executive Director of the Board under Rule 878. This stand by trust fund must meet the requirements specified in Rule 873.

Rule 871. Letter of Credit

- A.** An owner and operator may satisfy the requirements of Rule 865 by obtaining an irrevocable stand by letter of credit that conforms to the requirements of this Rule. The issuing institution must be an entity that has the authority to issue letters of credit in la jurisdiction of Puerto Rico and whose letter of credit operations are regulated and overseen by a federal agency or agency of Puerto Rico.
- B.** The letter of credit must be written according to the laws and regulations of the Commonwealth of Puerto Rico.
- C.** An owner and operator who uses a letter of credit to satisfy the requirements of Rule 865 must also establish a stand by trust fund when the letter of credit is acquired. Under the terms of the letter of credit, all amounts paid pursuant to a draft by the Executive Director of the EQB will be deposited by the issuing institution directly into the stand by trust fund in accordance with instructions from the Executive Director of the Board under Rule 878. This stand by trust fund must meet the requirements specified in Rule 873.
- D.** This letter of credit must be irrevocable with a term specified by the issuing institution. The letter of credit must provide that credit be automatically renewed for the same term as the original term, unless, at least one hundred twenty (120) days before the current expiration date, the issuing institution notifies the owner or operator by certified mail of its decision not to renew the letter of credit. Under the terms of the letter of credit, the one hundred twenty (120) days will begin on the date when the owner or operator receives the notice, as evidenced by the return receipt.

Rule 872. Trust Fund

- A.** An owner and operator may satisfy the requirements of Rule 865 by establishing a trust fund that conforms in accordance with the Law 219-2012, Puerto Rico Trusts Act, by a notarized public instrument... The trustee must be an entity that has the authority to act as a trustee and whose trust operations are regulated and examined by a federal agency or by the EQB in which the fund is established.
- B.** The wording of the trust agreement must be identical to the wording specified in Rule 873.B and must be accompanied by a formal certification of acknowledgement as specified in Rule 873.B.
- C.** The trust fund, when established, must be funded for the full required amount of coverage, or funded for part of the required amount of coverage and used in combination with other mechanism(s) that provide the remaining required coverage.

- D. If the value of the trust fund is greater than the required amount of coverage, the owner or operator may submit a written request to the Executive Director of the Board for release of the funds that may be in excess.
- E. If other financial assurance as specified in this Part is substituted for all or part of the trust fund, the owner or operator may submit a written request to the Executive Director of the Board for release of the excess.
- F. Within sixty (60) days after receiving a request from the owner or operator for release of funds as specified in paragraphs D or E of this Rule, the Executive Director of the Board will instruct the trustee to release to the owner and operator such funds as the Executive Director of the Board specifies in writing.

Rule 873. Stand by Trust Fund

- A. An owner or operator using any one of the mechanisms authorized by this Part, must establish a stand by trust fund when the authorized mechanism is acquired. The trustee of the stand by trust fund must be an entity with the authority to act as a trustee and whose trust operations are regulated and examined by a federal agency or by the Board, in which the fund is established.
- B. The alternate trust agreement must be drafted in accordance with the laws and regulations of the Commonwealth of Puerto Rico.
- C. The alternate trust agreement must be accompanied by an official certificate of recognition drafted in accordance with the laws and regulations of the Commonwealth of Puerto Rico.
- D. The Executive Director of the EQB shall order the trustee to reimburse the trust fund balance alternative to financial security provider if the President determines that it will incur additional costs for corrective action or claims occur not from third parties as a result of an escape mechanism covered by a financial security for which it was established trust fund alternative.
- E. An owner and operator may establish a trust fund as the depository mechanism for all funds assured in compliance with this Rule.

Rule 874. Substitution of Financial Assurance Mechanisms by Owner or Operator

- A. An owner and operator may substitute any alternate financial assurance mechanisms as specified in this Part, provided that at all times he maintains an effective financial assurance mechanism or combination of mechanisms that satisfies the requirements of Rule 865.
- B. After obtaining alternate financial assurance as specified in this Part, an owner or operator may cancel a financial assurance mechanism by providing notice to the provider of financial assurance and the Board.

Rule 875. Cancellation or Nonrenewal by Provider of Financial Assurance

- A.** Except as otherwise provided, a provider of financial assurance may cancel or fail to renew an assurance mechanism by sending a notice of termination by certified mail to the owner and operator.
1. Termination of a guarantee, a surety bond, or a letter of credit may not occur until one hundred twenty (120) days after the date on which the owner and operator receives the notice of termination, as evidenced by the return receipt.
 2. Termination of insurance, or risk retention group coverage, except for non-payment or misrepresentation by the insured, or state-funded assurance, shall not occur until sixty (60) days after the date on which the owner and operator receives the notice of termination, as evidenced by the return receipt. Termination for non-payment of premium or misrepresentation by insured shall not occur until a minimum of ten (10) days after the date on which the owner or operator receives the notice of termination, as evidenced by the return receipt.
- B.** If a provider of financial responsibility cancels or fails to renew for reasons other than incapacity of the provider as specified in this Rule, the owner or operator must obtain alternate coverage as specified in this Rule within sixty (60) days after receipt of the notice of termination.

Rule 876. Reporting by Owner and Operator

- A.** Within thirty (30) days after the owner and operator identifies a release from an UST System, which is required to be reported under Rule 840 or Rule 843 of this Regulation.
1. If the owner and operator fails to obtain alternate coverage as required under this Part, within thirty (30) days after the owner or operator receives notice of:
 - a. Bankruptcy proceedings in accordance with Title 11 of the U.S. Code have been initiated, either voluntarily or involuntarily, identifying the financial assurance provider as the debtor.
 - b. Suspension or revocation of the authority of a financial assurance provider to issue a financial assurance mechanism.
 - c. Failure of a surety to comply with the requirements of financial proof.
 - d. Other incapacity of the provider of financial assurance; or
- B.** The Executive Director of the Board may require at any time that an owner and operator provide evidence of financial responsibility or any other information relevant to this Part, as described in this Part.

Rule 877. Recordkeeping

- A.** Owners and operators must maintain evidence of all financial assurance mechanisms used to demonstrate financial responsibility under this Part for all underground storage tanks subject to this Regulation, until released from the requirements of this Part under Rule 879. The owner and operator must maintain such evidence at the UST System site.
- B.** An owner and operator must maintain the following types of evidence of financial responsibility:
 - 1. An owner and operator using an assurance mechanism specified in this Part must maintain a copy of the instrument worded as specified.
 - 2. An owner and operator using a financial test or guarantee must maintain a copy of the chief financial officer's letter based on year-end financial statements for the most recent completed financial reporting year. Such evidence must be filed no later than one hundred twenty (120) days after the close of the financial reporting year.
 - 3. An owner and operator using a guarantee, surety bond, or letter of credit must maintain a copy of the signed stand by trust fund agreement and copies of any amendments to the agreement.
 - 4. An owner and operator using an insurance policy or risk retention group coverage must maintain a copy of the signed insurance policy or risk retention group coverage policy, with the endorsement or certificate of insurance and any amendments to the agreements.
 - 5. An owner and operator covered by any assurance of the Commonwealth of Puerto Rico must maintain on file a copy of any evidence of coverage supplied by or required by the Government of Puerto Rico.
 - 6. An owner and operator using an assurance mechanism specified, inclusive, must maintain an updated copy of a certification of financial responsibility according to the laws and regulations of the Commonwealth of Puerto Rico.
 - 7. The owner and operator must update this certification whenever the financial assurance mechanism(s) used to demonstrate financial responsibility change(s).

Rule 878. Drawing on Financial Assurance Mechanisms

- A.** The Executive Director of the Board may require the guarantor or the institution issuing a letter of credit to certify the amount of financial security fund if:
 - 1. The Executive Director of the Board determines or suspects that a release from an UST System covered by the mechanism has occurred and so it is the owner and operator notified.

2. The owner and operator has notified the Executive Director of the Board, under Part V or VI, of a release from an UST System covered by the mechanism.

B. The Executive Director of the Board can withdraw funds from a trust if:

1. The Executive Director of the Board makes a final determination that a release has occurred and immediate corrective action or long term is necessary for the escape, and the owner and operator , after being served properly and after being given the opportunity to meet , not corrective action has been performed , as required by Part VI, or
2. The Executive Director of the Board has received either:
 - a. A certification by the owner and operator and the third part Plaintiff and attorneys representing the owner and operator and the third part Plaintiff, which one claim for damage to third parties must be paid. The certification must be drafted in accordance with the laws and regulations of the Commonwealth of Puerto Rico.
 - b. A judgment against the owner and operator for bodily injury or property damage, caused by an accidental release from an UST covered by financial assurance mechanism under this part.

C. If the Executive Director of the Board determines that the amount of corrective action costs and third party liability claims eligible for payment under paragraph B, may exceed the balance of the stand by trust fund and the obligation of the provider of financial assurance, the first priority for payment shall be corrective action costs necessary to protect human health and the environment. The Executive Director of the Board shall pay third party liability claims in the order in which the Executive Director receives certifications under paragraph B.2.a and corresponding court orders under paragraph B.2.b.

Rule 879. Release from the Requirements

The owner and operator shall be not required to maintain, for a UST System, financial responsibility required under this Part, if it has been permanently closed; no other UST System installation and obtained a release of the Board; or after corrective action was completed, no other UST System installation and obtained a release of the Board, as required by Part VII.

Rule 880. Bankruptcy or Other Incapacity of Owner and Operator or Provider of Financial Assurance

- A.** Of filing the bankruptcy petition owner and operator under any of the chapters, according to Title 11 of the U.S. Code, shall immediately notify to the Board by certified mail, by the terms of the guarantee specified.
- B.** Of filing the bankruptcy petition guarantor under any of the chapters, according to Title 11 of the U.S. Code, shall immediately notify the owner, operator and to the Board by certified mail, by the terms of the guarantee specified.

- C. An owner and operator who obtains financial assurance by a mechanism other than the financial test of self-insurance will be deemed to be without the required financial assurance in the event of a bankruptcy or incapacity of its provider of financial assurance, or a suspension or revocation of the authority of the provider of financial assurance to issue a guarantee, insurance policy, risk retention group coverage policy, surety bond, or letter of credit. The owner or operator must obtain alternate financial assurance as specified in this Part within ten (10) days after receiving notice of such an event. If the owner or operator does not obtain alternate coverage within ten (10) days after such notification, he must notify the Executive Director of the Board.
- D. Within ten (10) days after receipt of notification that a Puerto Rico assurance provider has become incapable of paying for assurance corrective action or third-party compensation costs, the owner and operator must obtain alternate financial assurance.

Rule 881. Replenishment of Guarantees, Letters of Credit, or Surety Bonds

- A. If at any time after a stand by trust is funded upon the instruction of the Executive Director of the Board with funds drawn from a guarantee, letter of credit, or surety bond, and the amount in the stand by trust is reduced below the full amount of coverage required, the owner or operator shall by the anniversary date of the financial mechanism from which the funds were drawn:
 - 1. Replenish the value of financial assurance to equal the full amount of coverage required, or
 - 2. Acquire another financial assurance mechanism for the amount by which funds in the stand by trust have been reduced.
- B. For purposes of this Rule, the full amount of coverage required is the amount of coverage to be provided by Rule 865 of this Part. If a combination of mechanisms was used to provide the assurance funds, which were drawn upon, replenishment shall occur by the earliest anniversary date among the mechanisms.

Rule 882. RESERVED

Rule 883. RESERVED

Rule 884. RESERVED

Rule 885. RESERVED

Rule 886. RESERVED

Rule 887. RESERVED

PART X. REQUIREMENTS FOR UST SYSTEM OPERATORS

Rule 888. General Requirement for All UST Systems

At the effective date of this Regulation, all owners and operators of UST Systems, must designate Class A Operators, Class B Operators, and Class C Operators, that meet the requirements of this Part.

Rule 889. Designation of Operators

UST Systems owners and operators must designate:

- A.** At least one (1) Class A Operators and one (1) Class B Operator for each UST or group of UST Systems at a facility; and
- B.** Each individual who meets the definition of Class C Operator at the UST facility as a Class C Operator.

Rule 890. Requirements for Operator Training

UST System owners and operators must ensure Class A, Class B, and Class C Operators meet the requirements of this Part. Any individual designated for more than one operator class must successfully complete the required training program according to the class operator in which the individual is designated.

A. Class A Operators. Each Class A Operator designated must be trained and pass an Exam, through an Accredited Training Program by the Board, in accordance with this Part.

- 1. At a minimum, the Training Program for Class A Operators must provide general knowledge of the following:
 - a. Basic concepts UST Systems and its components;
 - b. Operation and maintenance;
 - c. Spills and overfills prevention;
 - d. Releases detection and related reports;
 - e. Corrosion protection and related tests;
 - f. Emergency response;
 - g. Product and equipment compatibility;
 - h. Financial responsibility;
 - i. Notification and storage tank registration;

- j. Temporary and permanent closure;
 - k. Related reporting and recordkeeping;
 - l. Environmental and regulatory consequences of releases; and
 - m. Training requirements for Class B and Class C Operators.
2. At a minimum, the training program must evaluate Class A Operators to determine these individuals have the knowledge and skills to make informed decisions regarding compliance and determine whether appropriate individuals are fulfilling the operation, maintenance, and recordkeeping requirements for UST Systems in accordance with this Rule.

B. Class B Operators. Each Class B Operator designated must be trained and pass an Exam, through an Accredited Training Program by the Board, in accordance with this Part.

1. At a minimum, the Training Program for Class B Operators must provide general knowledge of the following:
- a. Basic concepts UST Systems and its components;
 - b. Operation and maintenance;
 - c. Spills and overfills prevention;
 - d. Releases detection and related reports;
 - e. Corrosion protection and related tests;
 - f. Emergency response;
 - g. Product and equipment compatibility;
 - h. Reporting and recordkeeping;
 - i. Environmental and regulatory consequences of releases; and
 - j. Training requirements for Class A and Class C Operators.
2. At a minimum, the Training Program must evaluate Class B Operators to determine these individuals have the knowledge and skills to implement applicable UST regulatory requirements in the field on the components of typical UST Systems or, as applicable, site specific equipment used at an UST facility in accordance with this Part.

C. Class C Operators. Each Class C Operator designated must be trained and pass an Exam, through an Accredited Training Program by the Board, in accordance with this Part.

1. At a minimum, the Training Program for the Class C Operator must have general knowledge of the following:
 - a. Emergencies;
 - b. Alarms caused by spills or releases from the UST System.
 - c. Basics UST Systems, its components;
 - d. Environmental and regulatory implications of the releases, and
 - e. Training requirements for Class A Operators and Class B Operators.
2. At a minimum, the Training Program must evaluate Class C Operators, to determine these individuals have the knowledge and skills to take appropriate action in response to emergencies or alarms caused by spills or releases from an UST Systems.

Rule 891. Actualization of Operator Training

- A.** Class A Operators, Class B Operators and Class C Operators of UST Systems determined by the Board to be out of compliance, must complete a training program in accordance with requirements in this Regulation. At a minimum, the training must cover the topics determined to be out of compliance. UST System owners and operators must ensure Class A Operators, Class B Operators and Class C Operators are retrained pursuant to this Part, no later than thirty (30) days after the date the Board determined that the facility is out of compliance, except in one of the following situations:
1. If a Class A Operators, Class B Operators and Class C Operators took an annual refresher training.
 2. If the annual refresher training for Class A, Class B and Class C operators covered the applicable requirements in this Regulation.

Rule 892. Documentation

Owners and operators of UST System must maintain a list of designated Class A Operators, Class B Operators, and Class C Operators and maintain records verifying that training and retraining, as applicable, have been completed, in accordance with this Regulation as follows:

A. The list must:

1. Identify all current Class A Operators, Class B Operators, and Class C Operators at the facility; and
2. Include names, class of operator trained, date assumed duties, date each completed initial training, and any retraining.

- B.** Records verifying completion of training or retraining must be a paper or electronic record for Class A Operators, Class B Operators, and Class C Operators. The records, at a minimum, must identify name of trainee, date trained, and operator training class completed. Owners and operators must maintain these records for as long as Class A Operators, Class B Operators, and Class C Operators are designated. The following requirements also apply to the following types of training:
1. Records from classroom or field training programs must, at a minimum, be signed by the trainer or examiner and list the printed name of the trainer or examiner and the company name, address, phone number and fax number;
 2. Records from computer based training must, at a minimum, indicate the name of the training program and web address, if Internet based; and
 3. Records of retraining must include those areas on which the Class A Operators, Class B Operators and Class C Operator has been retrained.
- C.** The records specified above must be submitted to the Board for Class A Operators, Class B Operators and Class C Operators.

Rule 893. RESERVED

Rule 894. RESERVED

PART XI. ACREDITATION OF TRAINING PROGRAMS

Rule 895. Operators Training Program

Any Training Program must meet the minimum requirements of this Rule.

Rule 896. Accreditation of Training Programs

- A.** Training School Administrator for UST Systems Operators may request accreditation to offer courses and refresher courses in Spanish and English, training in any of the following categories: Class A Operator, Class B Operator and Class C Operator.
- B.** Training School Administrator will not provide, offer, training courses of UST Systems Operators without first seeking and receiving appropriate accreditation as required in this Rule.

Rule 897. Accreditation requirements

For the Training School to obtain and maintain accreditation from the Board to offer courses for UST Systems Operators, the Program must meet and maintain the following minimum requirements for each category for which accreditation is requested:

- A. Entity:** Be a corporation duly incorporated under the laws and regulations of the Commonwealth of Puerto Rico.
- B. Training School Administrator.** The president of the corporation legally constituted that offers a Training Program, must employ an Training School Administrator, that possess:
 - 1. A baccalaureate or post graduate university degree in engineering, environmental science, or a related field, or
 - 2. Two (2) years of experience in the administration of specialized training programs for UST Systems Operators, or
 - 3. Industry expertise in UST Systems including: installation, operation, closure, environmental research, pollution mitigation or others relevant aspects to UST Systems.
 - 4. Training School Administrator will be responsible for ensuring that the Training Program, at all times, comply with the requirements of this Rule.
- C. Principal and Guest Instructor.** The president of the corporation legally constituted that offers a Training Program, shall appoint for each training course one (1) certified Principal Instructor and one (1) or more Guest Instructors. The Principal Instructor and Guest Instructor shall:
 - 1. Demonstrate experience, education, or training in teaching workers or adults.

2. Successful completion of a course of Training UST Systems Operators of a proven Training Program, in all three (3) categories.
3. Demonstrate that has two (2) years' experience in managing specialized Training Programs for UST Systems Operators or industry expertise in UST Systems including: installation, operation, closure, environmental research, pollution mitigation and other aspects relevant to UST Systems.
4. The Guest Instructors will teach specific subjects on training courses, that is, lectures, practical teaching activities or work practices.
5. The Principal Instructor will be responsible for organizing the course and supervising the teaching of the curriculum.

D. Trainings courses.

1. Training courses will be evaluated by the Board based on the following requirements: (1) the course administration, (2) the duration of the course, (3) the curriculum, (4) methods of trainings, (5) the qualifications of the instructors, (6) the efficiency of teaching instructor, (7) the technical accuracy of the materials and instructions, (8) tests, (9) training certificate and (10) any other information the Board determines necessary. The evaluation will be carried out according to the requirements of this Rule.
2. Training School Administrator shall ensure the availability and provide the necessary amenities for the lectures, course exams administration, practical skills training and activities evaluation. This includes providing training equipment that reflects current work practices, and maintain equipment and facilities, as needed. Training School Administrator shall notify the Board of any change of address.
3. Upon completion of the courses, the Training School Administrator shall make available to all course participants copies of the Regulation and any other document deemed pertinent as: reference manuals, quick search guides, among others.

E. Theoretical and Practical Curriculum.

1. The Training School Administrator is responsible for ensuring that instructors teach, precisely, the training course curriculum that was accredited by the Board.
2. The Training Program will offer courses that teach all working practices related to the operation of UST Systems in this Regulation. These standards will be taught in the adequate courses, so that the trainees receive the necessary knowledge as UST Systems operators according to their category, and thus ensure that they can carry out the activities of which they are responsible.
3. To be accredited by the Board, the Training School Administrator must ensure that the training course curriculum includes, at least, the following items listed below. The requirements listed marked with asterisks (*) indicate areas that require practical skills activities, as an integral part of the course.

a. Class A Operators:

- i. Basics UST Systems and components.
- ii. Operation and maintenance.
- iii. Prevention of spills and overfills.
- iv. Detection of leaks.
- v. Protection against corrosion.
- vi. Responding to emergencies.
- vii. Product compatibility and equipment.
- viii. Financial responsibility.
- ix. Registration and Permits UST Systems by the Board.
- x. Temporary and permanent closure.
- xi. Reports and related records retention.
- xii. Environmental and regulatory implications of the leaks.
- xiii. Training requirements for Class B Operators and Class C Operators.
- xiv. Roles and responsibilities of UST Systems Operator
- xv. Information on controlled substances in UST Systems and adverse effects to health and the environment.
- xvi. Information on the Regulation, regulations and federal and state guidelines.
- xvii. Inspection methods UST Systems. *
- xviii. Method for operating a UST Systems. *
- xix. Preparation of inspection reports. *
- xx. Maintenance of files and records.
- xxi. Interpretation of inspection reports and risk assessment. *
- xxii. Recognition and control of risks arising from UST Systems. *
- xxiii. Methods of mitigation, cleanup and risk reduction UST Systems. *

b. Class B Operators:

- i. Basics UST Systems, components.
- ii. Operation and maintenance.
- iii. Prevention of spills and overfills.
- iv. Leak Detection and reports.
- v. Corrosion protection and related tests.
- vi. Responding to emergencies.
- vii. Product compatibility and equipment.
- viii. Reports and related records retention.
- ix. Environmental and regulatory implications of the leaks.
- x. Training requirements for Class A Operators and Class C Operators.
- xi. Roles and responsibilities of UST Systems Operator
- xii. Information on controlled substances in UST Systems and adverse effects to health and the environment.
- xiii. Information on the Regulation, regulations and federal and state guidelines.
- xiv. Maintenance of files and records.

c. Class C Operators:

- i. Basics UST Systems, components.
 - ii. Operation and maintenance
 - iii. Emergencies.
 - iv. Alarms caused by spills or leaks UST Systems.
 - v. Environmental and regulatory implications of the leaks.
 - vi. Training requirements for Class A Operator and Class B Operator.
 - vii. Roles and responsibilities of UST Systems Operator
 - viii. Information on controlled substances in UST Systems and adverse effects to health and the environment.
 - ix. Information on the Regulation, regulations and federal and state guidelines.
 - x. Maintenance of files and records.
4. The Training School Administrator may also request, simultaneously or separately, to be accredited to offer refresher training courses in any of the following categories: Class A Operator, Class B Operator and Class C Operator. To be accredited by the Board to offer a refresher course, a Training Program must meet and maintain the following minimum requirements:
- a. In each review course by category, should cover the topics of curriculum of courses UST Systems operation listed in this Rule, as required.
 - b. Ensure that the refresher courses curriculum include, at least, the following:
 - i. A review of the most recent practices related to operation activities UST Systems, in general.
 - ii. A review of the most recent laws and regulations relating to the activities of UST Systems Operation, in general.
 - iii. A review of the most recent technology related activities UST Systems operation, in general.
 - c. The duration of each refresher course shall be a minimum of eight (8) hours of training.

F. System evaluation.

1. For each course offered, the Training School Administrator will conduct a practical skills assessment, if applicable, and a closed book exam.
2. The course exam will be developed in accordance with the course outline. Any examination of an initial training course, for Class A Operator, will consist of a minimum of fifty (50) multiple choice questions. For other categories (Class B Operator or Class C Operator) exams will consist of a minimum of twenty (25) multiple choice questions.
3. To successfully complete the training course, each participant must attend one hundred percent (100 %) of the training course, successfully complete practical skills assessment,

and pass the exam with eighty percent (80 %) or more of correct answers.

4. Failure consists in not passing the exam with eighty percent (80 %) or more of correct answers. In this case the participant will be allowed to perform the exam again, but after two (2) failures, the participant will have to take the full course before repeating the exam again.

G. Operator's certification.

1. After the trainee demonstrates that met all the requirements of the Training Program and passed the relevant examination, the Training School Administrator shall certify the applicant as an Operator, according to the category.
2. To certify compliance, the Training School Administrator will issue each participant a certificate of UST Systems Operator, according to category. This certificate shall contain at least the following:
 - a. Name, address and last four (4) Social Security numbers of the participant;
 - b. Title of the training course specifying whether it is an initial or refresher course;
 - c. Date of training course and passing the examination of the applicable course;
 - d. Statement that the participant completed the course and passed the exam requirements and the practical skills assessment;
 - e. The certification number of the participant;
 - f. The name and signature of the Training School Administrator and the printed name of the Principal Trainers;
 - g. The name, address and telephone number of the Training Program;
 - h. Location of training course, if different to the Training Program;
 - i. Date of expiry of the certificate, one (1) year from the date it was certified;
 - j. Language in which the course was administered (Spanish or English) and
 - k. Accreditation of the course date, number of accreditation awarded to Training Program by the Board.
 - l. Any other information deemed necessary.
3. The Training School Administrator will assign to any person certified a certification number and a photo identification card.
4. All certificates shall expire twelve (12) months from the date they were certified. The work performed by the UST Systems Operator, after these twelve (12) months and prior to renewal of the certificate shall constitute a violation of this Regulation.
5. Participants must comply with the requirements of this Rule to maintain certification as UST Systems Operator, according to their category.
6. Only the certification exam that is part of the Training Program course can be taken. The person cannot train with a certified training school and take the exam with another different Training School, since training and exam are consequent and cannot be separated.

Rule 898. Quality Plan.

- A.** The Training School Administrator shall develop and implement a Quality Plan for UST Systems Operator courses, according to category. The Training School Administrator shall ensure that procedures and measures established by the Quality Plan are followed.
- B.** The Quality Plan will be used to maintain and improve the quality of Training Program over time. This plan shall contain, at least, the following elements:
 - 1. Procedures for periodically reviewing training materials and the course exam, to reflect innovations in the field of matter.
 - 2. Procedure for annual review by the Program Administrator of the competence of Principal Instructor and Guests Instructors.
 - 3. Instructors must follow the training curriculum that was accredited by the Board.
 - 4. A training day will have a minimum of eight (8) hours of direct instruction, including classroom, practical training or field visits.
 - 5. The working time and teaching time shall not exceed twelve (12) hours in a twenty four (24) hours.
 - 6. All training courses requirements must be completed within a maximum period of two (2) weeks from the date of commencement.
 - 7. Training courses will have at least one (1) Principal Instructor and one (1) Guest Instructor.
 - 8. Establish procedures for participants to take the course exam, no more than two (2) times for each training course. After two (2) failures, the participant will have to take the full course before repeating the exam.
 - 9. Provide the necessary safeguards to ensure that the training course participants do not have access to exam questions, before or after administering the same.
 - 10. Establish procedures to prevent fraud in the administration of any exam. The Quality Plan will establish the safety measures to be taken in the administration of the exam. Among other things, the identity of each participant must be verified through photo identification card.

Rule 899. Accreditation Process

The procedures and requirements that a Training School Administrator must meet to be accredited by the Board are:

- A. Application:** All Training School Administrator that interest accreditation of School Training Program, must submit an application to the Board.
 - 1. A completed application on forms to be adopted by the Board, with the necessary and relevant information, and signed by the president of the corporation legally constituted and by the Training School Administrator. This information must include the name, address, e-mail, telephone and facsimile numbers of the Training Program, and a list of all categories for which it seeks accreditation.

2. A statement signed by the president of the corporation legally constituted and by the Training School Administrator, certifying that the Training Program meets the minimum requirements of this Rule and will comply, at all times, with all the requirements of this Regulation. The statement shall, also, include that the Training School Administrator will be responsible for maintaining the validity and integrity of the practical skills assessment, to ensure that properly evaluates the performance of the trainees in the work practices and procedures associated with each topic of the course, and will, also, be responsible for maintaining the validity and integrity of the course examinations to ensure that they adequately assess knowledge and trainee's retention of the course topics.
3. A copy of the student's manuals and instructors manuals to be used for each category of training, in the language in which the courses are taught (Spanish or English). It, also, includes a checklist on the course content, to identify and locate the sections of the manual that covers the required topics.
4. A copy of the agenda for each course, which shall include, but not be limited to, the start and completion time and the time devoted daily to teach each course topic.
5. A copy of each training exam with the correct answers marked for each of the exam questions.
6. A description of the facilities and equipment to be used for the conference, exam of the course and the teaching of practical skills.
7. A copy or description of all audio and visual materials to be used in each course.
8. A copy of the exam outline for each training course.
9. A detailed description of each activity of teaching practical skills and skills assessment, including the criteria for determining the proficiency of the participant.
10. A detailed description of the learning objectives or performance to be taught for each course topic.
11. A copy of the Quality Plan.
12. A model of an original certificate of UST Systems Operator.
13. The Board will recognize the following documents as evidence that the Training Schools Administrators, Principals Instructors and Guests Instructors meet the educational requirements, work experience and training, or any of them:
 - a. A copy of the official academic transcript or diploma as evidence that satisfies the academic requirements;
 - b. Summary, reference letters or documents relating to work experience, as evidence of

meeting the work experience requirements. These materials shall include, without limitation, the work history that documents related experience, including dates of work, name, address and telephone number of the employer, positions that has held, completed projects and description of responsibilities for projects;

- c. A copy of the certificates of training courses for instructors and specific courses related to UST Systems Operator, as proof of having met the training requirements.

B. Accreditation Fees. All Training School Administrators who seeks accreditation of a Training Program with the Board, must submit a filing fee for the amount of one hundred (\$ 100) dollars and an accreditation fee for the amount of four hundred (\$ 400) dollars for each training category, payable by certified check or money order to Secretary of the Treasury. The filing fee is nonrefundable.

C. Evaluation of the accreditation application.

1. The Board will review the accreditation application and the documentation submitted in accordance with this Rule.
2. In case of any deficiency, the Board will notify the applicant in writing and provide a term to submit response to these deficiencies. If the deficiencies are not corrected, within a period of forty five (45) days from the date of receipt of notice from the Board, the application and documentation will be returned to the applicant and the applicant will be required to submit a new application. The filling of the application does not constitute an accreditation of the course.

D. Accreditation Certification.

1. If after the Board's technical staff review, the accreditation application meets the requirements of the Board, it will be approved.
2. The Board shall notify the Training School Administrator that the UST System Operators Training Program in accordance with the category, has been accredited and will assign an approval number. Along with the accreditation notice, the Board shall issue a certificate for each accredited category.
3. All accreditation shall expire twelve (12) months from the date the Board issued accreditation. To offer training courses after the accreditation expiration and prior to renewal of such accreditation constitutes a violation of this Rule.

Rule 900. UST Systems Operator Certification Reciprocity of another State, Tribe or Territory of the United States.

A. Any person holding a certificate of UST Systems Operator in any category that has been issued in another state, territory, or tribe of the United States, may request such certification reciprocity to any Training School in Puerto Rico accredited by the Board. The Training

School Administrator will have the authority to recognize the certification from another state, tribe or territory, since training taken in the state, tribe or territory must have met the minimum requirements in this Regulation.

- B.** Anyone who wants to be certified by reciprocity must take a refresher course from an Accredited Training Program and pass the relevant examination, as established in this Rule.
- C.** Any person who wants to be certified by reciprocity shall, also, submit to the Accredited Training School the following:
 - 1. Submit a completed application, signed by the applicant with all required information according to the requirements of this Rule;
 - 2. Original and copy of the certificate issued by the state, tribe or U.S. territory in which the person seeks certification by reciprocity. These documents will be submitted to the Training School Administrator, who will certify as true and exact copies of the original and return the originals.
- D.** The Training School Administrator will verify the validity of the certificate issued by the state, tribe or U.S. territory prior to certification as UST Systems Operator. If is not possible to verify the certificate validity, the applicant shall comply with the certification process, as if he had never taken a course.

Rule 901. People Certified before the Enactment of this Regulation

- A.** Any person who has received an UST Systems Operator training by any Training School before the effective date of this Regulation, may apply for a certification at an Accredited Training School by the Board, if it meets the following requirements:
 - 1. Submit a completed application, signed by the applicant, with all required information according to the requirements of this Rule;
 - 2. Successfully complete a refresher course offered by an Accredited Training Program by the Board, if one (1) years have elapsed from the date of the UST System Operator training, before the effective date of this Regulation.
 - 3. Pass the UST Systems Operator certification exam for the category for which it was previously trained;
- B.** Individuals certified before the effective date of this Regulation, may apply for certification within six (6) months from the effective date of this Regulation. After six (6) months of the effective date of this Regulation, the applicant must comply with the certification process, as if had never taken a course.

Rule 902. Suspension, Revocation and Modification of an UST Systems Operator Certification

- A.** The Board and the Training School Administrator may investigate the actions of any person certified as UST Systems Operator. The Board may suspend, revoke or modify the

certification of such person, when it is determined:

1. Documents were obtained by fraudulent means;
2. Achieved admission and completed an Accredited Training Program by false representation related to the admission requirements;
3. Obtained certification by fraudulent means or false misrepresentations of the certification requirements, or documents related to education, training or experience;
4. Worked as UST Systems Operator without certification;
5. Allowed the use or duplication of the certification;
6. Failed to comply with adequate rules and work practices for activities, as provided in this Regulation;
7. Violated federal or state laws and regulations related to UST Systems Operation;
8. Used people, not certified, to perform work requiring certification.
9. Committed any other act which affects the health, welfare and public safety.

B. Once the Training School Administrator gets acquainted with irregularities committed by the UST Systems Operator, must, immediately, notify to the Board.

C. When an UST Systems Operator certification is revoked, the person may qualify after a minimum period of six (6) months and up to five (5) years maximum, at the discretion of the Board, counted from the date of revocation.

Rule 903. Notification Requirements for Training Program, Records and Registration

A. The Training School Administrator shall submit to the Board the following:

1. A notice of intent to conduct a training course. Notifications for the training courses, must be postmarked or received at DCUST ten (10) calendar days before the course start date. If the course was canceled, the Training School Administrator shall notify the Board at least one (1) day before the scheduled start date to begin the course. The notice of intent to conduct a training course shall be made on forms adopted by the Board. The information to be provided is as follows:
 - a. Name, address, phone number of the Training Program and name of the contact person;
 - b. Title of training course;
 - c. Dates of the training course and the exam;
 - d. Commencement and completion time of the training course;
 - e. Course location and directions;
 - f. Course's language (Spanish or English)
 - g. Course Principal Instructor and Guests Instructors

- h. School Training Administrator signature.
2. A list of persons enrolled in the course, no later than seven (7) days after the last day of the training. The list of persons enrolled in the course must be submitted on forms to be adopted by the Board. The information to be provided is: name of each participant who attended the training course, or has received an UST Systems Operator certificate. List of persons who passed the certification with the certification data and the expiration dates of the certification.
3. Any change in: course length, curriculum, training methods, manual or training materials, instructor, course exam, training certificate, Training School Administrator and contact person. This must be in writing, at least ten (10) calendar days before the scheduled start date for the training course.
4. The changes must be approved by the Board before their implementation, so that the course is accepted for accreditation purposes.
5. The curriculum, materials and documents reflecting any changes, as provided in this Rule. These should be submitted to the Board, when the School Training Administrator applies for re accreditation.
6. Information on how to evaluate each student in relation to practical skills training, tasks and working procedures. This includes, but is not limited to: instructor who conducted the evaluation, criteria to qualify, facilities that are used, and the ratio of approved and failed.
7. The results of the evaluations of the course exams, practical skills assessments and a record of course completion certificate for each student.
 - a. Training School Administrator shall maintain and make available to the Board all the information related to the accredited Training Program, as provided in this Rule. This should be available at any time to the Board's inspection and audit.
 - b. Training School Administrator will retain records and files specified in this Rule, at the address in the Training Program accreditation application, for a minimum of five (5) years. Training School Administrator shall notify the Board, within thirty (30) calendar days, on changes at the address specified in the Training Program accreditation application, transfer of files and records outside of this address.

Rule 904. Training Programs Audit

- A. Training School Administrator will allow to the Board to attend, evaluate and inspect any training course, the course exam and have access to the records of the training courses, without charges or hindrances to the Board; that for purposes of evaluating compliance with this Regulation.

- B. Officials of the DCUST will conduct periodic audits, without notice, on Trainings Programs accredited for compliance with this Regulation.

Rule 905. Minimum Requirements for Renewal of Training Programs Accreditation

- A. A Training School Administrator who files a renewal of an accreditation application, must submit it on forms to be adopted by the Board. The application must be signed by the Training School Administrator. The renewal application must include the following:
 1. Name, address and phone number of Training Program;
 2. A list of all courses for which the Administrator seeks accreditation renewal;
 3. A description of any changes in the training facilities, equipment, curriculum, practical activities, trainers and quality assurance plan made after the approval of the last application.
 4. A statement signed by the Training School Administrator certifying that the Program meets the requirements set in this Regulation.
- B. The application for renewal accreditation must be submitted to the Board, thirty (30) days before the expiration date for each category accredited by the Board. The renewal accreditation application must include a filing fee of twenty-five (\$25) dollars and a renewal fee in the amount of four hundred (\$400) dollars for each category, payable by certified check or money order addressed to Secretary of the Treasury. The application filing fee is non-refundable.
- C. The Training School Administrator who files a renewal accreditation application after the expiration date, shall be governed by the requirements specified in this Rule, as a new applicant for accreditation purposes.
- D. The Board may inspect the Training Program at any time to verify the content of the renewal accreditation application. If the Training Program meets all renewal requirements, the Board will issue an accreditation certificate.

Rule 906. Reciprocity of a Training Program

- A. Any Training School Administrator may request that the Board approve accredited courses, if their training courses or refresher courses have been accredited by a state, tribe or territory outside Puerto Rico.
- B. Training School Administrator who seeks Board accreditation by reciprocity, must meet the same requirements specified in this Part, as a new applicant.

Rule 907. Suspension, Revocation and Amendment of the Accreditation Trainings.

- A. The Board may investigate the actions of any accredited Training School and may suspend, revoke or modify an Accredited Training Program and impose fines or both, upon a determination that the Training Program, the School Training Administrator, or others with

responsibility within the Program, have violated any provision of this Rule or have made misleading statements about the content of the training course to the Board or the participants, have not complied with the state and federal statutes and regulations related to UST Systems, or have made false or misleading statements to the Board on the accreditation or renewal application, or any other violation of this Regulation.

- B.** Upon revocation of the accreditation of a Training Program, it may be for a minimum of six (6) months and not more than five (5) years at the discretion of the Board. The Board may, also, impose administrative penalties for violations of this rule.
- C.** In cases where the Board determines that the violation has occurred for acts caused by a person within the Training Program, the Board may revoke the accreditation, and also, revoke the certification of such person for a minimum term of six (6) months and no more than five (5) years and impose administrative fines or both.

Rule 908. RESERVED

Rule 909. RESERVED

PART XII. GENERAL PROVISIONS

Rule 910. Monitoring, Recordkeeping, Reporting, Sampling and Testing Methods

A. Monitoring, Recordkeeping, and Reporting. The Board may require the owner and operator of an UST facility the use and maintenance of monitoring equipment and to keep records. In addition, prepare and submit those periodic reports required under this Regulation that the Board deems necessary.

B. Sample Collection and Analysis

1. All sample collection, preservation, and analysis of samples shall be carried out in accordance with test methods and procedures specified in PARPCUST (Appendix I), the EPA regulations (40 CFR Parts 141 to 257) and as provided for in the ASTM, which are accepted by the Board.
2. All chemical analyses shall be certified by a chemist licensed in Puerto Rico. In addition, Standard Operating Procedures (SOPs) and the Quality Assurance/Quality Control (QA/QC) Program of the laboratory that performed the analyses shall, also, be provided.
3. Laboratories may initially submit to the Board the SOPs and QA/QC procedures being implemented by them. Annually, the laboratories shall review such documents, update them and submit them again, if these have been revised. If no revisions were necessary, the corresponding laboratories shall submit a certification to the Board indicating that the SOPs and QA/QC procedures being implemented have not been modified.

C. Certification of Records and Reports. All records and reports required by this Regulation shall be submitted with a sworn statement or affidavit of the owner and operator or of a highest-ranking official representing the person or entity that owns or operates the facility. Such sworn statement shall attest to the veracity, correctness, and completeness of such records and reports. If the owner or operator is a corporation, the highest-ranking official being the corporate President, a Vice-President, the highest ranking corporate officer with an office in Puerto Rico, or a duly authorized representative upon presentation of delegation documents. An official of equivalent rank may attest to records and reports of organizations other than corporations.

D. Certification Oath. The person responsible for signing the records and reports shall make the following certification:

“I certify that all information submitted in this document, and all corresponding attachments are accurate, true and complete. The information provided has been presented without the intent to lessen the facts or commit fraud. I am aware that on discovery of any deceit or fraud related with documents I signed, I will be subjected to penalties, including fines, imprisonment or both.”

Rule 911. Equipment Malfunction Reporting

- A. In the event that any UST pollution control equipment or other related equipment breaks down, malfunctions, ruptures, releases or is rendered partially or totally inoperative in such a manner as to cause a release of the regulated substance in violation of this Regulation, or any monitoring or other information indicating that the regulated substance may present a risk to an underground source of drinking water, the owner or operator responsible for such equipment, or facility shall report immediately to the Board such failure, breakdown or non-compliance, following the failure or non-compliance and must provide all pertinent available facts, including the estimated duration of the non-compliance or malfunction, according to this Regulation.
- B. The owner and operator shall take all technically feasible steps to minimize or correct any adverse impact on the environment.
- C. The Board shall be notified in writing within seven (7) days after the occurrence of an incident using the procedure established in the Part V, although corrective action is initiated in accordance with Part VI of this Regulation.

Rule 912. Confidentiality of Information

All information, records or reports, or to be presented to the Board, under the provisions of this Regulation, shall be available to the public for inspection and copying.

Rule 913. Right of Entry to Inspect

- A. **Right of Entry.** Representatives of the Board, upon presentation of their credentials and subject to pertinent provisions of the Environmental Public Policy Act, shall:
 - 1. Have the right of entry, without prior notice, to any premise on which an UST System is located or in which any record required to be maintained under this Regulation is located;
 - 2. Have access to inspect and copy any record(s) required by the Board or by this Regulation and to inspect and review any facility, equipment or test procedures regulated or required under this Regulation; and
 - 3. Have access to sample or monitor, any substance or parameter in any location, with the purpose of assuring compliance with the provisions of this Regulation.

Rule 914. Public Notice and Public Hearings

- A. **Public Notice.** The Board will not require the publication of a public notice for any type of procedure required under this Regulation.
- B. **Public Hearings.** The Board may hold public hearings as it deems necessary and appropriate, in accordance and in compliance with LPAU.

Rule 915. Field Citation Expedited Enforcement Procedures

- A.** The Board will consider the following criteria when selecting violations for which it is appropriate to issue a field citation:
 - 1. Violations that are clear cut and easily verifiable;
 - 2. Violations that are easily correctable; and
 - 3. First time violators.
- B.** Field citation penalties will be adopted by the Board by resolution of the Governing Board.
- C.** When a violation exists, the Board Inspector will issue to the offender a field citation form, entitled “Expedited Enforcement Compliance Order and Settlement Agreement”, to be adopted by the Board by resolution of the Governing Board.
- D. Procedures**
 - 1. The owner and operator issued a field citation must pay the penalty amount and correct the violation within thirty (30) calendar days from the date of issuance.
 - 2. If the owner and operator does not pay the penalty amount and correct the violation within thirty (30) calendar days from the date of issuance, the Board will pursue more formal enforcement measures pursuant to this Part.
 - 3. The Board may consider granting a thirty (30) day extension beyond the thirty (30) day period in which the owner or operator must pay the penalty amount and correct the violation, if the following conditions are met:
 - a. The owner and operator files a formal request for the extension; demonstrates that there are factors beyond the control of the owner or operator that necessitate an extension; and
 - b. The Board believes that compliance will be achieved within the period of the extension.
 - 4. The Board may, also, consider extending the period of thirty (30) days in case of occurrence of an event of force majeure.

Rule 916. Notice of Violation and Compliance Order

- A.** Whenever the Board determines that provisions of this Regulation have been violated, the Board may issue a written notice of violation to the alleged violator.
- B.** All notice of violation shall specify the violation and, where compliance has not been achieved and the period granted to attain compliance. The notice will also specify any

requirements that the Board deems necessary to achieve compliance.

- C. The Board may issue Orders to Do, Show Cause, Cease and Desist, or take any other action in accordance with the Environmental Public Policy Act.

Rule 917. Closure of a Facility or an UST System

- A. The Board may order the closure of a facility or UST System found in non-compliance with this Regulation and the Law.
- B. The person against whom the Order to Cease and Desist is issued, can request an administrative hearing setting out the reasons for the order to be modified or revoked and should not be enforced. The filing of the request for administrative hearing does not exempt any person from complying with or obeying any order or decision of the Board.

Rule 918. Penalties and Damage Actions Recovery

- A. **Penalties.** The Board may impose administrative penalties for any violation of the provisions of this Regulations and orders and decisions under its laws or regulations. Administrative penalties can amount to twenty five thousand dollars (\$ 25,000) per day for each violation. Each day for which the violation persists shall be consider a separate violation.
- B. **Contumacy.** In cases of contumacy is incurred, perpetration or continuance of acts for which has already been penalty , or failure to comply with any order or resolution issued by the Board, it may impose an additional administrative penalty not exceed fifty thousand dollars (\$ 50,000) per day for each violation.

C. Criminal Sanctions

1. **Violations of this Regulation.** Any violation of this Regulation or to any authorization or permit issued under this Regulation shall constitute a misdemeanor, and shall be subject to the penalties prescribed by the Environmental Public Policy Act.
 2. **Violations of the certification process.** Any person who violates the provisions of this Regulation for the certification process, or providing a false representation, certification or statement under this Regulation, or that provides false representation in any report required by the Board, is subject to the applicable penalties according to the Environmental Public Policy Act.
- D. **Recovery Actions.** The Board may go to any court to recover the total value of damages done to Puerto Rico environment and natural resources, which were caused by any violation of this Regulation and orders and decisions issued under its authority.

Rule 919. Revocation of authorization

The Board may, in any case of violation of any applicable Rules, suspend, amend or revoke any certification, approval or permit granted under this Regulation.

Rule 920. Inconsistent or contradictory Provisions

If a two requirements established in this Regulation or applicable laws are different, shall prevail and apply the requirements that are more restrictive.

Rule 921. Derogation

This Regulation derogate the Underground Storage Tanks Control Regulation, No. 4362 of November 14, 1990 and interpretative resolutions issued under it, and any other relevant determination.

Rule 922. Separability Clause

If a Court declares any provision of this Regulation illegal or unconstitutional, such declaration or sentence shall not affect the other provisions of this Regulation, each one being considered as separate.

Rule 923. Effectiveness

This Regulation shall go into effect thirty (30) days after the date of its filing at the Puerto Rico's State Department, in conformity with LPAU.

Rule 924. Public Record

The Board shall maintain and publish a record indicating the number of active regulated UST facilities, and the status of these facilities with respect to inspections and summary information pertaining to release sources and causes, known as LUST list. This public record shall be maintained in tabular format and shall be updated and posted in the EQB internet page (www.jca.gobierno.pr).

Rule 925. Adopted language to this Regulation

The Spanish language version, is adopted by the Board as Regulation. If there is a translation in the English language, and if there is any difference with the version adopted by the Board, the Spanish version prevails.

Rule 926. Amendments to the Regulations

The process of amendments to this Regulation, shall be in accordance with the provisions of the LPAU.

PART XIII. GENERAL PROHIBITIONS

Rule 927. General Prohibition Against Surface and Coastal Waters Pollution.

No person shall cause or allow a spill or release of regulated substances from an UST System into surface or coastal waters of the Commonwealth of Puerto Rico.

Rule 928. General Prohibition Against Groundwater Pollution

No person shall cause or allow the contamination of an existing or potential groundwater source of drinking water.

Rule 929. General Requirement for Compliance with Regulation

No person shall cause or allow the installation, operation or closure of an UST System in violation of this Regulation, or other applicable laws or regulations of the Commonwealth of Puerto Rico.

Rule 930. General Prohibition on Handling of Regulated Substances

No person shall cause or allow the installation, operation or closure of an UST System without taking all practicable measures to control fires, explosions, releases and spills. Regulated substances shall be transported, stored processed and disposed, in such manner, that it do not cause a hazard to health or public security.

Rule 931. General Prohibition Against Illegal Operation of an UST System

No person shall install, operate, modify, close, investigate, or perform corrective actions of an UST System without a permit from the Board.

Rule 932. General Prohibition Against UST System Sitting in Flood Areas

- A.** Except for existing UST System that provides adequate protection, no person shall cause or allow the installation or operation of UST System in flood areas that limit the flow of water or reduce the temporary water storage capacity of the flood plain, so as to pose a hazard to human health, wildlife, ground or water resources.
- B.** No person shall cause or allow installation of a new UST System at a distance less than four (4) feet between the tank bottom and the water table, unless it is a double walled UST with an interstitial detection system or a UST system that provides the same protection as a double walled UST and complies with the requirements of this Regulation.

Rule 933. Prohibitions for the Operation of Retail Gasoline Service Stations, Gasoline Service Stations that Supply Government Vehicles, Private Organizations and Motor Vehicle Dealers

A. During School Hours:

1. No owner and operator of retail gasoline service station or gasoline service stations that serve government vehicles, private organizations and dealers of motor vehicles established before January 26, 2004, located within a radius of thousand (1,000) feet from a public or private school or a post-secondary institution, shall perform the following activities:
 - a. Receive gasoline or any other fuel in their tanks; perform cleaning activities; maintenance or any other action that involves opening and leaving exposed fuel tanks, except in those activities covered in Part III of this Regulation.
 - b. No gasoline distributor will serve any owner and operator of retail gasoline service station, gasoline service stations, that supply government vehicles, private organizations and motor vehicle dealers that are within a radius of a thousand (1,000) feet from a public, private school or a post-secondary institution.

B. Prohibitions for Locating Retail Gasoline Service Stations. No person shall establish a new retail gasoline service station in a radius of a thousand (1,000) feet from a public or private school or a post-secondary institution.

C. Exemptions. Due to geographical limitations, the municipalities of Vieques and Culebra are exempted of compliance with the provisions in paragraphs A and B of this Rule.

Rule 934. Prohibition of Field Constructed Tanks

No person shall establish field constructed tanks for the storage of substances subject to the provisions of this Regulation.

Rule 935. Fuel Product Delivery Prohibition (Red Tag)

- A. It shall be unlawful to deliver to, deposit into, or accept a regulated substance into an UST at a facility that has been identified by the Board as ineligible for fuel deposit or delivery.
- B. In order to prevent the delivery of a regulated substance into an UST system that has been identified by the Board as ineligible, a tamper-proof red tag shall be affixed to the fill pipe of the ineligible UST, clearly identifying the tank as ineligible for delivery, deposit, or acceptance of product.
- C. This affixed red tag shall serve as written notification to the owner, operator, and the product delivery industry of the prohibition of delivery to the UST System.

- D.** A red tag shall immediately, be affixed upon finding by the Board of any of the following:
1. Required spill prevention equipment is not installed;
 2. Required overfill protection equipment is not installed;
 3. Required release detection equipment is not installed;
 4. Required corrosion protection equipment is not installed; or
 5. Other conditions that the Board deems appropriate.
- E.** The Board may delay the affixing of a red tag to an UST for maximum of one hundred eighty (180) days upon determination that:
1. No urgent threat to public health exists; and
 2. Such an action would jeopardize the availability of, or access to, fuel in any rural or remote area.
- F.** A red tag shall be affixed immediately, to an UST upon finding by the Board of any of the following conditions:
1. Failure to properly operate or maintain release detection equipment;
 2. Failure to properly operate or maintain spill, overfill, or corrosion protection equipment;
or
 3. Failure to maintain financial responsibility;
 4. Failure to protect a buried metal flexible connector from corrosion;
 5. Other conditions that the Board deems appropriate.
- G.** No owner and operator shall receive any regulated substance into any UST, to which notification of delivery prohibition (red tag) has been affixed.
- H.** No person selling any regulated substance shall deliver or cause to be delivered a regulated substance into any UST, to which notification of delivery prohibition (red tag) has been affixed.
- I.** It shall be unlawful for any person, other than an authorized representative of the Board, to remove, tamper, destroy, or damage a red tag affixed to any UST by Board personnel.
- J.** In order for an owner and operator of an UST, which has been red tagged, to have the tank reclassified by the Board as eligible to receive delivery of a regulated substance, he or she must provide a written statement to the Board indicating that the deficiencies listed in the

noncompliance notice have been corrected.

K. The Board will determine whether the deficiencies have been corrected as soon as practicable, within five (5) business days, after receipt of the owner's written statement of compliance.

L. Upon verification of compliance, Board personnel will remove the red tag.

Rule 936. RESERVED

PART XIV. FEES

Rule 937. Application Processing Fees

Anyone who submits a Permit Application, an Initial Registration Application, or a Permit Renewal Application must pay a non-refundable administrative fee of fifty (\$50) dollars for processing the application.

Rule 938. Initial Registration, Permits, Renewal and Amendments to Permits Fees

A. The Board establishes that any owner and operator who submits an application for: initial registration, installation permit, closure permit, operating permit, renewal permit, modification permit, must pay a fee for processing the application along with a fee depending on the type of application. Such charges are summarized in the following Table.

Volume in gallons		Application Processing	Initial Registration	Installation and Closure Permits	Operation and Renewal Permit	Minor Modification Permit	Major Modification Permit
No Gas Stations	5,000 or less	\$50.00*	\$25.00**	\$50.00**	\$150.00**	\$50.00**	\$150.00**
	5,001 - 15,000	\$50.00*	\$50.00**	\$100.00**	\$300.00**	\$50.00**	\$150.00**
	15,001 - 100,000	\$50.00*	\$100.00**	\$200.00**	\$600.00**	\$50.00**	\$150.00**
	100,001 or more	\$50.00*	\$200.00**	\$400.00**	\$1,200.00**	\$50.00**	\$150.00**
Gas Stations		\$50.00*	\$ 75.00**	\$150.00**	\$450.00**	\$50.00**	\$150.00**
* Charges by facility							
**Charges must be multiplied by the number of tanks that owns the facility							

Table 6. Initial Registration, Permits, Renewals and Amendments to Permits Fees

B. The application processing fees and initial registration, permits, renewal and amendments to permits fees shall be deposited at the same time, but as separate charges. If the application is denied and such determination is final, the Board shall not reimburse the charges.

C. Modifications:

1. **Minor modification:** Changes that do not represent design modifications to the UST System and are, only, changes to a specific application or document.
2. **Major modification:** Changes that represent design modifications to the UST System and affect several documents filed previously.

Rule 939. Reports and Plans Evaluation Fees

Anyone who submits a Plan, Reports or Results of a Plan shall pay a non-refundable administrative fee of fifty (\$ 50) dollars for processing the application.

Rule 940. Fees for Copies of Records

All requests for duplicate records or copies of records, must be submitted in writing by the owner and operator of the facility. For this purposes, a fee of fifty (\$0.50) cents per page will be charged.

Rule 941. Exemptions from Fees

Public schools, hospitals and charitable institutions shall be exempted from the fees requirements in this Part.

Rule 942. Test and Analysis Fees

- A. The owner and operator of the facility shall pay a fee to cover the costs of monitoring practice, analysis and testing by the Board.
1. After concluding the tests, the Board will provide written notice to the owner or operator of the facility concerning the fee to be paid.
 2. These fees must be paid within thirty (30) days after the billing date.
 3. After payment of the corresponding test or analysis fee has been received, the Board will provide a copy of the report to the facility owner or operator.

Rule 943. Fee Payment

Payment of all fees shall be made in cash, personal checks, certified checks or money orders, payable to the Secretary of the Treasury of the Commonwealth of Puerto Rico. This payment must be made at the Finance Division of the Environmental Quality Board or at the Regional Offices of the EQB, to be deposited in a special account designated by the Board. The payment shall be made in the format to be adopted by the Board.

Rule 944. RESERVED

APPENDIX I



EQB
ENVIRONMENTAL QUALITY BOARD
Commonwealth of Puerto Rico

PROCEDURES, ACTIONS AND REQUIREMENTS FOR PERMANENT CLOSURE OF UNDERGROUND STORAGE TANK SYSTEMS (PARPCUST)

(TRANSLATION OF SPANISH VERSION)



COMMONWEALTH OF
PUERTO RICO
Environmental Quality Board

Water Quality Area

**COMMONWEALTH OF PUERTO RICO
OFFICE OF THE GOVERNOR
ENVIRONMENTAL QUALITY BOARD**

To assure compliance with Commonwealth State Act 416 of September 2004 (Environmental Public Policy Act) and the Puerto Rico Underground Storage Tank Control Regulation, Regulation Num. 4362, approved on November 14, 1990, the Puerto Rico Environmental Quality Board, as amended, issues this document which provides for:

**PROCEDURES, ACTIONS AND REQUERIMENTS
FOR PERMANENT CLOSURE OF UNDERGROUND STORAGE
TANK SYSTEM**

(PARPCUST)

Document approved on May 5, 2011 under Resolution Num. R-11-7-3 issued by the
Governing Board of Environmental Quality Board

TABLE OF CONTENTS

List of Tables

List of Figures

List of Attachments

List of Acronyms

1. Introduction

2. Details Corresponding to the Site

3. Closure Procedures

- a. Preparation of site and excavation
- b. Product removal from lines and tanks
- c. Tank degasification
- d. Removal of pipe lines and tank
- e. Sampling activities
- f. Unusual situations during sampling
 - 1. Weather conditions
 - 2. Problems at the time of sampling
 - 3. Access denial
 - 4. Difficult Access
 - 5. Sampling personnel not present at site
 - 6. Insufficient or inappropriate equipment and/or materials to perform sampling
 - 7. Lack of EQB required documentation to perform sampling activities
 - 8. Dangerous conditions on site
- g. Post sampling activities
- h. Disposal of wastes generated
 - (i.) Asphalt and concrete
 - (ii.) Impacted and non-impacted soil
 - (iii.) Internal content of lines and UST
 - (iv.) Tanks, lines and accessories
 - (v.) Water or liquid substances found
- i. Closure on site
 - (i.) Boring
 - 1. Boring by direct push

2. Boring with rotary drill

- (ii). Closure of boring and installation of monitoring well
- j. Vapor sampling handling of groundwater
 - (i). Monitoring of vapors in the excavation
 - (ii). Handling of groundwater
- k. Impacted soil and / or groundwater
 - (i). Site investigation plan
 - (ii). Corrective action plan

4. **Quality Control and Quality Assurance (QC/QA) Program**

- a. Sampling points and samples to take
- b. Analytical Requirements
- c. Collection of Samples
- d. Decontamination Procedure
- e. Custody of Samples
- f. Sample Identification
- g. Chain of Custody Protocols
- h. Handling of Samples
- i. Quality control and quality assurance (QA/QC) requirements
- j. Audits
- k. Corrective actions in sampling procedures
- l. Personnel and Laboratory qualifications
- m. Sampling equipment

5. **Health and Safety Plan**

- a. Purpose
- b. Plan de Aceptación y Conocimiento de Seguridad en el Lugar
- c. Health and safety meetings on site
- d. Training requirements
- e. Medical monitoring requirements
- f. Respirator adjustment testing requirements
- g. Responsibilities
- h. Access to medical and exposure record of site worker
- i. Hazards notification
- j. Health and safety risk analysis
- k. Hazards associated with heavy equipment
- l. General hazards at the site
- m. Personal protection (safety) equipment
 - (i). Level A
 - (ii). Level B
 - (iii). Level C
 - (iv). Level D
- n. Air sampling and action levels

- (i). Routine requirements for air monitoring
 - (ii). Instruments
- o. Site control
 - (i). Work zones
 - (ii). Standard operating procedures and general safety in the field
- p. Decontamination
 - (i). Personnel
 - (ii). Sampling equipment
 - (iii). Disposal of contaminated materials
 - (iv). Emergency decontamination
 - (v). Personal protection equipment clean-up
- q. Contingency plan and emergency response
 - (i). Contacts and emergency telephones
 - (ii). Personnel responsibilities during emergencies
 - (iii). Medical emergencies
 - (iv). Fire or explosion
 - (v). Spills or leaks
 - (vi). Procedures and escape routes
 - (vii). Accidents within the perimeter
 - (viii). Control of traffic / transit

6. Documentation

- a. Data management
- b. Record of information
- c. Procedure to detect and correct errors
- d. Final closure report

7. Review and approval of final report

- a. Narrative
- b. Verification of chain of custody
- c. Evaluation of results
- d. Analysis of quality control samples
- e. Linearity of parameters
- f. Report on general review of analytical data
- g. Evaluación Técnica de los Trabajos de Campo

8. Applicable regulations

- a. Federal regulation
- b. Commonwealth regulation
- c. Procedures in EQB to use PARPCUST

References

Attachments

LIST OF TABLES

- Table 1.** Analytical requirements and acceptable soil clean-up levels for UST facilities
- Table 2.** Analytical requirements and acceptable clean-up levels in water for UST facilities
- Table 3.** Definition and frequency of the QA/QC requirements
- Table 4.** Activity vs. protection level
- Table 5.** Traffic control in the transit route
- Table 6.** Results of chemical analyses performed on soil samples and QA/QC taken during removal of UST
- Table 7.** Results of chemical analyses performed on water and QA/QC samples taken during removal of UST
- Table 8.** QA/QC Report for Soil
- Table 9.** QA/QC Report for Water

LIST OF FIGURES

Figure 1. Graphical representation of site preparation and excavation

Figure 2. Graphical representation of degasification, tank removal and suitability of excavation

Figure 3. Handling and disposal of wastes from a UST closure activity

Figure 4. Graphical representation of soil and tank disposal

Figure 5. Typical construction of monitoring well

Figure 6. UST closure process flowchart

Figure 7. Graphical representation of sampling activity

Figure 8. Corrective actions flow chart for Field and Laboratory

LIST OF ATTACHMENTS

PARPCUST 1. Air Monitoring Form

PARPCUST 2. Security Awareness Plan

PARPCUST 3. Work Site Visit Record

PARPCUST 4. Agencies Emergency Contact Personnel

PARPCUST 5. Emergency Equipment Available on Site

PARPCUST 6. Accidents Report

PARPCUST 7. Security Briefing Chart

PARPCUST 8. Lesión/Exposure Report

PARPCUST 9. WQA Certifications

PARPCUST 10. Certification of Records and Reports

PARPCUST 11. Sampling Points During UST Closure Activities

PARPCUST 12. Safety Guide for Excavations

PARPCUST 13. OSHA Guide for Traffic and Transit Control

PARPCUST 14. CARS Form

LIST OF ACRONYMS

(As commonly used in the work environment)

AALA	American Association for Laboratory Accreditation
ACA-1A	ACA-1A
ACA-2A	ACA-2A
API	American Petroleum Institute
APR	Air Purifier Respirator
CARS	Corrective Action Report System
CC	Chain of Custody
COLIWASA	Composite Liquid Waste Sampler
EPA	Environmental Protection Agency
EQB	Environmental Quality Board
USTCD	Underground Storage Tank Control Division
HAZWOPER	Hazardous Waste Operations and Emergency Response
HSWMR	Hazardous Solid Wastes Management Regulation
IDLH	Immediate Danger to Life and Health
LCSD	Laboratory Control Spike Duplicate
LEL	Lower Exposure Limit
MSDS	Material Safety Data Sheet
MS/MSD	Matrix Spike / Matrix Spike Duplicate
NELAP	National Environmental Laboratory Accreditation Program
NFAD	No Further Action Determination
NHSWMR	Non-Hazardous Waste Management Regulation
NIOSH	National Institute for Occupational Safety and Health
OSHA	Occupational Safety Health Act
OVA	Organic Vapor Analyzer
PARPCUST	Procedures, Actions and Requirements for Permanent Closure of Underground Storage Systems
PDF	Portable Document Format
PID	Photo-Ionization Detector
PPE	Personal Protective Equipment
PPM	Parts Per Million
PR	Puerto Rico
PRASA	Puerto Rico Aqueduct and Sewer Authority
PROSHA	Puerto Rico Occupational Safety and Health Administration
PSICD	Point Source Inspection and Compliance Division
QAPP	Quality Assurance Project Plan

QA/QC	Quality Assurance / Quality Control
RCRA	Resource Conservation and Recovery Act
RPD	Relative Precision Deviation
SOP	Standard Operating Procedure
TLV	Threshold Limit Value
TPH	Total Petroleum Hydrocarbons
USCS	Unified Soil Classification System
USDOT	US Department of Transportation
USTCR	Underground Storage Tank Control Regulation
USTS	Underground Storage Tank System
UST	Underground Storage Tank
VOC	Volatile Organic Compounds

1. INTRODUCTION

The internal process of the USTCD to authorize, inspect on-going activities, evaluate the final report and generate a release (No Further Action Determination or NFAD) for a permanent UST closure requires a prolonged period of time from the technical personnel due to the significant amount of information that is necessary to evaluate for each site on a case by case basis. In some cases this is due to inherent deficiencies in the information submitted for evaluation, which may be inconsistent, incomplete and/or disorganized).

Currently, each of the major oil companies and other regulated organizations have presented "Generic Closure Plans" that have been evaluated and approved by EQB on an individual basis with the intention of making the permanent closure process of USTs as expeditious as possible. However, this has not proved to be very productive because the closure activities and the documentation procedure have not been standardized. Each company generates different documents with a variety of information and errors frequently prolong the time that EQB can finally approve a permanent closure of a given UST.

The purpose of the PARPCUST is to present a clear and detailed description of all the documents, actions, procedures and requirements that must be complied with to successfully achieve closure of regulated UST systems that contained regulated substances. The PARPCUST includes minimum clean-up levels required to be achieved for the different compounds in the regulated products that may be present in the soil and/or water of a UST site location before the facility receives a release and no further action determination for the specific UST site.

With clear, detailed and uniform information the regulated community should be able to audit itself and be able to assure itself that the information being submitted to EQB is complete and correct. This will allow the USTCD to streamline the review and approval of documentation necessary for the permanent closure of USTs.

The purpose of this document is to assist the regulated community in the process of permanent closure of regulated USTs in the most complete, appropriate and expeditious manner with the least intervention from EQB. However, to achieve this it is necessary that the regulated community audit itself in the strictest and reliable manner, assuring that the information submitted to the Board is will allow the appropriate completion of this process in all respects. We consider that PARPCUST addresses all the processes and requirements necessary for an expeditious permanent final closure, as long as all the procedures, actions and requirements are properly addressed and documented by the regulated community.

The objective of PARPCUST is to determine if there are regulated substances present as result of activities performed at a UST site used to store petroleum derived fuels. Therefore, PARPCUST includes all the information required by PREQB from the petitioner to assure that the closure process be as complete and exact as required by PREQB to complete the expeditious approval of the closure process and the final closure report. Once determined that the UST site location is free of applicable regulated pollutants, PREQB will be able to issue the corresponding release (No Further Action Determination or NFAD).

Every person, firm, commerce, industry, public or private entity, state and federal government

agency that owns or operates an underground storage tank system (UST System), as defined in the USTCR, and will cease operations of such UST, has ceased operations or has abandoned UST in the property or site of operation, must comply with the requirements established in this document. The Closure Permit Application and the corresponding fees must be submitted to the Main Office of the Puerto Rico Environmental Quality Board (PREQB) in San Juan or in any of the Regional Offices of PREQB that corresponds to the Municipality where the UST site is located.

The PARPCUST are consistent with the USTCR. The PARPCUST include, among other things, the QA/QC protocols applicable to the required sampling and analysis activities. These protocols are necessary to assure that the results obtained comply with the applicable QA/QC standards and requirements with respect to precision, reproducibility and confidence of the results and objective of the project is achieved.

Below is provided, a detailed description of the documents, actions, procedures and requirements with which the petitioner must comply with for a permanent closure of a UST system, taking into account that a UST system includes tanks, associated lines and auxiliary equipment.

2. DETAILS OF SITE

All information pertaining to the project must be provided in the Form to be adopted by the Board. The information includes the following:

- a. Owner(s) of the site where the UST system is located, owner of the UST system and operator of the USTs.
- b. Company or companies in charge of the environmental supervision, security, sampling and laboratory.
- c. Organizational chart of the Personnel in charge of the activities to be performed with their respective addresses and telephones.
- d. Location (site address) and geographical Lambert Coordinates of the site where the UST is located. Type of zoning for the site.
- e. General description of the type of activity performed at the site and type of service provided on site.
- f. Description of the UST and lines, construction material (galvanized or stainless steel, fiberglass, concrete, among others), volume capacity of the System in gallons, type of piping (pressure or suction, single or double walled, rigid or flexible).
- g. Record of modifications, extensions and spills in the site or in the UST system. For these events include all available field and laboratory sample results.
- h. Background of the UST system, including installation date, service end date, liquid substances stored (common, commercial name and description), MSDS of the substances stored, results of the operation and maintenance of the release detection System, integrity tests, certification of the cathodic protection tests and any other detail or document available pertinent to the operation and maintenance of the UST system.
- i. Topographic map showing location of UST system with respect to adjacent properties, schools, property limits, surface waterbodies, groundwater extraction wells (PRASA owned, community owned and private), sinkholes, caves as well as other UST systems within a 1,500 feet. The map should be at an appropriate scale (1:20,000) and should be at least letter size.
- j. Drawing (“as built”) of the UST System located at the site. This drawing must be sealed and signed by a professional engineer licensed to practice in Puerto Rico.

- k. General description of the geology and hydrology of the site, including depth of groundwater (water table) and direction of groundwater flow.
- l. Aerial photos of the area surrounding the tank(s) site.
- m. Endorsement of the Fire Department, Use Permit and any other permit required by applicable regulations in effect, if the installation is in operation up to the time of UST System closure is to be performed.
- n. Any other additional information useful to fully describe the UST System and evidence the compliance with applicable state and federal laws and regulations.

3. CLOSURE PROCEDURES

In accordance with RCTAS, the following publications establish procedures for cleanup and closure that may be used as guidance to comply with such Rule. These are:

- API- 1604: RECOMMENDED PRACTICE CLOSURE OF UST
- API-2015: CLEANING PETROLEUM STORAGE TANKS
- API-1631: INTERIOR LINING OF UST
- NIOSH “Criteria for a recommended standard...working in confined space”

At no time shall a UST be removed from the pit without the presence of corresponding technical personnel from PREQB. All UST removal activity and sample collection on site must be performed with prior notification and coordination with the USTCD within at least ten (10) working days before the start-up of field closure activities, as established in ACA1-A and ACA2-A (See Attachment). This coordination should take into account that EQB’s presence during any sampling activity scheduled for weekends, holidays or administrative recess is at EQB’s discretion. The applicant must obtain previous approval from EQB to proceed with the sampling activity in the absence of EQB personnel. See 3.f (v) of this section.

The EQB will not accept a final Sampling Report from a site where:

- (1) EQB technical personnel was not present during the sampling activity and
- (2) EQB did issue previous authorization to proceed with such activity.

In such case the petitioner must repeat the sampling activity assuring the presence of the corresponding EQB technical personnel. The petitioner must be aware of this requirement and always assure the presence of the corresponding EQB technical personnel before start-up of activities.

a. Preparation of site and excavation

Once the work areas have been delineated and all the necessary equipment and materials are available to perform the demolition activities, these are initiated until the surface of the USTs is fully uncovered within the tank pit.

The petitioner should perform visual inspections of all the heavy equipment that is to be used in the excavation prior to initiation of the daily excavation activities to assure that they are not sources of target pollutants at the site and thus affect the sample collection and analytical results.

During excavating activities, readings will be taken continually with an explosion meter to determine the explosion potential inside and around the excavation. Any reading above the 25% Lower Explosion Limit (LEL), will require immediate

notification to the Fire Department. The Fire Marshall may modify the Work Plan activities established for the tank(s) removal.

b. Product removal from lines and tanks

Once the floor and surface soil are removed the top of the tank is left uncovered. This is performed in such manner that all possible outflow points are sealed, leaving open only the main vent and the top lid of the tanks, such that all vapors exit thru the main vent line.

Once the tank and accessory connections are exposed, these must be carefully inspected to determine if any damage has occurred as result of:

- leaking as result of corrosion
- wear down of lines
- separation of metal
- structural faults in soldering and joints

The content of lines and accessory connections must be drained towards the tank avoiding all type of spill. The lines must be purged with water or air, from the dispenser pumps towards the tanks. The water and product resulting from the purge of lines will be deposited inside the tank as precautionary measure to avoid spills in the excavation area. In addition, the tank should be rinsed with the least volume of water possible to facilitate removal of residues accummulated at the bottom.

If the tank were to have had any material inside, proceed to remove it utilizing a suction pump that complies with the safety requirements established under API 1604. If a vacuum truck is used, make sure the area where the truck is to be parked is on firm soil, grounded to avoid sparks and in an area free of vapors. Once the tank has been washed and excess product water and sediment have been removed, proceed to degas the tank.

Figure 1. Preparation of site and excavation.

BREAKTHROUGH OF CEMENT AND ASPHALT



SOIL REMOVAL FROM TANK PIT



VAPOR MONITORING DURING SOIL REMOVAL



UNCOVERING OF UPPER PART OF TANK



UNCOVERING THE UPPER PART OF TANK



UNCOVERING TANK LINES AND ACCESSORIES



c. Tank degassing

There are various methods for removing residual gases from fuel. One of these is injecting inert gas like carbon dioxide (CO₂) or nitrogen (N₂) thru the tank ventilation, as established in section 4.2 of the closure guidelines API-1604. In case the petitioner utilizes another degassing method, previously authorized in the field by the EQB representative at the time the tasks are being performed, this should be indicated in the Closure Final Report.

d. Line and tank removal

There will be a verification to assure that all lines associated with the UST are properly disconnected from the UST before proceeding with the following tasks.

Utilizing a crane or any other appropriate equipment, remove each tank from the pit and place it over a polypropylene sheet on a level and secure surface to prevent movement until it is inspected by EQB personnel.

The excavation area shall be inspected in detail and all pertinent information shall be documented, including:

- soil decoloration
- presence of free product
- emissions of vapors
- presence of water

e. Sampling activities

See Section 4. QA/QC for PARPCUST.

Figure 2. Illustration of degasification, tank removal and preparation of excavation.



f. Unusual situations that may occur during the sampling activities

(i). Climatological conditions.

If at the moment when UST removal and sampling activities are to start, there are unfavorable climatological conditions and the Health and Safety Officer considers that these may affect the work, personnel security or may hinder continuation of the scheduled tasks these activities shall be stopped until work conditions are safe.

(ii). Problems present at the moment of sampling.

In the case that material removal cannot continue due to the presence of a particular obstacle such as a street, public utilities facilities (water, electricity, gas pipeline, etc.), slope, waterbody, structures, archeological and/or historical sites, among others, samples shall be taken at the points where it was possible to extend the excavation and this shall be documented in the Final Closure Report with the corresponding justification (narrative, photographic evidence and any other pertinent information) as to why it was not possible to continue removing soil. This decision must be approved by the EQB representative present at the site before proceeding with the sampling activity. In this case, PREQB shall evaluate the action plan to be followed as proposed in the final report.

(iii). Access denial.

If access to any EQB personnel such as inspectors, technicians, etc. is denied by any person representing the owner and/or any entity, such person, owner or entity shall present to EQB the just cause that motivates such denial. EQB personnel shall evaluate the reasons for denial and shall at all times avoid confrontation that may result from such denial of access. In extreme cases, pertinent authorities must be notified immediately and in the case of EQB personnel, the immediate supervisor, the Water Quality Area Director and/or the EQB Legal Division must be notified to address the issue.

(iv). Difficult access.

In case of landslides, vehicle accidents, mechanical malfunctions, among others, that block access to the area and/or the tank pits for sampling activities, it is necessary to follow the indications of the Health and Safety Officer at the site and the owners or contracted personnel in charge at the site should determine the actions to be taken to address the problems. At no moment shall the safety of the personnel or the general public be at risk. The final decision taken must be approved by the EQB personnel present at the project site.

(v). Sampling Personnel not present at the site.

At the time of work start-up the petitioner should be assured that all the required personnel are on site and ready to start working. This includes the EQB corresponding technical personnel that must be notified on a timely basis to make the corresponding arrangements to be on site. In case the EQB technical personnel is not present on site, the petitioner should contact the USTCD and the Manager of the Water Quality Area to confirm that EQB has knowledge of the sampling activity and that EQB representatives are not present at time of sampling start-up

activities. At no time and without justification shall EQB authorize start-up activities for removal of a UST in the absence of the corresponding authorized EQB personnel.

In the event that a particular situation occurs and such situation impedes the presence of an EQB technical representative in the sampling activity, the USTCD shall issue a written communication where it clearly authorizes startup activities in the absence of EQB technical personnel and shall notify the GPD and the Water Quality Area Manager.

If at any time the EQB technical personnel find a site where, at the time of arrival, the UST has been removed and the sampling has been performed without the corresponding authorization, the Water Quality Area Manager shall be notified immediately and form Sampling Inspection Form (See Attachment) shall be filled to record the event. This attachment shall be submitted to the USTCD to make the corresponding referral to the Legal Office for enforcement action.

A Final UST Closure Report for a site where designated EQB technical personnel was not present during the sampling activity shall not be accepted, unless the report includes the corresponding previous authorization to perform such sampling activity.

(vi). Lack of equipment and/or materials to perform the sampling

If at the start-up of UST closure activities the petitioner does not have the necessary equipment and/or materials to perform the task, this may be sufficient reason to cancel the sampling activity. In this case, the petitioner should coordinate a new date with the USTCD. Under no circumstances may the petitioner continue with the removal of a UST if the appropriate equipment and/or materials for sampling are not available.

(vii). Lack of EQB required documentation to perform sampling activities.

The petitioner must complete all requirements established in the USTCR before start-up of UST removal activities required for closure of USTs. The EQB technical personnel assigned to inspect the activities are responsible for the verification of compliance of all required documentation prior to initiation of the field job activities. Any discrepancy, deficiency or lack of information shall be sufficient cause to cancel the sampling activity and the petitioner must coordinate a new sampling date with the USTCD. It is the petitioner's responsibility to have available all necessary documents during the time the field work is being performed. These are: Copy of PARPCUST. Copy of Closure Authorization (Closure Permit) issued by EQB, General Permit for Other Works, Field Notebook, and Chain of Custody Forms.

(viii). Dangerous conditions in the area

If at any time during the soil sampling activity the PID presents high readings, the person in charge of health and safety at the site shall be responsible for evaluating the risk in the area. In case there is risk of explosion the precautionary measures

established in the Health and Safety Plan must be implemented and warning must be provided to the corresponding authorities. If there is no major risk and work activities can continue, these shall continue until the PID levels decrease further. Once the PID levels reach the lower levels sample collection can continue.

g. Post Monitoring Activities

Once the soil and/or water samples are taken from the excavations and all impacted fill material (gravel or soil) is removed, the excavated areas should be restored to the original levels. These areas should be filled with prime selected material free of pollutants and compatible with the existing soil characteristics.

h. Disposal of wastes generated

(i). Asphalt and concrete.

Prior to start-up of site closure activities, calculated estimates of the total wastes to be generated and the corresponding arrangements for the appropriate disposal of these wastes, including the tank(s) removed must be completed in order to avoid interference of closure activities.

All material removed from the UST surface, such as asphalt, concrete or similar material, must be placed on a polypropylene liner and covered with a similar liner to protect the from rain and storm runoff as well as reduce dust emissions. This material should be separated from all other material removed from the tank pit to minimize the amount of material that may be impacted with regulated product (See Figure 1). The liner must be at least 0.006 inch thick and must be maintained intact for the duration of the corresponding closure activities on site.

The specific companies identified in the UST Closure Permit Application for transport and disposal of these wastes must be used. Final disposal (manifests) must be submitted to EQB as Attachments to the Final Closure Report.

The excavated material must be removed from site, preferably immediately but, not later than 30 days after being generated.

(ii). Soil removed – impacted and non-impacted.

Soil being removed from the tank pit may or may not show detectable concentrations of regulated organic vapors. Soil which readings exceeds 100 ($X > 100$) ppm in OVA readings is considered impacted and soil which shows readings below 100 ($X < 100$) ppm is considered non-impacted.

Non-impacted soil ($X < 100$) may be placed over a polypropylene liner and covered with a similar liner to protect it from rain, stormwater runoff and minimize dust emissions. This material should be maintained separate from impacted material that may removed from the tank pit to minimize cross contamination (See Fig. 4).

Before starting closure activities, the applicant should make the corresponding arrangements with the corresponding contractor for transport and disposal of the impacted soil (>100 ppm). This information must be submitted as part of the closure application for the UST system.

Once identified as impacted, the soil is kept, depending on the amount removed, in tanks of 55 gallons capacity or other container for this type of waste and the person in charge of the project must assure that the waste is transported and disposed of as required. This material must be removed from site, preferably at the time it is generated or as may be maintained on site for a period not to exceed thirty (30) days after being generated, as previously agreed upon with the EQB technician. Disposal of the wastes must be in compliance with the Regulation for Hazardous and Non-Hazardous Solid Wastes promulgated by EQB. Evidence of final disposal (disposal manifests) must be submitted to PREQB as an attachment to the Closure Final Report.

If the soil is maintained on site, it must be placed over a polypropylene liner and covered with a similar liner to protect it from rain, stormwater and minimize dust emissions and sedimentation. This material must be kept separate from other non-impacted material removed from the tank pit to minimize cross contamination (See Figure 4).

If the soil is deposited in 55 gallon containers, these must be sealed and clearly identified using stick-on labels, stored in appropriate and secure place out of reach from the general public and covered to prevent release to the environment until final disposal. The labels must be waterproof and the content of the container should be identified including date the waste was generated and the telephone contact in case of emergency.

(iii). Content of lines and UST.

Content of the UST must be maintained in containers of 55 gallons to facilitate disposal. These containers must be USDOT approved and their specifications must comply with the health and safety requirements. The containers must be sealed, clearly identified with labels, and maintained stored in an appropriate and secure location out of reach to the general public and covered in such manner that prevents release to the environment until final disposal as hazardous or non-hazardous material. These containers and their content must be disposed of in accordance with applicable federal and state regulations. The labels must be waterproof and must identify the content of the containers, date the waste was generated and the contact telephone number in case of emergency. The applicant must retain evidence of final disposal of the wastes generated (manifest) and submit it to EQB as attachment to the Final Closure Report.

(iv). Tank, lines and accessories.

The applicant must make the necessary arrangements with the corresponding companies for the transport and disposal of the UST, lines and accessories before closure activities are initiated.

The lines should be aerated and cut for later disposal. The removed lines, tanks and accessories cannot be used again for industrial or domestic UST systems or any other use. All these materials must be made unusable performing perforations and/or cuts on site before being transported for appropriate disposal as a non-hazardous waste. The materials may also be disposed in authorized recycling companies.

These materials must be removed from the site within thirty (30) days after they are generated and evidence of final disposal (manifest, photos, etc.) submitted to EQB as attachments to the Closure Final Report.

(v). Water or liquid substances found.

In tank pits with water it is necessary to the liquid phase (if any is detected) as soon as it is detected. Sampling should be coordinated after the free product is removed, taking into account the analytical requirements indicated in Table 2. If the water at the bottom of the pit represents the groundwater level, then it should not be required that the pit (excavation) be emptied, given that it will continue to have water. The products and substances removed from the pit should be characterized for the corresponding disposal as hazardous or non-hazardous wastes.

These wastes should be stored separately in containers of 55 gallons to facilitate disposal. These containers must be USDOT approved and their specifications must meet Health and Safety requirements. The containers must be sealed, clearly identified using stick-on labels, maintained stored in an appropriate and secure site out of reach to the general public and covered to prevent release to the environment until characterization and final disposal in accordance with applicable state and federal regulations. The labels must be waterproof and identify the content of the container, the date the waste was generated and the emergency contact telephone number.

These materials must be removed from site within thirty (30) days from the date it is generated and evidence of disposal (manifests, fotos, etc.) must be submitted to EQB as attachment to the Closure Final Report.

Figure 3. Illustration showing disposal of wastes generated during UST closure activity.

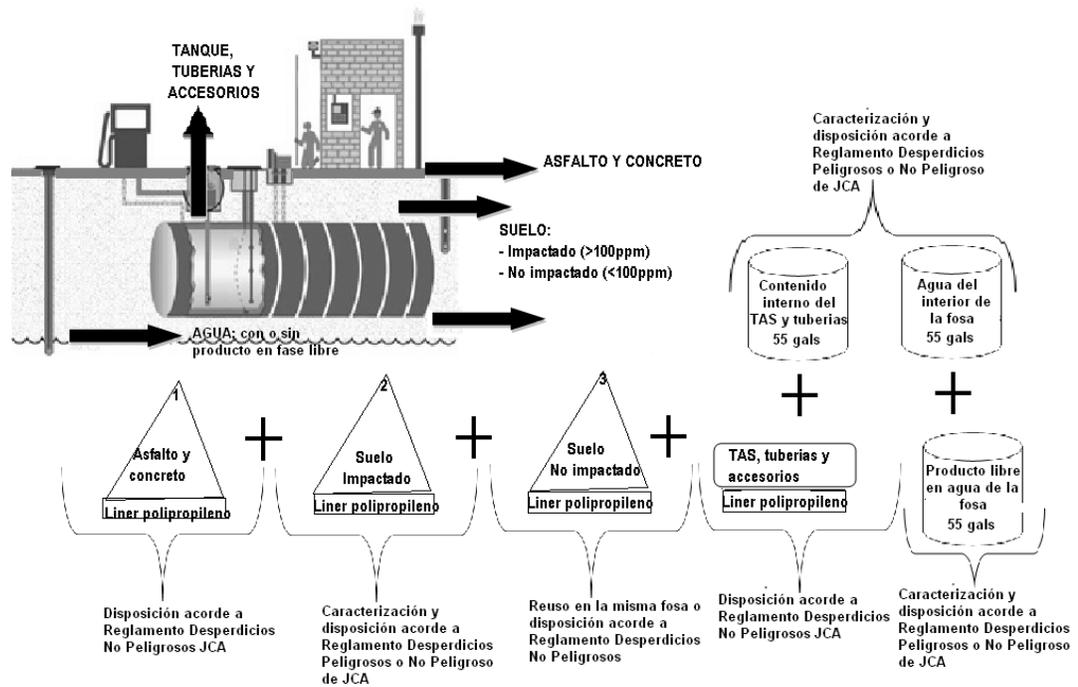
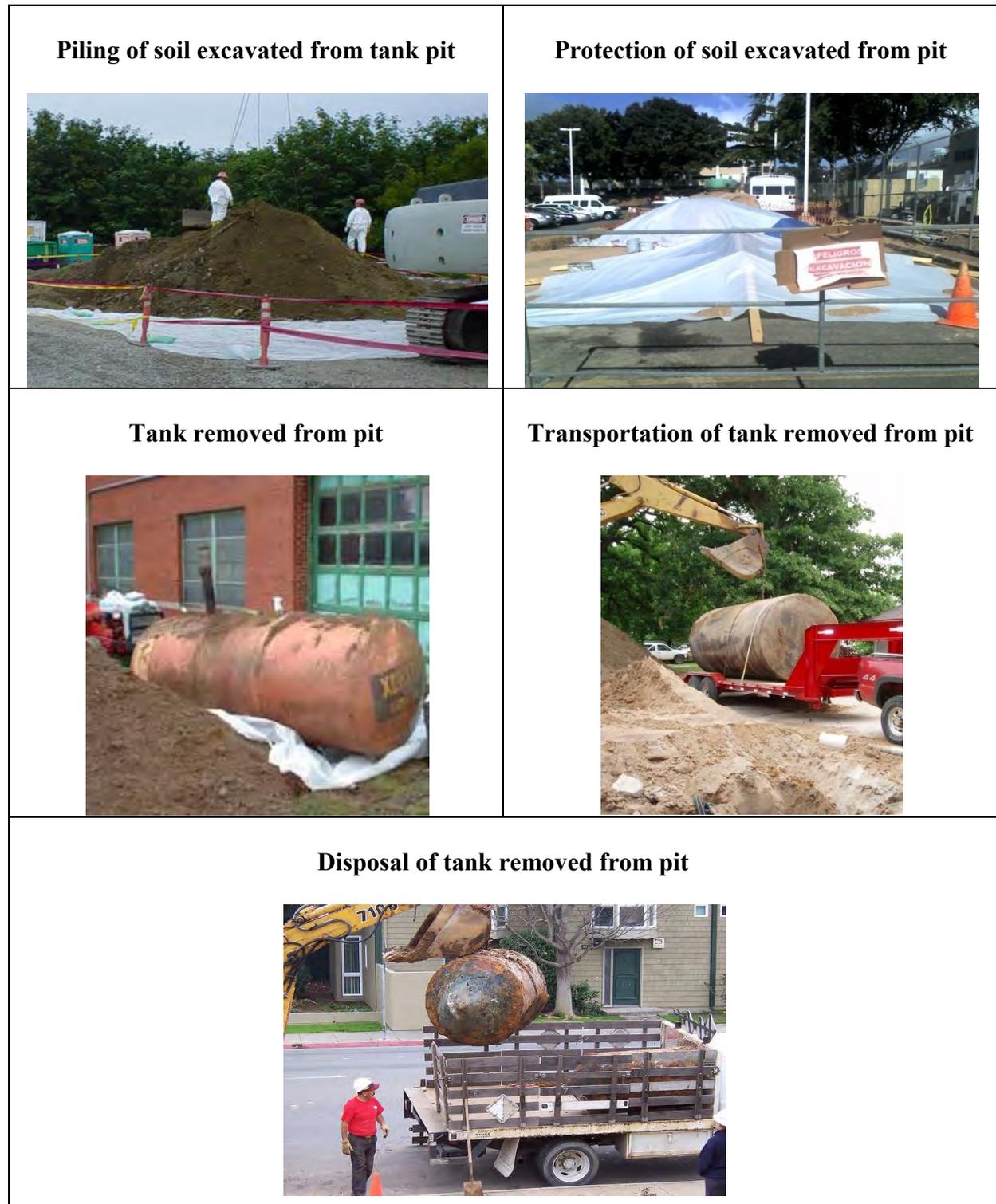


Figure 4. Illustration of various steps in the process of UST removal.



i. Closure on Site

The procedures for UST closure on site are similar to those described earlier, except with respect to excavation and the sampling. The difference between the two is that once the sampling procedures for vapors removal of all the product is completed, instead of excavating to remove the tank, the top of the tank is perforated. The tank is inspected to verify that the interior is empty and then it is washed as described in section 3.b. The interior of the tank is verified again to assure it is free of all product. Solid material (such as sand or wet cement) is used to fill the tank through the perforations on the top of the tank. All activities performed should be documented with digital photos and these should be submitted as an attachment to the Final Closure Report.

The EQB reserves the authority to require removal of the UST and deny closure on site. The following conditions may be considered to deny closure on site:

- Applicable state or federal regulations
- If there is documented evidence that indicates the possibility the UST had leaks or spills. The documentary evidence includes inventory records, tests performed to the tanks, among others.
- If during the closure process the soil or water is contaminated.

This section describes the general procedures to follow during the investigation activities of soil drilling as part of the on-site closure of the UST. Below are the generally accepted procedures for drilling. These procedures apply similarly to Phase II Investigation Programs (Site Investigation or Characterization).

- (i). Drilling:** Soil samples are normally taken by either the “Direct Push” method or “Rotatory Drilling” method using hollow drill bits and a modified California Sampler. Below is provided a general description of the procedures for both methods.

1. Direct Push

The direct push method requires penetration of the soil with a stainless steel sampler containing an acetate cylinder inside. The sampler is introduced into the soil using pressure from the impact of a pneumatic hammer. The hammer impacts the sampler, which in turn penetrates the soil. The sampler is provided with a conical tip at the point to prevent soil from entering the acetate cylinder until the required depth is reached. Once the required depth is reached, the sampler is attached to rod and the push method continues up to the point where the desired sample depth is reached.

To perform the sampling the safety lock on the tip is released and the rod with the sampler is pushed into the soil to collect the corresponding samples at the desired depths. The acetate cylinder inside the sampler rod is removed and soil samples to be analyzed are taken from the acetate cylinder and placed in the corresponding required glass containers. After each of the required samples are taken, these are labeled and placed in portable coolers with ice to maintain

conditions of $<4^{\circ}\text{C}$ during the field work and transportation to the laboratory where the required analyses are to be made.

2. Drilling with Rotary Drill

Using this system the soil samples are taken using hollow bits. During the actual drilling, the bit is equipped with a retractible tip which prevents soil from entering the bit. The tip is inserted through the hollow stem of the bit using a wire line or rod and is screwed on to the upper part of the rotating system of the drill.

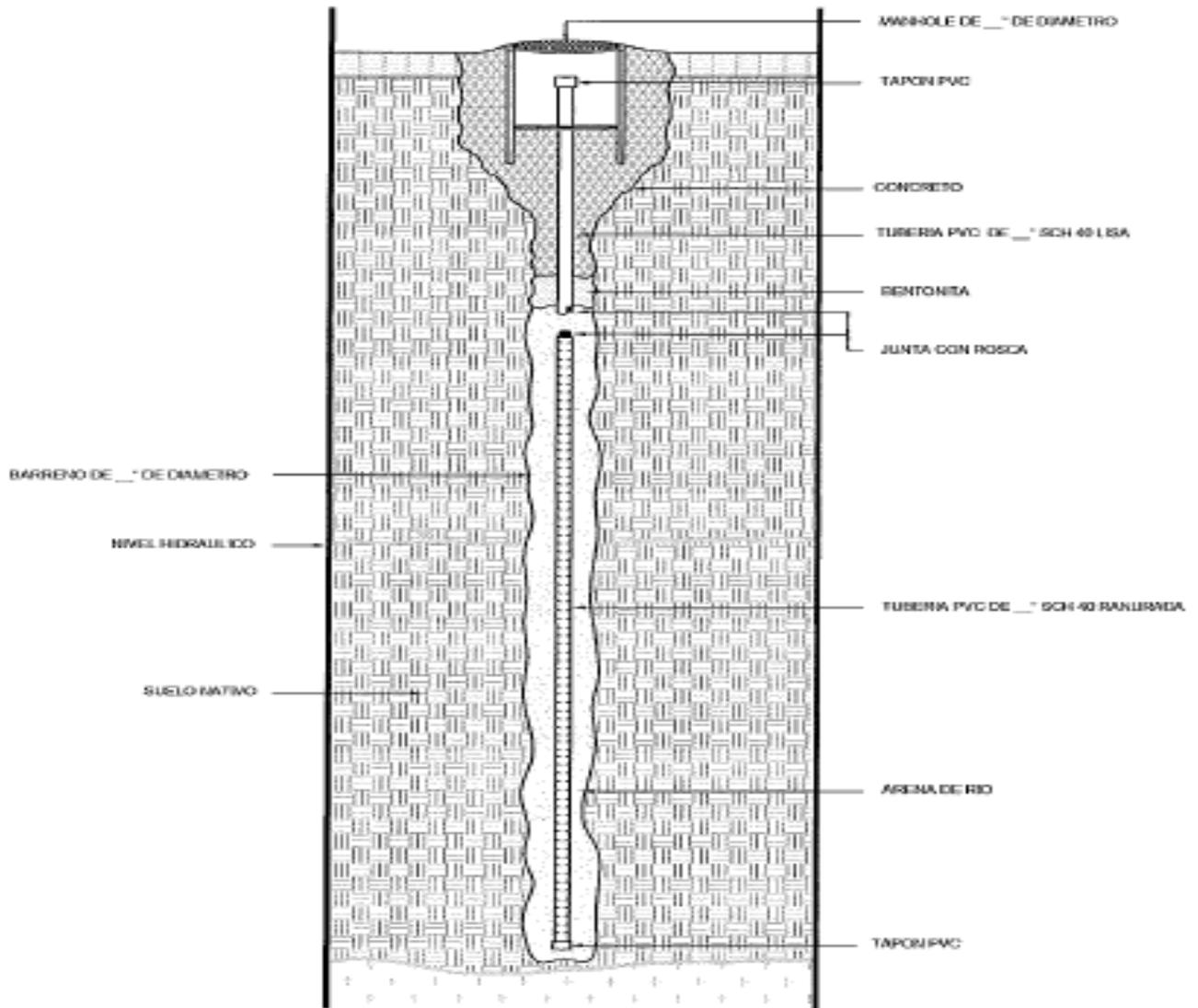
Soil samples are taken utilizing the Modified California Sampler. The Sampler is screwed on to the lower portion of the rod which in turn screws on to the upper portion. The Sampler is lowered inside the hollow stem of the bits, the rods are screwed in the upper part to a 140 pounds hammer and penetrates from 18 to 24 inches, depending on the length of the Sampler. The sampling is performed by lifting the hammer some 30 inches releasing it rhythmically over the rod. The Sampler penetrates the soil and allows the soil sample to enter the blade located in the lower part.

After taking the Sampler to the desired depth, it is retrieved. The rings at the points of the Sampler are removed and the soil samples are collected in corresponding containers provided by the laboratory. The containers with soil samples are labeled and placed in portable refrigerators with ice to maintain the samples cold during the field work and Transportation to the Laboratory for the corresponding analyses.

- (ii). Closure of Perforations and Installation of Monitoring Well.** Once each boring has been completed and the corresponding samples have been collected for chemical analyses, the bores should be appropriately sealed. Generally, this is performed by filling bore with cement, sand and bentonite up to the soil surface, with the objective of sealing the bore to prevent substances from entering the soil through the bore.

If necessary or required, a monitoring well may be installed in the bore. The typical construction of a monitoring well is illustrated as example in Figure 5 below.

Figure 5. Typic construction of a monitoring well



j. Vapor Monitoring and Groundwater Management

During UST removal activities it is recommended that any petroleum hydrocarbon impacted fill material and/or groundwater that may come up during the excavation activities should be removed from the site. The evaluative process will establish if the product came from the UST removed, an existing UST or some other nearby spill that migrated towards the excavated areas. If impacted soil or water are found, the corresponding investigative activities must be performed following the general procedures established below:

- (i). **Vapor monitoring in the pit or excavation.** A portion of the soil is taken and placed in a glass container up to half the capacity. The container shall be sealed with aluminum foil and tightly closed with the cap. The container is exposed to the sun for approximately ten (10) minutes, afterwards the cap is removed.

Using and OVA with PID, measure the organic vapor content in the head space of the jar by inserting the tip of the instrument through the aluminum paper.

The soil shall be classified utilizing the Unified Soil Classification System (USCS). Under the section Description of Soil Sample, the grain size, color, level of humidity and other pertinent data to the USCS shall be entered into the Record of Description of soil sample. The soil color observed shall be identified using the Munsell Soil Color Samples.

The soil samples shall be obtained following the procedure described in the QA/QC Program included in Chapter 4 of this document.

The soil monitoring shall be performed utilizing an Organic Vapor Analyzer (OVA) as the excavation progresses, to determine the content of volatile organic compounds (VOCs). As general rule, a reading for vapor headspace shall be taken for every four (4) cubic yards of soil removed. These readings shall be included in the field notebook. More frequent samples shall be taken if conditions require it.

Disposal of impacted and non-impacted soil shall be performed in accordance with section 3.h.(ii) of this document.

(ii). Handling of Groundwater.

If groundwater is found during the UST excavation process, it is necessary to visually inspect and determine if it is impacted with free-phase product.

The water intercepted and accumulated in the bottom of the pit should be sampled to verify whether or not it complies with the analytical requirements and acceptable levels in water established in Table 2. The water samples should be collected in duplicates and shall be collected independently of its origin.

The number of samples and distribution of sampling points will depend on the size of the excavation and the visual detection of free floating product. The EQB personnel in charge of the inspection will determine the points to be sampled and the quantity of samples to be taken. In small pits where only one water sample is taken, it should be taken in duplicate and when more than one sample is taken at least one should be taken in duplicate.

Once the water sampling has been performed in the pit the water in the pit may be disposed of according to Section 3.h.(v) of this document.

If impacted soil or water samples cannot be removed due to security factors, access or the presence of structures, soil excavation shall cease, the pit shall be closed and procedures pertaining to Health and Security shall be complied with to prevent major security problems and vapor emissions to the environment. A site investigation must be performed in accordance with Section 3.k.(i) of this document with the objective of delineating horizontally and vertically the hydrocarbons detected.

k. Impacted soil and/or water

- (i). **Site Investigation Plan.** This plan is implemented to determine the nature and extent of the impact caused by regulated substances on a given site. This includes the collection of site specific data to evaluate the pollution impact on the site being studied.

These investigations involve boring for soil samples and the collection and chemical analysis of separate soil samples collected at intervals of different established depths (See section 3.i.(ii)).

The Site Investigation Plan shall be submitted to the Water Quality Area in accordance with the technical information requirements established in the Site Investigation Plan (Form to be adopted by the Board). This document shall be reviewed by the Water Quality Area Quality Assurance Officer and afterwards by the USTCD Technical Personnel. Upon completion of both evaluations the Plan is either approved for implementation or required corrections must be provided prior to approval. After favorable evaluations from both reviewers the Plan is approved. Upon completion of the investigation, a report indicating the findings at the site must be submitted to GPD. This report should also include a wide variety of other related essential information to be evaluated by EQB (Form to be adopted by the Board). This report shall be evaluated to determine if a No Further Action Release may be issued or if a site remediation is required.

- (ii). **Corrective Action Plan.** Once the need is determined, EQB shall require the submittal of a Corrective Action Plan to the Water Quality Area prior to its implementation.

The Corrective Action Plan (CAP) shall discuss alternatives of remediation, available technology and shall evaluate the most appropriate for the site taking into account the lithology, groundwater, levels of impact on the soil and/or water, waterbodies nearby, underground utilities (water, sanitary sewers, telephone and power lines), nearby groundwater wells, risks to human health, animal or wildlife (flora and fauna) among other factors. The CAP is to be submitted to the WQA in accordance with the requirements of technical information to be included in the Corrective Action Plan (Form to be adopted by the Board).

This document shall be evaluated by the QA/QC Officer of the WQA and the technical personell of the USTCD assigned to the project. Upon approval of the Plan submitted, the corresponding actions to remediate the site shall start. During the period of remediation progress reports are to be submitted in accordance with the frequency established in the CAP. During the remediation period progress reports must be submitted as established in the approved CAP. This is required in order to determine the effectiveness of the selected technology as the remediation progresses.

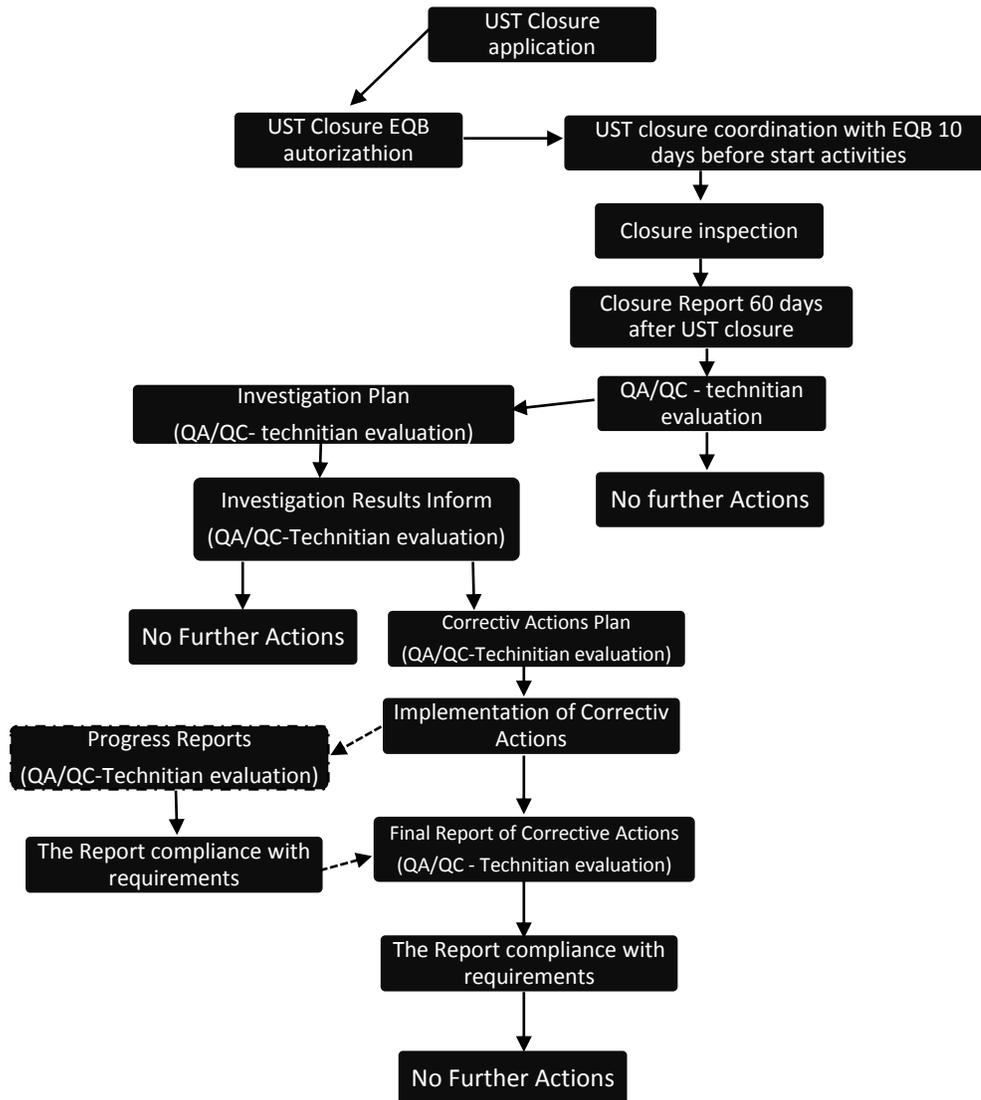
Reporting periods may vary from case to case and this shall be established in the approval letter of the CAP to be issued by the WQA. However, these shall be

submitted to EQB at the point when significant reductions in the initial pollutant levels have been achieved. The hard (paper) copies of the periodic progress reports (monthly, every two months, or every semester from start-up date, as required in each particular case) that the petitioner must document as result of the specific technology being used or for other reasons, shall be kept in the petitioners files and not submitted to EQB. These reports are to be submitted to EQB in PDF digital format as requested by EQB or other concerned Agency or as attachment in the final report of the corrective action required.

When remediation activities reach the acceptable pollutant levels (see Tables 1 y 2), EQB should be notified to coordinate the inspection of the final sampling activity with the corresponding EQB technical personnel to oversee the corresponding sampling procedure. Once these activities have been completed accordingly, the final report on the corrective actions shall be submitted to EQB in accordance with the requirements established in the Content Guidance for the Corrective Action Plan and Report (Form to be adopted by the Board). This report requires the Evaluation of the Water Quality Area QA/QC Officer and the GPD technical staff.to determine if the applicant is released from any additional work.

Below is shown a flowchart of the steps to follow during the closure process of USTs up to the completion of the remediation activities:

Figure 6. Flowchart of the UST closure process.



4. QA/QC PROGRAM

a. Sampling points and samples to take (see Attachment 12)

A minimum of one (1) soil sample shall be taken for each point where lines associated with the UST system come out from tank pit., two (2) soil samples from the ground in the tank pit (just underneath the fill port of each UST, one (1) soil sample from each side wall of the pit along the UST. In addition, a duplicate shall be taken for at least every ten (10) samples or less. The duplicate shall be from one of the sidewalls of the pit for each sampling day and for each matrix (i.e. soil, water).

The number of sampling points shall be determined in accordance with the size of the excavation, the manner in which the USTs were installed, visual inspection of the pit, the geology, topography or lithology of the area. If any of the sidewalls of the pit exceed the length of twenty (20) feet linearly, additional samples must be taken at the rate of one (1) sample additional sample for each additional twenty (20) feet in length for each wall in the excavation.

If water is observed in the bottom of the excavation, (1) duplicate sample of the bottom shall be taken for small pits and various duplicate samples, under the discretion of the inspector. For large pits soil samples shall be collected at one foot above the water level. In this case, duplicate samples shall be taken in duplicate for both water and soil.

b. Analytical Requirements

Tables 1 and 2 presented in Section 4. QA/QC Program indicate each one of the matrixes that should be sampled for closure of a UST and include substances, environmental parameter, analytical methods, type of sample, type of container, preservative, holding time and minimum clean-up levels adopted for purposes for this Plan.

c. Collection of Samples

Before taking each sample, the sampling personnel shall carefully wash their hands with soap and clean water and shall dry them carefully. This step shall be performed when there is direct contact with the soil or water suspected to be impacted with petroleum derived hydrocarbons.

Once washed new disposable gloves should be put on both hands. These gloves shall be placed on both hands. The gloves shall be discarded each time there is a change in station to avoid cross-contamination from one point to another.

Samples for Volatile Organic Compounds (VOCs) must be the first to be collected to prevent the vapors from escaping to the environment and not be detected in the analysis.

In the case where the samples are collected with disposable tools it will not be necessary to collect the Equipment Blank. In the event the samples are collected with spatula or spoon, the surface soil is removed to a desired depth (6 inches), the sample is collected and deposited in the corresponding container as specified in Tables 1 and 2.

Liquid samples shall be collected in the corresponding containers without any observable air bubbles or empty spaces in the container that may affect the results of the VOCs.

The soil samples to be collected should be grab and deposited directly in their respective containers compacting the soil in such manner that there are no empty spaces that may affect the results of Volatile Organic Compounds (VOCs).

If there is potential risk in the safety of the personnel when samples are to be taken, these shall be taken using a digger. If there is water at the bottom of the pit, samples should be collected with a bailer.

Figure 7. Illustration of sampling activity



Table 1. Analytical requirements and acceptable clean-up levels in soils for installations with USTs

Substance	Environmental Parametrs	EPA Methods	Sample Type	Sample Container †	Preservative	Maximum Holding Time in days for Extracción / Analysis	Acceptable Clean-up Levels (ppm)
Gasoline	TPH (GRO)	8015C* 8015B	Grab	4 ounces	Cool to 4° C	7/40	100
Diesel	TPH (DRO)	8015C* 8015B	Grab	4 ounces	Cool to 4° C	14/40	100
Oil	TPH (ORO)	8015C* 8015B	Grab	4 ounces	Cool to 4° C	14/40	100
Used Oil	TPH	8015C* 8015B	Grab	4 ounces	Cool to 4° C	14 /40	100
Kerosene	TPH	8015C* 8015B	Grab	4 ounces	Cool to 4° C	14/40	100
Jet Fuel	TPH	8015C* 8015B	Grab	4 ounces	Cool to 4° C	14/40	100
Bunker	TPH	8015C* 8015B	Grab	4 ounces	Cool to 4° C	14/40	100
Fuel Oil	TPH	8015C* 8015B	Grab	4 ounces	Cool to 4° C	14/40	100
Benzene	BTEX	8260B* 8021B	Grab	4 ounces	Cool to 4° C	7/40	5
Toluene	BTEX	8260B* 8021B	Grab	4 ounces	Cool to 4° C	7/40	10
Ethyl-benzene	BTEX	8260B* 8021B	Grab	4 ounces	Cool to 4° C	7/40	10
Xylenes	BTEX	8260B* 8021B	Grab	4 ounces	Cool to 4° C	7/40	10
Lead ††	Antiknocking Additive	6010 6020* Series 7000	Grab	4 ounces	Cool to 4° C	180	400 (Residential) 800 (Industrial)
MTBE †††	Oxygenating Additive	8015C 8021B 8260B*	Grab	4 ounces	Cool to 4° C	7/40	39 (Residential) 190 (Industrial)

SOURCE: Regional Screening Levels (RSL) for Chemical Contaminants at Superfund Sites, Region 9 PRGs, Regions 3 and Region 6, EPA Waste's official compendium of analytical and sampling methods that have been evaluated and approved for use in complying with RCRA regulations.

† Wide-mouth glass bottles with Teflon lid.

†† Analysis required for anti-knocking additives in instalations that were in service before January 1, 1996 and for all USTs that contained products with these additives.

††† Analysis required for oxygenating additives in UST installations that were in service after January 1, 1979 and for all USTs that contained fuels with additives.

* Most sensitive method.

Table 2. Analytical requirements and acceptable clean-up levels in water for installations with USTs

Substance	Environmental Parameter	EPA Method	Type of Sample	Sample Container †	Parameters	Maximum Holding Time in days for Extracion / Analysis	Acceptable Clean-up Level (ppm)
Gasoline	TPH (GRO)	8015C* 8015B	Grab	2 Vial ‡ 40mL	Cool to 4° C, HCl pH <2	7/40	50
Diesel	TPH (DRO)	8015C* 8015B	Grab	1 Liter Amber	Cool to 4° C, HCl pH <2	14/40	50
Oil	TPH (ORO)	8015C* 8015B	Grab	1 Liter Amber	Cool to 4° C, HCl pH <2	14/40	50
Used Oil	TPH	8015C* 8015B	Grab	1 Liter Amber	Cool to 4° C, HCl pH <2	14 /40	50
Kerosene	TPH	8015C* 8015B	Grab	1 Liter Amber	Cool to 4° C, HCl pH <2	14/40	50
Jet Fuel	TPH	8015C* 8015B	Grab	1 Liter Amber	Cool to 4° C, HCl pH <2	14/40	50
Bunker	TPH	8015C* 8015B	Grab	1 Liter Amber	Cool to 4° C, HCl pH <2	14/40	50
Fuel Oil	TPH	8015C* 8015B	Grab	1 Liter Amber	Cool to 4° C, HCl pH <2	14/40	50
Benzene	BTEX	8260B* 8021B	Grab	2 Vials of 40 mL	Cool to 4° C, HCl pH <2	7/40	0.005
Toluene	BTEX	8260B* 8021B	Grab	2 Vials of 40 mL	Cool to 4° C, HCl pH <2	7/40	1
Etihylbenzene	BTEX	8260B* 8021B	Grab	2 Vials of 40 mL	Cool to 4° C, HCl pH <2	7/40	0.7
Xylenes	BTEX	8260B* 8021B	Grab	2 Vials of 40 mL	Cool to 4° C, HCl pH <2	7/40	10
Lead ††	Antiknocking Additive	6010 6020* Serie 7000	Grab	500 mL	Cool to 4° C, HNO3 pH<2	180	0.015
MTBE †††	Oxygenating Additive	8015C 8021B 8260B*	Grab	3 Vials of 40 mL	Cool to 4° C, HCl pH <2	7/40	0.012

SOURCE: National Primary Drinking Water Standards Regulation, Puerto Rico Water Quality Standards Regulation and EPA's official compendium of analytical and sampling methods that have been evaluated and approved for use in complying with RCRA regulations.

‡ Vial = glass bottle with teflon cap with septum.

†† Analysis for additives with anti-knicking additives in UST installations that were in service before January 1, 1996 and for all USTs that contained fuels with additives.

††† Analysis for oxygenating additives will be required for instalations with USTs that were in service after January 1, 1979 and for all USTs that contained fuels with additives.

* Most sensitive method.

d. Decontamination Procedure

The sampling plan is based on the use of equipment previously cleaned to the maximum level possible. However, it may be necessary to decontaminate (decon) particular sampling equipment in the field. This section describes the field procedures that should be used to decontaminate sampling equipment (stainless steel, teflon, etc) if necessary.

The decon procedure must be performed outside of the sampling site and the equipment must be transported to the site wrapped in plastic bags to avoid contamination during storage and transportation. Such process should be performed by the sampling personnel to decontaminate non-disposable or dedicated equipment.

The equipment decon procedures shall be performed in accordance with EQB specifications, utilizing as reference, RCRA Quality Assurance Guidelines described below:

1. Brush or scrub with phosphate free detergent in water
2. Rinse with water
3. Air dry
4. Wrap in aluminum foil

All wastes generated as result of the decon process must be collected and stored in the appropriate manner and disposed in accordance with applicable federal and state regulation. Copy of the disposal manifest must be included as attachment to the Final Closure Report.

e. Custody of Samples

Legal custody of samples start from the point the clean sample containers are received in the laboratory and ends when these are delivered to the laboratory for the respective analyses. The Chain of Custody (CC) is a document used to Evidence the custody and possession of the samples from the moment the sampling activities are started up to the point the results are reported. This document must reflect continuity of custody through signature, date and time all persons who at any moment had custody of the samples.

Any deviation from the custody protocol is sufficient reason to invalidate the chemical phase of the final sampling report, therefore the sampling personnel that has custody of the samples in the field must allways maintain possession of the samples and keep them on sight. Everything that is written in the chain of custody must be legible and in permanent, nonerasable ink. If an error occurs, this must be crossed over with a single line, initialed and dated correspondingly.

f. Identification of Samples

An alphanumeric code that identifies the site, specific matrix, specific sample, and sample sequence number shall be assigned to each sample collected. The following is a general guide for the identification of samples:

- The first soil sample collected shall be identigied as boring number, followed by matrix, sample number. For example B1-SL-01.

- The next soil sample shall be identified as B2-SL-02 and likewise consecutively.
- The sample duplicate of the first boring is identified in the same manner but with the letters FD. For example B1-SL-01FD.

Alphanumeric Code for each matrix:

Water = WT Soil = SL Oil = OL

Field Bland = FB

Trip Blank = TB

Equipment Blank = EB

Field Duplicate = FD

g. Chain of custody protocol

The chain of custody (CC) must be numbered in sequential form and should include information:

- Project name and site
- Sample identification
- Matrix code (soil or water)
- Sample preservation (if applicable)
- Date and time of sample collection
- Sample type (grab) or (composite)
- Analytical method
- Name, date and signature of sampler
- Name, date and signature of the person who received the samples
- Bill number or copy of shipping or transfer of custody (shipping company)
- Shipping date

The CC protocols include the field sample collection activities, as well as the shipment of samples to the laboratory. The CC is completed and sent with the samples to the analytical laboratory in the corresponding coolers for the corresponding analysis.

When the custody is transferred to a messenger for delivery the following day, the CC should be signed and dated by the person who relinquished custody. The CC is placed in a plastic bag attached with an adhesive tape to the top of the cooler. The shipping document of the messenger is used instead of the messengers signature in the CC for the time the messenger retains custody of the samples. Custody seals are used on the shipping coolers when the samples are shipped to an outside (not local) laboratory, to prevent tampering and/or adulteration of the samples during the trip.

Only one cooler shall be packed at a time to minimize the time the samples are out of ice. The transport of the samples shall comply with the requirements of the Federal Department of Transportation (USDOT) and PR Customs Service.

h. Handling of Samples

Samples are to be preserved in accordance with the parameter sampled (see Tables 1 and 2), the sample containers shall be placed in a plastic ZIPLOC bag for each

parameter, matrix and station, and shall be stored in coolers with ice at a temperature of $4^{\circ}\text{C} \pm 2^{\circ}\text{C}$. This temperatura should be verified in the field by the sampling personnel at intervals of one (1) hour, by means of a certified thermometer, and corroborated by an EQB technician. Such temperatura must be documented in the field logbook..

Samples shall be shipped to a contracted laboratory in coolers for the corresponding analyses complying with the corresponding holding time established in the corresponding accompanying CC.

The holding time, is the máximum time allowed between sampling time and sample analysis and/or extraction, based on the analysis of factors of interest, sample stability and preservative used, if any.

Upon receipt, the laboratory custody personnel shall perform the following verifications.

1. The coolers shall be inspected for damage of leaks.
2. Once the cooler is opened, the temperatura control bottle shall be the first to be checked to verify that the samples were maintained at a temperature of $4^{\circ}\text{C} \pm 2^{\circ}\text{C}$. This information shall be made in the laboratory and recorded in the CC (chain of custody).
3. The information specified in the samples labels shall b compared to the information in the CC to assure that all sample containers are present. If any container has been lost, broken or incorrectly identified, the laboratory shall immediately notify the leader of the sampling team and shall document this in the CC.
4. The date and time of receipt of samples in the laboratory shall be documented in the CC, acknowleging receipt of the samples.
5. After signing the CC, the Laboratory accepts responsibility for storage, preparing, analyzing and disposing of the samples.

Sample labels should be waterproof and shall be placed in the exterior of the container. Each label should include the following information.

- Project name
- Site (station) identification
- Sample sequence number
- Type of sample (*grab/composite*)
- Analytical method or perameters
- Preservative (if it applies)
- Date and time of collection
- Name of sampler

i. Quality assurance and quality control requirement

These are a series of oparational principles that must be followed closely in the sampling and laboratory analyses phases to obtain reliable and defensible results. These principles must be clearly defined and apply equally to liquid and soil samples.

The QA/QC standards must be clearly defined and apply to both liquid and soil samples, must be analyzed for the same parameters as the field samples and reported as additional samples (see Table 3).

j. Audits

The Laboratory and sampling Activities shall be audited at the time the EQB QA/QC Officer considers it necessary, to verify the permanent implementation of PARPCUST. The audit shall include observations of the field activities to determine if they comply with PARPCUST. If implementation of corrective actions are considered necessary in during the sampling activities, the Project Director shall be notified and this person shall take the pertinent corrective measure.

Table 3. Definition and frequency of QA/QC requirements

Control Sample	Definition	Frequency
Trip Blank	This sample is prepared with deionized water and is placed in the samples cooler at departure time from the laboratory and during the full sampling period until the samples collected in the field are delivered to the laboratory. The objective of this sample is to detect any pollutant inside the cooler during the transport of samples and to assure that changes in pressure and temperature the occur during the trip do not affect the confidence with respect to the results.	This blank shall be transported in the cooler that will be used each sampling day for each matrix with the rest of the samples corresponding to each specific matrix until the samples are delivered to the laboratory for the corresponding analyses to determine if there was cross contamination during the sample shipment..
Field Blank	This sample is prepared in the laboratory with deionized water and is included along with the sampling equipment from the time they leave the Laboratory. This sample shall be opened at the start of the sampling activities and shall remain opened until all samples for volatile organic compounds (VOCs) have been collected and sealed at the end of the sampling activity. This sample is expected to demonstrate the presence of any vapors in the environment at the time the VOCs are being sampled that may, in any manner, affect the results of VOCs of interest (TPH and BTEX).	This sample shall be collected for each day of sampling and while VOCs are collected.
Equipment Blank	This sample is obtained from the deionized water poured over the sampling equipment that was cleaned and decontaminated. This is used to determine the effectiveness of the cleaning process of non-disposable equipment. However, if disposable or dedicated equipment is used, it shall not be necessary to collect this blank.	This sample shall be collected for eah sampling day and for representative equipment (solid/liquid) and shall be analyzed for all parameters required in the closure plan.
Field Duplicate	This is an additional sample taken at random that is collected simultaneously in separate containers from the same station or sampling point. This sample is used to document the precision of the sampling activiy and the results reported by the laboratory.	This sample shall be collected for eah matrix (soil and water) at the rate of 10 % of the total samples collected for each day of sampling.

The QA/QC Officer shall audit the laboratory. This shall include internal and external calibrations, applicable SOPs, reagent preparations, personnel qualifications, verification of internal QA/QC (triplicates, method blanks and matrix-spike) in accordance with approved methods.

k. Corrective actions in sampling procedures

The corrective actions in sampling procedures are requested when problems are detected, such as deficiencies or deviations from the requirements, reason for which it is necessary to document this situation. The purpose of documenting such action is to maintain strict control in the follow-up from the moment the problem is detected up to the point elimination.

It is important to mention that the purpose of a corrective action is to identify, analyze and eliminate the causes of the deficiencies and prevent them from recurring. A good analysis of the cause of the problem is to determine exactly what caused it and once corrected, the efficiency should improve significantly. Therefore, if deficiencies are reduced successfully, it should not be necessary to perform corrective actions.

The requirement of corrective actions shall be directed by the manager of the project. The manager may delegate implementation to another person, but the manager is responsible for the performance and elimination of the problem so that the results are reliable.

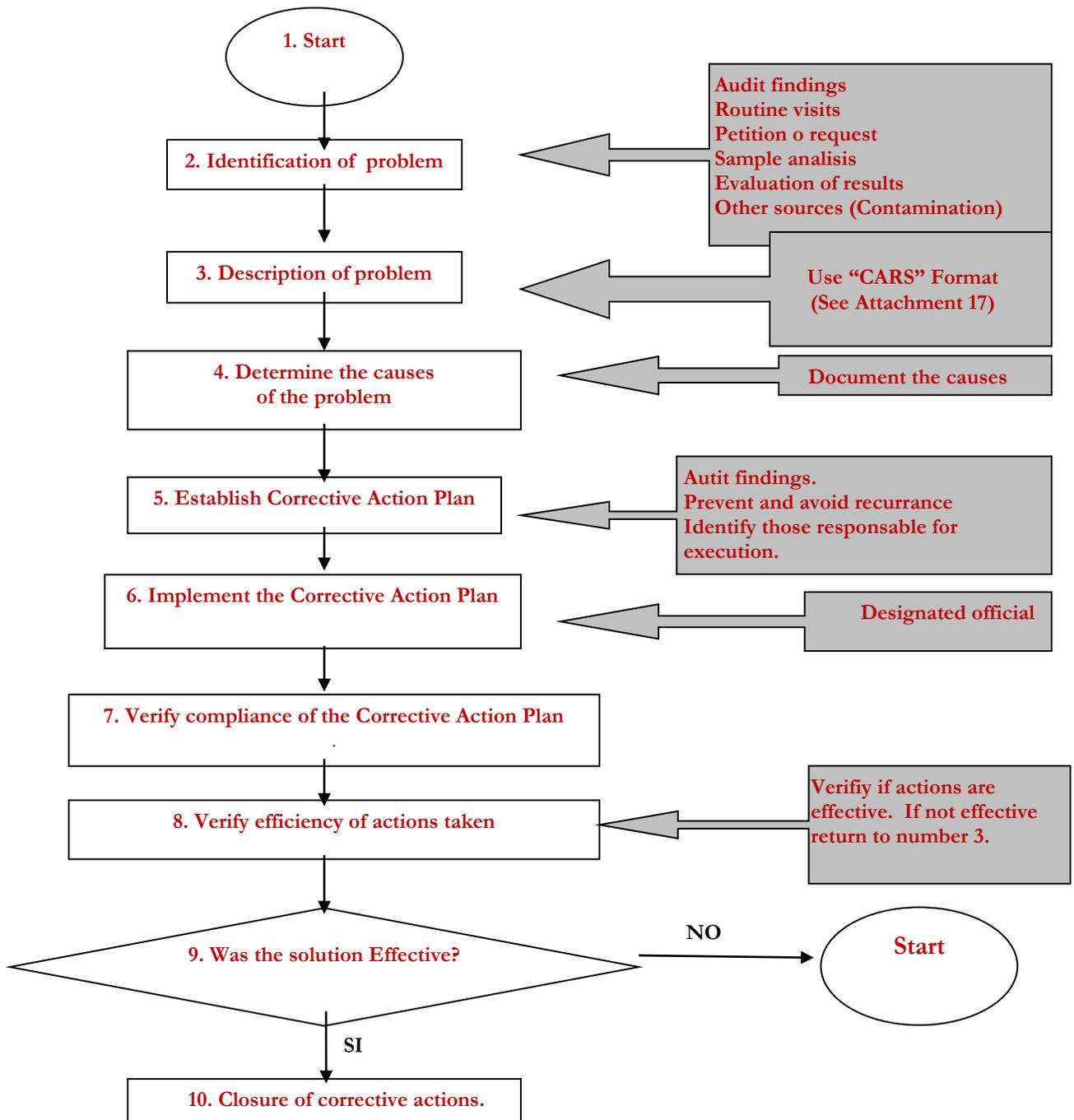
Therefore, the sampling personnel and laboratory analyst should be fully capable and certified for the job they perform. It is not sufficient that they know how to perform the procedure, they should also be capable to be aware if they are doing the procedure correctly, can detect problems and can correct the errors that may come up.

It is important to indicate that the decision making process depends on the quality of the results released by the laboratory. Therefore, it is necessary that the field and Laboratory analyses be performed under the most strict quality control system possible.

1. Personnel and laboratory qualification

In order to assure quality, confidence and precision of the results, the Environmental Laboratory used for chemical analysis of the samples should be properly accredited and/or certified by one (1) of the following accreditation and certification programs: **“National Environmental Laboratory Accreditation Program (NELAP)”** and/or **“American Association for Laboratory Accreditation (AALA)”**

Figure 8. Flow diagram for corrective actions in field sampling and laboratory



m. Sampling equipment

To assure good operation and assurance of all the field equipment appropriate functioning, these should be inspected, calibrated and tested during and after all Activities, following the specificatiois and recommendations of the manufacturer.

During the sampling events, all equipments are calibrated once a day prior to start-up of activities. The readings obtained from this calibration shall be entered in the field

book by the project officer or in the document of each equipment. In case that the equipment fails calibration, two additional calibrations should be performed to corroborate the correct functioning of the equipment and keep in mind extraordinary situations such as high temperatures and humidity. If after three (3) consecutive calibrations the equipment fails, this equipment should not be used under any circumstances in closure and/or sampling activities. It is recommended that replacement (backup) equipment be available in case of malfunction or damage to the primary equipment.

All equipment should be cleaned daily after field activities have ceased for the day. All the equipment should be cleaned after the daily field activities and stored in accordance with the manufacturer's specifications. Equipment, calibration gases, chemical solutions, etc., should always be available, and not exposed to high temperatures.

Monitoring equipment like OVA should be protected from contamination as much as possible by keeping them adequately covered as much as possible. This type of equipment must be inspected daily before use to assure it is functioning properly.

Instruments that will be used in field activities and which require calibration include the OVA, thermometer, pH meter and others, as instructed by the manufacturer.

The materials to be used during the field and sampling activities include the following, among others:

- Teflon® liners
- PVC pipes 2" diameter, schedule 40
- Clean sand
- Bentonite
- Cement
- Ice Coolers
- Bottles with Teflon® caps
- Disposable or stainless steel spatulas
- Disposable latex gloves
- Hand auger
- Security fencing material
- Purging gas
- Water hose

The materials should be inspected and inventoried periodically by the Project Manager to assure that their usable condition, expiration dates and storage conditions are consistent with the instructions of the manufacturers.

The Project Manager or Health and Safety Officer must verify that all materials, equipment, etc., comply with the required specifications, including expiration dates. Sample bottles, jars and others should be obtained daily from the laboratory that will perform the sample analysis. It is recommended that backup material (sample bottles,

jars, equipment and instruments) be available on site in case unexpected events occur, for example: breakage of bottles, equipment, instruments or additional sampling is required, etc.

5. HEALTH AND SECURITY PLAN

This Health and Security Plan describes the protocols, minimum general guidance that must be followed as part of the tasks involved in the removal of USTs or site investigation; however, the petitioner should assure compliance at all times with the applicable state and federal regulations in effect at that moment applicable to health and safety in the work place. This Health and Safety Plan should be available at all moments to the PROSHA Personnel and any other public Agency that may request it.

The PROSHA officers have the responsibility of assuring the strict compliance of these laws and they may also impose any type of sanction and penalty depending on the incompliance of the functions of the employees and workers on the site.

The EQB is not responsible for incompliance of any part of Health and Safety Plan. EQB's only objective is to inform the petitioner of the minimum information that must be considered to perform the work required to remove a UST in a secure and safe manner. The EQB inspectors at the site of a UST removal activities will simply assure the the petitioner has provided the required security on the site and that the required activities are being performed in a safe manner for the employees and surrounding community. Any irregularity or potential danger identified by the inspector shall be notified to the petitioner who is directly responsible for correcting any deficiency. In situations where any conflict occurs concerning compliance with laws and/or regulations pertaining to health and safety to the community, the EQB inspector should present a complaint to PROSHA for the pertinent corresponding action required by applicable law and/or regulation.

The plan has been designed to protect the personnel working on site, visitors and general public from the security risks and materials already known or suspected of being health hazards. The procedures and guidelines provided in PARPCUST, are based on the updated information available at the time it was prepared. Specific sections of this document may be changed or revised if particular applicable new or revised information is available or when the conditions of the site change significantly. Any change or revision to this plan shall be considered as an amendment and must be authorized by EQB.

The OSHA or any other applicable law or regulation shall be placed on site before any job activities are initiated.

a. Purpose

The purpose of this plan is to provide a description of the scope of work to be performed and establish the security measures necessary to protect the personnel working on site and the general public from known or suspected hazards to their security and/or health present in the site. The procedures and guidance in this document are based on the most updated information available at the time of approval. Specific sections of this plan may be changed or revised if additional, more precise

information is available or when the conditions at a particular site change significantly. The methods and procedures described in this plan were prepared using the guidance established under 29 CFR 1910.120.

b. Plan on acceptance and knowledge of security on site

The person in charge at the site shall be responsible for informing every person assigned to work on site or that visit the site beyond clean-up/security zone, the content of this plan and must be sure that every person signs the form Knowledge and Security Plan (See Attachment). Upon signing the form the persons are acknowledging that they have been informed of the known and suspected security and health hazards, as well as the protocols required to minimize exposure to such hazards at the site.

In addition, all personnel visiting the site must sign the Visits Sheet (See Attachment), indicating the date and time of visit.

c. Site meetings on health and security

A meeting on health and safety is essential and it should be performed during the first day of mobilization to the site and before starting the work activities. Assistance to this meeting is compulsory for all personnel that has been assigned to the work site. Once the meeting is concluded, the Personnel present must sign the sheet (See Attachment) in the Knowledge of the Security Plan, including assistance and understanding of the security protocols. As additional personnel is integrated into the group, it is the Project Manager's responsibility to make sure that the new personnel receives the corresponding orientation (presentation) concerning the protocols of health and safety (See Attachment) and that they sign the Attachment Knowledge of the Security Plan.

Health and security meetings shall be held periodically, at least once per week, during the time the project is being implemented. These meetings shall be carried out to inform about the changes in conditions at the site of work, to assure the the personal protection equipment is placed in the proper site, it is being used correctly and to address any matter concerning the health and safety of the workers. The Safety Official shall complete the Sheet on Security Presentation in Attachment, indicating the date, time, topics discussed and the personnel present at the meeting.

d. Requirements of training

All personnel assigned to the site must have successfully completed a forty (40) hour course and annual eight (8) hour training courses for hazardous wastes at the work site in accordance with OSHA 29CFR 1910.120.

e. Requirements of medical monitoring

All personnel assigned to the site should be registered in the Medical Surveillance Program in compliance with the requirements of OSHA 29 CFR 1910.120 (f). The personnel must have completed satisfactorily the physical exam during the past twelve (12) months and be medically certified to work in a site with hazardous wastes and be able to use the appropriate personal protection equipment and respiratory protection equipment, if required.

f. Requirements for testing respirator adjustments

All personnel assigned to the area that have to use respirators must be aware of the Respiratory Protection Program in accordance with OSHA requirements (29 CFR 1910.134). All personnel required to use respirators must have passed a respirator adjustment test within a period not greater than six (6) months. Written proof of the test shall be required for the corresponding type of respirator to be used at the work site, whether it be half or full face mask. The Security Officer shall make sure that the respirator used by the personnel is the correct one and that it is of the same size, brand and model as that specified in the person's respirator adjustment records during the last six (6) months.

g. Responsibilities

The Project Manager, along with the Health and Safety Officer shall be responsible for managing the project, as well as coordinating the Health and Safety protocols and procedures for all the personnel on site at all times. All OSHA and EPA Health and Safety requirements shall be considered during the course of the project. This Health and Safety Plan covers all personnel on site; however, each subcontractor is also responsible for the health and safety of their employees. If any dispute arises pertaining to health and safety the matter should be addressed as follows:

1. The Project Manager and the Health and Safety Officer shall meet to discuss and resolve all necessary issues to address any health and/or safety issues at the site. The solution agreed upon shall be recorded in the Health and Safety Plan for the specific project required.
2. If the issues cannot be resolved in the field, work activities concerning the controversy shall be suspended until external Health and Safety Officials (PROSHA or OSHA) are consulted.
3. Any person that observes health and safety problems or violations to the health and safety requirements should report them immediately to the Project's Security Officer.

The worker should be the person most conscious of his own safety. For that reason, each worker has specific tasks to assure himself of his security and that of his fellow workers.

These include assuring that he:

- has full knowledge of his tasks and always applying the safe work practices.
- can recognize hazards at the job and can always take the necessary precautions to assure his safety and that of the others.
- Informs his supervisors of the hazards and the recommend how to eliminate them and how to improve the security at the site.
- Participating and cooperating actively in safety program in general
- Maintaining good health and clean personal habits
- Using check lists and safety procedures
- Using safety equipment
- Preventing self injuries and to the others

Disciplinary and compliance System

Failure to follow the safety procedures or use of safety equipment may result in disciplinary action, not only for the self risk involved but also to the risk others, inside and outside of the project, are exposed.

The penalties shall be implemented in the following manner:

1. First infraction shall be a verbal warning by the supervisor and will be documented in the employee file.
2. The second infraction will require a suspension for one day.
3. The third infraction the employee will be suspended for three days.
4. If the employee does not follow the safety rules, even after these disciplinary actions, the employee shall be permanently dismissed from the job site.

h. Access to medical record and worker's exposure

OSHA provides workers and their designated representative's right to access any relevant exposure information as well as the medical record in accordance with 29 CFR 1910.120. The "notification" of access to the worker's exposure shall be placed in a visible place during the field operations.

i. Communication of hazards

The company contracted for Health and Safety at the project site shall maintain all the personnel assigned to the site informed about possible risks associated with the work, to assist in mitigating the risks and prevent exposures. This information shall be presented to the personnel before starting any field activity. The personnel shall confirm having received this information by signing the knowledge and acceptance sheet included in Attachments of this documents.

The following information pertaining to Hazardous Materials shall be presented by the Health and Safety Official of the contracted company.

- Materials Safety Data Sheets (MSDS)
- Chemical / physical hazards
- Personal protection equipment
- Signs

j. Risk analysis for health and security

This analysis will identify the general risks associated with the specific operations of the site and should present an evaluation of the potential chemical hazards or documents that exist on site. Every effort should be made with the objective of reducing or eliminating these hazards. Those that cannot be eliminated must be reduced or controlled using best engineering controls and/or using personal protection equipment.

k. Dangers associated with heavy equipment

This section discusses the hazards associated with the work around the cranes, excavators, wastes transport, material and/or equipment trucks.

- All heavy equipment must have back-up alarm.

- The personnel must have visual contact with the operator of the machine before approaching the equipment.
- The operators must be aware of the personnel present in the area and must use the appropriate hand signals before making the maneuver.
- The operators must use helmets while operating the machine unless the machine has an enclosed cabin or a covered operator box.
- The operators must use a helmet when they go to and return from their equipment.
- The operators must be cautious when maneuvering near power lines.
- The contractor shall provide surveillance support to guarantee the safe entrance and exit of project trucks.

I. General hazards on site

Heat exhaustion

When temperature exceeds 70°F and the personnel is using personal protection suit, a Heat Exhaustion program must be implemented. The workers will have frequent short periods to rest and drink water.

Heat fatigue is caused by a number of factors including environmental conditions, clothing, work load and individual characteristics of each worker. The use of personal protection equipment may increase the possibility of heat fatigue or heat stroke. Use of personal protection equipment places a worker of hazardous materials at high risk of developing heat exhaustion. This may result in health effects that may go from fatigue to serious symptoms, including death. These conditions may be avoided if frequent rests and liquids are consumed to replace the loss by perspiration.

If a situation of this nature occurs, it is recommended to carry out the following procedure:

1. Take the person to a fresh secure place
2. Remove the protective clothing
3. If the person is awake, provide drinking fluid with electrolytes (ex. Gatorade)
4. Let the person rest until the skin cools down

Eye wash protection

All Activities that may include the possibility of splashing, eye injury, etc., must have eyewash equipment available on site, as required by 29 CFR 1910.151 (c).

Ear protection

All the Personnel that performs work on equipment that generate sounds or noise must be provided with adequate ear protection.

Fire prevention

Operations that include potential fire risks must be performed in such manner that these risks may be minimized. Fire extinguishers and tools that do not generate sparks should be used or be available as necessary. The possible sources of sparks should be removed from the area. When necessary, explosion proof tools shall be used to prevent fire or explosion.

Excavation

Any excavation greater than four feet deep into which a personnel must enter shall be designed and constructed in accordance with the applicable requirements of 29CFR 1926, Subpart P. The guidance for security in excavations is provided as Attachment 14.

m. Personal protection equipment

The lowest level of protection equipment required is Level D. The following equipment are required for use by the personnel working at the project site in the project. The following equipment shall be required for personnel working at the project site:

- Work related clothing
- Helmet
- Safety boots or shoes with steel tip
- Safety glasses
- Leather gloves or similar materials
- Ear protectors
- Harness for personnel working in heights or excavations
- Reflector jacket

This level may be increased to a higher protection level depending on the explosive level of the pollutant and the risks inherent on the job to be performed.

The following is a brief description of the Personal Protection Equipment (PPE) that may be required during various phases of the project. The terms used are those established by EPA: Levels A, B, C y D. If breathing protection equipment is required, this must be NIOSH approved and must be used in accordance with OSHA 29 CFR 1910.134. The requirements of the different levels of protection are defined below.

(i). Level A

Protection at Level A is used when:

- Hazardous substances that require the highest level of protection for skin, eyes and respiratory system.
- Substances with known or suspected high risk level for the skin.
- Chemical concentrations of the substance are known to be above the level of Immediate Danger to Life and Health (IDLH).
- Biological risks known or suspected require Level A.

(ii). Level B. This protection is used when:

- The substance has been identified and requires a high level of respiratory protection, but a lower protection level for the skin.
- Concentrations in the air are IDLH or above the maximum of the full face Air Purifying Respirator (APR).
- Oxygen deficiency or oxygen deficient atmosphere (<19.5%) are possible.
- Entrances into confined spaces require use of Level B PPE.

(iii). Level C. Protection Level C should be used when:

- a substance requires the same level of Protection as Level B, but with a lower respiratory protection level.
- the types of pollutants in the air have been identified, the concentrations measured and the decision to use respiratory protection indicates that use of an APR is sufficient to filter the pollutant. has been made.
- the substance has the adequate warnings requirements and all criteria for APR have been complied.

(iv). Level D. Level D protection is used when:

- The atmosphere does not contain unknown hazards
- Work tasks are not anticipated to have splash, immersions or any possible inhalation or unexpected contact with concentrations of hazardous chemicals.
- Atmospheric concentrations of pollutants are lower than TLV.

Table 4. Activity vs Protection Level

Activity	Personal Protection Equipment Level	Special Requirements
Excavation	D	Increase up to Level C if necessary based on sampling results of air and/or the possibility of skin contact.
Soil sampling	D	Go up to Level C if required based on the air sampling results and/or the possibility of skin contact.
Water sampling	D	Increase up to Level C, if necessary, based on the results of the air sampling and/or possible skin contact.
Removal of wastes or residues	C	Decrease to Level D with Level C protective clothing based on the air sampling results.
Removal of sludge	C	Decrease to Level D with Level C protective clothing based on the air sampling results.

n. Air monitoring and action levels

In accordance with 29 CFR 1910.120(h), the air sampling is performed to identify and quantify the levels of particles or vapors and airborne gases of hazardous substances as well as health risks, in order to determine the appropriate protection level required for personnel working at the site. The reference to be used is 10% of the LEL and/or vapor readings above the IDLH as maximum limit to stop the field work activities.

(i). Routine requirements for air sampling.

Air samplings are to be performed at the following moments or as specified by the Safety Official.

- Before work activities are initiated to establish that the conditions are safe.
- When the possibility of a flammable atmosphere has developed or there is an IDLH condition.
- During the course of the work to verify the pollutant levels in the respiratory zone.
- When work starts at a different site from where it started.
- When the pollutants found are different from those identified previously.
- When a different operation has started.

- When the tasks involve the handling of containers with leaks or when work is performed in areas clearly contaminated with fluids.
- During entering confined spaces.

(ii). Instruments.

Field measurements for the detection of volatile organic compounds (VOCs) shall be performed using an OVA or PID. All the data obtained by the instrument shall be documented in the air monitoring form (Attachment 2). All the equipment calibration data should be gathered. This data must be available for review by the persons involved in the project. The air monitoring instruments shall be calibrated and maintained in accordance with the manufacturer's specifications.

o. Site control

(i). Work zones.

The fundamental purpose for the controls at the site is to establish the perimeter of the danger zone, reduce pollutant migration to clean areas and prevent access to exposure of hazardous materials by non-authorized personnel. At the end of each work day, the site must be secured to prevent non-authorized entry. The work zones in the site may include:

Clean or support zones

This area is used to store materials and equipment not contaminated, vehicle parking, office and laboratory facilities, sanitary facilities and materials receiving. The Personnel that enter to this zone may include delivery Personnel, visitors, security guards and others, who not necessarily are allowed in the exclusion zone. All personnel that enter the support zone must report to the post command and sign an entry and exit log. There shall be a controlled entry and exit site from the clean zone to the decontamination zone.

Decontamination zone

The decontamination zone shall provide a site for personal protection equipment removal and for final decontamination of Personal Protection Equipment (PPE). All the personnel and equipment must exit through the Decon Area.

Exclusion zone / Hot zone

The Exclusion Zone or "Hot Zone" is the contaminated zone within the perimeter of the site. Entry to and exit from the zone shall be through a designated site. Warning signs shall be placed to identify the exclusion zone, for example,
 "Danger – only authorized personnel allowed"
 "Protection equipment required beyond this point"

(ii). Standard operating procedures and general field security

- The Buddy System shall be used at all times field Personnel are in the exclusion zone, specially if the personnel is required to use Level C Personal Protection Equipment or greater. Nobody shall perform field work alone.

Visual communication, as well as voice or radio, shall be maintained at all times.

- Up to wherever possible, contact with contaminated or potentially contaminated surfaces shall be avoided. Walk around (not across) any surface suspected of being contaminated, faded or stained. All personnel shall be maintained away from the containers with wastes, unless it is necessary to take samples or handle them. The equipment must be protected from contamination maintaining it covered with plastic or bagged.
- Smoking inside or outside of the designated areas in support zones is definitely prohibited.
- Hands and face should be washed once the decontamination area is abandoned, in that order.
- Beards and/or any other facial hair that interferes with the respirator adjustment may limit entry to the exclusion zone. Personnel with beard will not be able to enter the hot or exclusion zone.

- All the equipment must be decontaminated or properly discarded once leaving the exclusion zone, as determined by the project manager.
- All personnel leaving the exclusion zone must do so following the decontamination procedures as described in the Health and Safety Plan.
- The PPE as described in the Health and Safety Plan will be required for all field personnel working on site.

p. Decontamination

In general terms, everything that goes into the hot zone must be decontaminated or properly disposed once it comes out of this zone. All personnel, including any state or federal official, must enter and leave the exclusion zone through the decontamination zone. Before demobilization, the contaminated equipment must be decontaminated and inspected by the Safety Officer on site, and later taken to the clean zone. Any waste generated by the decontamination procedures must be stored in the designated area within the exclusion zone, pending disposal approval.

The waste generated must be stored in an area protected with visible physical barriers; each container must be properly labeled and placed over wooden pallets for easy handling and protection against floor contact. If considered necessary, the containers may be protected from weather conditions by use of 0.006 inch thick polyethylene sheets.

q. Decontamination of Personnel.

The personnel may be contaminated in different manners, including:

- By contact with vapors, gases, sprays, splashing of materials or particulates in the air.
- Walking across liquid puddles or contaminated soils.
- Using contaminated instruments or equipment.

Even taking into account safety measures, contamination may occur. Harmful

material can be transferred to clean areas exposing unprotected personnel. During removal of contaminated dressware, the personnel may be exposed to contact with the clothing or be affected by inhalation of the pollutant. To prevent such events, the decontamination procedures must be developed and established before any person enters the site and maintain them for throughout the full operation at the site

The personnel decontamination procedures should be based on the corresponding pollutant and level of protection required at the site. The personnel decontamination should be based on the corresponding contaminant and the level of protection used for the personnel on site.

(i). Sampling equipment.

Sampling equipment, when used on site, shall require a special cleanup procedure.

All personnel decontamination shall be performed using the appropriate clothing made for the corresponding decontamination level determined by the Health and Safety Officer. The decontamination activities will be shared and shifted within the work team.

The equipment decontamination procedures shall be performed in accordance with the Environmental Quality Board's specifications using the RCRA Quality Assurance Guidelines described below:

1. Brush or scrub with water and a phosphate free detergent
2. Rinse with water
3. Air dry
4. Wrap in aluminum paper

(ii). Disposal of contaminated materials.

All the materials and equipment used for decontamination must be appropriately disposed. The clothing, tools, brushes, pails, and all other contaminated equipment must be packed and stored in a particular place until the corresponding arrangements for decontamination or final disposal have been completed. Dress-up materials that have not been decontaminated completely can be secured in plastic bags before being removed from the site.

(iii). Emergency decontamination.

Personnel with medical or injury problems may require decontamination. There is a possibility that decontamination may aggravate or cause greater harm to the health. In the event that the person's life may be in danger and it is necessary to provide first aid and provide emergency medical treatment, the decontamination procedures shall be omitted, as long as it is notified to the persons that will be providing emergency treatment to the affected person. In each case, a member of the site management team must accompany the contaminated personnel to the medical facility to provide advice concerning the manner the decontamination should be performed.

(iv). Cleaning of Personal Protection Equipment.

Respirators, reusable clothing and any other personal items should be decontaminated and sanitized before reuse. The inside of masks and the clothing become dirty as result of exhaling, the body oils and perspiration. The manufacturer's instructions should be used to clean the respirators. The list of emergency equipment available at the site should be provided in accordance with the Attachment in this document.

r. Contingency Plan and Emergency Response

It is essential that the personnel on site be prepared in the event of an emergency. Emergencies may occur for different reasons: illness, injuries, chemical explosions, fires, explosions, spills, release of hazardous substances and even climate changes.

(i). Contacts and Emergency Telephones

A Contact List should be provided with names and telephone numbers of the people that, in one way or other, have knowledge of the work activities that will be performed in the project. A list of telephone numbers of the persons who, in one way other, have knowledge of the activities to be performed in the Project in case of emergencies (See Attachment). A location map of the nearest hospital to the work site should be provided. Copies of this list should be submitted to EQB as an attachment in to the Closure Authorization application.

All emergency equipment will be located in an accesible area. The exact location should be determined in the field before start-up of field work activities. (See Attachment).

(ii). Personnel Responsibilities During Emergencies.

The security official, in charge of the project site security, has the responsibility of responding and taking action in emergency situations. This person, among other things, shall be in charge of:

- Taking the necessary measures to protect the personnel, including evacuation of the exclusión zone, total evacuation and securing the zone. In addition, this person can require increase or decrease in the level of protection of clothing and respirators.
- Taking the necessary measures to protect the public and environment, including isolating and securing the area to prevent access to surface waters and controlling as much as posible the extent of the emergency.
- Assure that federal, state and local (municipal) agencies have been notified and the emergency plan is activated and coordinated. In the occurrence of fire or an explosión, the Fire Department shall be notified immediately. If toxic substances are released to the air, local authorities should be notified in order for them to evaluate the possibility of evacuating the site. In case of a spill, those in charge of the drinking water systems should be alerted.
- Assure the the appropriate decontamination procedure is followed for exposed or injured personnel.

- Determine the causes of the incident and make the corresponding recommendations to prevent recurrence.
- Make sure that all required reports have been prepared.
- In case someone has been injured, depending on the type and severity of the injury, notify the medical consultant.
- Notify the required regulatory and support agencies.
- Prepare a report of injuries/exposure (See Attachment).
- If the incident results in one or more fatalities or in the hospitalization of three or more persons, notify the Health and Safety Office within an eight (8) hours period.

(iii). Medical Emergencies.

Any person ill or injured in the exclusion zone must be decontaminated to the maximum level possible. If it is a minor illness or lesion, a complete decontamination should be performed and if possible provide first aid before being transported for medical assistance. If the condition is serious, at least a partial decontamination (for example, undress completely and dress again with clean clothes or cover with a blanket). First aid should be administered while the ambulance or paramedics arrive. All lesions and illnesses should be reported to the Security Officer.

Any person transported and injured to the hospital for treatment should have the appropriate instructions with respect to the route of the hospital and the information pertaining to the chemicals involved. Any vehicle used to transport a person exposed to the site conditions must be cleaned and decontaminated, as necessary.

(iv). Fire or Explosion.

In the event of a fire or explosion, the Fire Department must be notified immediately. As soon as they arrive the Security Officer must inform the Chief of Firemen the exact location and nature of the fire as well as the identification and location of hazardous material at the site.

As a security measure, personnel on site qualified to address this type of event, may use available equipment at the site to address the fire or remove or isolate any hazardous or flammable material that may contribute to the fire. In case of a significant event the personnel on site must backout from the area and wait for the Fire Department.

(v). Spills or Leaks.

In the event that a spill or leak occurs, the site personnel should locate the source of the spill and stop it, if it is possible to achieve in a safe manner and start the recuperation of the spill material. There should be an equipment and materials kit to prevent and/or to address the spill immediately.

(vi). Procedures and Escape Routes.

The evacuation routes shall be established according to the work areas. Evacuation must be performed immediately without procuring equipment in extreme emergency conditions. Refer to site map to identify the escape routes. The applicant must submit the site map to EQB as an attachment to the Closure Permit Application.

- Site evacuation shall be alerted by all means possible, including the continuous sounds of an air siren, a vehicle or radio siren and direct verbal communication or through loud speakers.
- At all possible moments maintain the evacuation upwind from the spill site or from when smoke, gases or vapors are moving.
- Leave through the decontamination (decon) unit, if possible.
- If the evacuation cannot be performed through a decon unit, the site personnel should assist in removing the contaminated clothing near the exclusion zone, leaving the clothing at the exclusion zone or safe place near the exclusion zone.
- The Security Officer should confirm the presence of all the people present to assure that everyone has been evacuated.

(vii). Accidents in the perimeter.

If any person in the site observes an accident, that person must submit an accident report (See Attachment) and provide this report to the Health and Safety Officer, within seventy-two hours. Nearby accidents are those that, depending on the circumstances, may result in death, personal injury and/or damage to property or equipment.

(viii). Traffic control / traffic.

This section provides a program for traffic control and safety during field activities. The objective of the program is to standardize and clarify the minimum expectations of the practices of traffic control. Everyone working in field projects must understand the different Protection levels in the job and how to implement them..

The Personal Protective Equipment (PPE) is divided in three categories that address a corresponding risk level. These risks include the combination of exposure to traffic and its speed, the complexity of the tasks to be performed and the difficulty that may occur to identify the clothing as result of the surroundings. The background materials should be a green-yellow fluorescent, orange-reddish fluorescent, orange-reddish fluorescent (high visibility orange) or fluorescent red and should provide a 360 degree visibility. The retro reflector should be at least two inches (2") above the barricade. In case multiple bands or reflector materials are utilized, these should be separated by at least the width of the bands.

As part of the basic PPE required in a health and safety plan, it is expected that personnel in field projects use high visibility clothing from level 2 and above. Level 3 is required for any job to be performed during the night or where the traffic flow during the night exceeds thirty-five (35) miles per hour.

The digging of trenches in the work area requires that highly visible traffic cones (including one or more banners) or barriers, have should have at least forty-eight (48) inches high. These should be utilized in the field and anywhere there is a possibility that a vehicle may enter the work zone.

Traffic Control Apparatus

The selection of traffic control apparatus should be based on minimum expectations and through considerations of the specific hazard level at the work site. It is important to keep in mind that the purpose of most traffic barriers is to provide a visible alert to the traffic and ordinarily do not provide any physical barrier between the worker and the traffic.

Protection Levels

The protection level shall depend on the particular factors of the task to be performed.

Level 1. Routine activities of short duration (less than 10 minutes) where the worker may be aware of the traffic in the surrounding area, for example, taking survey readings.

Level 2. Work Activities that prevent the worker from being alert to the traffic irrespective of the duration and activities that may take more than ten (10) minutes and where level 3 has not been declared.

Level 3. Tasks of high workload the distract the employees attention from the traffic (this includes tasks that generate loud sounds which do not allow the worker hear the traffic that may approach suddenly). Tasks performed under low light and/or at night and those tasks that require the closure of access between the access route and the work area (for example, if the main access to the station is closed). In thses situations a posting of appropriate warning sign is required for the oncoming traffic.

Level 4. Traffic control in the middle of a traffic route.

Table 5. Traffic control in the middle of a traffic route

Conditions	Level 1	Level 2	Level 3	Level 4
Traffic or activity volumen	None /Low	Moderate	High	High
Duration of activity	< 10 minutes	>10 minutes	Extended	Extended
Concerns of third parties	Low	Low	Moderate	High
Size of work area	Small	Average	Large	Large
Use of heavy equipment	No	No	Yes	Yes
USDOT requirements	No	No	No	Yes

Among recommended practices for different types of levels are:

Level 1. Use a minimum of 4 cones or delimiters for each work area with a maximum of 4 feet distance between them. If possible use a vehicle with intermittent lights to provide a visual alert and physical protection from the rest of the traffic. Always have one person to take care exclusively of the traffic or being alert to the traffic while the companion performs the work. Use this technique always when the conditions of the area make it necessary, such as places where there is high concentration of electric or hybrid cars which at low speeds frequently cannot be heard. If work is being performed in areas for more than ten (10) minutes use Level 2 below.

Level 2. Use a tape in the delimiters, banners, field vehicles (with intermittent lights) and/or other traffic control devices. The barriers or barricades may also be used in conjunction with other systems noise these can make if impacted by another vehicle. The buddy system where a companion assumes charge of the traffic should be used in all cases where the employee cannot focus himself on the traffic or where this person is exposed to dangers as result of the traffic. These Level 2 practices should be used to secure areas in a temporary manner or to isolate a storage area or move materials and/or equipment.

Level 3. Use plastic security fences and/or barriers type 2 or 3. In addition, local electrical utilities may also be used to provide greater visibility. Concerns of the client should also be taken into consideration, such as not obstructing gasoline dispensers. These Level 3 measures should be implemented in those instances where heavy equipment, rotary or electrical tools are used. These measures are implemented as a measure of protection for the employees and public near slow moving traffic or routes with high traffic volume, sidewalks around potential trip risk areas and to control the movement of others. If there is no potential of traffic from other than job personnel, then Level 3 measures are not required.

Level 4. Used for any traffic route. This level may require supervision of a licensed traffic controller. If the frequency of vehicles backing up is low, the requirement of at least 48 inches for traffic control devices does not apply.

Summary of the Traffic Control Plan

A Traffic Control Plan describes the control measures to be used to manage the flow of vehicles and pedestrians in a secure manner around the work area. The scope of this control plan may vary from a detailed plan to a simple representation with figures or typical drawings contained in manuals approved by the government roads and highway agency or specific drawings contained in the work contract. If the specific characteristics of the work area are unknown, a pre-planning field visit to the site is recommended.

Depending on the area or region where the work is being performed, the requirements or safe practices at these levels may change and require stricter measures. A detailed analysis of security on the job is required.

Summary of the Requirements for Closure of Public Traffic Routes:

Generally, the service of a licensed traffic controller provider is required in order to be allowed to close public transit route.

The closure of public sidewalks, parking spaces along the street, etc. may require permits and not necessarily a traffic controller service provider.

Work in Public Traffic Routes

Typically to be able to work on public traffic routes authorization from local authorities is required. If the project requires it, precise maps with the correct design of lanes and directions must be prepared.

In the majority of cases it may be necessary to use a licensed traffic controller service provider. Those permits that must be obtained should be requested beforehand from the corresponding authorities to assure that they are available on a timely manner. Many of these permits restrict the periods of time the work can be performed. The task of directing the traffic between the work area and the right of way does not require a licensed traffic controller.

Security Analysis in the Work of Traffic Control

In pre-planning, it is necessary to develop an evaluation of security on the job that considers the conditions of traffic, analyzes the possible risks that it represents and that action be taken to establish a more secure traffic control area. The more experienced personnel should be involved in this analysis so that it be specific to the work area and achieves the mitigation of possible risks. This information should be provided to the employees involved and assure that it be updated daily.

Conditions to be considered at the Moment of Evaluating Security on the Work Site

At the moment of making an evaluation of security, existing traffic signs should be taken into consideration and those additional that may be necessary, speed reducers and breakdowns in the roadway. The space necessary to perform the work, bicycle routes, pedestrian flow, access to residences, schools, Centers of Diagnostics and Treatment (CDT), etc., lanes that merge to form one, weather conditions and visual restrictions are also matters that should be taken under consideration beforehand.

In the particular case of pedestrians, these should not be directed towards direct contact with vehicles, equipment, operations or vehicular traffic in the work area. The pedestrian should be provided with a safe route similar as much as possible to the characteristics found in the sidewalk or pedestrian right of way. Access to entrances and exits to and from buildings must be considered along with the wide

range of persons that might be making use of the pedestrian area to be rehabilitated. Not all persons are equal and it is necessary to be prepared for pedestrians with particular needs, such as physical impairments, hearing impairments, blindness among others.

Additional Measures to be considered

Coordinate with the owner or the person in charge of the site to discuss the evaluation of traffic at the site and near it. Always be aware and identify possible risks, be alert to cars and have a planned escape route to exit the work area in case of emergency. Maintain an upright position, don't give your back to the traffic if at all possible, don't trust anyone, even when you think they have seen you.

Work off peak rush hours and minimize work time in traffic. Park field vehicles with intermittent lights on to block off traffic and install additional lights on them. Use security perimeters with bright colors and high intensity lights during nightshift work. Use temporary pavements and secure Police assistance during peak traffic hours, if necessary.

In the Attachment of this document presents a traffic control guide taken from OSHA, which may be used as a reference to follow.

6. DOCUMENTATION

a. Data Management

All the information corresponding to each specific project must be maintained organized, in chronological order and detailed to assure that at any time information pertaining to the project is requested it is available. The information should be sufficiently detailed to address any inquiry and demonstrate that all relevant matters pertaining to the project have been addressed.

b. Information Record

The field personnel shall maintain a record of all field operations, sampling and corrective actions in field notebooks with consecutively numbered pages. The entries are to be made in non-erasable ink and should include date and signature of the person that made the entry. The documentation of information in the notebooks will facilitate entry of information into any database and should include at least the following, as necessary:

- Project title (UST facility ID with action being performed)
- Location (specific site location, including coordinates)
- Date and time of sampling activity
- Type of sampling activity (soil, groundwater, vapors)
- Names and positions of the persons participating in the sampling activity and name of the firm they represent
- Weather conditions during the field activities
- Coordinates of sampling points
- Depth at which samples are taken in each specific sampling station

- Description of each sample taken (color, odor, visual evaluation)
- Description of the conditions in the sides and bottom of the excavation (color of soil, distinctive odor, stains, or visual evidence of product release, groundwater, etc.).
- Identification of conditions that may affect the representativeness of a sample (recent storm event, high river flow, stormy seas, flooding, etc.).
- Signature of the person that makes the entries.

The owner of the Project must keep all site specific documents, including field work, must be kept on file for a minimum of three (3) years. A hard copy of these same documents shall be kept in the case file at EQB for three years.

Procedure to Detect and Correct Errors

Under situations the field notebook may be under risk of contamination or damage, the observations or data should be documented in another field notebook and later transferred to the original notebook documenting the reasons for which this was done. Whenever possible, both notebooks should be retained as evidence. All original evidences should be maintained with the case file.

All field documents should be kept at the project site in order to maintain them updated with observations, events and measures taken during the field investigation.

Any correction or change performed to the field documents should be done by crossing out the error with a single line (to allow the error to be seen), writing the correction beside, not over it. The person making the correction should also include his/her initials and date the correction was made. Use of corrective tapes, inks or write-over are not accepted.

c. Closure Final Report

Within 90 calendar days after completing all field work and having received the laboratory final report with the analytical results, a Closure Final Report containing all laboratory analytical and field results and observations must be submitted to the GPD for review and approval. All information and data provided in the report is considered confidential until the GPD, within thirty (30) calendar days of receipt of the report either, approves the report as final and issues final comments on the report which may be:

- (a) Release of no further action or
- (b) Requirement for a site investigation.

Closure Final Report

This report shall describe in detail all field activities performed in the field, conditions of the site, observations and any corrective action that may have been implemented and that may contribute to the evaluation of the results and in the decision making process.

The Closure Final Report should include the following:

- Filing Application for the UST system
- ACA 1B y ACA 2B (Attachment 10)

- Cover letter that includes the following corresponding details:
 - Project name
 - Type of activity
 - Name of the companies involved
 - Physical location of the site where the activities were performed date on which the UST system was removed
 - Date of Closure Authorization issued by EQB
- Narrative of the closure activities performed, sampling Procedures followed and the results of laboratory analyses.
- Diagram showing the exact location of the sampling points with respect to the location of the UST System and other structures and Activities within a radius of 1,500 feet.
- Evidence that the analytical results are validated (including data qualifiers of the results) by a third party independent to the analytical laboratory. The data validation must be performed in accordance with the EPA Region II validation protocols. The validation guidelines and Standard Operating Procedures are available at the following EPA Internet site:
 - www.epa.gov/r02earth/qa/documents.htm.
- Summary of the field conditions during the sampling activity, including any change since sampling plan was established.
- Brief description of the handling and final disposal of the USTs and any sludge, fluid containing regulated substances, water, piping, soil, entre otras cosas, removed as part of the closure process (include evidence of the manifests).
- Certification of the contractor that performed the UST closure, sealed and signed.
- Tables 6 y 7 of the PARPCUST that provide the sampling results, parameters and sampling points.
- Laboratory sheets that show the results of the sampling points. These sheets include the analytical data, method, type of samples (soil or water) and person who performed the analyses.
- Evidence that the analyses, results and QA/QC are sealed and certified by a chemist licensed in Puerto Rico (provide copy of the license).
- Tables 8 and 9 of PARPCUST which indicate the statistical summary of laboratory quality control for each parameter and matrix (% Recovery Precision (RPD), Laboratory Control Duplicate (LC/LCD), Surrogate and Matrix Spike Duplicate (MS/MSD) as applicable). These should include approval criteria of each analysis.
- Chromatographs and calibration curves with raw data.
- Copy of the field notebook and chain of custody properly documented.
- Photographic evidence, in digital format, concerning the different stages of the UST system closure process, location of the different sampling points that includes sampling station at each point, date, time and brief description.
- All information concerning Corrective Actions performed during the sampling and Laboratory analytical phases.
- Instrument calibration sheets.
- Documentation used to substantiate other field activities (for example return receipt documents, equipment calibration sheets, construction of monitoring wells, etc.).

7. REVIEW AND ACCEPTANCE OF FINAL REPORT

In this section are described the criteria used to determine acceptance, rejection or qualification of information pertaining to a particular project submitted to EQB. Basically, this is the process by which the Final Closure Report is verified and approved once the applicant completes the closure process and laboratory results are obtained.

The primary validation is under the responsibility of the sampling and laboratory personnel which are parties that have the knowledge to determine if the work performed complies with the requirements of EQB established in this document. Both, sampling and laboratory personnel must be adequately prepared and certified for the work they perform. It is not sufficient that they know how to perform a procedure, it is necessary that they are also capable of being aware that the procedure is being performed correctly, be able to detect errors and correct them when they occur. The technical staff, whether sampling or laboratory must review all analytical reports and if any deficiency is found must correct it and clarify the report in accordance with section 4k pertaining to corrective actions.

When, through quality controls, errors are identified that do not comply with the requirements of QA/QC it is necessary to stop the analyses and determine the causes of such non-compliance.

The analytical results that should be included as part of the Sampling Final Report should be validated in accordance with the validation protocols of EPA Region 2. The validation guidelines and Standard Operating Procedures may be found at the following Internet site: www.epa.gov/r02earth/qa/documents.html.

The validation report should be in table format and should include at least the following information:

- Narrative of how the samples were received, including temperature
- Time of analyses
- Collection of control samples and results
- Percent recovery and precision of duplicates

Table 6. Results of Chemical Analyses performed on the samples of SOIL and QA/QC taken during removal of UST

Sample ID #	Depth (feet-inch)	T P H (ppm)								B T E X (ppm)						Lead (ppm)	MTBE (ppm)
		Gasoline (GRO)	Diesel (DRO)	Oil (ORO)	Used Oil (ORO)	Kerosene	Jet Fuel	Bunker	Fuel Oil	Benzene	Toluene	Ethylbenzene	o- Xylene	m, p- Xylene	Total Xylenes		
Duplicates																	
Equipment Blank																	
Field Blank																	
Trip Blank																	
Reported Limit																	
Methods utilized																	
ppm: parts per million - Mg/Kg : Milligrams per Kilogram																	

Table 7. Results of Chemical Analyses performed on Water and QA/QC samples taken during UST removal

Sample ID #	Depth (feet-inch)	T P H (ppm)								B T E X (ppm)						Lead (ppm)	MTBE (ppm)
		Gasoline(GRO)	Diesel (DRO)	Oil (ORO)	Oil (ORO)	Kerosene	Jet Fuel	Bunker	Fuel Oil	Benzine	Toluene	Ethylbenzene	o- Xylene	m, p- Xylene	Total Xylenes		
Duplicates																	
Equipment Blank																	
Field Blank																	
Trip Blank																	
Reported Limit																	
Methods used																	

ppm: parts per million - Mg/Kg : Milligrams per Kilogram

Table 8. QA/QC Report for SOIL

Parameter		MS Spike (Quantity)	Sample Found	MS Found	MSD Found	MS %Rec	MSD %Rec	RPD	QC Limits MS/MSD	RPD	Qualifier
T P H (ppm)	Gasoline (GRO)										
	Diesel (DRO)										
	Oil (ORO)										
	Used Oil (ORO)										
	Kerosene										
	Jet Fuel										
	Bunker										
	Fuel Oil										
B T E X	Benzene										
	Toluene										
	Ethylbenzene										
	O- Xylene										
	m, p- Xylene										
	Total Xylene										
Lead (ppm)											
MTBE (ppm)											

ppm: parts per million - Mg/Kg : Milligram per Kilogram

TABLE 9. QA/QC Report for WATER PHASE

Parameter		MS Spike (Volume)	Sample Found	MS Found	MSD Found	MS % Rec.	MSD % Rec.	RPD	QC Limits MS/MSD	RPD	Qualifier
T P H (ppm)	Gasoline (GRO)										
	Diesel (DRO)										
	Oil (ORO)										
	Used Oil (ORO)										
	Kerosene										
	“Jet Fuel”										
	“Bunker”										
“Fuel Oil”											
B T E X	Benzene										
	Toluene										
	Ethylbenzene										
	o-Xylene										
	m, p-Xylene										
	Total Xylenes										
Lead (ppm)											
MTBE (ppm)											
ppm = parts per million = Mg/Kg : Milligrams per Kilogram											

Below are indicated the steps used by the QA/QC Officer of the WQA and the technical Personnel of the GPD to review the analytical and technical data provided in the Final UST Closure Report submitted by the petitioner in accordance with section 6.d:

a. Narrative

The narrative must provide all information pertaining to the conditions of how the samples were received in the Laboratory and if all the samples were submitted and analyzed as required.

b. Verification of Chain of Custody

This is used to verify the handling and custody of samples, analytical methods, parameters, matrixes, type of containers used, preservatives, type of sample, temperature at which the samples were received at the laboratory, duplicates and time of analysis of each parameter. In addition, custody of the samples is verified to assure that the process was performed correctly. In this case, any inconsistency may result in the invalidation of the chemical phase which would require another round of laboratory analyses.

c. Evaluation of results

The results obtained and the depths at which the samples were collected are correlated based on the narrative provided.

d. Analysis of Quality Control Samples

The results of the control samples (field blanks, trip blanks, equipment blanks) are evaluated. The results of these blanks should indicate total absence of substance for which the sample is being analyzed. Duplicates are then evaluated in accordance with the following formulas:

$$\% \text{ Rec} = \frac{\text{(Observed value of sample + Spiked sample)}}{\text{Grab sample}} - (\text{known value} * 100)$$

% Rec: Percent Recovery

$$\text{RSD} = \frac{X_1 - X_2}{(X_1 + X_2)/2} * 100$$

RSD: Relative Standard Deviation

X₁: First sample and X₂: Second sample

The acceptable level of accuracy for analyses varies between laboratories. Item (e) indicates the precision in the field. That precision and the acceptable level should be about 30% or less for water and 50% or less for soil. These calculations are developed for each and every parameter.

e. Linearity of the parameters

The correlation coefficient must be greater than 0.995; in the case it may be lower and the analyses have been completed, this may be sufficient cause to invalidate the data. In instrument runs best laboratory practices indicate the blanks should be run first to assure that equipment is in optimal operating conditions. After the blanks come the samples, then laboratory duplicates of that group, followed by field duplicates, control samples and last being the method blanks.

f. Report on general review of analytical data

The QA/QC Officer shall evaluate the analytical data following the Attachment in this document as guidance. Once the data is reviewed, a report is issued indicating whether the data pertaining to the chemical phase is acceptable or not. This report is issued as an internal document of the Water Quality Area QC/QA Program. This report is forwarded to USTCD for the technical evaluation of the field work.

g. Technical evaluation of the field work

The technical evaluation includes an extensive and detailed review of the data submitted in the Final UST Closure Report to assure that these have been properly documented. In addition, the inspection report performed by the EQB technical personnel present during the sampling and closure activities is evaluated (See Attachment) along with the Report on General Review of Analytical Data by the QA/QC Officer, in order to have a detailed knowledge of the case and determine, on the basis of such evaluation, what should be the next step in the case. This may be a determination of additional evaluation of the site, provide a relief of further action or a determination of other corresponding action. As result of this technical evaluation the GPD shall issue the corresponding response to the petitioner.

8. APPLICABLE REGULATIONS

a. Federal regulations

- Code of Federal Regulations, Title 42, Chapter 82, Subchapter IX, Subtitle I of the Hazardous Solid Wastes Act, as amended.
- *American Recovery and Reinvestment Act* (ARRA Act, Pub. L. 111-5, specifically the [LUST provision of the American Recovery and Reinvestment Act](#)).
- Code of Federal Regulations, Parts 280, 281 and 282.50 thru 282.105. These regulations are divided in three sections: technical requirements, financial responsibility requirements and objectives to approve delegation of these programs to States, as amended.
- *Energy Policy Act* of 2005 (Pub. L. 109-58) , as amended.

b. State regulations:

- Section 4(b)(3) of Act 416 of September 22, 2004, as amended, with respect to the Presentation, Evaluation and Implementation of Environmental Documents, as amended.
- Regulation for the Process of Presentation, Evaluation and Handling of Environmental Documents, Regulation num. 6510 of August 22, 2002, as amended.
- Regulation for Processing of General Permits, Regulation num. 7308 of March 1, 2007, as amended.
- Regulation for the Control of Underground Storage Tanks, Regulation num. 4362, as amended.
- Regulation for the Certification of Plans and Documents at the Environmental Quality Board, Regulation num. 4209 of February 26, 1986, as amended.
- Regulation for the Control of Hazardous Solid Wastes, Regulation num. 2863 of March 1982, as amended.
- Regulation for the Control of Non-hazardous Wastes, Regulation num. 5717 of November 10, 1997, as amended.

c. Actions at EQB that require use of PARPCUST

- Submit a Closure Permit Application
- Obtain the Closure Permit from EQB
- Notification and Coordination of Sampling with EQB
- Submit a Final Closure Report

- Obtain a UST Release or a Site Investigation application from EQB
- Perform the site inspection and submit the report for EQB evaluation
- Obtain a UST Release or Corrective Action Application
- Submit the Corrective Action Plan for EQB evaluation
- Perform Corrective Actions and submit the required report in accordance with the approvals issued
- Perform sampling activity in presence of EQB when Corrective Actions are being finalized
- Submit final report of Corrective Action for EQB evaluation
- Obtain a release from EQB

REFERENCES

1. Soil Screening Guidance, USEPA, 1996.
2. How to Effectively Recover Free Product at Leaking Underground Storage Tank Sites: A Guide for State Regulators, USEPA, 1996.
3. How to Evaluate Alternative Cleanup Technologies For Underground Storage Tank Sites: A Guide for Corrective Actions Plan Reviewers, USEPA, 1995.
4. Operating and Maintaining Underground Storage Tank Systems: Practical Help and Checklist, USEPA, 2000.
5. Expedite Site Assessment Tools for Underground Storage Tank Sites: A guide for Regulators, USEPA, 1997.
6. SW-846, Third Edition with updates, Revision 6, 2004.
<http://www.epa.gov/epawaste/hazard/testmethods/index.htm>.
7. Methods and Guidance for Analysis of Water, USEPA, EPA 821-C-99-004, June 1999.
8. EPA screening level (SL) tables. http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/Generic_Tables/index.htm.

ATTACHMENTS
PARCUST



JCA
 JUNTA DE CALIDAD AMBIENTAL
 Estado Libre Asociado de Puerto Rico



ÁREA DE CALIDAD DE AGUA
 DIVISION DE CONTROL DE TANQUES DE ALMACENAMIENTO SOTERRADOS

PARPCPTAS-004

**Personal de Agencias de Contacto
 En caso de emergencia**

Contacto de Emergencia	Nombre de la Institución	Número de Teléfono
Agencia Estatal para el Manejo de Emergencias		
Bomberos		
Ambulancia		
Policía		
Unidad de Respuesta a Materiales Peligrosos		
Centro de Control de Envenenamiento		
Servicios Médicos en el lugar (onsite)	<input type="checkbox"/> Sí <input type="checkbox"/> No	N/A
Oficial de Salud y Seguridad		
Nombre		
Hospital		
Dirección		
Ruta al Hospital (explicar brevemente e incluir un mapa de la ubicación del hospital)		



PARPCPTAS-005

Equipo de emergencia
 Disponible en el lugar

Equipo de comunicación

	Teléfonos celulares
	Radio comunicadores
	Señales manuales
	Señales con banderas y letreros
	Alarmas o sirenas de emergencia

Equipo de monitoreo

	Medidor de porcentaje de oxígeno (Tipo instrumento:)
	Medidor de vapores COV (Tipo de instrumento:)
	Medidor de % LEL (Tipo de instrumento:)

Equipo médico

	Primeros auxilios
	Estación de lavado de ojos
	Ducha de emergencia
	Sábanas
	Camillas, etc.

Equipo contra incendios

	Extintores de fuego

Equipo Contra derrames

	Materiales absorbentes
	Absorbente seco o granulado
	Otros:

Equipo de seguridad adicional:



ÁREA DE CALIDAD DE AGUA
DIVISION DE CONTROL DE TANQUES DE ALMACENAMIENTO SOTERRADOS

PARPCPTAS-008

Informe de Lesión/exposición

Nombre del Proyecto:	Núm. UST:
Localización:	Gerente de Proyecto:
Fecha:	Hora de la lesión:

Oficial de Salud y Seguridad:

INFORMACIÓN PERSONAL:

Nombre del lesionado:	
Dirección:	
Cargo que ocupa:	
Edad:	
Sexo:	

CATEGORIA DEL ACCIDENTE:(vehículo de motor, fuego, daño a la propiedad, exposición química, otros (por favor explique)

GRADO DE SEVERIDAD DE LA LESION / EXPOSICION (no-incapacitante, incapacitante, tratamiento médico, fatalidad)

NATURALEZA DE LA LESION / EXPOSICION

CLASIFICACION DE LA LESION / EXPOSICION: (Favor verificar)

<input type="checkbox"/> FRACTURAS	<input type="checkbox"/> ULCERAS DE AGUA	<input type="checkbox"/> AGOTAMIENTO POR CALOR
<input type="checkbox"/> DISLOCACION	<input type="checkbox"/> QUEMADURAS POR CALOR	<input type="checkbox"/> ALERGIA DERMAL
<input type="checkbox"/> CALAMBRES	<input type="checkbox"/> QUEMADURAS POR RADIACION	<input type="checkbox"/> MAREOS
<input type="checkbox"/> ABRASIONES	<input type="checkbox"/> QUEMADURAS QUIMICAS	<input type="checkbox"/> ALERGIA RESPIRATORIA
<input type="checkbox"/> LACERACIONES	<input type="checkbox"/> PICADAS	

PARTE DEL CUERPO AFECTADA:

GRADO DE INCAPACIDAD:**FECHA EN QUE EL TRATAMIENTO MEDICO FUE RECIBIDO:****INFORMACION SOBRE LESION / EXPOSICION**

Agente causante más directamente relacionado con la lesión / exposición (objeto, sustancia, material, maquinaria, equipo, condiciones)

Fue el clima un factor?

Condición ambiental, mecánica, física al momento de la lesión / exposición (Especifique)

Factores personales (aptitud impropia, falta de conocimiento o destreza, reacción lenta, fatiga):

Nivel de equipo de protección personal especificado en el Plan de Salud y Seguridad

Medicamentos:

Estaba la persona lesionada utilizando el equipo de protección personal requerido?

Si no, como el equipo actual utilizado difiere del especificado en el Plan de Salud y Seguridad?

Qué se podrá hacer para evitar que este tipo de accidente no sea recurrente? (modificación de equipo, Cambios mecánicos, adiestramiento adicional, etc.)

Narre en detalle una descripción de la lesión / exposición. Cómo ocurrió? Por qué? Objetos, equipo, herramientas usadas, circunstancias, tareas asignadas, etc. (Especifique)

Testigos de la lesión / exposición (Nombres y testigos oculares)



PARPCPTAS-009-1A

Certificación Recibo Plan de Muestreo

ACA 1-A

(Certificación a ser sometida para actividades de muestreo relacionado con cierres, rastreos y remediación, entre otros).

Esta certificación debe ser sometida en original junto a la solicitud de radicación para sistemas de Tanques de Almacenamiento Soterrados y copia de la misma someterla a la DICFP del ACA diez (10) días laborables **antes** de efectuarse la actividad de cierre.

Por la presente, yo _____ en mi carácter de _____ Del
 (Nombre y apellidos) (Título o posición)

laboratorio _____ certifico que he recibido copia fiel y exacta del PARPCPTAS para Cierres
 (Nombre del laboratorio)

De TAS de la JCA para el proyecto _____
 (Número identificación)

_____, ubicado en _____ . Que
 (Nombre de la empresa) (Dirección física)

las actividades incluidas en dicho PARPCPTAS en las cuales _____
 (Nombre laboratorio)

tenga inherencia, serán efectuadas acorde con lo establecido en el mismo.

 Firma
 Sello/Número licencia (Si aplica)

(En caso de que la toma de muestras y los análisis de laboratorio sean realizados por diferentes entidades, cada una de las mismas deberá cumplimentar esta certificación).



PARPCPTAS-009-2A

Certificación Recibo Plan de Muestreo

ACA 2-A

(Certificación a ser sometida para actividades de muestreo relacionado con cierres, rastreos y remediación, entre otros).

Esta certificación debe ser sometida en original junto a la solicitud de radicación para sistemas de Tanques de Almacenamiento Soterrados y copia de la misma someterla a la DICFP del ACA diez (10) días laborables **antes** de efectuarse la actividad de cierre.

Por la presente, yo _____ en mi carácter de _____
 (Nombre y apellidos) (Título o posición)

certifico que he recibido copia fiel y exacta del PARPCPTAS para Cierre de

 (Nombre empresa)

TAS de la JCA para el proyecto

 (Número identificación)

, ubicado en _____ . Que

 (Nombre de empresa)

 (Dirección física)

las actividades incluidas en dicho PARPCPTAS en las cuales

 (Nombre de empresa)

tenga inherencia, serán efectuadas acorde con lo establecido en el mismo.

 Firma

Sello/Número licencia (Si aplica)

(En caso de que la toma de muestras y los análisis de laboratorio sean realizados por diferentes entidades, cada una de las mismas deberá cumplimentar esta certificación).



JCA
 JUNTA DE CALIDAD AMBIENTAL
 Estado Libre Asociado de Puerto Rico



ÁREA DE CALIDAD DE AGUA
 DIVISION DE CONTROL DE TANQUES DE ALMACENAMIENTO SOTERRADOS

PARPCPTAS-009-1B

Certificación Actividades de Muestreo

ACA 1-B

Esta certificación deberá ser completada y ser sometida en original junto con los resultados, Información de control de calidad y certeza de calidad y cualquier otro documento referente a las actividades efectuadas bajo el PARPCPTAS para Cierre de TAS de JCA.

Por la presente, yo _____

en mi carácter

de

(Nombre y apellidos)

(Título o posición)

de

certifico que he efectuado todas las actividades en las cuales

(Nombre empresa)

tenemos inherencia, incluidas en el PARPCPTAS para Cierre de TAS de la Junta de Calidad Ambiental

para el proyecto _____,

(Número identificación)

(Nombre empresa)

, ubicado en

(Dirección física)

y que dichas actividades se hicieron en

Conformidad con el PARPCPTAS para Cierre de TAS de la JCA.

Firma

Sello/Número licencia (Si aplica)

(En caso de que la toma de muestras y los análisis de laboratorio sean realizados por diferentes entidades, cada una de las mismas deberá cumplimentar esta certificación).



JCA
 JUNTA DE CALIDAD AMBIENTAL
 Estado Libre Asociado de Puerto Rico



ÁREA DE CALIDAD DE AGUA
 DIVISION DE CONTROL DE TANQUES DE ALMACENAMIENTO SOTERRADOS

PARPCPTAS-009-2B

Certificación Actividades de Muestreo

ACA 2-B

Esta certificación deberá ser completada y ser sometida en original junto con los resultados, Información de control de calidad y certeza de calidad y cualquier otro documento referente a las actividades efectuadas bajo el PARPCPTAS para Cierres de TAS de JCA

Por la presente, yo

en mi

Del

carácter de

(Nombre y apellidos)

(Título o posición)

laboratorio

certifico que he efectuado todas las actividades en las

(Nombre del laboratorio)

cuales tenemos inherencia, incluidas en el PARPCPTAS para Cierre de TAS de la Junta de Calidad Ambiental

para el proyecto

(Número
identificación)

,

(Nombre empresa)

, ubicado en

_____ y que dichas actividades se hicieron en

(Dirección física)

Conformidad con el PARPCPTAS para Cierre de TAS de la JCA.

Firma

Sello/Número licencia (Si aplica)

(En caso de que la toma de muestras y los análisis de laboratorio sean realizados por diferentes entidades, cada una de las mismas deberá cumplimentar esta certificación).



JCA
 JUNTA DE CALIDAD AMBIENTAL
 Estado Libre Asociado de Puerto Rico



ÁREA DE CALIDAD DE AGUA
 DIVISION DE CONTROL DE TANQUES DE ALMACENAMIENTO SOTERRADOS

PARPCPTAS-010

Certificación de Registros e Informes

Yo _____

Con el título o posición _____

En mi carácter de dueño u oficial de más alto rango en representación de la entidad o compañía _____

Ubicada en _____

Y registrada con el número del sistema de Tanques de Almacenamiento Soterrado (TAS):

UST-____-____ en la División de Protección de Aguas Subterráneas (DPAS) certifico que se utilizará el PARPCPTAS para Cierre de TAS de la Junta de Calidad Ambiental.

También certifico que todos los TAS y las líneas asociadas a ser instalados en este lugar (si aplica) serán construidos con doble pared y monitoria intersticial según requerido por el Acta Federal de Energía de 2005 (Energy Policy Act of 2005).

Además, en cumplimiento con la Regla 1002 del Reglamento para el Control de Tanques de Almacenamiento Soterrados, por la presente certifico que toda la información sometida en este documento y en todos los anejos es exacta, verídica y completa y que la misma ha sido expuesta sin intención de desvirtuar los hechos o de cometer fraude. Tengo conocimiento que de descubrirse cualquier falsedad o fraude estaré sujeto a penalidades de multas, encarcelamiento o ambas penas.

Nombre y apellidos

Firma

Compañía

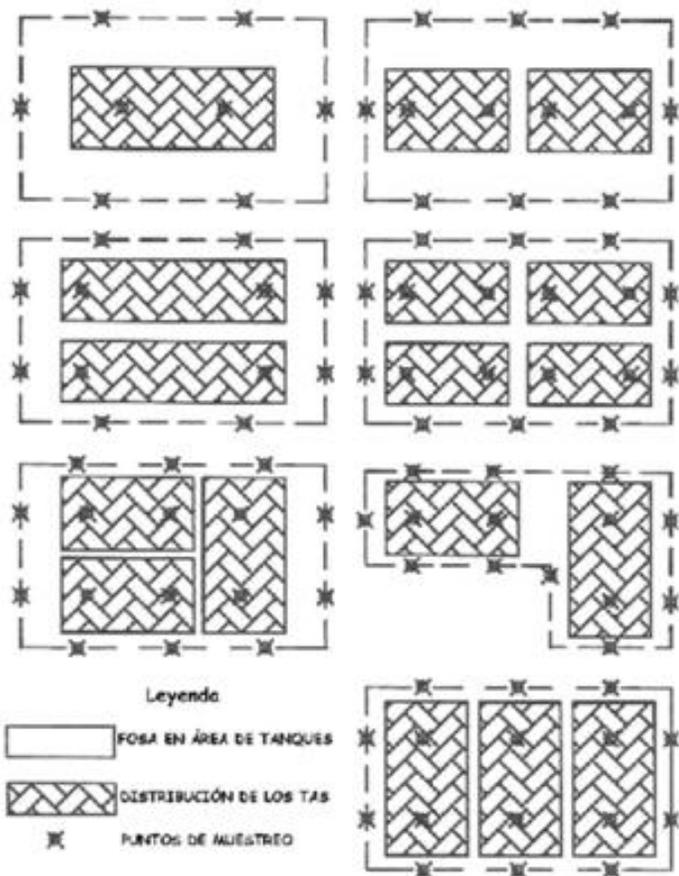
Título o posición

Fecha

PARPCPTAS-011

Puntos de Muestreo durante cierre de tanques de almacenamiento soterrados

Esquema de muestreo para diferentes distribuciones de TAS



Esquema para excavación con agua en el fondo de la fosa



Esquema para trincheras de tubería de distribución y surtidores





[Construction](#) > [Construction Outreach TOC](#) > Excavations

**Construction Safety and Health
Outreach Program**

U.S. Department of Labor
OSHA Office of Training and Education
May 1996

Excavations

INTRODUCTION

The Occupational Safety and Health Administration (OSHA) issued its first Excavation and Trenching Standard in 1971 to protect workers from excavation hazards. Since then, OSHA has amended the standard several times to increase worker protection and to reduce the frequency and severity of excavation accidents and injuries. Despite these efforts, excavation-related accidents resulting in injuries and fatalities continue to occur.

To better assist excavation firms and contractors, OSHA completely updated the existing standard to simplify many of the existing provisions, add and clarify definitions, eliminate duplicate provisions and ambiguous language, and give employers added flexibility in providing protection for employees. The standard was effective as of March 5, 1990.

In addition, the standard provides several new appendices. One appendix provides a consistent method of soil classification. Others provide sloping and benching requirements, pictorial examples of shoring and shielding devices, timber tables, hydraulic shoring tables, and selection charts that provide a graphic summary of the requirements contained in the standard.

This discussion highlights the requirements in the updated standard for excavation and trenching operations, provides methods for protecting employees against cave-ins, and describes safe work practices for employees.

SCOPE AND APPLICATION

OSHA's revised rule applies to all open excavations made in the earth's surface, which includes trenches.

According to the OSHA construction safety and health standards, a *trench* is referred to as a narrow excavation made below the surface of the ground in which the depth is greater than the width—the width not exceeding 15 feet. An *excavation* is any man-made cut, cavity, trench, or depression in the earth's surface formed by earth removal. This can include excavations for anything from cellars to highways.

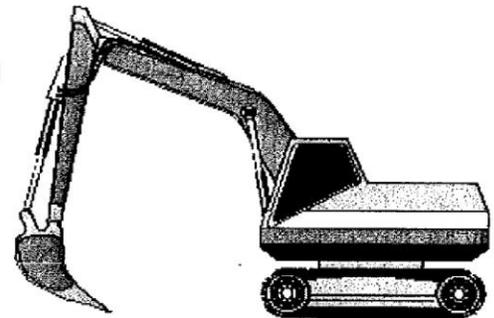
GENERAL REQUIREMENTS

Planning for Safety

Many on-the-job accidents are a direct result of inadequate initial planning. Correcting mistakes in shoring and/or sloping after work has begun slows down the operation, adds to the cost, and increases the possibility of an excavation failure. The contractor should build safety into the pre-bid planning in the same way all other pre-bid factors are considered.

It is a good idea for contractors to develop safety checklists before preparing a bid, to make certain there is adequate information about the job site and all needed items are on hand.

These checklists should incorporate elements of the relevant OSHA standards as well as other information necessary for safe operations.



It is also important, before beginning work, for employers to provide employees who are exposed to public vehicular traffic with warning vests or other suitable garments marked with or made of reflectorized or high-visibility material and ensure that they wear them. Workers must also be instructed to remove or neutralize surface encumbrances that may create a hazard.

In addition, no employee should operate a piece of equipment without first being properly trained to handle it and fully alerted to its potential hazards.

In the training and in the site safety and health program, it also is important to incorporate procedures for fast notification and investigation of accidents.

On-the-Job Evaluation

The standard requires that a competent person inspect, on a daily basis, excavations and the adjacent areas for possible cave-ins, failures of protective systems and equipment, hazardous atmospheres, or other hazardous conditions. If these conditions are encountered, exposed employees must be removed from the hazardous area until the necessary safety precautions have been taken. Inspections are also required after natural (e.g., heavy rains) or man-made events such as blasting that may increase the potential for hazards.

Larger and more complex operations should have a full-time safety official who makes recommendations to improve the implementation of the safety plan. In a smaller operation, the safety official may be part-time and usually will be a supervisor.

Supervisors are the contractor's representatives on the job. Supervisors should conduct inspections, investigate accidents, and anticipate hazards. They should ensure that employees receive on-the-job safety and health training. They should also review and strengthen overall safety and health precautions to guard against potential hazards, get the necessary worker cooperation in safety matters, and make frequent reports to the contractor.

It is important that managers and supervisors set the example for safety at the job site. It is essential that when visiting the job site, all managers, regardless of status, wear the prescribed personal protective equipment such as safety shoes, safety glasses, hard hats, and other necessary gear (see CFR 1926.100 and 102).

Employees must also take an active role in job safety. The contractor and supervisor should make certain that workers have been properly trained in the use and fit of the prescribed protective gear and equipment, that they are wearing and using the equipment correctly, and that they are using safe work practices.

Cave-Ins and Protective Support Systems

Support Systems

Excavation workers are exposed to many hazards, but the chief hazard is danger of cave-ins. OSHA requires that in all excavations employees exposed to potential cave-ins must be protected by sloping, or benching the sides of the excavation; supporting the sides of the excavation, or placing a shield between the side of the excavation and the work area.

Designing a protective system can be complex because of the number of factors involved—soil classification, depth of cut, water content of soil, changes due to weather and climate, or other operations in the vicinity. The standard, however, provides several different methods and approaches (four for sloping and four for shoring, including the use of shields)⁽¹⁾ for designing protective systems that can be used to provide the required level of protection against cave-ins.

One method of ensuring the safety and health of workers in an excavation is to slope the sides to an angle not steeper than one and one-half horizontal to one vertical (34 degrees measured from the horizontal). These slopes must be excavated to form configurations that are in accordance with those for Type C soil found in Appendix B of the standard. A slope of this gradation or less is considered safe for any type of soil (see Figure

1).

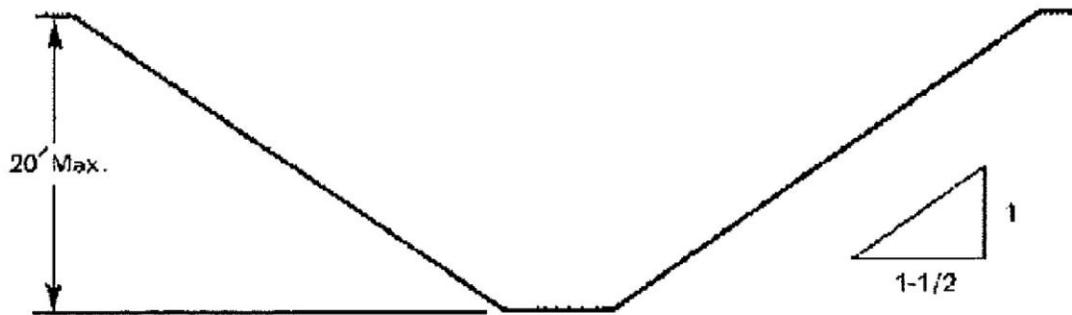


Figure 1. Excavations Made in Type C Soil

All simple slope excavations 20 feet or less in depth shall have a maximum allowable slope of 1 1/2:1.

A second design method, which can be applied for both sloping and shoring, involves using tabulated data, such as tables and charts, approved by a registered professional engineer. These data must be in writing and must include sufficient explanatory information to enable the user to make a selection, including the criteria for determining the selection and the limits on the use of the data.

At least one copy of the information, including the identity of the registered professional engineer who approved the data, must be kept at the worksite during construction of the protective system. Upon completion of the system, the data may be stored away from the job site, but a copy must be made available, upon request, to the Assistant Secretary of Labor for OSHA.

Contractors also may use a trench box or shield that is either designed or approved by a registered professional engineer or is based on tabulated data prepared or approved by a registered professional engineer. Timber, aluminum, or other suitable materials may also be used. OSHA standards permit the use of a trench shield (also known as a welder's hut) as long as the protection it provides is equal to or greater than the protection that would be provided by the appropriate shoring system (see Figure 2).

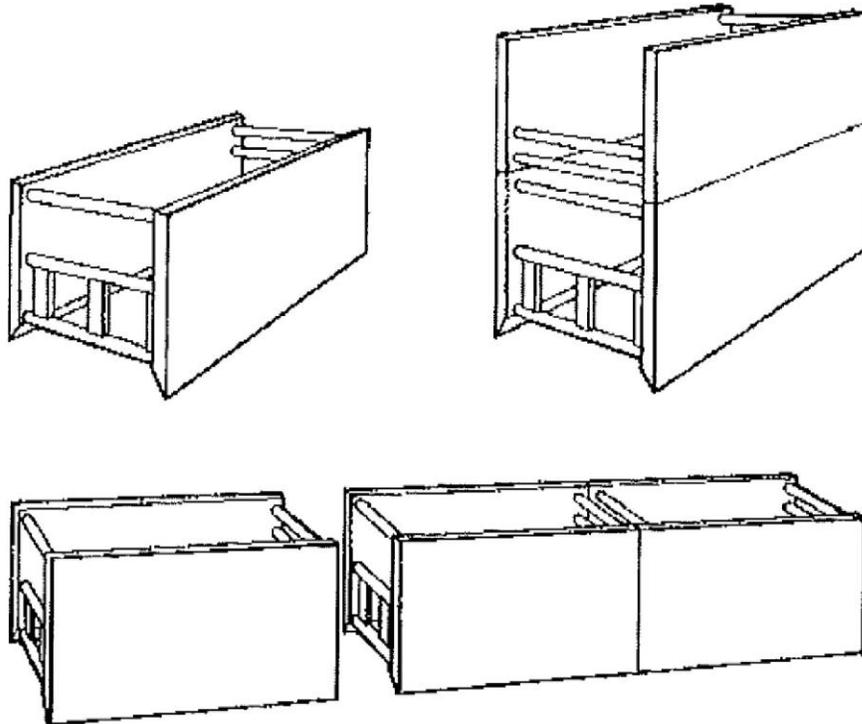


Figure 2. Trench Shields

The employer is free to choose the most practical design approach for any particular circumstance. Once an approach has been selected, however, the required performance criteria must be met by that system.

The standard does not require the installation and use of a protective system when an excavation (1) is made entirely in stable rock, or (2) is less than 5 feet deep and a competent person has examined the ground and found no indication of a potential cave-in.

Safety Precautions

The standard requires the employer to provide support systems such as shoring, bracing, or underpinning to ensure the stability of adjacent structures such as buildings, walls, sidewalks or pavements.

The standard prohibits excavation below the level of the base or footing of any foundation or retaining wall unless (1) a support system such as underpinning is provided, (2) the excavation is in stable rock, or (3) a registered professional engineer determines that the structure is sufficiently removed from the excavation and that excavation will not pose a hazard to employees.

Excavations under sidewalks and pavements are also prohibited unless an appropriately designed support system is provided or another effective method is used.

Installation and Removal of Protective Systems

The standard requires the following procedures for the protection of employees when installing support systems:

- Securely connect members of support systems,
- Safely install support systems,
- Never overload members of support systems, and

- Install other structural members to carry loads imposed on the support system when temporary removal of individual members is necessary.

In addition, the standard permits excavation of 2 feet or less below the bottom of the members of a support or shield system of a trench if (1) the system is designed to resist the forces calculated for the full depth of the trench, and (2) there are no indications, while the trench is open, of a possible cave-in below the bottom of the support system. Also, the installation of support systems must be closely coordinated with the excavation of trenches.

As soon as work is completed, the excavation should be back-filled as the protective system is dismantled. After the excavation has been cleared, workers should slowly remove the protective system from the bottom up, taking care to release members slowly.

Materials and Equipment

The employer is responsible for the safe condition of materials and equipment used for protective systems. Defective and damaged materials and equipment can result in the failure of a protective system and cause excavation hazards.

To avoid possible failure of a protective system, the employer must ensure that (1) materials and equipment are free from damage or defects, (2) manufactured materials and equipment are used and maintained in a manner consistent with the recommendations of the manufacturer and in a way that will prevent employee exposure to hazards, and (3) while in operation, damaged materials and equipment are examined by a competent person to determine if they are suitable for continued use. If materials and equipment are not safe for use, they must be removed from service. These materials cannot be returned to service without the evaluation and approval of a registered professional engineer.

Other Hazards

Falls and Equipment

In addition to cave-in hazards and secondary hazards related to cave-ins, there are other hazards from which workers must be protected during excavation-related work. These hazards include exposure to falls, falling loads, and mobile equipment. To protect employees from these hazards, OSHA requires the employer to take the following precautions:

- Keep materials or equipment that might fall or roll into an excavation at least 2 feet from the edge of excavations, or have retaining devices, or both.
- Provide warning systems such as mobile equipment, barricades, hand or mechanical signals, or stop logs, to alert operators of the edge of an excavation. If possible, keep the grade away from the excavation.
- Provide scaling to remove loose rock or soil or install protective barricades and other equivalent protection to protect employees against falling rock, soil, or materials.
- Prohibit employees from working on faces of sloped or benched excavations at levels above other employees unless employees at lower levels are adequately protected from the hazard of falling, rolling, or sliding material or equipment.
- Prohibit employees under loads that are handled by lifting or digging equipment. To avoid being struck by any spillage or falling materials, require employees to stand away from vehicles being loaded or unloaded. If cabs of vehicles provide adequate protection from falling loads during loading and unloading operations, the operators may remain in them.

Water Accumulation

The standard prohibits employees from working in excavations where water has accumulated or is accumulating unless adequate protection has been taken. If water removal equipment is used to control or prevent water

from accumulating, the equipment and operations of the equipment must be monitored by a competent person to ensure proper use.

OSHA standards also require that diversion ditches, dikes, or other suitable means be used to prevent surface water from entering an excavation and to provide adequate drainage of the area adjacent to the excavation. Also, a competent person must inspect excavations subject to runoffs from heavy rains.

Hazardous Atmospheres

Under this provision, a competent person must test excavations greater than 4 feet in depth as well as ones where oxygen deficiency or a hazardous atmosphere exists or could reasonably be expected to exist, before an employee enters the excavation. If hazardous conditions exist, controls such as proper respiratory protection or ventilation must be provided. Also, controls used to reduce atmospheric contaminants to acceptable levels must be tested regularly.

Where adverse atmospheric conditions may exist or develop in an excavation, the employer also must provide and ensure that emergency rescue equipment, (e.g., breathing apparatus, a safety harness and line, basket stretcher, etc.) is readily available. This equipment must be attended when used.

When an employee enters bell-bottom pier holes and similar deep and confined footing excavations, the employee must wear a harness with a lifeline. The lifeline must be securely attached to the harness and must be separate from any line used to handle materials. Also, while the employee wearing the lifeline is in the excavation, an observer must be present to ensure that the lifeline is working properly and to maintain communication with the employee.

Access and Egress

Under the standard, the employer must provide safe access and egress to all excavations. According to OSHA regulations, when employees are required to be in trench excavations 4-feet deep or more, adequate means of exit, such as ladders, steps, ramps or other safe means of egress, must be provided and be within 25 feet of lateral travel. If structural ramps are used as a means of access or egress, they must be designed by a competent person if used for employee access or egress, or a competent person qualified in structural design if used by vehicles. Also, structural members used for ramps or runways must be uniform in thickness and joined in a manner to prevent tripping or displacement.

SUMMARY

Trenching and excavation work presents serious risks to all workers involved. The greatest risk, and one of primary concern, is that of a cave-in. Furthermore, when cave-in accidents occur, they are much more likely to result in worker fatalities than other excavation-related accidents. Strict compliance, however, with all sections of the standard will prevent or greatly reduce the risk of cave-ins as well as other excavation-related accidents.

Regulations (Standards - 29 CFR)

Sloping and Benching - 1926 Subpart P App B

Regulations (Standards - 29 CFR) - Table of Contents

● Part Number:	1926
● Part Title:	Safety and Health Regulations for Construction
● Subpart:	P
● Subpart Title:	Excavations
● Standard Number:	1926 Subpart P App B
● Title:	Sloping and Benching

(a) **Scope and application.** This appendix contains specifications for sloping and benching when used as methods of protecting employees working in excavations from cave-ins. The requirements of this appendix apply when the design of sloping and benching protective systems is to be performed in accordance with the requirements set forth in § 1926.652(b)(2).

(b) **Definitions.**

Actual slope means the slope to which an excavation face is excavated.

Distress means that the soil is in a condition where a cave-in is imminent or is likely to occur. Distress is evidenced by such phenomena as the development of fissures in the face of or adjacent to an open excavation; the subsidence of the edge of an excavation; the slumping of material from the face or the bulging or heaving of material from the bottom of an excavation; the spalling of material from the face of an excavation; and ravelling, i.e., small amounts of material such as pebbles or little clumps of material suddenly separating from the face of an excavation and trickling or rolling down into the excavation.

Maximum allowable slope means the steepest incline of an excavation face that is acceptable for the most favorable site conditions as protection against cave-ins, and is expressed as the ratio of horizontal distance to vertical rise (H:V).

Short term exposure means a period of time less than or equal to 24 hours that an excavation is open.

(c) **Requirements -- (1) Soil classification.** Soil and rock deposits shall be classified in accordance with appendix A to subpart P of part 1926.

(2) **Maximum allowable slope.** The maximum allowable slope for a soil or rock deposit shall be determined from Table B-1 of this appendix.

(3) **Actual slope.** (i) The actual slope shall not be steeper than the maximum allowable slope.

(ii) The actual slope shall be less steep than the maximum allowable slope, when there are signs of distress. If that situation occurs, the slope shall be cut back to an actual slope which is at least 1/2 horizontal to one vertical (1/2H:1V) less steep than the maximum allowable slope.

(iii) When surcharge loads from stored material or equipment, operating equipment, or traffic are present, a competent person shall determine the degree to which the actual slope must be reduced below the maximum allowable slope, and shall assure that such reduction is achieved. Surcharge loads from adjacent structures shall be evaluated in accordance with § 1926.651(l).

(4) **Configurations.** Configurations of sloping and benching systems shall be in accordance with Figure B-1.

**TABLE B-1
MAXIMUM ALLOWABLE SLOPES**

SOIL OR ROCK TYPE	MAXIMUM ALLOWABLE SLOPES (H:V)(1) FOR EXCAVATIONS LESS THAN 20 FEET DEEP(3)
STABLE ROCK	VERTICAL (90°)
TYPE A (2)	3/4:1 (53°)
TYPE B	1:1 (45°)
TYPE C	1 1/2:1 (34°)

Footnote(1) Numbers shown in parentheses next to maximum allowable slopes are angles expressed in degrees from the horizontal. Angles have been rounded off.

Footnote(2) A short-term maximum allowable slope of 1/2H:1V (63°) is allowed in excavations in Type A soil that are 12 feet (3.67 m) or less in depth. Short-term maximum allowable slopes for excavations greater than 12 feet (3.67 m) in depth shall be 3/4H:1V (53°).

Footnote(3) Sloping or benching for excavations greater than 20 feet deep shall be designed by a registered professional engineer.

Figure B-1

Slope Configurations

(All slopes stated below are in the horizontal to vertical ratio)

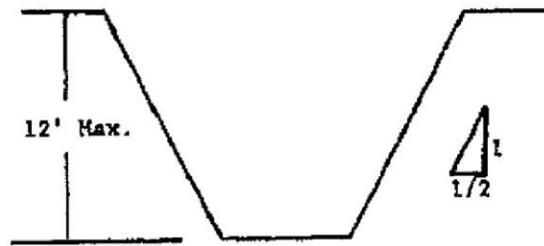
B-1.1 Excavations made in Type A soil.

1. All simple slope excavation 20 feet or less in depth shall have a maximum allowable slope of 3/4:1.



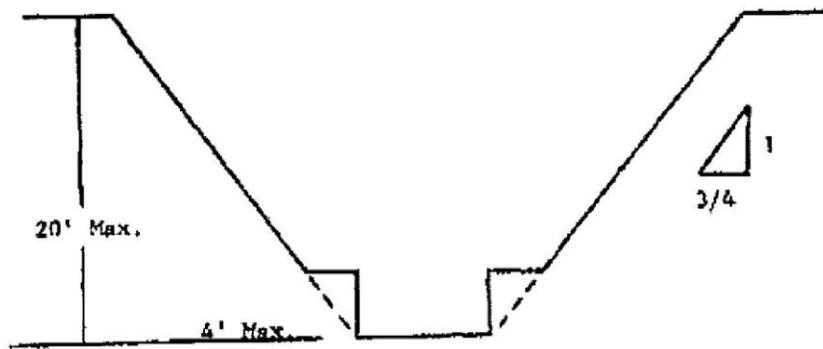
SIMPLE SLOPE -- GENERAL

Exception: Simple slope excavations which are open 24 hours or less (short term) and which are 12 feet or less in depth shall have a maximum allowable slope of $\frac{1}{2}$:1.

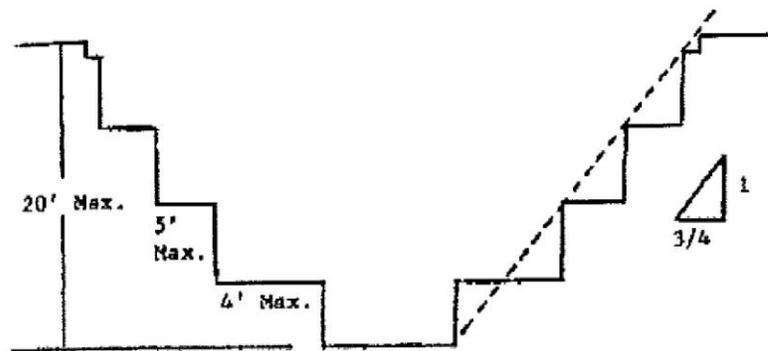


SIMPLE SLOPE -- SHORT TERM

2. All benched excavations 20 feet or less in depth shall have a maximum allowable slope of $\frac{3}{4}$ to 1 and maximum bench dimensions as follows:

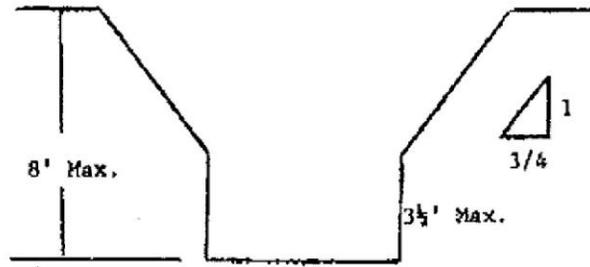


SIMPLE BENCH



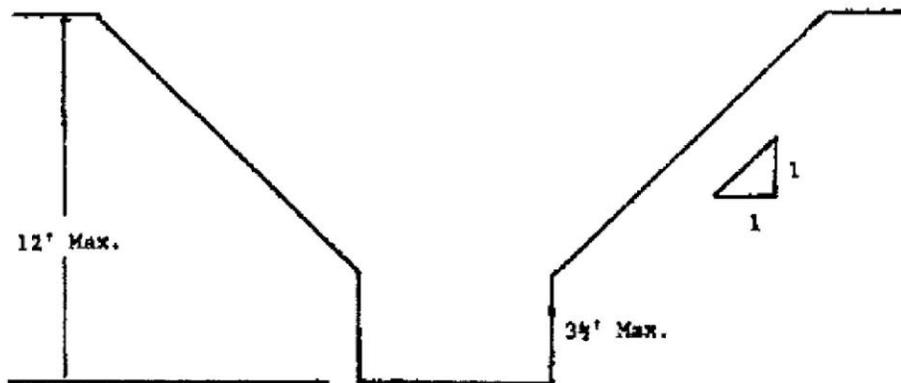
MULTIPLE BENCH

3. All excavations 8 feet or less in depth which have unsupported vertically sided lower portions shall have a maximum vertical side of $3\frac{1}{2}$ feet.



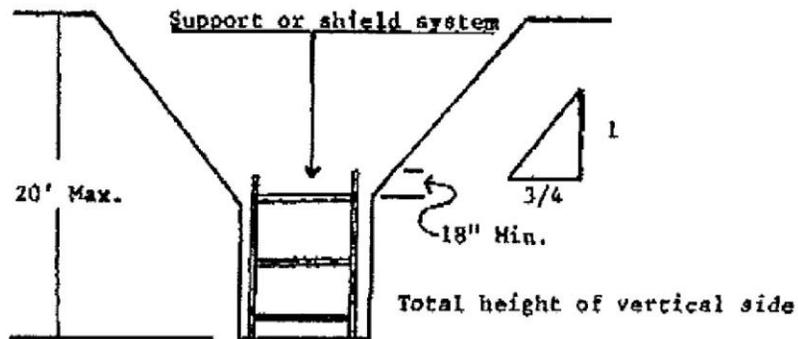
UNSUPPORTED VERTICALLY SIDED LOWER PORTION -- MAXIMUM 8 FEET IN DEPTH)

All excavations more than 8 feet but not more than 12 feet in depth with unsupported vertically sided lower portions shall have a maximum allowable slope of 1:1 and a maximum vertical side of 3½ feet.



UNSUPPORTED VERTICALLY SIDED LOWER PORTION -- MAXIMUM 12 FEET IN DEPTH)

All excavations 20 feet or less in depth which have vertically sided lower portions that are supported or shielded shall have a maximum allowable slope of ¾:1. The support or shield system must extend at least 18 inches above the top of the vertical side.

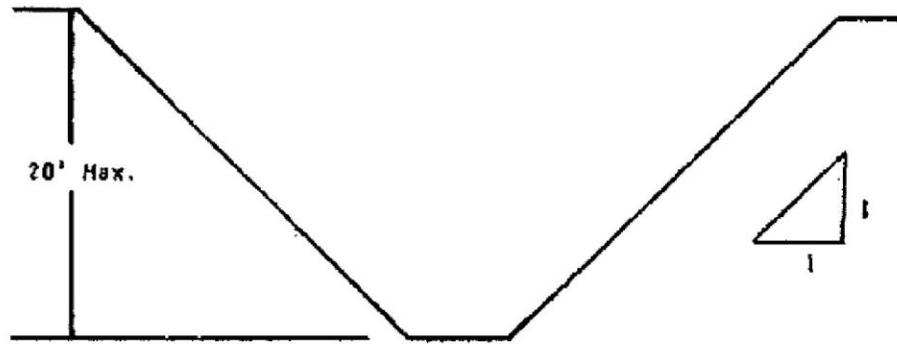


SUPPORTED OR SHIELDED VERTICALLY SIDED LOWER PORTION

4. All other simple slope, compound slope, and vertically sided lower portion excavations shall be in accordance with the other options permitted under § 1926.652(b).

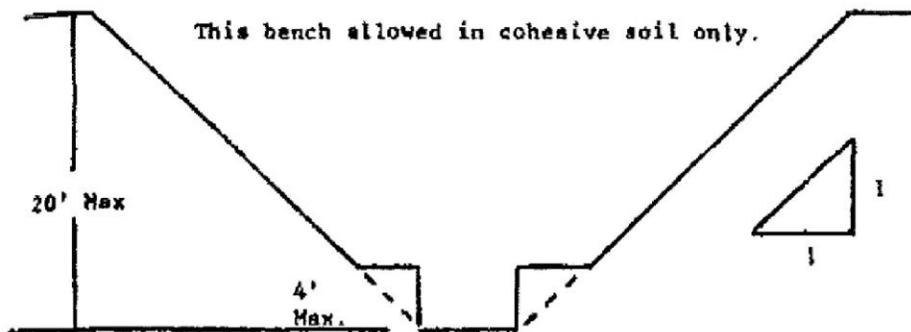
B-1.2 Excavations Made in Type B Soil

1. All simple slope excavations 20 feet or less in depth shall have a maximum allowable slope of 1:1.

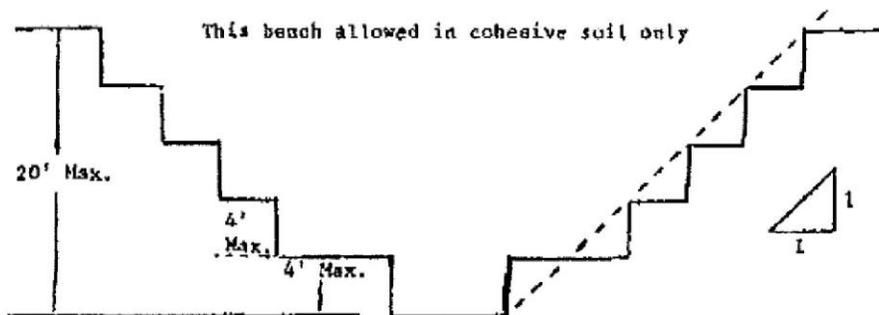


SIMPLE SLOPE

2. All benched excavations 20 feet or less in depth shall have a maximum allowable slope of 1:1 and maximum bench dimensions as follows:

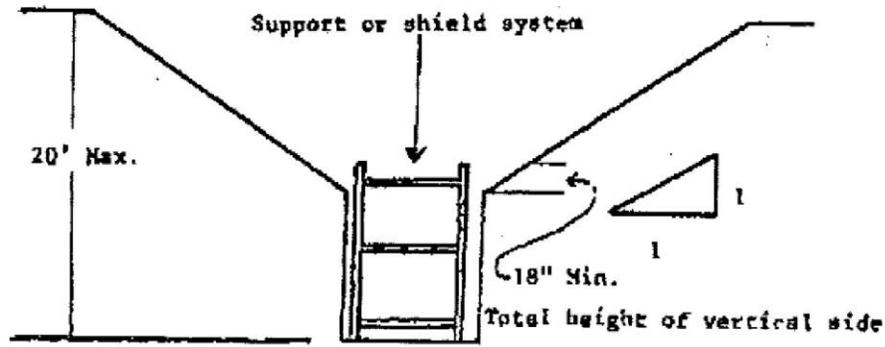


SINGLE BENCH



MULTIPLE BENCH

3. All excavations 20 feet or less in depth which have vertically sided lower portions shall be shielded or supported to a height at least 18 inches above the top of the vertical side. All such excavations shall have a maximum allowable slope of 1:1.

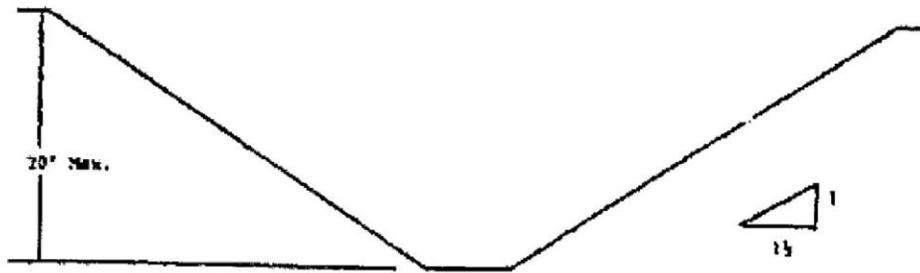


VERTICALLY SIDED LOWER PORTION

4. All other sloped excavations shall be in accordance with the other options permitted in § 1926.652(b).

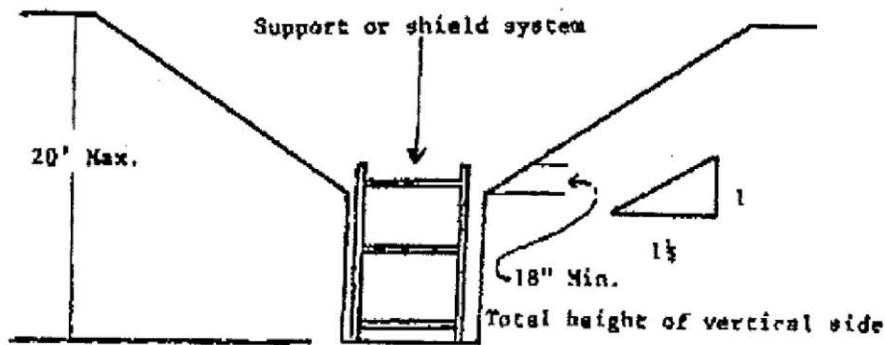
B-1.3 Excavations Made in Type C Soil

1. All simple slope excavations 20 feet or less in depth shall have a maximum allowable slope of 1½:1.



SIMPLE SLOPE

2. All excavations 20 feet or less in depth which have vertically sided lower portions shall be shielded or supported to a height at least 18 inches above the top of the vertical side. All such excavations shall have a maximum allowable slope of 1½:1.



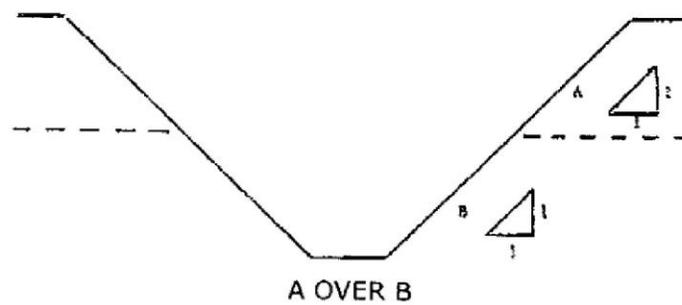
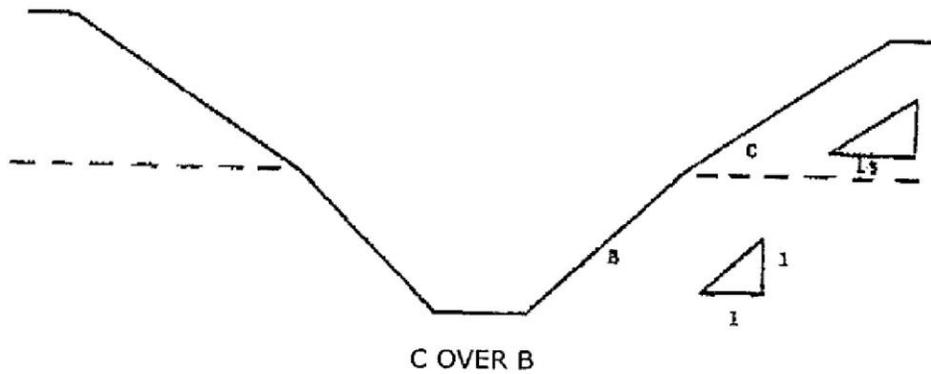
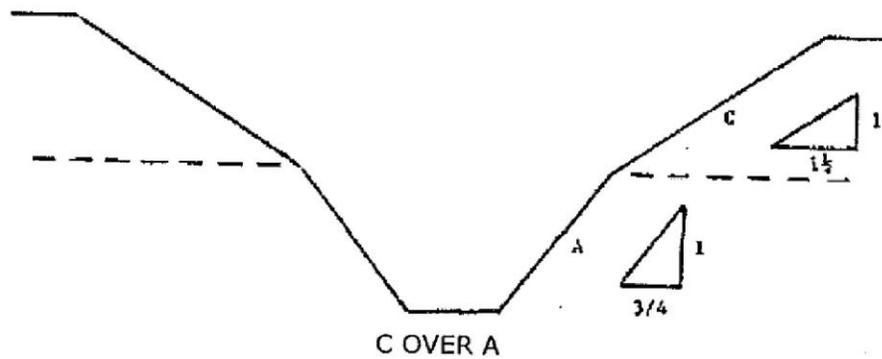
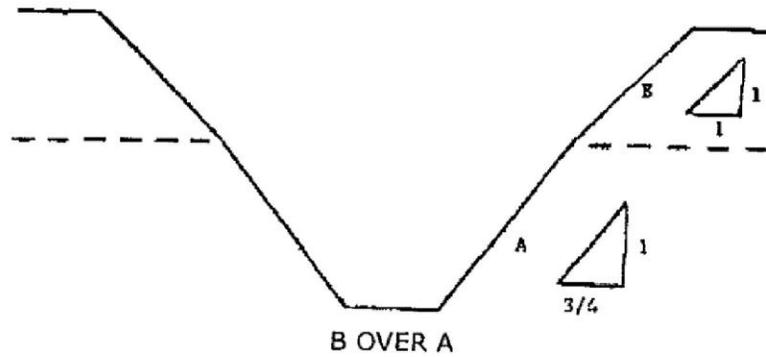
VERTICAL SIDED LOWER PORTION

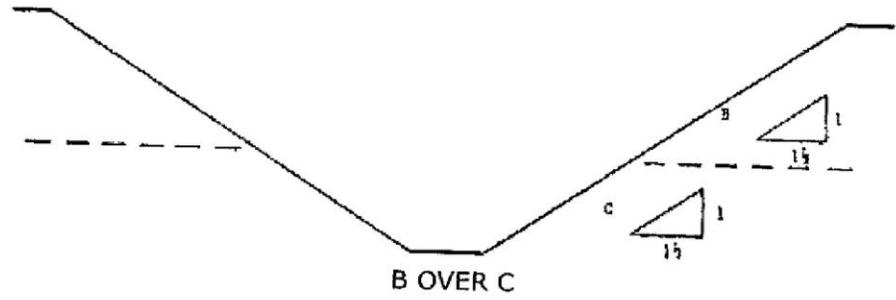
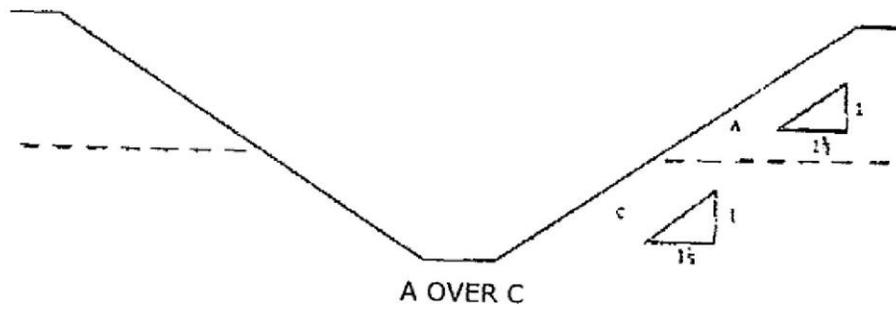
3. All other sloped excavations shall be in accordance with the other options permitted in §

1926.652(b).

B-1.4 Excavations Made in Layered Soils

1. All excavations 20 feet or less in depth made in layered soils shall have a maximum allowable slope for each layer as set forth below.





2. All other sloped excavations shall be in accordance with the other options permitted in § 1926.652(b).



Tomado de: http://www.osha.gov/doc/highway_workzones/mutcd/6c_temporary.html

Manual on Uniform Traffic Control Devices (MUTCD): Temporary Traffic Control Elements

C. TEMPORARY TRAFFIC CONTROL ELEMENTS

6C-1. TRAFFIC CONTROL PLANS

Traffic Control Plans (TCP's) play a vital role in providing continuity of safe and efficient traffic flow, to the extent interruptions in normal flow are necessary for temporary traffic control operations or other events that must temporarily disrupt normal traffic flow. Important auxiliary provisions that cannot conveniently be specified on project plans can easily be incorporated into Special Provisions within the TCP.

A TCP describes traffic controls to be used for facilitating vehicle and pedestrian traffic through a temporary traffic control zone. The plan may range in scope from being very detailed, to merely referencing typical drawings contained in the MUTCD, standard approved highway agency drawings and manuals, or specific drawings contained in contract documents. The degree of detail in the TCP depends entirely on the complexity of the situation, and TCP's should be prepared by persons knowledgeable about the fundamental principles of temporary traffic control and the work activities to be performed.

Traffic control planning requires forethought. Provisions may be incorporated into the project bid documents that enable contractors to develop alternate traffic control plans, which may be used only if the responsible agency finds they are as good as those provided in the plans/specifications. For maintenance and minor utility projects that do not require bidding, forethought must be given to selecting the best traffic control before occupying the temporary traffic control zone. Also, coordination must be made between projects to ensure that duplicate signing is not used and to ensure compatibility of traffic control between adjacent projects.

Modifications of TCP's may be necessary because of changed conditions or determination of even better ways of handling traffic safely and efficiently, while permitting efficient temporary traffic control activities to progress.

6C-2. DEFINITION OF TEMPORARY TRAFFIC CONTROL ZONE COMPONENTS

The temporary traffic control zone includes the entire section of roadway between the first advance warning sign through the last traffic control device, where traffic returns to its normal path and conditions. Most temporary traffic control zones can be divided into four areas: the advance warning area, the transition area, the activity area, and the termination area. Figure VI-1 illustrates these four areas. The four components that constitute a temporary traffic control zone are described in the order that drivers encounter them. They include the following:

a. *Advance Warning Area*

In the advance warning area, drivers are informed of what to expect. The advance warning may vary from a single sign or flashing lights on a vehicle to a series of signs in advance of the temporary traffic control zone transition area. On freeways and expressways, where driver speed is generally in the higher range (45 mph or more), signs may be placed from 500 feet to 1/2 mile or more before the temporary traffic control zone. The true test of adequacy of sign spacing is to evaluate how much time the driver has to perceive and react to the condition ahead. In this regard, the use of speed, roadway condition, and related driver expectancy must be considered in order to derive a practical sign spacing distance. As a guide, table II-1 in section 2C-3 should be used in conjunction with consideration of actual or anticipated field conditions. Effective placement of warning signs for urban and rural locals is as follows:

(1) *Urban*

Warning sign spacing in advance of the transition area normally range from four to eight times the speed (mph) in feet, with the high end of the range being used when speeds are relatively high. When single advance warning signs are used (as in the case of low-speed residential streets), the advance warning area can be as short as 200 feet. When two or more advance signs are used on higher-speed streets such as major arterials, the advance warning area should extend a greater distance. (See table VI-3.)

(2) *Rural*

Rural roadways are characterized by higher speeds. Spacing for the placement of warning signs is substantially longer—from 8 to 12 times the speed (mph) in feet. Two or more advance warning signs are normally used in these conditions, the advance warning area should extend 1,500 feet or more in open highway conditions. (See table VI-3.)

Advance warning is normally not needed when the activity area is sufficiently removed from the driver's path that it does not interfere with traffic.

b. *Transition Area*

When redirection of the driver's normal path is required, traffic must be channelized from the normal path to a new path. This redirection is intended to occur at the beginning of the transition area. In mobile operations, this transition area moves with the work space. Transition areas usually involve strategic use of tapers, which (because of their importance) are discussed in more detail in section 6C-3.

c. *Activity Area*

The activity area is an area of roadway where the work takes place. It is composed of the work space and the traffic space, and may contain one or more buffer spaces.

(1) *Work Space*

The work space is that portion of the roadway closed to traffic and set aside for workers, equipment, and material. Work space may be fixed or may move as work progresses. Long-term work spaces are usually delineated by channelizing devices or shielded by barriers to exclude traffic and pedestrians.

(2) *Traffic Space*

The traffic space is the portion of the roadway in which traffic is routed through the activity area.

(3) *Buffer Space*

The buffer space is an optional feature in the activity area that separates traffic flow from the work activity or a potentially hazardous area and provides recovery space for an errant vehicle. Neither work activity nor storage of equipment, vehicles, or material should occur in this space. Buffer spaces may be positioned longitudinally and laterally, with respect to the direction of traffic flow.

(a) *Longitudinal Buffer Space*

The longitudinal buffer space may be placed in the initial portion of a closed lane in advance of the work space, as shown in figure VI-1. When a protection vehicle is placed in advance of the work space, only the space upstream of the vehicle constitutes the buffer space.

The longitudinal buffer space, as depicted in figure VI-2, should be used where a closed lane separates opposing traffic flows. Typically, it is formed as a traffic island and defined by channelizing devices.

A guide for the length of longitudinal buffer space is shown in table VI-1. The length may be adjusted to satisfy individual agency needs.

(b) *Lateral Buffer Space*

A lateral buffer space may be used to separate the traffic space from the work space, as shown in figure VI-1, or a potentially hazardous area, such as an excavation or pavement drop-off. A lateral buffer space also may be used between two travel lanes, especially those carrying opposing flows. The width of the lateral buffer space should be determined by engineering judgment.

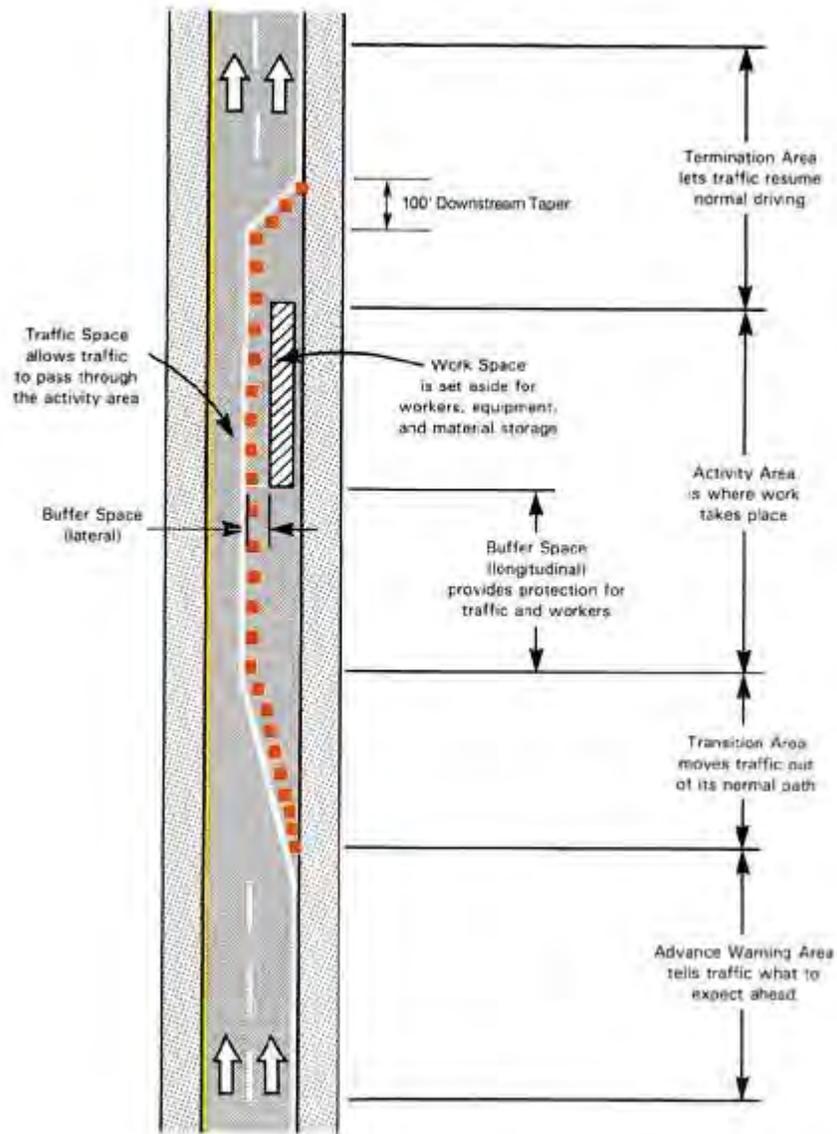


Figure VI-1. Component parts of a temporary traffic control zone.

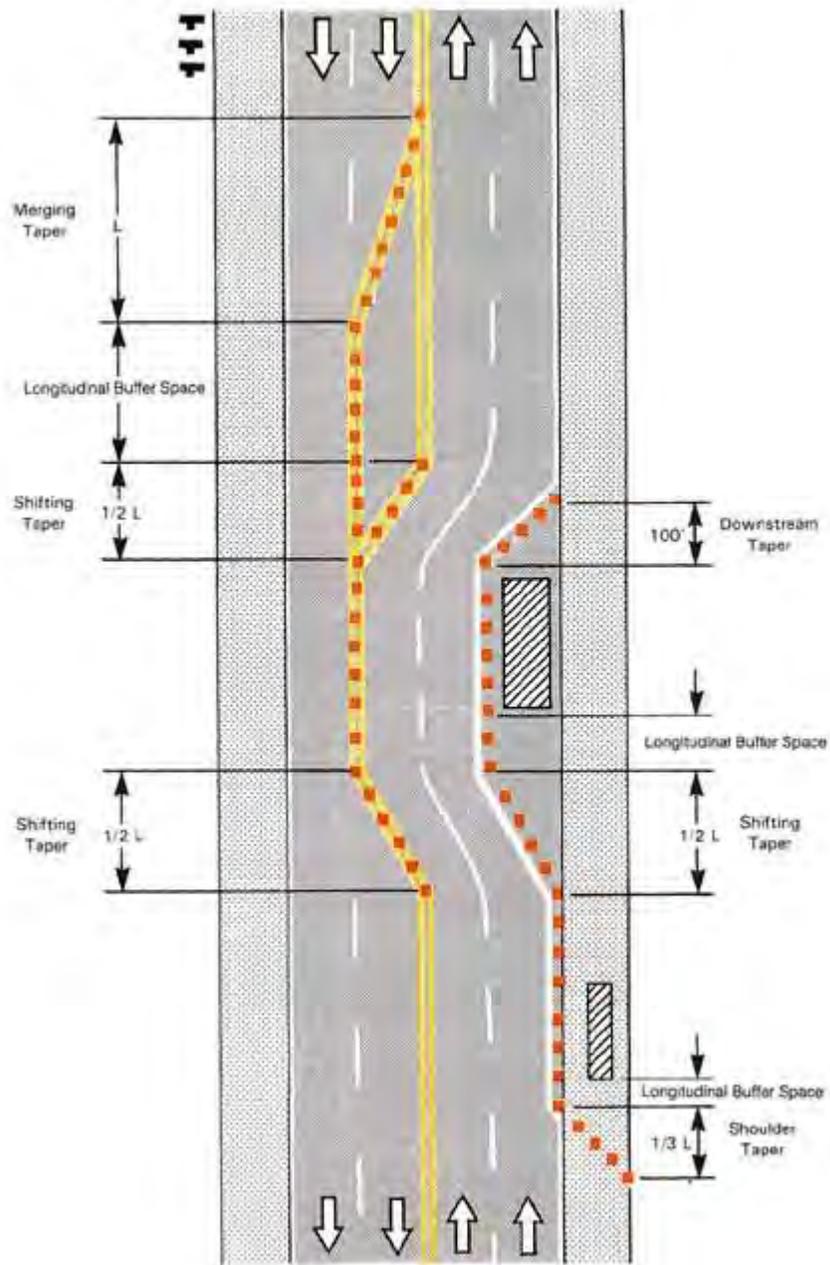


Figure VI-2. Tapers and buffer space.

Table VI-1. Guidelines for length of longitudinal buffer space¹

Speed* (mph)	Length (feet)
20	35
25	55
30	85
35	120
40	170
45	220
50	280
55	335
60	415
65	485

*Posted speed, off-peak 85th percentile speed prior to work starting, or the anticipated operating speed in mph.

¹Based upon American Association of State Highway and Transportation Officials (AASHTO) braking distance portion of stopping sight distance for wet and level pavements (A Policy on Geometric Design of Highways and Streets, AASHTO, 1990, p. 120). This AASHTO document also recommends adjustments for the effect of grade on stopping and variation for trucks.

(4) Incident Management Vehicle Storage Space

When work occurs on a high-volume, highly congested facility in an urban area, it is optional to allow space to store emergency vehicles (e.g., tow trucks) to respond quickly to traffic incidents. The storage space is typically provided at the beginning or end of the activity area, or both. An emergency vehicle storage area should not extend into any portion of the buffer space.

d. Termination Area

The termination area is used to return traffic to the normal traffic path. The termination area extends from the downstream end of the work area to the END ROAD WORK signs, if posted. Conditions may be such that posting of END ROAD WORK signs is not helpful. For example, the END ROAD WORK signs should normally not be used if other temporary traffic control zones begin within a mile of the end of the work space in rural areas, or about a quarter-mile within urban areas. For normal daytime maintenance operations, the END ROAD WORK SIGN is optional.

6C-3. TAPERS

A common important element of a temporary traffic control zone is a roadway taper. Tapers may be used in both the transition and termination areas. Tapers are created using a series of channelizing devices or pavement markings placed to move traffic out of or into its normal path. Whenever tapers are to be used near interchange ramps, crossroads, curves, or other influencing factors, it may be desirable to adjust the length of tapers. Longer tapers are not necessarily better than shorter tapers (particularly in urban areas characterized by short block lengths, driveways, etc.), because extended tapers tend to encourage sluggish operation and to encourage drivers to delay lane changes unnecessarily. The real test of taper length involves observation of driver performance after traffic control plans are put into effect. Types of taper lengths are presented in table VI-2. The maximum space between devices in a taper normally approximates the distance in feet of the speed in miles per hour (i.e.: a 55 mph speed road should normally have devices spaced about 55 feet apart). Types of tapers are shown in figure VI-2 and the two-way traffic taper is shown in figure VI-3:

Table VI-2. Taper length criteria for temporary traffic control zones

Type of taper	Taper length
Upstream tapers	
Merging taper	L minimum
Shifting taper	1/2 L minimum
Shoulder taper	1/3 L minimum
Two-way traffic taper	100 feet maximum
Downstream tapers	100 feet minimum
(use is optional)	
Formulas for L*	
Speed	Formula
40 mph or less	$L = \frac{WS^2}{60}$
45 mph or greater	$L = W \times S$

*L = Taper length in feet.

W = Width of offset in feet.

S = Posted speed, off-peak 85th percentile speed prior to work starting, or the anticipated operating speed in mph.

a. Merging Taper

A merging taper requires the longest distances because drivers are required to merge with an adjacent lane of

traffic at the prevailing speed. The taper should be long enough to enable merging drivers to adjust their speeds and merge into a single lane before the end of the transition. For freeways, expressways, and other roadways having a speed of 45 mph or greater, the minimum length for merging tapers should be computed by a formula $L = W \times S$. For residential, urban, and other streets with speeds less than 45 mph, the formula $L = (W \times S^2)/60$ should be used. Under either formula, L is the taper length in feet, W is the lateral shift of traffic due to the partially or fully closed lane (in feet), and S is the posted speed, the off-peak 85th percentile speed prior to work starting or the anticipated operating speed. The formula $L = (W \times S^2)/60$ is used for speeds less than 45 mph because slower traffic can merge safely in a shorter distance.

b. *Shifting Taper*

A shifting taper is used when merging is not required, but a lateral shift is needed. Approximately one-half L has been found to be adequate. Where more space is available, it may be beneficial to use longer distances. Guidance for changes in alignment may also be accomplished by using horizontal curves designed for normal highway speeds.

c. *Shoulder Taper*

A shoulder taper may be beneficial on high-speed roadways with improved shoulders that may be mistaken for driving lanes (when work is occurring in the shoulder area). If used, shoulder tapers approaching the activity area should have a length of about one-third L. If a shoulder is used as a travel lane either through practice or during a temporary traffic activity, a normal merging or shifting taper should be used. An example of a shoulder taper is presented in figure VI-2.

d. *Downstream Taper*

The downstream taper may be useful in termination areas to provide a visual cue to the driver that access is available to the original lane/path that was closed. When a downstream taper is used, it should have a minimum length of about 100 feet per lane, with devices spaced about 20 feet apart. An example of a downstream taper is shown in figure VI-2.

e. *One-Lane, Two-Way Taper*

The one-lane, two-way traffic taper is used in advance of an activity area that occupies part of a two-way roadway in such a way that a portion of the road is used alternately by traffic in each direction. Typically, traffic is controlled by a temporary traffic signal or a flagger. A short taper having a maximum length of 100 feet with channelizing devices at approximately 20-foot spacings should be used to guide traffic into the one-way section. An example of a one-lane, two-way traffic taper is presented in figure VI-3.

6C-4. DETOURS AND DIVERSIONS

At detours, traffic is directed onto another roadway to bypass the temporary traffic control zone. Detours should be signed clearly over their entire length so that motorists can easily determine how to return to the original roadway.

At diversions, traffic is directed onto a temporary roadway or alignment placed in or next to the right-of-way, e.g., median crossovers or lane shifts.

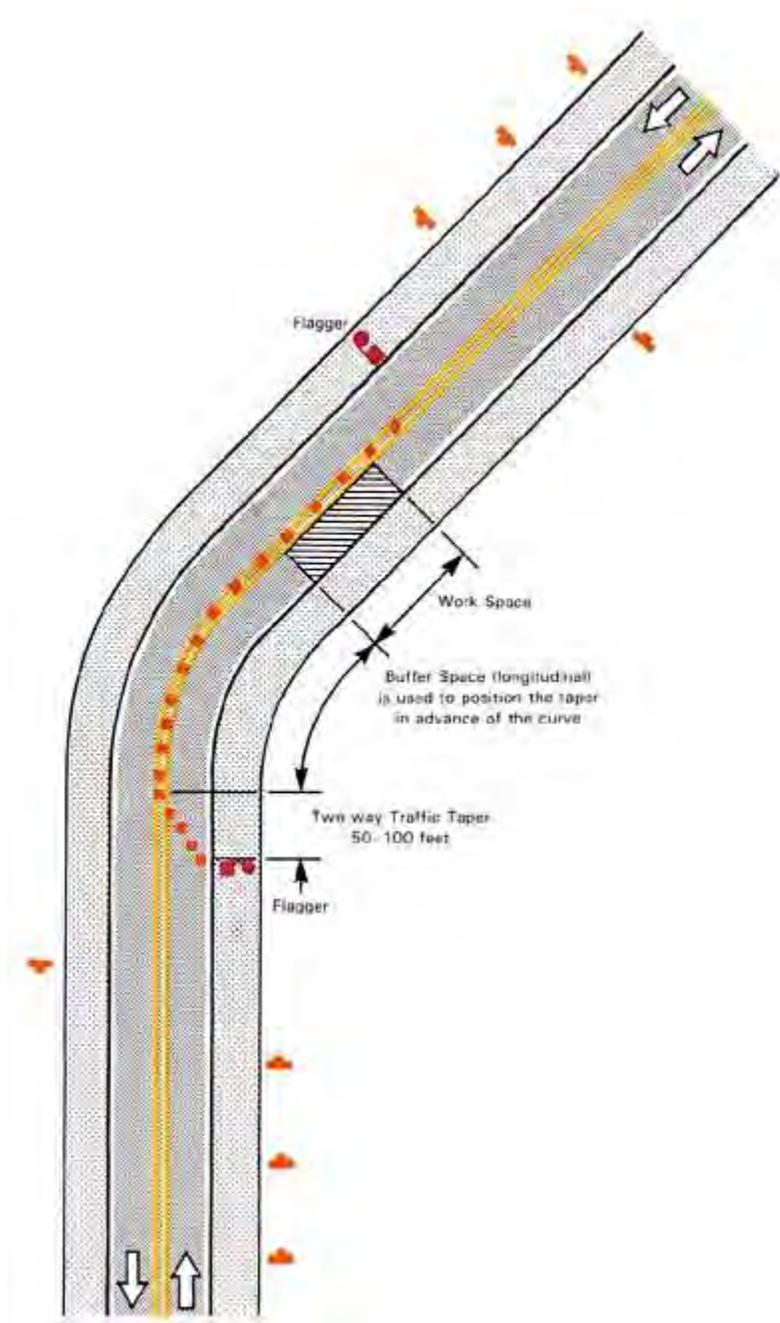


Figure VI-3. Example of one lane-two way traffic control.
 6C-5. ONE-LANE, TWO-WAY TRAFFIC CONTROL

Where traffic in both directions must, for a limited distance, use a single lane, provision should be made for alternate one-way movement through the constricted section. Some means of coordinating movements at each end shall be used to avoid head-on conflicts and to minimize delays. Control points at each end should be chosen to permit easy passing of opposing lines of vehicles. At a "spot" obstruction, however, such as an isolated pavement patch on roadways with lower speeds and adequate sight distance, the movement may be self-regulating.

Alternate one-way traffic control may be accomplished as appropriate by flagger control, a flag-carrying or official car, a pilot car, traffic signals, or by using stop or yield control. This section discusses each of these traffic control techniques. (See section 6E-2 for flagger qualifications.)

a. *Flagger Method*

Where a one-lane two-way temporary traffic control zone is short enough to allow visibility from one end to the other, traffic may be controlled by either a single flagger or by a flagger at each end of the section. When a single flagger is used, the flagger should be stationed on the shoulder opposite the obstruction or work space, or in a position where good visibility and traffic control can be maintained at all times. When good visibility and traffic control cannot be maintained by one flagger station, traffic may be controlled by a flagger at each end of the

section. One of the flaggers should be designated as the coordinator. Flaggers should be able to communicate orally or with signals. These signals should not be mistaken for flagging signals. The use of radios may also be desirable even though visual contact is possible.

b. *Flag Transfer Method*

Flag carrying is effective when the route is well defined. It should be employed only when the one-way traffic is confined to a relatively short length of road, usually not more than 1 mile in length.

The driver of the last vehicle proceeding into the one-lane section is given a red flag (or other token) and instructed to deliver it to the flagger at the other end. The opposite flagger, upon receipt of the flag, then knows that it is safe to allow traffic to move in the other direction. The flag being carried should always be clean and dry. A variation of this method is the use of an "official" car that always follows the last vehicle proceeding through the section. The use of an official car eliminates the possibility of loss of the flag.

c. *Pilot Car Method*

A pilot car is used to guide a queue of vehicles through a normally complex temporary traffic control zone or detour. Its operation must be coordinated with flagging operations or other controls at each end of the one-lane section.

The pilot car should have the name of the contractor or contracting authority prominently displayed. The PILOT CAR sign (G20-4) shall be mounted at a conspicuous location on the rear of the vehicle.

Two or more pilot cars may be used to guide two-way traffic through a particularly complex detour.

d. *Temporary Traffic Signal Method*

Traffic signals may be used to control vehicular traffic movements in temporary traffic control zones. Traffic signals should also be considered for half-width bridge reconstruction on low- to moderate-volume highways. Typical applications include highway or street intersections with a temporary haul road or equipment crossing and through areas requiring alternating one-way traffic operations.

e. *Stop or Yield Control Method*

A yield or stop sign may be installed on low- volume, two-lane roads where one side of the roadway is closed and the other side must serve both directions. The side that is closed should yield to or stop for oncoming traffic on the side that is open. The approach to the side that is not closed must be visible (for a distance equal to the safe-passing sight distance for that approach) to the driver who must yield or stop. See section 3B-5, Warrants for No-Passing Zones at Curves.

6C-6. TRANSIT CONSIDERATIONS

Provision for effective continuity of transit service needs to be incorporated into the temporary traffic control planning process. Oftentimes, public transit buses cannot efficiently be detoured in the same manner as other vehicles (particularly for short-term maintenance projects). On transit routes, the TCP shall provide for features such as temporary bus stops, pull-outs, and waiting areas for transit patrons.



JCA
 JUNTA DE CALIDAD AMBIENTAL
 Estado Libre Asociado de Puerto Rico



ÁREA DE CALIDAD DE AGUA
 DIVISION DE CONTROL DE TANQUES DE ALMACENAMIENTO SOTERRADOS

PARPCPTAS-0014

FORMATO PARA LAS ACCIONES CORRECTIVAS Y PREVENTIVAS
CARS "Corrective Action Report System".

ACCION

Correctiva Preventiva

Fecha:

Área:

Origen del Problema (No Conformidad)

Auditoria de Calidad _____

- Requerimientos de QA/QC _____
- Problemas con Instrumentación _____
- Sugerencias Internas _____
- Visitas Gerenciales, Seguimiento _____
- Otras fuentes de información (explique) _____

Descripción del Problema (No Conformidad)

Identificación de la Causa del Problema

Acción Correctiva

CERTIFICACION

Nombre persona responsable de investigación:

Firma Persona Responsable de la Investigación:

Fecha de Implantación de Acción Correctiva:

Nombre y Firma del Gerente del Área:

Fecha:

SEGUIMIENTO A LA IMPLANTACIÓN DE ACCIONES CORRECTIVAS Y PREVENTIVAS

Fecha:	
Nombre de quien verifica:	
Fue implantada?	<input type="checkbox"/> Si <input type="checkbox"/> No
Comentarios:	
Firma de quien verifica:	
Firma del Gerente:	
Fecha:	

Definiciones:

- **No Conformidad = incumplimiento de los requisitos.**
- **Acciones Correctivas = conjunto de acciones tomadas para eliminar las causas de un incumplimiento y evitar que se repita nuevamente.**
- **Acción Preventiva = conjunto de acciones tomadas para eliminar las causas de un incumplimiento potencial destinado a identificar oportunidades de mejora.**

APPENDIX II

Codes of practice that can be used as a guide to meet a few sections of this Regulation

Rule 804.A. The following codes of practice can be used as a guide to comply with this Rule:

- A) Publication SP 0285 of NACE International, “External Corrosion Control of Underground Storage Systems by Cathodic Protection”;
- B) Publication SP 0169 of NACE International, “Control of External Corrosion on Underground or Submerged Metallic Piping Systems”;
- C) Publication 1632 of American Institute of Petroleum, “Cathodic Protection of Underground Petroleum Storage Tanks and Piping Systems”; o
- D) Publication R892 of Steel Tank Institute, “Recommended Practice for Corrosion Protection of Underground Piping Networks Associated with Liquid Petroleum Storage and Dispensing Systems”.

Rule 807.A. The following codes of practice can be used as a guide to comply with this Rule:

- A) Publication 1316 of Underwriters Laboratories, “Glass-Fiber-Reinforced Plastic Underground Storage Tanks for Petroleum Products, Alcohols, and Alcohol-Gasoline Mixtures”; o
- B) Publication S615 of Underwriters Laboratories of Canada, “Standard for Reinforced Plastic Underground Tanks for Flammable and Combustible Liquids”.

Rule 807.A.2. The following codes of practice can be used as a guide to comply with this Rule:

- A) Specification of Steel Tank Institute “sti-P3® Specification and Manual for External Corrosion Protection of Underground Steel Storage Tanks”;
- B) Publication 1746 of Underwriters Laboratories, “Standard for External Corrosion Protection System for Steel Underground Storage Tanks”;
- C) Publication S603, “Standard for Steel Underground Tanks for Flammable and Combustible Liquids,” y S603.1, “Standard for External Corrosion Protection Systems for Steel Underground Tanks for Flammable and Combustible Liquids,” y S631, “Standard for Isolating Bushings for Steel Underground Tanks Protected with External Corrosion Protection Systems” del Underwriters Laboratories de Canada;
- D) Publication F841 of Steel Tank Institute, “Standard for Dual Wall Underground Steel Storage Tanks”; o
- E) Publication SP 0285 of NACE International, “External Corrosion Control of Underground Storage Systems by Cathodic Protection,” and Publication 58 of Underwriters Laboratories, “Standard for Steel Underground Tanks for Flammable and Combustible Liquids”.

Rule 807.A.3. The following codes of practice can be used as a guide to comply with this Rule:

- A) Publication 1746 of Underwriters Laboratories, “Standard for External Corrosion Protection Systems for Steel Underground Storage Tanks”;
- B) Publication F894 of Steel Tank Institute, “ACT–100R Specification for External Corrosion Protection of FRP Composite Steel USTs”;
- C) Publication F961 of Steel Tank Institute, “ACT–100–UR Specification for External Corrosion Protection of Composite Steel Underground Storage Tanks”; o
- D) Publication F922 of Steel Tank Institute, “Steel Tank Institute Specification for Permatank®”.

Rule 807.A.6. The following codes of practice can be used as a guide to comply with this Rule:

- A) Publication 58 of Underwriters Laboratories, “Standard for Steel Underground Tanks for Flammable and Combustible Liquids”;
- B) Publication 1316 of Underwriters Laboratories, “Glass-Fiber-Reinforced Plastic Underground Storage Tanks for Petroleum Products, Alcohols, and Alcohol-Gasoline Mixtures”;
- C) Publication 1746 of Underwriters Laboratories, “Standard for External Corrosion Protection Systems for Steel Underground Storage Tanks”;
- D) Publication F841 of Steel Tank Institute, “Standard for Dual Wall Underground Steel Storage Tanks”; o
- E) Publication F922 of Steel Tank Institute, “Steel Tank Institute Specification for Permatank®”.

Rule 807.B.1. The following codes of practice can be used as a guide to comply with this Rule:

- A) Publication 971 of Underwriters Laboratories (UL), “Standard for Non-Metallic Underground Piping for Flammable Liquids”; o
- B) Publication S660 of Underwriters Laboratories of Canada, “Standard for Non-Metallic Underground Piping for Flammable Liquids”.

Rule 807.B.2.d. The following codes of practice can be used as a guide to comply with this Rule:

- A) Publication 1632 of American Institute of Petroleum, “Cathodic Protection of Underground Petroleum Storage Tanks and Piping Systems”;
- B) Publication 971A of Underwriters Laboratories, “Outline of Investigation for Metallic Underground Fuel Pipe”;

- C) Publication R892 of Steel Tank Institute, “Recommended Practice for Corrosion Protection of Underground Piping Networks Associated with Liquid Petroleum Storage and Dispensing Systems”;
- D) Publication SP 0169 of NACE International, “Control of External Corrosion on Underground or Submerged Metallic Piping Systems”; o
- E) Publication SP 0285 of NACE International, “External Corrosion Control of Underground Storage Systems by Cathodic Protection”.

Rule 807.B.5. The following codes of practice can be used as a guide to comply with this Rule:

- A) Publication 971 of Underwriters Laboratories, “Standard for Non-Metallic Underground Piping for Flammable Liquids”; o
- B) Publication 971A of Underwriters Laboratories, “Outline of Investigation for Metallic Underground Fuel Pipe”.

Rule 807.D. The following codes of practice can be used as a guide to comply with this Rule:

- A) Publication 1615 of American Institute of Petroleum, “Installation of Underground Petroleum Storage System”, o
- B) Publication RP100 of Petroleum Equipment Institute, “Recommended Practices for Installation of Underground Liquid Storage Systems”, o
- C) Standard 30 of National Fire Protection, "Flammable and Combustible Liquids Code" and Standard 30A, “Code for Motor Fuel Dispensing Facilities and Repair Garages”.

Rule 808.B.3. The following codes of practice can be used as a guide to comply with this Rule:

- A) Publication 1631 of American Institute of Petroleum, “Interior Lining and Periodic Inspection of Underground Storage Tanks”;
- B) Publication 631 of National Leak Prevention Association, “Entry, Cleaning, Interior Inspection, Repair, and Lining of Underground Storage Tanks”;
- C) Publication SP 0285 of NACE International, “External Corrosion Control of Underground Storage Tank Systems by Cathodic Protection”; y
- D) Publication 1632 of American Institute of Petroleum, “Cathodic Protection of Underground Petroleum Storage Tanks and Piping Systems”.
- E) National Leak Prevention Association Standard 631, "Entry, Cleaning, Interior Inspection, Repair, and Lining of Underground Storage Tanks"; o

- F) Practice Recommended by Ken Wilcox Associates, “Recommended Practice for Inspecting Buried Lined Steel Tanks Using a Video Camera”.

Rule 808.E. The following codes of practice can be used as a guide to comply with this Rule:

- A) Standard SP 0285 of NACE International, “External Control of Underground Storage Tank Systems by Cathodic Protection”;
- B) Standard SP 0169 of NACE International, “Control of External Corrosion on Underground or Submerged Metallic Piping Systems”;
- C) Standard 631 of National Leak Prevention Association, “Entry, Cleaning, Interior Inspection, Repair, and Lining of Underground Storage Tanks”; o
- D) Standard G158 of American Society for Testing and Materials, “Standard Guide for Three Methods of Assessing Buried Steel Tanks”.

Rule 813.A. The following codes of practice can be used as a guide to comply with this Rule:

Procedures for transfer described in the Publication 385 of National Fire Protection Association (NFPA), “Standard for Tank Vehicles for Flammable and Combustible Liquids” or the Publication 1007 of American Institute of Petroleum (API), “Loading and Unloading of MC 306/DOT 406 Cargo Tank Vehicles”.

Publication 1621 of API, “BulkLiquid Stock Control at Retail Outlets”.

RULE 814.B.2. The following codes of practice can be used as a guide to comply with this Rule:

- A) Method of proof TM 0101 of NACE International, “Measurement Techniques Related to Criteria for Cathodic Protection on Underground or Submerged Metallic Tank Systems”;
- B) Method of proof TM0497 del NACE International, “Measurement Techniques Related to Criteria for Cathodic Protection on Underground or Submerged Metallic Piping Systems”;
- C) Practice R051 of Steel Tank Institute, “Cathodic Protection Testing Procedures for sti-P3 USTs”;
- D) Practice SP 0285 of NACE International, “External Control of Underground Storage Tank Systems by Cathodic Protection”; o
- E) Practice SP 0169 of NACE International, “Control of External Corrosion on Underground or Submerged Metallic Piping Systems”.

Rule 816.A. The following codes of practice can be used as a guide to comply with this Rule:

- A) Standard 30 of NFPA, “Flammable and Combustible LiquidsCode”;
- B) Publication RP 2200 of API, “Repairing Crude Oil, Liquefied Petroleum Gas, and Product

Pipelines”;

- C) Publication RP 1631 OF API, “Interior Lining and Periodic Inspection of Underground Storage Tanks”;
- D) Standard 326 of NFPA, “Safeguarding of Tanks and Containers for Entry, Cleaning, or Repair”;
- E) Standard 631 of National Leak Prevention Association, “Entry Cleaning, Interior Inspection, Repair, and Lining of Underground Storage Tanks”
- F) Practice R972 of Steel Tank Institute, “Recommended Practice for the Addition of Supplemental Anodes to sti-P3® Tanks”;
- G) Practice SP 0285 of NACE International, "External Control of Underground Storage Tank Systems by Cathodic Protection"; o
- H) Practice T-95-02 of Fiberglass Tank and Pipe Institute, “Remanufacturing of Fiberglass Reinforced Plastic (FRP) Underground Storage Tanks”.

Rule 818.C.2. The following codes of practice can be used as a guide to comply with this Rule:

- A) Publication RP1200 of Petroleum Equipment Institute (PEI), “Recommended Practices for the Testing and Verification of Spill, Overfill, Leak Detection and Secondary Containment Equipment at UST Facilities”

Rule 819.A.3. The following codes of practice can be used as a guide to comply with this Rule:

- A) Practice R012 of Steel Tank Institute, “Recommended Practice for Interstitial Tightness Testing of Existing Underground Double Wall Steel Tanks”;
- B) Protocol of Fiberglass Tank and Pipe Institute, “Field Test Protocol for Testing the Annular Space of Installed Underground Fiberglass Double and Triple-Wall Tanks with Dry Annular Space”; o
- C) Practice RP1200 of Petroleum Equipment Institute, “Recommended Practices for the Testing and Verification of Spill, Overfill, Leak Detection and Secondary Containment Equipment at UST Facilities”.

Rule 820.B. The following codes of practice can be used as a guide to comply with this Rule:

- A) Practice RP 900 of Petroleum Equipment Institute, “Recommended Practices for the Inspection and Maintenance of UST Systems”.

Rule 828.A. The following codes of practice can be used as a guide to comply with this Rule:

- A) Practice RP1200 of Petroleum Equipment Institute, “Recommended Practices for the Testing and Verification of Spill, Overfill, Leak Detection and Secondary Containment Equipment at UST Facilities”.

Rule 831.B.6. The following codes of practice can be used as a guide to comply with this Rule:

Publication 1621 of API, “Bulk Liquid Stock Control at Retail Outlets”

Rule 851.C. The following codes of practice can be used as a guide to comply with this Rule:

- A) Publication RP 1604 of API, “Closure of Underground Petroleum Storage Tanks”;
- B) Publication 2015 of API, “Requirements for Safe Entry and Cleaning of Petroleum Storage Tanks”;
- C) Publication 2016 of API, “Guidelines and Procedures for Entering and Cleaning Petroleum Storage Tanks”;
- D) Publication RP 1631 of API, “Interior Lining and Periodic Inspection of Underground Storage Tanks”;
- E) Publication 326 of NFPA, “Safeguarding of Tanks and Containers for Entry, Cleaning, or Repair”;
- F) Publication 80-106 of NIOSH, “Criteria for a Recommended Standard... Working in Confined Space”

APPENDIX III

**List of substances identified as hazardous under the Federal Rules (40 CFR Part 302)
Section 101(4) of the CERCLA Act.**

CASRN	Hazardous substance
50000	Formaldehyde.
50077	Azirino[2',3':3,4]pyrrolo[1,2-a]indole-4,7-dione,6-amino-8- [[[(aminocarbonyl)oxy)methyl]-1,1a,2,8,8a, 8b-hexahydro-8a-methoxy-5-methyl-, [1aS-(1alpha, 8beta,8aalpha,8balpha)]-
	Mitomycin C.
50180	Cyclophosphamide.
	2H-1,3,2-Oxazaphosphorin-2-amine, N,N-bis(2-chloroethyl)tetrahydro-, 2-oxide.
50293	Benzene, 1,1'-(2,2,2- trichloroethylidene)bis[4-chloro-.
	DDT.
	4,4'-DDT.
50328	Benzo[a]pyrene.
	3,4-Benzopyrene.
50555	Reserpine.
	Yohimban-16-carboxylic acid,11,17-dimethoxy-18-[(3 ,4,5-trimethoxybenzoyl)oxy]-, methyl ester (3beta, 16beta,17alpha,18beta,20alpha)-.
51285	Phenol, 2,4-dinitro-.
	2,4-Dinitrophenol.
51434	Epinephrine.
	1,2-Benzenediol,4-[1-hydroxy-2-(methylamino) ethyl]-.
51796	Carbamic acid, ethyl ester.
	Ethyl carbamate.
	Urethane.
52686	Trichlorfon.
52857	Famphur.
	Phosphorothioic acid, O-[4-[(dimethylamino) sulfonyl]phenyl] O,O-dimethyl ester.
53703	Dibenz[a,h]anthracene.
	Dibenzo[a,h]anthracene.
	1,2:5,6-Dibenzanthracene.
53963	Acetamide, N-9H-fluoren-2-yl-.
	2-Acetylaminofluorene.
54115	Nicotine, & salts.
	Pyridine, 3-(1-methyl-2-pyrrolidinyl)-, (S)-, & salts.
55185	Ethanamine, N-ethyl-N-nitroso-.
	N-Nitrosodiethylamine.
55630	Nitroglycerine.
	1,2,3-Propanetriol, trinitrate.

55914	Diisopropylfluorophosphate (DFP).
	Phosphorofluoridic acid, bis(1-methylethyl) ester.
56042	Methylthiouracil.
	4(1H)-Pyrimidinone, 2,3-dihydro-6-methyl-2-thioxo-.
56235	Carbon tetrachloride.
	Methane, tetrachloro-.
56382	Parathion.
	Phosphorothioic acid, O,O-diethyl O-(4-nitrophenyl) ester.
56495	Benz[<i>j</i>]aceanthrylene, 1,2-dihydro-3-methyl-.
	3-Methylcholanthrene.
56531	Diethylstilbestrol.
	Phenol, 4,4'-(1,2-diethyl-1,2-ethenediyl)bis-, (E).
56553	Benz[<i>a</i>]anthracene.
	Benzo[<i>a</i>]anthracene.
	1,2-Benzanthracene.
56724	Coumaphos.
57147	Hydrazine, 1,1-dimethyl-.
	1,1-Dimethylhydrazine.
57249	Strychnidin-10-one, & salts.
	Strychnine, & salts.
57476	Physostigmine.
	Pyrrolo[2,3- <i>b</i>]indol-5-ol, 1,2,3,3a,8,8a-hexahydro-1,3a,8-trimethyl-, methylcarbamate (ester), (3a <i>S</i> - <i>cis</i>)-.
57578	beta-Propiolactone.
57647	Benzoic acid, 2-hydroxy-, compd. with (3a <i>S</i> - <i>cis</i>)-1,2,3,3a,8,8a-hexahydro-1,3a,8-trimethylpyrrolo[2,3- <i>b</i>]indol-5-yl methylcarbamate ester (1:1). Physostigmine salicylate.
57749	Chlordane.
	Chlordane, alpha & gamma isomers.
	CHLORDANE (TECHNICAL MIXTURE AND METABOLITES).
	4,7-Methano-1H-indene, 1,2,4,5,6,7,8,8- octachloro-2,3,3a,4,7,7a-hexahydro-.
57976	Benz[<i>a</i>]anthracene, 7,12-dimethyl-.
	7,12-Dimethylbenz[<i>a</i>]anthracene.
58899	γ-BHC.
	Cyclohexane, 1,2,3,4,5,6-hexachloro-(1α,2α,3β,4α,5α,6β)-.
	Lindane.
	Lindane (all isomers).
58902	Phenol, 2,3,4,6-tetrachloro-.
	2,3,4,6-Tetrachlorophenol.

59507	p-Chloro-m-cresol.
	Phenol, 4-chloro-3-methyl-.
59892	N-Nitrosomorpholine.
60004	Ethylenediamine-tetraacetic acid (EDTA).
60117	Benzenamine, N,N-dimethyl-4-(phenylazo)-.
	Dimethyl aminoazobenzene.
	p-Dimethylaminoazobenzene.
60297	Ethane, 1,1'-oxybis-.
	Ethyl ether.
60344	Hydrazine, methyl-.
	Methyl hydrazine.
60355	Acetamide.
60515	Dimethoate.
	Phosphorodithioic acid, O,O-dimethyl S-[2(methylamino)-2-oxoethyl] ester.
60571	Dieldrin.
	2,7:3,6-Dimethanonaphth[2,3-b]oxirene, 3,4,5,6,9,9-hexachloro-1a,2,2a,3,6,6a,7,7a-octahydro-, (1aalpha,2beta,2aalpha,3beta,6beta, 6aalpha,7beta, 7aalpha)-.
61825	Amitrole.
	1H-1,2,4-Triazol-3-amine.
62384	Mercury, (acetato-O)phenyl-.
	Phenylmercury acetate.
62442	Acetamide, N-(4-ethoxyphenyl)-.
	Phenacetin.
62500	Ethyl methanesulfonate.
	Methanesulfonic acid, ethyl ester.
62533	Aniline.
	Benzenamine.
62555	Ethanethioamide.
	Thioacetamide.
62566	Thiourea.
62737	Dichlorvos.
62748	Acetic acid, fluoro-, sodium salt.
	Fluoroacetic acid, sodium salt.
62759	Methanamine, N-methyl-N-nitroso-.
	N-Nitrosodimethylamine.
63252	Carbaryl.
	1-Naphthalenol, methylcarbamate.
64006	m-Cumenyl methylcarbamate.

	3-Isopropylphenyl N-methylcarbamate. Phenol, 3-(1-methylethyl)-, methyl carbamate.
64006	Phenol, 3-(1-methylethyl)-, methyl carbamate (m-Cumenyl methylcarbamate).
64186	Formic acid.
64197	Acetic acid.
64675	Diethyl sulfate.
65850	Benzoic acid.
66751	Uracil mustard.
	2,4-(1H,3H)-Pyrimidinedione, 5-[bis(2-chloroethyl) amino]-.
67561	Methanol.
	Methyl alcohol.
67641	Acetone.
	2-Propanone.
67663	Chloroform.
	Methane, trichloro-.
67721	Ethane, hexachloro-.
	Hexachloroethane.
68122	Dimethylformamide.
70257	Guanidine, N-methyl-N'-nitro-N-nitroso-.
	MNNG.
70304	Hexachlorophene.
	Phenol, 2,2'-methylenebis[3,4,6-tri- chloro-.
71363	n-Butyl alcohol.
	1-Butanol.
71432	Benzene.
71556	Ethane, 1,1,1-trichloro-.
	Methyl chloroform.
	1,1,1-Trichloroethane.
72208	Endrin.
	Endrin, & metabolites.
	2,7:3.6-Dimethanonaphth[2,3-b]oxirene,3,4,5,6,9,9-hexachloro-1a,2,2a,3,6,6a,7,7a-octahydro-, (1aalpha,2beta,2abeta,3alpha, 6alpha,6abeta,7beta,7aalpha)-, & metabolites.
72435	Benzene, 1,1'-(2,2,2-trichloroethylidene)bis[4- methoxy-.
	Methoxychlor.
72548	Benzene, 1,1'-(2,2-dichloroethylidene)bis[4-chloro-.
	DDD.
	TDE.
	4,4'-DDD.

72559	DDE
	4,4'-DDE.
72571	Trypan blue.
	2,7-Naphthalenedisulfonic acid, 3,3'-[(3,3'-dimethyl-(1,1'-biphenyl)-4,4'-diyl)-bis(azo)]bis(5-amino-4-hydroxy)-tetrasodium salt.
74839	Bromomethane.
	Methane, bromo-.
	Methyl bromide.
74873	Chloromethane.
	Methane, chloro-.
	Methyl chloride.
74884	Iodomethane
	Methane, iodo-.
	Methyl iodide.
74895	Monomethylamine.
74908	Hydrocyanic acid.
	Hydrogen cyanide.
74931	Methanethiol.
	Methyl mercaptan.
	Thiomethanol.
74953	Methane, dibromo-.
	Methylene bromide.
75003	Chloroethane.
	Ethyl chloride.
75014	Ethene, chloro-.
	Vinyl chloride.
75047	Monoethylamine.
75058	Acetonitrile.
75070	Acetaldehyde.
	Ethanal.
75092	Dichloromethane.
	Methane, dichloro-.
	Methylene chloride.
75150	Carbon disulfide.
75207	Calcium carbide.
75218	Ethylene oxide.
	Oxirane.
75252	Bromoform.
	Methane, tribromo-.

75274	Dichlorobromomethane.
75343	Ethane, 1,1-dichloro-.
	Ethylidene dichloride.
	1,1-Dichloroethane.
75354	Ethene, 1,1-dichloro-.
	Vinylidene chloride.
	1,1-Dichloroethylene.
75365	Acetyl chloride.
75445	Carbonic dichloride.
	Phosgene.
75503	Trimethylamine.
75558	Aziridine, 2-methyl-.
	2-Methyl aziridine.
	1,2-Propylenimine.
75569	Propylene oxide.
75605	Arsinic acid, dimethyl-.
	Cacodylic acid.
75649	tert-Butylamine.
75694	Methane, trichlorofluoro-.
	Trichloromonofluoromethane.
75718	Dichlorodifluoromethane.
	Methane, dichlorodifluoro-.
75865	Acetone cyanhydrin.
	Propanenitrile, 2-hydroxy-2-methyl-.
	2-Methylactonitrile.
75876	Acetaldehyde, trichloro-.
	Chloral.
75990	2,2-Dichloropropionic acid.
76017	Ethane, pentachloro-.
	Pentachloroethane.
76448	Heptachlor.
	4,7-Methano-1H-indene, 1,4,5,6,7,8,8-heptachloro-3a,4,7,7a-tetrahydro-.
77474	Hexachlorocyclopentadiene.
	1,3-Cyclopentadiene, 1,2,3,4,5,5-hexa- chloro-.
77781	Dimethyl sulfate.
	Sulfuric acid, dimethyl ester.
78002	Plumbane, tetraethyl-.
	Tetraethyl lead.
78591	Isophorone.

78795	Isoprene.
78819	iso-Butylamine.
78831	Isobutyl alcohol.
	1-Propanol, 2-methyl-.
78875	Propane, 1,2-dichloro-.
	Propylene dichloride.
	1,2-Dichloropropane.
78886	2,3-Dichloropropene.
78933	2-Butanone.
	MEK.
	Methyl ethyl ketone.
78999	1,1-Dichloropropane.
79005	Ethane, 1,1,2-trichloro-.
	1,1,2-Trichloroethane.
79016	Ethene, trichloro-.
	Trichloroethylene.
79061	Acrylamide.
	2-Propenamide.
79094	Propionic acid.
79107	Acrylic acid.
	2-Propenoic acid.
79118	Chloroacetic acid.
79196	Hydrazinecarbothioamide.
	Thiosemicarbazide.
79221	Carbonochloridic acid, methyl ester.
	Methyl chlorocarbonate.
79312	iso-Butyric acid.
79345	Ethane, 1,1,2,2-tetrachloro-.
	1,1,2,2-Tetrachloroethane.
79447	Carbamic chloride, dimethyl-.
	Dimethylcarbamoyl chloride.
79469	Propane, 2-nitro-.
	2-Nitropropane.
80159	alpha,alpha-Dimethylbenzylhydroperoxide.
	Hydroperoxide, 1-methyl-1-phenylethyl-.
80626	Methyl methacrylate.
	2-Propenoic acid, 2-methyl-, methyl ester.
81812	Warfarin, & salts.
	2H-1-Benzopyran-2-one, 4-hydroxy-3-(3-oxo-1-phenylbutyl)-, & salts.

82688	Benzene, pentachloronitro-.
	PCNB.
	Pentachloronitrobenzene.
	Quintobenzene.
83329	Acenaphthene.
84662	Diethyl phthalate.
	1,2-Benzenedicarboxylic acid, diethyl ester.
84742	Di-n-butyl phthalate.
	Dibutyl phthalate.
	n-Butyl phthalate.
	1,2-Benzenedicarboxylic acid, dibutyl ester.
85007	Diquat.
85018	Phenanthrene.
85449	Phthalic anhydride.
	1,3-Isobenzofurandione.
85687	Butyl benzyl phthalate.
86306	N-Nitrosodiphenylamine.
86500	Guthion.
86737	Fluorene.
86884	alpha-Naphthylthiourea.
	Thiourea, 1-naphthalenyl-.
87650	Phenol, 2,6-dichloro-.
	2,6-Dichlorophenol.
87683	Hexachlorobutadiene.
	1,3-Butadiene, 1,1,2,3,4,4-hexachloro-.
87865	Pentachlorophenol.
	Phenol, pentachloro-.
88062	Phenol, 2,4,6-trichloro-.
	2,4,6-Trichlorophenol.
88722	o-Nitrotoluene.
88755	o-Nitrophenol.
	2-Nitrophenol.
88857	Dinoseb.
	Phenol, 2-(1-methylpropyl)-4,6-dinitro-.
90040	o-Anisidine.
91087	Benzene, 1,3-diisocyanatomethyl-.
	Toluene diisocyanate.
	2,4-Toluene diisocyanate.
91203	Naphthalene.

91225	Quinoline.
91587	beta-Chloronaphthalene.
	Naphthalene, 2-chloro-.
	2-Chloronaphthalene.
91598	beta-Naphthylamine.
	2-Naphthalenamine.
91667	N,N-Diethylaniline.
91805	Methapyrilene.
	1,2-Ethanediamine, N,N-dimethyl-N'-2-pyridinyl-N'- (2-thienylmethyl)-.
91941	[1,1'-Biphenyl]-4,4'-diamine,3,3'-dichloro-.
	3,3'-Dichlorobenzidine.
92524	Biphenyl.
92671	4-Aminobiphenyl.
92875	Benzidine.
	[1,1'-Biphenyl]-4,4'-diamine.
92933	4-Nitrobiphenyl.
	Propanoic acid, 2-(2,4,5-trichlorophenoxy)-.
	Silvex (2,4,5-TP).
	2,4,5-TP acid.
93765	Acetic acid, (2,4,5-trichlorophenoxy)-.
93721	2,4,5-T.
	2,4,5-T acid.
93798	2,4,5-T esters.
94111	2,4-D Ester.
94586	Dihydrosafrole.
	1,3-Benzodioxole, 5-propyl-.
94597	Safrole.
	1,3-Benzodioxole, 5-(2-propenyl)-.
94791	2,4-D Ester.
94804	2,4-D Ester.
95476	o-Xylene.
95487	o-Cresol.
95501	Benzene, 1,2-dichloro-.
	o-Dichlorobenzene.
	1,2-Dichlorobenzene.
95534	Benzenamine, 2-methyl-.
	o-Toluidine.
95578	o-Chlorophenol.
	Phenol, 2-chloro-.

	2-Chlorophenol.
95807	Benzenediamine, ar-methyl-.
	Toluenediamine.
	2,4-Toluene diamine.
95943	Benzene, 1,2,4,5-tetrachloro-.
	1,2,4,5-Tetrachlorobenzene.
95954	Phenol, 2,4,5-trichloro-.
	2,4,5-Trichlorophenol.
96093	Styrene oxide.
96128	Propane, 1,2-dibromo-3-chloro-.
	1,2-Dibromo-3-chloropropane.
96457	Ethylenethiourea.
	2-Imidazolidinethione.
97632	Ethyl methacrylate.
	2-Propenoic acid, 2-methyl-, ethyl ester.
98011	Furfural.
	2-Furancarboxaldehyde.
98077	Benzene, (trichloromethyl)-.
	Benzotrichloride.
98099	Benzenesulfonic acid chloride.
	Benzenesulfonyl chloride.
98828	Benzene, (1-methylethyl)-.
	Cumene.
98862	Acetophenone.
	Ethanone, 1-phenyl-.
98873	Benzal chloride.
	Benzene, (dichloromethyl)-.
98884	Benzoyl chloride.
98953	Benzene, nitro-.
	Nitrobenzene.
99081	m-Nitrotoluene.
99354	Benzene, 1,3,5-trinitro-.
	1,3,5-Trinitrobenzene.
99558	Benzenamine, 2-methyl-5-nitro-.
	5-Nitro-o-toluidine.
99650	m-Dinitrobenzene.
99990	p-Nitrotoluene.
100016	Benzenamine, 4-nitro-.
	p-Nitroaniline.

100027	p-Nitrophenol.
	Phenol, 4-nitro-.
	4-Nitrophenol.
100254	p-Dinitrobenzene.
100414	Ethylbenzene.
100425	Styrene.
100447	Benzene, (chloromethyl)-.
	Benzyl chloride.
100470	Benzonitrile.
100754	N-Nitrosopiperidine.
	Piperidine, 1-nitroso-.
101144	Benzenamine, 4,4'-methylenebis[2-chloro-.
	4,4'-Methylenebis(2-chloroaniline).
101279	Barban. Carbamic acid, (3-chlorophenyl)-, 4-chloro-2-butynyl ester.
101553	Benzene, 1-bromo-4-phenoxy-.
	4-Bromophenyl phenyl ether.
101688	MDI.
	Methylene diphenyl diisocyanate.
101779	4,4'-Methylenedianiline.
103855	Phenylthiourea.
	Thiourea, phenyl-.
105464	sec-Butyl acetate.
105679	Phenol, 2,4-dimethyl-.
	2,4-Dimethylphenol.
106423	p-Xylene.
106445	p-Cresol.
106467	Benzene, 1,4-dichloro-.
	p-Dichlorobenzene.
	1,4-Dichlorobenzene.
106478	Benzenamine, 4-chloro-.
	p-Chloroaniline.
106490	Benzenamine, 4-methyl-.
	p-Toluidine.
106503	p-Phenylenediamine.
106514	p-Benzoquinone.
	2,5-Cyclohexadiene-1,4-dione.
	Quinone.
106887	1,2-Epoxybutane.

106898	1-Chloro-2,3-epoxypropane.
	Epichlorohydrin.
	Oxirane, (chloromethyl)-.
106934	Dibromoethane.
	Ethane, 1,2-dibromo-.
	Ethylene dibromide.
106990	1,3-Butadiene.
107028	Acrolein.
	2-Propenal.
107051	Allyl chloride.
107062	Ethane, 1,2-dichloro-.
	Ethylene dichloride.
	1,2-Dichloroethane.
107108	n-Propylamine.
	1-Propanamine.
107120	Ethyl cyanide.
	Propanenitrile.
107131	Acrylonitrile.
	2-Propenenitrile.
107153	Ethylenediamine.
107186	Allyl alcohol.
	2-Propen-1-ol.
107197	Propargyl alcohol.
	2-Propyn-1-ol.
107200	Acetaldehyde, chloro-.
	Chloroacetaldehyde.
107211	Ethylene glycol.
107302	Chloromethyl methyl ether.
	Methane, chloromethoxy-.
107493	Diphosphoric acid, tetraethyl ester.
	Tetraethyl pyrophosphate.
107926	Butyric acid.
108054	Vinyl acetate.
	Vinyl acetate monomer.
108101	Hexone.
	Methyl isobutyl ketone.
	4-Methyl-2-pentanone.
108247	Acetic anhydride.
108316	Maleic anhydride.

	2,5-Furandione.
108383	m-Xylene.
108394	m-Cresol.
108463	Resorcinol.
	1,3-Benzenediol.
108601	Dichloroisopropyl ether.
	Propane, 2,2"-oxybis[2-chloro-.
108883	Benzene, methyl-.
	Toluene.
108907	Benzene, chloro-.
	Chlorobenzene.
108941	Cyclohexanone.
108952	Phenol.
108985	Benzenethiol.
	Thiophenol.
109068	Pyridine, 2-methyl-.
	2-Picoline.
109739	Butylamine.
109773	Malononitrile.
	Propanedinitrile.
109897	Diethylamine.
109999	Furan, tetrahydro-.
	Tetrahydrofuran.
110009	Furan.
	Furfuran.
110167	Maleic acid.
110178	Fumaric acid.
110190	iso-Butyl acetate.
110543	Hexane.
110758	Ethene, (2-chloroethoxy)-.
	2-Chloroethyl vinyl ether.
110805	Ethanol, 2-ethoxy-.
	Ethylene glycol monoethyl ether.
110827	Benzene, hexahydro-.
	Cyclohexane.
110861	Pyridine.
111422	Diethanolamine.
111444	Bis(2-chloroethyl) ether.
	Dichloroethyl ether.

	Ethane, 1,1'-oxybis[2-chloro-.
111546	Carbamodithioic acid, 1,2-ethanediybis-, salts & esters.
	Ethylenebisdithiocarbamic acid, salts & esters.
111911	Bis(2-chloroethoxy) methane.
	Dichloromethoxyethane.
	Ethane, 1,1'-[methylenebis(oxy)]bis(2-chloro-.
114261	Phenol, 2-(1-methylethoxy)-, methylcarbamate.
	Propoxur (Baygon).
115026	Azaserine.
	L-Serine, diazoacetate (ester).
115297	Endosulfan.
	6,9-Methano-2,4,3-benzodioxathiepin, 6,7,8,9,10,10-hexachloro-1,5,5a,6,9,9a-hexahydro-, 3-oxide.
115322	Dicofol.
116063	Aldicarb.
	Propanal, 2-methyl-2-(methylthio)-, O-[(methylamino)carbonyl]oxime.
117806	Dichlone.
117817	1,2-Benzenedicarboxylic acid, bis(2-ethylhexyl) ester.
	Bis(2-ethylhexyl)phthalate.
	DEHP.
	Diethylhexyl phthalate.
117840	Di-n-octyl phthalate.
	1,2-Benzenedicarboxylic acid, dioctyl ester.
118741	Benzene, hexachloro-.
	Hexachlorobenzene.
119380	Carbamic acid, dimethyl-, 3-methyl-1-(1-methylethyl)-1H-pyrazol-5-yl ester. Isolan.
119904	[1,1'-Biphenyl]-4,4'-diamine,3,3'-dimethoxy-.
	3,3'-Dimethoxybenzidine.
119937	[1,1'-Biphenyl]-4,4'-diamine,3,3'- dimethyl-.
	3,3'-Dimethylbenzidine.
120127	Anthracene.
120581	Isosafrole.
	1,3-Benzodioxole, 5-(1-propenyl)-.
120809	Catechol.
120821	1,2,4-Trichlorobenzene.
120832	Phenol, 2,4-dichloro-.
	2,4-Dichlorophenol.
121142	Benzene, 1-methyl-2,4-dinitro-.

	2,4-Dinitrotoluene.
121211	Pyrethrins.
121299	Pyrethrins.
121448	Ethanamine, N,N-diethyl-.
	Triethylamine.
121697	N,N-Dimethylaniline.
121755	Malathion.
122098	alpha,alpha-Dimethylphenethylamine.
	Benzeneethanamine, alpha,alpha-dimethyl-.
122429	Carbamic acid, phenyl-, 1-methylethyl ester. Propham.
122667	Hydrazine, 1,2-diphenyl-.
	1,2-Diphenylhydrazine.
123319	Hydroquinone.
123331	Maleic hydrazide.
	3,6-Pyridazinedione, 1,2-dihydro-.
123386	Propionaldehyde.
123626	Propionic anhydride.
123637	Paraldehyde.
	1,3,5-Trioxane, 2,4,6-trimethyl-.
123739	Crotonaldehyde.
	2-Butenal.
123864	Butyl acetate.
123911	1,4-Diethyleneoxide.
	1,4-Dioxane.
123922	iso-Amyl acetate.
124049	Adipic acid.
124403	Dimethylamine.
	Methanamine, N-methyl-.
124414	Sodium methylate.
124481	Chlorodibromomethane.
126727	Tris(2,3-dibromopropyl) phosphate.
	1-Propanol, 2,3-dibromo-, phosphate (3:1).
126987	Methacrylonitrile.
	2-Propenenitrile, 2-methyl-.
126998	Chloroprene.
127184	Ethene, tetrachloro-.
	Perchloroethylene.
	Tetrachloroethylene.

127822	Zinc phenolsulfonate.
129000	Pyrene.
130154	1,4-Naphthalenedione. 1,4-Naphthoquinone.
131113	Dimethyl phthalate. 1,2-Benzenedicarboxylic acid, dimethyl ester.
131748	Ammonium picrate. Phenol, 2,4,6-trinitro-, ammonium salt.
131895	Phenol, 2-cyclohexyl-4,6-dinitro-. 2-Cyclohexyl-4,6-dinitrophenol.
132649	Dibenzofuran.
133062	Captan.
133904	Chloramben.
134327	alpha-Naphthylamine. 1-Naphthalenamine.
137268	Thioperoxydicarbonic diamide ([H2N)C(S)]2S2, tetramethyl-. Thiram.
137304	Zinc, bis(dimethylcarbamoedithioato-S,S')-. Ziram.
140885	Ethyl acrylate. 2-Propenoic acid, ethyl ester.
141786	Acetic acid, ethyl ester. Ethyl acetate.
142289	1,3-Dichloropropane.
142712	Cupric acetate.
142847	Dipropylamine. 1-Propanamine, N-propyl-.
143339	Sodium cyanide Na(CN).
143500	Kepone. 1,3,4-Metheno-2H-cyclobuta[cd]pentalen-2-one, 1,1a,3,3a,4,5,5,5a,5b,6-decachlorooctahydro-.
145733	Endothall. 7-Oxabicyclo[2.2.1]heptane-2,3-dicarboxylic acid.
148823	L-Phenylalanine, 4-[bis(2-chloroethyl)amino]-. Melphalan.
151508	Potassium cyanide K(CN).
151564	Aziridine. Ethylenimine.

152169	Diphosphoramid, octamethyl-.
	Octamethylpyrophosphoramid.
156605	Ethene, 1,2-dichloro- (E).
	1,2-Dichloroethylene.
156627	Calcium cyanamid.
189559	Benzo[<i>rst</i>]pentaphene.
	Dibenzo[<i>a,i</i>]pyrene.
191242	Benzo[<i>ghi</i>]perylene.
193395	Indeno(1,2,3- <i>cd</i>)pyrene.
205992	Benzo[<i>b</i>]fluoranthene.
206440	Fluoranthene.
207089	Benzo(<i>k</i>)fluoranthene.
208968	Acenaphthylene.
218019	Chrysene.
225514	Benz[<i>c</i>]acridine.
297972	O,O-Diethyl O-pyrazinyl phosphoro-
	thioate.
	Phosphorothioic acid, O,O-diethyl O-pyrazinyl ester.
298000	Methyl parathion.
	Phosphorothioic acid, O,O-dimethyl O-(4-nitrophenyl) ester.
298022	Phorate.
	Phosphorodithioic acid, O,O-diethyl S-[(ethylthio) methyl] ester.
298044	Disulfoton.
	Phosphorodithioic acid, O,O-diethyl S-[2-(ethylthio)ethyl] ester.
300765	Naled.
301042	Acetic acid, lead(2+) salt.
	Lead acetate.
302012	Hydrazine.
303344	Lasiocarpine.
	2-Butenoic acid, 2-methyl-, 7-[[2,3-dihydroxy-2-(1-methoxyethyl)-3-methyl-1-oxobutoxy]methyl]-2,3,5,7a-tetrahydro-1H-pyrrolizin-1-yl ester, [1S-[1alpha(<i>Z</i>),7(2 <i>S</i> *,3 <i>R</i> *)], 7aalpha)]-.
305033	Benzenebutanoic acid, 4-[bis(2-chloroethyl)amino]-.
	Chlorambucil.
309002	Aldrin.
	1,4:5,8-Dimethanonaphthalene, 1,2,3,4,10,10-hexachloro-1,4,4a,5,8,8a-hexahydro-, (1alpha,4alpha,4abeta,5alpha,8alpha, 8abeta)-.
311455	Diethyl-p-nitrophenyl phosphate.
	Phosphoric acid, diethyl 4-nitrophenyl ester.
315184	Mexacarbate.

	Phenol, 4-(dimethylamino)-3,5-dimethyl-, methylcarbamate (ester).
319846	alpha—BHC.
319857	beta—BHC.
319868	delta—BHC.
329715	2,5-Dinitrophenol.
330541	Diuron.
333415	Diazinon.
334883	Diazomethane.
353504	Carbon oxyfluoride.
	Carbonic difluoride.
357573	Brucine.
	Strychnidin-10-one, 2,3-dimethoxy-.
460195	Cyanogen.
	Ethanedinitrile.
463581	Carbonyl sulfide.
465736	Isodrin.
	1,4:5,8-Dimethanonaphthalene, 1,2,3,4,10,10-hexachloro-1,4,4a,5,8,8a-hexahydro-, (1alpha,4alpha,4abeta,5beta,8beta, 8abeta)-.
492808	Auramine.
	Benzenamine, 4,4'-carbonimidoylbis[N,N-dimethyl-.
494031	Chlornaphazine.
	Naphthalenamine, N,N'-bis(2-chloro-
	ethyl)-.
496720	Benzenediamine, ar-methyl-.
	Toluenediamine.
	2,4-Toluene diamine.
504245	4-Aminopyridine.
	4-Pyridinamine.
504609	1-Methylbutadiene.
	1,3-Pentadiene.
506616	Argentate(1-), bis(cyano-C)-, potassium.
	Potassium silver cyanide.
506649	Silver cyanide Ag(CN).
506683	Cyanogen bromide (CN)Br.
506774	Cyanogen chloride (CN)Cl.
506876	Ammonium carbonate.
506967	Acetyl bromide.
509148	Methane, tetranitro-.
	Tetranitromethane.

510156	Benzeneacetic acid, 4-chloro- α - (4-chlorophenyl)- α -hydroxy-, ethyl ester.
	Chlorobenzilate.
513495	sec-Butylamine.
528290	o-Dinitrobenzene.
532274	2-Chloroacetophenone.
534521	4,6-Dinitro-o-cresol, and salts.
	Phenol, 2-methyl-4,6-dinitro-, & salts.
540738	Hydrazine, 1,2-dimethyl-.
	1,2-Dimethylhydrazine.
540841	2,2,4-Trimethylpentane.
540885	tert-Butyl acetate.
541093	Uranyl acetate.
541537	Dithiobiuret.
	Thioimidodicarbonic diamide
	$[(H_2N)C(S)]_2NH$.
541731	Benzene, 1,3-dichloro-.
	m-Dichlorobenzene.
	1,3-Dichlorobenzene.
542621	Barium cyanide.
542756	1-Propene, 1,3-dichloro-.
	1,3-Dichloropropene.
542767	Propanenitrile, 3-chloro-.
	3-Chloropropionitrile.
542881	Bis(chloromethyl)ether.
	Dichloromethyl ether.
	Methane, oxybis(chloro-.
543908	Cadmium acetate.
544183	Cobaltous formate.
544923	Copper cyanide $Cu(CN)$.
554847	m-Nitrophenol.
557197	Nickel cyanide $Ni(CN)_2$.
557211	Zinc cyanide $Zn(CN)_2$.
	Zinc cyanide $Zn(CN)_2$.
557346	Zinc acetate.
557415	Zinc formate.
563122	Ethion.
563688	Acetic acid, thallium(1+) salt.
	Thallium(I) acetate.
573568	2,6-Dinitrophenol.

584849	Benzene, 1,3-diisocyanatomethyl-.
	Toluene diisocyanate.
	2,4-Toluene diisocyanate.
591082	Acetamide, N-(aminothioxomethyl)-.
	1-Acetyl-2-thiourea.
592018	Calcium cyanide $\text{Ca}(\text{CN})_2$.
592041	Mercuric cyanide.
592858	Mercuric thiocyanate.
592870	Lead thiocyanate.
593602	Vinyl bromide.
594423	Methanesulfonyl chloride, trichloro-.
	Trichloromethanesulfonyl chloride.
598312	Bromoacetone.
	2-Propanone, 1-bromo-.
606202	Benzene, 2-methyl-1,3-dinitro-.
	2,6-Dinitrotoluene.
608731	HEXACHLOROCYCLOHEXANE (all isomers).
608935	Benzene, pentachloro-.
	Pentachlorobenzene.
609198	3,4,5-Trichlorophenol.
610399	3,4-Dinitrotoluene.
615532	Carbamic acid, methylnitroso-, ethyl ester.
	N-Nitroso-N-methylurethane.
621647	Di-n-propylnitrosamine.
	1-Propanamine, N-nitroso-N-propyl-.
624839	Methane, isocyanato-.
	Methyl isocyanate.
625161	tert-Amyl acetate.
626380	sec-Amyl acetate.
628637	Amyl acetate.
628864	Fulminic acid, mercury(2+)salt.
	Mercury fulminate.
630104	Selenourea.
630206	Ethane, 1,1,1,2-tetrachloro-.
	1,1,1,2-Tetrachloroethane.
631618	Ammonium acetate.
636215	Benzenamine, 2-methyl-, hydrochloride.
	o-Toluidine hydrochloride.
640197	Acetamide, 2-fluoro-.

	Fluoroacetamide.
644644	Carbamic acid, dimethyl-, 1-[(dimethyl-amino)carbonyl]-5-methyl-1H-pyrazol-3-yl ester. Dimetilan.
680319	Hexamethylphosphoramidate.
684935	N-Nitroso-N-methylurea.
	Urea, N-methyl-N-nitroso-.
692422	Arsine, diethyl-.
	Diethylarsine.
696286	Arsonous dichloride, phenyl-.
	Dichlorophenylarsine.
757584	Hexaethyl tetraphosphate.
	Tetraphosphoric acid, hexaethyl ester.
759739	N-Nitroso-N-ethylurea.
	Urea, N-ethyl-N-nitroso-.
764410	1,4-Dichloro-2-butene.
	2-Butene, 1,4-dichloro-.
765344	Glycidylaldehyde.
	Oxiranecarboxyaldehyde.
815827	Cupric tartrate.
822060	Hexamethylene-1,6-diisocyanate.
823405	Benzenediamine, ar-methyl-.
	Toluenediamine.
	2,4-Toluene diamine.
924163	N-Nitrosodi-n-butylamine.
	1-Butanamine, N-butyl-N-nitroso-.
930552	N-Nitrosopyrrolidine.
	Pyrrolidine, 1-nitroso-.
933755	2,3,6-Trichlorophenol.
933788	2,3,5-Trichlorophenol.
959988	alpha-Endosulfan.
1024573	Heptachlor epoxide.
1031078	Endosulfan sulfate.
1066304	Chromic acetate.
1066337	Ammonium bicarbonate.
1072351	Lead stearate.
1111780	Ammonium carbamate.
1116547	Ethanol, 2,2'-(nitrosoimino)bis-.
	N-Nitrosodiethanolamine.

1120714	1,2-Oxathiolane, 2,2-dioxide.
	1,3-Propane sultone.
1129415	Carbamic acid, methyl-, 3-methylphenyl ester. Metolcarb.
1185575	Ferric ammonium citrate.
1194656	Dichlobenil.
1300716	Xylenol.
1303282	Arsenic oxide As ₂ O ₅ .
	Arsenic pentoxide.
1303328	Arsenic disulfide.
1303339	Arsenic trisulfide.
1309644	Antimony trioxide.
1310583	Potassium hydroxide.
1310732	Sodium hydroxide.
1314325	Thallic oxide.
	Thallium oxide Tl ₂ O ₃ .
1314621	Vanadium oxide V ₂ O ₅ .
	Vanadium pentoxide.
1314803	Phosphorus pentasulfide.
	Phosphorus sulfide.
	Sulfur phosphide.
1314847	Zinc phosphide Zn ₃ P ₂ .
1314870	Lead sulfide.
1319728	2,4,5-T amines.
1319773	Cresol (cresylic acid).
	Cresols (isomers and mixture).
	Cresylic acid (isomers and mixture).
	Phenol, methyl-.
1320189	2,4-D Ester.
1321126	Nitrotoluene.
1327533	Arsenic oxide As ₂ O ₃ .
	Arsenic trioxide.
1330207	Benzene, dimethyl-.
	Xylene.
	Xylene (mixed).
	Xylenes (isomers and mixture).
1332076	Zinc borate.
1332214	Asbestos.
1333831	Sodium bifluoride.

1335326	Lead subacetate.
	Lead, bis(acetato-O)tetrahydroxytri.
1336216	Ammonium hydroxide.
1336363	Aroclors.
	PCBs.
	POLYCHLORINATED BIPHENYLS.
1338234	Methyl ethyl ketone peroxide.
	2-Butanone peroxide.
1338245	Naphthenic acid.
1341497	Ammonium bifluoride.
1464535	1,2:3,4-Diepoxybutane.
	2,2'-Bioxirane.
1563388	7-Benzofuranol, 2,3-dihydro-2,2-dimethyl-. Carbofuran phenol.
1563662	7-Benzofuranol, 2,3-dihydro-2,2-dimethyl-, methylcarbamate.
	Carbofuran.
1582098	Trifluralin.
1615801	Hydrazine, 1,2-diethyl-.
	N,N'-Diethylhydrazine.
1634044	Methyl tert-butyl ether.
1646884	Aldicarb sulfone. Propanal, 2-methyl-2-(methyl-sulfonyl)-, O-[(methylamino)carbonyl] oxime.
1746016	TCDD.
	2,3,7,8-Tetrachlorodibenzo-p-dioxin.
1762954	Ammonium thiocyanate.
1863634	Ammonium benzoate.
1888717	Hexachloropropene.
	1-Propene, 1,1,2,3,3,3-hexachloro-.
1918009	Dicamba.
1928387	2,4-D Ester.
1928478	2,4,5-T esters.
1928616	2,4-D Ester.
1929733	2,4-D Ester.
2008460	2,4,5-T amines.
2032657	Mercaptodimethur.
	Methiocarb.
	Phenol, (3,5-dimethyl-4-(methylthio)-, methylcarbamate.
2303164	Carbamothioic acid, bis(1-methylethyl)-,
	S-(2,3-dichloro-2-propenyl) ester.

	Diallate.
2303175	Carbamothioic acid, bis(1-methylethyl)-, S-(2,3,3-trichloro-2-propenyl) ester. Triallate.
2312358	Propargite.
2545597	2,4,5-T esters.
2631370	Phenol, 3-methyl-5-(1-methylethyl)-, methyl carbamate. Promecarb.
2763964	3(2H)-Isoxazolone, 5-(aminomethyl)-. 5-(Aminomethyl)-3-isoxazolol.
2764729	Diquat
2921882	Chlorpyrifos.
2944674	Ferric ammonium oxalate.
2971382	2,4-D Ester.
3012655	Ammonium citrate, dibasic.
3164292	Ammonium tartrate.
3165933	Benzenamine, 4-chloro-2-methyl-, hydrochloride. 4-Chloro-o-toluidine, hydrochloride.
3251238	Cupric nitrate.
3288582	O,O-Diethyl S-methyl dithiophosphate. Phosphorodithioic acid, O,O-diethyl S-methyl ester.
3486359	Zinc carbonate.
3547044	DDE.
3689245	Tetraethyldithiopyrophosphate. Thiodiphosphoric acid, tetraethyl ester.
3813147	2,4,5-T amines.
4170303	Crotonaldehyde. 2-Butenal.
4549400	N-Nitrosomethylvinylamine. Vinylamine, N-methyl-N-nitroso-.
5344821	Thiourea, (2-chlorophenyl)-. 1-(o-Chlorophenyl)thiourea.
5893663	Cupric oxalate.
5952261	Ethanol, 2,2'-oxybis-, dicarbamate. Diethylene glycol, dicarbamate.
5972736	Ammonium oxalate.
6009707	Ammonium oxalate.
6369966	2,4,5-T amines.

6369977	2,4,5-T amines.
6533739	Carbonic acid, dithallium(1+) salt.
	Thallium(I) carbonate.
7005723	4-Chlorophenyl phenyl ether.
7421934	Endrin aldehyde.
7428480	Lead stearate.
7439921	Lead.
7439976	Mercury.
7440020	Nickel.
7440224	Silver.
7440235	Sodium.
7440280	Thallium.
7440360	Antimony.
7440382	Arsenic.
7440417	Beryllium.
	Beryllium powder.
7440439	Cadmium.
7440473	Chromium.
7440508	Copper.
7440666	Zinc.
7446084	Selenium dioxide.
	Selenium oxide.
7446142	Lead sulfate.
7446186	Sulfuric acid, dithallium(1+) salt.
	Thallium(I) sulfate.
7446277	Lead phosphate.
	Phosphoric acid, lead(2+) salt (2:3).
7447394	Cupric chloride.
7488564	Selenium sulfide SeS ₂ .
7550450	Titanium tetrachloride.
7558794	Sodium phosphate, dibasic.
7601549	Sodium phosphate, tribasic.
7631892	Sodium arsenate.
7631905	Sodium bisulfite.
7632000	Sodium nitrite.
7645252	Lead arsenate.
7646857	Zinc chloride.
7647010	Hydrochloric acid.
	Hydrogen chloride.

7647189	Antimony pentachloride.
7664382	Phosphoric acid.
7664393	Hydrofluoric acid.
	Hydrogen fluoride.
7664417	Ammonia.
7664939	Sulfuric acid.
7681494	Sodium fluoride.
7681529	Sodium hypochlorite.
7697372	Nitric acid.
7699458	Zinc bromide.
7705080	Ferric chloride.
7718549	Nickel chloride.
7719122	Phosphorus trichloride.
7720787	Ferrous sulfate.
7722647	Potassium permanganate.
7723140	Phosphorus.
7733020	Zinc sulfate.
7738945	Chromic acid.
7758943	Ferrous chloride.
7758954	Lead chloride.
7758987	Cupric sulfate.
7761888	Silver nitrate.
7773060	Ammonium sulfamate.
7775113	Sodium chromate.
7778394	Arsenic acid H_3AsO_4 .
7778441	Calcium arsenate.
7778509	Potassium bichromate.
7778543	Calcium hypochlorite.
7779864	Zinc hydrosulfite.
7779886	Zinc nitrate.
7782414	Fluorine.
7782492	Selenium.
7782505	Chlorine.
7782630	Ferrous sulfate.
7782823	Sodium selenite.
7782867	Mercurous nitrate.
7783008	Selenious acid.
7783064	Hydrogen sulfide H_2S .
7783359	Mercuric sulfate.

7783462	Lead fluoride.
7783495	Zinc fluoride.
7783508	Ferric fluoride.
7783564	Antimony trifluoride.
7784341	Arsenic trichloride.
7784409	Lead arsenate.
7784410	Potassium arsenate.
7784465	Sodium arsenite.
7786347	Mevinphos.
7786814	Nickel sulfate.
7787475	Beryllium chloride.
7787497	Beryllium fluoride.
7787555	Beryllium nitrate.
7788989	Ammonium chromate.
7789006	Potassium chromate.
7789062	Strontium chromate.
7789095	Ammonium bichromate.
7789426	Cadmium bromide.
7789437	Cobaltous bromide.
7789619	Antimony tribromide.
7790945	Chlorosulfonic acid.
7791120	Thallium chloride TlCl.
7803512	Hydrogen phosphide.
	Phosphine.
7803556	Ammonium vanadate.
	Vanadic acid, ammonium salt.
8001352	Chlorinated camphene.
	Toxaphene.
8003198	Dichloropropane—Dichloropropene (mixture).
8003347	Pyrethrins.
8014957	Sulfuric acid.
10022705	Sodium hypochlorite.
10025873	Phosphorus oxychloride.
10025919	Antimony trichloride.
10026116	Zirconium tetrachloride.
10028225	Ferric sulfate.
10031591	Sulfuric acid, dithallium(1+) salt.
	Thallium(I) sulfate.
10039324	Sodium phosphate, dibasic.

10043013	Aluminum sulfate.
10045893	Ferrous ammonium sulfate.
10045940	Mercuric nitrate.
10049055	Chromous chloride.
10099748	Lead nitrate.
10101538	Chromic sulfate.
10101630	Lead iodide.
10101890	Sodium phosphate, tribasic.
10102064	Uranyl nitrate.
10102188	Sodium selenite.
10102439	Nitric oxide.
	Nitrogen oxide NO.
10102440	Nitrogen dioxide.
	Nitrogen oxide NO ₂ .
10102451	Nitric acid, thallium(1+) salt.
	Thallium(I) nitrate.
10102484	Lead arsenate.
10108642	Cadmium chloride.
10124502	Potassium arsenite.
10140655	Sodium phosphate, dibasic.
10192300	Ammonium bisulfite.
10196040	Ammonium sulfite.
10361894	Sodium phosphate, tribasic.
10380297	Cupric sulfate, ammoniated.
10415755	Mercurous nitrate.
10421484	Ferric nitrate.
10544726	Nitrogen dioxide.
	Nitrogen oxide NO ₂ .
10588019	Sodium bichromate.
10605217	Carbamic acid, 1H-benzimidazol-2-yl, methyl ester. Carbendazim.
11096825	Aroclor 1260.
11097691	Aroclor 1254.
11104282	Aroclor 1221.
11115745	Chromic acid.
11141165	Aroclor 1232.
12002038	Cupric acetoarsenite.
12039520	Selenious acid, dithallium(1+) salt.
	Thallium (I) selenite.

12054487	Nickel hydroxide.
12125018	Ammonium fluoride.
12125029	Ammonium chloride.
12135761	Ammonium sulfide.
12672296	Aroclor 1248.
12674112	Aroclor 1016.
12771083	Sulfur monochloride.
13463393	Nickel carbonyl Ni(CO) ₄ , (T-4)-.
13560991	2,4,5-T salts.
13597994	Beryllium nitrate.
13746899	Zirconium nitrate.
13765190	Calcium chromate.
	Chromic acid H ₂ CrO ₄ , calcium salt.
13814965	Lead fluoborate.
13826830	Ammonium fluoborate.
13952846	sec-Butylamine.
14017415	Cobaltous sulfamate.
14216752	Nickel nitrate.
14258492	Ammonium oxalate.
14307358	Lithium chromate.
14307438	Ammonium tartrate.
14639975	Zinc ammonium chloride.
14639986	Zinc ammonium chloride.
14644612	Zirconium sulfate.
15339363	Manganese, bis(dimethylcarbamo-dithioato-S,S')-. Manganese dimethyldithiocarbamate.
15699180	Nickel ammonium sulfate.
15739807	Lead sulfate.
15950660	2,3,4-Trichlorophenol.
16721805	Sodium hydrosulfide.
16752775	Ethanimidothioic acid, N-[[[(methylamino)carbonyl] oxy]-, methyl ester.
	Methomyl.
16871719	Zinc silicofluoride.
16919190	Ammonium silicofluoride.
16923958	Zirconium potassium fluoride.
17702577	Formparanate. Methanimidamide, N,N-dimethyl-N'-[2-methyl-4- [[[(methylamino)carbonyl]oxy]phenyl]-.
17804352	Benomyl.

	Carbamic acid, [1-[(butylamino)carbonyl]-1H-benzimidazol-2-yl]-, methyl ester.
18883664	D-Glucose, 2-deoxy-2[[[(methylnitrosoamino)-carbonyl]amino]-].
	Glucopyranose, 2-deoxy-2-(3-methyl-3-nitrosoureido)-, D-.
	Streptozotocin.
20816120	Osmium oxide OsO ₄ , (T-4)-.
	Osmium tetroxide.
20830813	Daunomycin.
	5,12-Naphthacenedione, 8-acetyl-10-[(3-amino-2,3,6-trideoxy-alpha-L-lyxo-hexopyranosyl)oxy]-7,8,9,10-tetrahydro-6,8,11-trihydroxy-1-methoxy-, (8S-cis)-.
20859738	Aluminum phosphide.
22781233	Bendiocarb. 1,3-Benzodioxol-4-ol, 2,2-dimethyl-, methyl carbamate.
22961826	Bendiocarb phenol. 1,3-Benzodioxol-4-ol, 2,2-dimethyl-.
23135220	Ethanimidothioic acid, 2-(dimethylamino)-N-[[[(methylamino)carbonyl]oxy]-2-oxo-, methyl ester. Oxamyl.
23422539	Methanimidamide, N,N-dimethyl-N'-[3-[[[(methylamino)-carbonyl]oxy]phenyl]-, monohydrochloride. Formetanate hydrochloride.
23564058	Carbamic acid, [1,2-phenylenebis(iminocarbonothioyl)]bis-, dimethyl ester. Thiophanate-methyl.
23950585	Benzamide, 3,5-dichloro-N-(1,1-dimethyl-2-propynyl)-. Pronamide.
25154545	Dinitrobenzene (mixed).
25154556	Nitrophenol (mixed).
25155300	Sodium dodecylbenzenesulfonate.
25167822	Trichlorophenol.
25168154	2,4,5-T esters.
25168267	2,4-D Ester.
25321146	Dinitrotoluene.
25321226	Dichlorobenzene.
25376458	Benzenediamine, ar-methyl-. Toluenediamine.
	2,4-Toluene diamine.
25550587	Dinitrophenol.
26264062	Calcium dodecylbenzenesulfonate.
26419738	1,3-Dithiolane-2-carboxaldehyde, 2,4-dimethyl-, O-[(methylamino)-carbonyl]oxime. Tirpate.
26471625	Benzene, 1,3-diisocyanatomethyl-.

	Toluene diisocyanate.
	2,4-Toluene diisocyanate.
26628228	Sodium azide.
26638197	Dichloropropane.
26952238	Dichloropropene.
27176870	Dodecylbenzenesulfonic acid.
27323417	Triethanolamine dodecylbenzene sulfonate.
27774136	Vanadyl sulfate.
28300745	Antimony potassium tartrate.
30525894	Paraformaldehyde.
30558431	Ethanimidothioic acid, 2-(dimethylamino)-N-hydroxy-2-oxo-, methyl ester. A2213.
32534955	2,4,5-TP esters.
33213659	beta - Endosulfan.
36478769	Uranyl nitrate.
37211055	Nickel chloride.
39196184	Thiofanox.
	2-Butanone, 3,3-dimethyl-1-(methylthio)-,O-[(methylamino)carbonyl] oxime.
42504461	Isopropanolamine dodecylbenzenesulfonate.
52628258	Zinc ammonium chloride.
52652592	Lead stearate.
52740166	Calcium arsenite.
52888809	Carbamothioic acid, dipropyl-, S-(phenylmethyl) ester. Prosulfocarb.
53467111	2,4-D Ester.
53469219	Aroclor 1242.
55285148	Carbamic acid, [(dibutylamino)-thio]methyl-, 2,3-dihydro-2,2-dimethyl-7-benzofuranyl ester. Carbosulfan.
55488874	Ferric ammonium oxalate.
56189094	Lead stearate.
59669260	Ethanimidothioic acid, N,N'-[thiobis[(methylimino)carbonyloxy]]bis-, dimethyl ester. Thiodicarb.
61792072	2,4,5-T esters.