

Component Universe: Coarsened Regulatory Compliance Mappings

Federal (40 CFR Part 280) and Pennsylvania (25 Pa. Code Ch. 245) Classifications

2026-01-13

Table of contents

1	Tank Infrastructure	4
1.1	Tank Construction	4
1.1.1	Raw Frequency Table	4
1.1.2	Coarsened Regulatory Mapping: Tank Construction	5
1.2	Tank Release Detection Method	7
1.2.1	Raw Frequency Table	7
1.2.2	Coarsened Regulatory Mapping: Tank Release Detection	8
2	Piping Infrastructure	10
2.1	Underground Piping Construction	10
2.1.1	Raw Frequency Table	10
2.1.2	Coarsened Regulatory Mapping: UG Piping Construction	11
2.2	UG Single / Inner Wall Piping	13
2.2.1	Raw Frequency Table	13
2.2.2	Coarsened Regulatory Mapping: UG Single/Inner Wall Piping	14
2.3	UG Outer Wall Piping	15
2.3.1	Raw Frequency Table	15
2.3.2	Coarsened Regulatory Mapping: UG Outer Wall Piping	16
2.4	Piping Release Detection Method	17
2.4.1	Raw Frequency Table	17
2.4.2	Coarsened Regulatory Mapping: Piping Release Detection	18
2.5	Line Leak Detector Shuts Off Pump	20
2.5.1	Raw Frequency Table	20
2.5.2	Coarsened Regulatory Mapping: LLD Pump Shutoff	21
2.6	Pump/Delivery System	22
2.6.1	Raw Frequency Table	22
2.6.2	Coarsened Regulatory Mapping: Pump/Delivery System	23
2.7	Piping Flexible Connectors	24
2.7.1	Raw Frequency Table	24
2.7.2	Coarsened Regulatory Mapping: Piping Flexible Connectors	25
2.8	Flex - Tank End	26
2.8.1	Raw Frequency Table	26
2.8.2	Coarsened Regulatory Mapping: Flex - Tank End	27
2.9	Flex - Dispenser End	28
2.9.1	Raw Frequency Table	28
2.9.2	Coarsened Regulatory Mapping: Flex - Dispenser End	29
2.10	AG Piping Construction & Corrosion Protection	30
2.10.1	Raw Frequency Table	30

2.10.2	Coarsened Regulatory Mapping: AG Piping Construction	31
3	Spill & Overfill Prevention	32
3.1	Spill Prevention	32
3.1.1	Raw Frequency Table	32
3.1.2	Coarsened Regulatory Mapping: Spill Prevention	33
3.2	Overfill Prevention	34
3.2.1	Raw Frequency Table	34
3.2.2	Coarsened Regulatory Mapping: Overfill Prevention	35
4	Containment Systems	36
4.1	UST Total Secondarily Contained	36
4.1.1	Raw Frequency Table	36
4.1.2	Coarsened Regulatory Mapping: UST Secondarily Contained	37
4.2	Tank-Top Containment Sumps	38
4.2.1	Raw Frequency Table	38
4.2.2	Coarsened Regulatory Mapping: Tank-Top Containment Sumps	39
4.3	Under-Dispenser Containment	40
4.3.1	Raw Frequency Table	40
4.3.2	Coarsened Regulatory Mapping: Under-Dispenser Containment	41
5	Vapor Recovery Systems	42
5.1	Vapor Recovery (Summary)	42
5.1.1	Raw Frequency Table	42
5.1.2	Coarsened Regulatory Mapping: Vapor Recovery	43
5.2	Stage I Vapor Recovery	44
5.2.1	Raw Frequency Table	44
5.2.2	Coarsened Regulatory Mapping: Stage I Vapor Recovery	45
5.3	Stage II Vapor Recovery	46
5.3.1	Raw Frequency Table	46
5.3.2	Coarsened Regulatory Mapping: Stage II Vapor Recovery	47
6	Appendix: Key Regulatory Dates Reference	48
7	Appendix: Citation URLs	49
7.1	Federal Sources	49
7.2	Pennsylvania Sources	49
8	Tank Upgrades & Retrofits	50
8.1	Tank Upgrade	50
8.1.1	Raw Frequency Table	50
8.1.2	Coarsened Regulatory Mapping: Tank Upgrade	51
9	Emergency Generator USTs	52
9.1	Emergency Generator	52
9.1.1	Raw Frequency Table	52
9.1.2	Coarsened Regulatory Mapping: Emergency Generator USTs	53
10	Administrative & Permitting	54
10.1	Fire Marshal Permit	54
10.1.1	Raw Frequency Table	54
10.1.2	Coarsened Regulatory Mapping: Fire Marshal Permit	55
10.2	Registration Certificate	56
10.2.1	Raw Frequency Table	56
10.2.2	Coarsened Regulatory Mapping: Registration Certificate	57
11	Appendix: Compliance Status Decision Tree	58

1 Tank Infrastructure

1.1 Tank Construction

1.1.1 Raw Frequency Table

Table 1

Table 2Component Universe: TANK CONSTRUCTION

COMPONENT_ATTRIBUTE_CODE	COMPONENT_TYPE	N
188	OTHER (COMPLIANT)	15
199	OTHER	69
1A	UNPROTECTED STEEL (SINGLE WALL)	5368
1B	CATHODICALLY PROTECTED STEEL (GALVANIC)	7094
1C	CATHODICALLY PROTECTED STEEL (IMPRESSED CURRENT)	2284
1D	UNPROTECTED STEEL (DOUBLE WALL)	75
1E	FIBERGLASS (SINGLE WALL)	8647
1F	FIBERGLASS (DOUBLE WALL)	8272
1G	STEEL W/PLASTIC OR FIBERGLASS JACKET (DOUBLE WALL)	5378
1H	STEEL W/FRP COATING (ACT 100 OR EQUIVALENT) (SINGLE WALL)	961
1I	STEEL W/LINED INTERIOR	750
1J	CONCRETE	31
1K	BOTTOM MODIFICATION	1
1N	UNKNOWN	194
1O	CATHODICALLY PROTECTED DOUBLE WALL STEEL (GALVANIC)	3100
1P	CATHODICALLY PROTECTED STEEL WITH LINER	572
1V	STEEL W/PLASTIC OR FRP JACKET W/ ANODES (DOUBLE WALL)	445
1W	STEEL W/FRP COATING W/ ANODES (SINGLE WALL)	15

1.1.2 Coarsened Regulatory Mapping: Tank Construction

Table 3

Table 4 Tank Construction: Coarsened Regulatory Compliance Mapping

CODE	COMPONENT_TYPE	N	Coarsened_Category	Federal_Status	Federal_Citation	PA_Status	PA_Citation
1D	UNPROTECTED STEEL (DOUBLE WALL)	75	Secondary Containment	Compliant (All Vintages)	§280.20(a); §280.43(g)	Compliant	§245.421(a)
1F	FIBERGLASS (DOUBLE WALL)	8272	Secondary Containment	Compliant (All Vintages)	§280.20(a)(1); UL 1316	Compliant	§245.421(a)
1G	STEEL W/PLASTIC OR FRP JACKET (DW)	5378	Secondary Containment	Compliant (All Vintages)	§280.20(a)(3); UL 1746	Compliant	§245.421(a)
1O	CP DOUBLE WALL STEEL (GALVANIC)	3100	Secondary Containment	Compliant (All Vintages)	§280.20(a)(2); STI F841	Compliant	§245.421(a)
1V	STEEL W/FRP JACKET W/ANODES (DW)	445	Secondary Containment	Compliant (All Vintages)	§280.20(a)(2)-(3)	Compliant	§245.421(a)
1A	UNPROTECTED STEEL (SINGLE WALL)	5368	Single Wall (Legacy)	Legacy: Compliant	§280.21; §280.41(a)(1)	Legacy: Compliant	§245.421(b)
1A	UNPROTECTED STEEL (SINGLE WALL)	NA	Single Wall (Legacy)	Post-4/11/16: NON-COMPLIANT	§280.20 intro para	Post-12/22/18: NON-COMPLIANT	§245.421(a)
1B	CP STEEL (GALVANIC)	7094	Single Wall (Legacy)	Legacy: Compliant	§280.20(a)(2); §280.31	Legacy: Compliant	§245.421(b); §245.432
1B	CP STEEL (GALVANIC)	NA	Single Wall (Legacy)	Post-4/11/16: NON-COMPLIANT	§280.20 intro para	Post-12/22/18: NON-COMPLIANT	§245.421(a)
1C	CP STEEL (IMPRESSED CURRENT)	2284	Single Wall (Legacy)	Legacy: Compliant	§280.20(a)(2); §280.31(c)	Legacy: Compliant	§245.421(b); §245.432
1C	CP STEEL (IMPRESSED CURRENT)	NA	Single Wall (Legacy)	Post-4/11/16: NON-COMPLIANT	§280.20 intro para	Post-12/22/18: NON-COMPLIANT	§245.421(a)
1E	FIBERGLASS (SINGLE WALL)	8647	Single Wall (Legacy)	Legacy: Compliant	§280.20(a)(1); §280.41(a)(1)	Legacy: Compliant	§245.421(b)
1E	FIBERGLASS (SINGLE WALL)	NA	Single Wall (Legacy)	Post-4/11/16: NON-COMPLIANT	§280.20 intro para	Post-12/22/18: NON-COMPLIANT	§245.421(a)
1H	STEEL W/FRP COATING (ACT-100) (SW)	961	Single Wall (Legacy)	Legacy: Compliant	§280.20(a)(3); STI ACT-100®	Legacy: Compliant	§245.421(b)
1H	STEEL W/FRP COATING (ACT-100) (SW)	NA	Single Wall (Legacy)	Post-4/11/16: NON-COMPLIANT	§280.20 intro para	Post-12/22/18: NON-COMPLIANT	§245.421(a)
1I	STEEL W/LINED INTERIOR	750	Single Wall (Upgraded)	Legacy: Conditional	§280.21(b)(1); API 1631	Legacy: Conditional	§245.421(b)
1I	STEEL W/LINED INTERIOR	NA	Single Wall (Upgraded)	Post-4/11/16: NON-COMPLIANT	§280.20 intro para	Post-12/22/18: NON-COMPLIANT	§245.421(a)
1J	CONCRETE	31	Single Wall (Legacy)	Legacy: Conditional	§280.20(a)(5)	Legacy: Conditional	§245.421(b)
1P	CP STEEL WITH LINER	572	Single Wall (Upgraded)	Legacy: Compliant	§280.21(b)(3)	Legacy: Compliant	§245.421(b)
1P	CP STEEL WITH LINER	NA	Single Wall (Upgraded)	Post-4/11/16: NON-COMPLIANT	§280.20 intro para	Post-12/22/18: NON-COMPLIANT	§245.421(a)
1W	STEEL W/FRP COATING W/ANODES (SW)	15	Single Wall (Legacy)	Legacy: Compliant	§280.20(a)(2)-(3)	Legacy: Compliant	§245.421(b)
1W	STEEL W/FRP COATING W/ANODES (SW)	NA	Single Wall (Legacy)	Post-4/11/16: NON-COMPLIANT	§280.20 intro para	Post-12/22/18: NON-COMPLIANT	§245.421(a)
188	OTHER (COMPLIANT)	15	Other/Unknown	Case-by-Case	§280.20(a)(5)	Case-by-Case	§245.421
199	OTHER	69	Other/Unknown	Presumed Non-Compliant	§280.20(a)	Presumed Non-Compliant	§245.421
1K	BOTTOM MODIFICATION	1	Other/Unknown	Repair Record Only	§280.33	Repair Record Only	§245.433
1N	UNKNOWN	194	Data Gap	UNKNOWN - Verify	N/A	UNKNOWN - Verify	N/A

1.2 Tank Release Detection Method

1.2.1 Raw Frequency Table

Table 5

Table 6Component Universe: TANK RELEASE DETECTION METHOD

COMPONENT_ATTRIBUTE_CODE	COMPONENT_TYPE	N
1299	OTHER	8
12A	MONTHLY INVENTORY CONTROL	3611
12B	ANNUAL TANK TIGHTNESS TESTING	2985
12C	TANK TIGHTNESS TESTING (EVERY 5 YEARS)	535
12D	STATISTICAL INVENTORY RECONCILIATION	4683
12E	AUTOMATIC TANK GAUGING	17834
12F	MANUAL TANK GAUGING (36 HRS)	407
12G	MANUAL TANK GAUGING (44 OR 58 HRS)	383
12H	INTERSTITIAL MONITORING (2 WALLS)	13753
12I	INTERSTITIAL MONITORING (LINER)	9
12J	GROUNDWATER MONITORING	79
12K	VAPOR MONITORING	58
12L	GROOVES MADE IN THE IMPERMEABLE PAD	2
12M	SLOTTED PIPE ABOVE THE IMPERMEABLE PAD	4
12N	NONE	2833
12O	EXEMPT	953

1.2.2 Coarsened Regulatory Mapping: Tank Release Detection

Table 7

Table 8 Tank Release Detection Method: Coarsened Regulatory Compliance Mapping

CODE	COMPONENT_TYPE	N	Coarsened_Category	Federal_Status	Federal_Citation	PA_Status	PA_Citation
12H	INTERSTITIAL MONITORING (2 WALLS)	13753	Secondary Containment (IM)	Compliant (All Vintages)	§280.43(g)	Compliant	§245.444(1)
12H	INTERSTITIAL MONITORING (2 WALLS)	NA	Secondary Containment (IM)	REQUIRED: Post-4/11/16 Tanks	§280.41(a)(2)	REQUIRED: Post-12/22/18	§245.444(1)
12I	INTERSTITIAL MONITORING (LINER)	9	Secondary Containment (IM)	Compliant (All Vintages)	§280.43(g)	Compliant	§245.444(1)
12L	GROOVES IN IMPERMEABLE PAD	2	Secondary Containment (IM)	Compliant (All Vintages)	§280.43(g)	Compliant	§245.444(1)
12M	SLOTTED PIPE ABOVE PAD	4	Secondary Containment (IM)	Compliant (All Vintages)	§280.43(g)	Compliant	§245.444(1)
12E	AUTOMATIC TANK GAUGING	17834	Internal Monitoring (ATG)	Legacy: Compliant	§280.43(d); 0.2 gph	Legacy: Compliant	§245.444(2)
12E	AUTOMATIC TANK GAUGING	NA	Internal Monitoring (ATG)	Post-4/11/16: NON-COMPLIANT	§280.41(a)(2) req IM	Post-12/22/18: NON-COMPLIANT	§245.444(1) req IM
12D	STATISTICAL INVENTORY RECONCILIATION	4683	Internal Monitoring (SIR)	Legacy: Compliant	§280.43(h); 0.2 gph	Legacy: Compliant	§245.444(6)
12D	STATISTICAL INVENTORY RECONCILIATION	NA	Internal Monitoring (SIR)	Post-4/11/16: NON-COMPLIANT	§280.41(a)(2) req IM	Post-12/22/18: NON-COMPLIANT	§245.444(1) req IM
12F	MANUAL TANK GAUGING (36 HRS)	407	Internal Monitoring (MTG)	Conditional: 550 gal only	§280.43(b) Table	Conditional: 550 gal	§245.444(3)
12F	MANUAL TANK GAUGING (36 HRS)	NA	Internal Monitoring (MTG)	Post-4/11/16: NON-COMPLIANT	§280.41(a)(2) req IM	Post-12/22/18: NON-COMPLIANT	§245.444(1) req IM
12G	MANUAL TANK GAUGING (44/58 HRS)	383	Internal Monitoring (MTG)	Conditional: 551-1000 gal	§280.43(b) Table	Conditional: 551-1000 gal	§245.444(3)
12G	MANUAL TANK GAUGING (44/58 HRS)	NA	Internal Monitoring (MTG)	Post-4/11/16: NON-COMPLIANT	§280.41(a)(2) req IM	Post-12/22/18: NON-COMPLIANT	§245.444(1) req IM
12A	MONTHLY INVENTORY CONTROL	3611	Inventory Control	SUNSET: Must pair w/ TTT	§280.43(a); §280.41(a)(1)(i)	SUNSET	§245.444(5)
12A	MONTHLY INVENTORY CONTROL	NA	Inventory Control	10-yr window expired (all)	§280.41(a)(1)(i)	10-yr window expired	§245.444(5)
12B	ANNUAL TANK TIGHTNESS TEST	2985	Tightness Testing	SUNSET: Supplemental only	§280.43(c); 0.1 gph	SUNSET: Supplemental	§245.444(4)
12B	ANNUAL TANK TIGHTNESS TEST	NA	Tightness Testing	10-yr window expired (all)	§280.41(a)(1)(i)	10-yr window expired	§245.444(4)
12C	TANK TIGHTNESS TEST (5 YRS)	535	Tightness Testing	SUNSET: Supplemental only	§280.43(c)	SUNSET: Supplemental	§245.444(4)
12J	GROUNDWATER MONITORING	79	External Monitoring	Conditional: Site Assessment	§280.43(f); GW 20 ft	Conditional: Site Assessment	§245.444(8)
12K	VAPOR MONITORING	58	External Monitoring	Conditional: Site Assessment	§280.43(e); Porous backfill	Conditional: Site Assessment	§245.444(7)
1299	OTHER	8	Other/Unclassified	Case-by-Case	§280.40(a)	Case-by-Case	§245.444
12N	NONE	2833	NON-COMPLIANT	VIOLATION	§280.40(a) requires RD	VIOLATION	§245.441 requires RD
12O	EXEMPT	953	Exempt/Deferred	Verify Exemption	§280.10(b)-(c)	Verify Exemption	§245.1(b)

2 Piping Infrastructure

2.1 Underground Piping Construction

2.1.1 Raw Frequency Table

Table 9

Table 10Component Universe: UG PIPING CONSTRUCTION

COMPONENT_ATTRIBUTE_CODE	COMPONENT_TYPE	N
288	OTHER (COMPLIANT)	31
299	OTHER	39
2A	BARE STEEL	5870
2B	CATHODICALLY PROTECTED, METALLIC	2137
2C	COPPER	213
2D	FIBERGLASS	6331
2E	FLEXIBLE NON-METALLIC	488
2F	UNKNOWN	218
2G	NONE	793
2H	MODIFICATION OF PIPING	15
2I	Double wall, metallic primary	490
2J	Double wall, rigid (FRP) primary	1623
2K	Double wall, flexible primary	2756
2L	TRENCH LINER	16
2M	JACKETED	15

2.1.2 Coarsened Regulatory Mapping: UG Piping Construction

Table 11

Table 12UG Piping Construction: Coarsened Regulatory Compliance Mapping

CODE	COMPONENT_TYPE	N	Coarsened_Category	Federal_Status	Federal_Citation	PA_Status	PA_Citation
2I	Double wall, metallic primary	490	Secondary Containment	Compliant (All Vintages)	§280.20(b); §280.43(g)	Compliant	§245.422(a)
2J	Double wall, rigid (FRP) primary	1623	Secondary Containment	Compliant (All Vintages)	§280.20(b)(1); UL 971	Compliant	§245.422(a)
2K	Double wall, flexible primary	2756	Secondary Containment	Compliant (All Vintages)	§280.20(b)(1)	Compliant	§245.422(a)
2L	TRENCH LINER	16	Secondary Containment	Compliant (All Vintages)	§280.43(g)	Compliant	§245.422(a)
2M	JACKETED	15	Secondary Containment	Compliant (All Vintages)	§280.20(b)	Compliant	§245.422(a)
2A	BARE STEEL	5870	Single Wall (Legacy)	Legacy: HIGH RISK	§280.21(c) req CP upgrade	Legacy: HIGH RISK	§245.422(b)
2A	BARE STEEL	NA	Single Wall (Legacy)	Post-4/11/16: NON-COMPLIANT	§280.20 intro para	Post-12/22/18: NON-COMPLIANT	§245.422(a)
2B	CATHODICALLY PROTECTED, METALLIC	2137	Single Wall (Legacy)	Legacy: Compliant	§280.20(b)(2); 3-yr CP test	Legacy: Compliant	§245.422(b); §245.432
2B	CATHODICALLY PROTECTED, METALLIC	NA	Single Wall (Legacy)	Post-4/11/16: NON-COMPLIANT	§280.20 intro para	Post-12/22/18: NON-COMPLIANT	§245.422(a)
2C	COPPER	213	Single Wall (Legacy)	Legacy: Conditional	§280.20(b)(3) site assess	Legacy: Conditional	§245.422(b)
2D	FIBERGLASS	6331	Single Wall (Legacy)	Legacy: Compliant	§280.20(b)(1); UL 971	Legacy: Compliant	§245.422(b)
2D	FIBERGLASS	NA	Single Wall (Legacy)	Post-4/11/16: NON-COMPLIANT	§280.20 intro para	Post-12/22/18: NON-COMPLIANT	§245.422(a)
2E	FLEXIBLE NON-METALLIC	488	Single Wall (Legacy)	Legacy: Compliant	§280.20(b)(1)	Legacy: Compliant	§245.422(b)
2E	FLEXIBLE NON-METALLIC	NA	Single Wall (Legacy)	Post-4/11/16: NON-COMPLIANT	§280.20 intro para	Post-12/22/18: NON-COMPLIANT	§245.422(a)
288	OTHER (COMPLIANT)	31	Other/Unknown	Case-by-Case	§280.20(b)(4)	Case-by-Case	§245.422
299	OTHER	39	Other/Unknown	Presumed Non-Compliant	§280.20(b)	Presumed Non-Compliant	§245.422
2F	UNKNOWN	218	Data Gap	UNKNOWN - Verify	N/A	UNKNOWN - Verify	N/A
2G	NONE	793	No Piping	N/A - Direct Fill/Gravity	§280.41(b) exemption	N/A	§245.445 exemption
2H	MODIFICATION OF PIPING	15	Maintenance Record	Repair Record Only	§280.33(d)	Repair Record Only	§245.433

2.2 UG Single / Inner Wall Piping

2.2.1 Raw Frequency Table

Table 13

Table 14Component Universe: UG SINGLE / INNER WALL PIPING

COMPONENT_ATTRIBUTE_CODE	COMPONENT_TYPE	N
2899	OTHER	34
28A	BARE STEEL	465
28B	CP PROTECTED	712
28C	COPPER	167
28D	FRP	8859
28E	FLEX	12507
28F	UNKNOWN	10
28G	NO DISPENSING PIPING	373
28I	STAINLESS STEEL	47

Table 15

Table 16UG Single/Inner Wall Piping: Coarsened Regulatory Compliance Mapping

CODE	COMPONENT_TYPE	N	Coarsened_Category	Federal_Status	Federal_Citation	PA_Status	PA_Citation
28D	FRP	8859	Non-Corrodible	Compliant (Inner Wall)	§280.20(b)(1); UL 971	Compliant	§245.422(a)(1)
28E	FLEX	12507	Non-Corrodible	Compliant (Inner Wall)	§280.20(b)(1)	Compliant	§245.422(a)(1)
28I	STAINLESS STEEL	47	Non-Corrodible	Compliant (Inner Wall)	§280.20(b)(1)	Compliant	§245.422(a)(1)
28A	BARE STEEL	465	Metallic (Requires CP)	Legacy: HIGH RISK	§280.21(c) req CP	Legacy: HIGH RISK	§245.422(b)
28B	CP PROTECTED	712	Metallic (CP Protected)	Legacy: Compliant	§280.20(b)(2)	Legacy: Compliant	§245.422(a)(2)
28C	COPPER	167	Metallic (Site-Specific)	Legacy: Conditional	§280.20(b)(3)	Legacy: Conditional	§245.422(b)
2899	OTHER	34	Other/Unknown	Case-by-Case	§280.20(b)(4)	Case-by-Case	§245.422
28F	UNKNOWN	10	Data Gap	UNKNOWN - Verify	N/A	UNKNOWN - Verify	N/A
28G	NO DISPENSING PIPING	373	No Piping	N/A	N/A	N/A	N/A

2.2.2 Coarsened Regulatory Mapping: UG Single/Inner Wall Piping

2.3 UG Outer Wall Piping

2.3.1 Raw Frequency Table

Table 17

Table 18Component Universe: UG OUTER WALL PIPING

COMPONENT_ATTRIBUTE_CODE	COMPONENT_TYPE	N
2999	OTHER, OUTER	263
29A	BARE STEEL, OUTER	204
29B	CP PROTECTED, OUTER	51
29D	FRP, OUTER	3985
29E	FLEX, OUTER	12227
29F	UNKNOWN, OUTER	14
29I	POLY-ENCASED STAINLESS STEEL, OUTER	19
29N	NONE	6295

Table 19

Table 20UG Outer Wall Piping: Coarsened Regulatory Compliance Mapping

CODE	COMPONENT_TYPE	N	Coarsened_Category	Federal_Status	Federal_Citation	PA_Status	PA_Citation
29D	FRP, OUTER	3985	Secondary Containment	Compliant Outer Wall	§280.20(b)(1); §280.43(g)	Compliant	§245.422(a)
29E	FLEX, OUTER	12227	Secondary Containment	Compliant Outer Wall	§280.20(b)(1); §280.43(g)	Compliant	§245.422(a)
29I	POLY-ENCASED SS, OUTER	19	Secondary Containment	Compliant Outer Wall	§280.20(b); §280.43(g)	Compliant	§245.422(a)
29A	BARE STEEL, OUTER	204	Metallic Outer	Requires CP if ground contact	§280.20(b)(2)	Requires CP	§245.422(a)(2)
29B	CP PROTECTED, OUTER	51	Metallic Outer (CP)	Compliant Outer Wall	§280.20(b)(2)	Compliant	§245.422(a)(2)
29N	NONE	6295	Single Wall System	Legacy: Acceptable	§280.41(b)(1)	Legacy: Acceptable	§245.445
29N	NONE	NA	Single Wall System	Post-4/11/16: NON-COMPLIANT	§280.20 intro para	Post-12/22/18: NON-COMPLIANT	§245.422(a)
2999	OTHER, OUTER	263	Other/Unknown	Case-by-Case	§280.20(b)(4)	Case-by-Case	§245.422
29F	UNKNOWN, OUTER	14	Data Gap	UNKNOWN - Verify	N/A	UNKNOWN - Verify	N/A

2.3.2 Coarsened Regulatory Mapping: UG Outer Wall Piping

2.4 Piping Release Detection Method

2.4.1 Raw Frequency Table

Table 21

Table 22Component Universe: PIPE RELEASE DETECTION METHOD

COMPONENT_ATTRIBUTE_CODE	COMPONENT_TYPE	N
5A	AUTOMATIC LINE LEAK DETECTOR	15109
5B	ANNUAL LINE TIGHTNESS TESTING (PRESSURE)	12413
5C	LINE TIGHTNESS TEST - 3 YEARS (SUCTION)	1646
5D	INTERSTITIAL MONITORING	10888
5E	GROUNDWATER MONITORING	63
5F	VAPOR MONITORING	33
5G	VISUAL INSPECTION	62
5H	NONE	2796
5I	EXEMPT	11903
5J	STATISTICAL INVENTORY RECONCILIATION	2558
5K	ELECTRONIC LINE LEAK DETECTOR	4762
5L	INTERSTITIAL MONITORING W/CONTINUOUS ALARM/SHUT OFF	7686

2.4.2 Coarsened Regulatory Mapping: Piping Release Detection

Table 23

Table 24 Piping Release Detection Method: Coarsened Regulatory Compliance Mapping

CODE	COMPONENT_TYPE	N	Coarsened_Category	Federal_Status	Federal_Citation	PA_Status	PA_Citation
5D	INTERSTITIAL MONITORING	10888	Secondary Containment (IM)	Compliant (All Vintages)	§280.43(g); §280.44(c)	Compliant	§245.445(1)
5D	INTERSTITIAL MONITORING	NA	Secondary Containment (IM)	REQUIRED: Post-4/11/16 Piping	§280.41(b)(2)	REQUIRED: Post-12/22/18	§245.445(1)
5L	IM W/CONTINUOUS ALARM/SHUTOFF	7686	Secondary Containment (IM+)	Compliant (All Vintages)	§280.43(g); §280.44(a)	Compliant	§245.445(1)
5A	AUTOMATIC LINE LEAK DETECTOR	15109	Line Leak Detection	Legacy Pressurized: Required	§280.44(a); 3 gph @ 10 psi	Required: Pressurized	§245.445(2)(i)
5A	AUTOMATIC LINE LEAK DETECTOR	NA	Line Leak Detection	Post-4/11/16: Required + IM	§280.41(b)(2)(i)	Post-12/22/18: + IM	§245.445(1)
5K	ELECTRONIC LINE LEAK DETECTOR	4762	Line Leak Detection	Legacy Pressurized: Required	§280.44(a)	Required: Pressurized	§245.445(2)(i)
5K	ELECTRONIC LINE LEAK DETECTOR	NA	Line Leak Detection	Post-4/11/16: Required + IM	§280.41(b)(2)(i)	Post-12/22/18: + IM	§245.445(1)
5B	ANNUAL LTT (PRESSURE)	12413	Tightness Testing	Legacy Pressurized: Annual	§280.44(b); 0.1 gph @ 1.5× OP	Annual	§245.445(2)(ii)
5B	ANNUAL LTT (PRESSURE)	NA	Tightness Testing	Post-4/11/16: NON-COMPLIANT alone	§280.41(b)(2) req IM	Post-12/22/18: + IM	§245.445(1)
5C	LTT - 3 YEARS (SUCTION)	1646	Tightness Testing	Legacy Suction: Every 3 yrs	§280.44(b); §280.41(b)(1)(ii)	Every 3 yrs	§245.445(3)
5C	LTT - 3 YEARS (SUCTION)	NA	Tightness Testing	Safe Suction: No RD required	§280.41(b)(1)(ii)(A) Safe Suction (E)	Safe Suction Exempt	§245.445(3)
5J	STATISTICAL INVENTORY RECONCILIATION	2558	SIR	Legacy: Conditional	§280.44(c); §280.43(h)	Conditional	§245.445(4)
5E	GROUNDWATER MONITORING	63	External Monitoring	Conditional: Site Assessment	§280.44(c); §280.43(f)	Conditional	§245.445(5)
5F	VAPOR MONITORING	33	External Monitoring	Conditional: Site Assessment	§280.44(c); §280.43(e)	Conditional	§245.445(5)
5G	VISUAL INSPECTION	62	Visual Only	Supplemental Only	Not standalone per §280.44	Supplemental Only	§245.445
5H	NONE	2796	NON-COMPLIANT	VIOLATION (Unless Safe Suction)	§280.41(b) requires RD	VIOLATION	§245.445 requires RD
5I	EXEMPT	11903	Exempt	Verify: Safe Suction or Exempt	§280.41(b)(1)(ii) or §280.10	Verify Basis	§245.1(b); §245.445(3)

2.5 Line Leak Detector Shuts Off Pump

2.5.1 Raw Frequency Table

Table 25

Table 26Component Universe: LINE LEAK DETECTOR SHUTS OFF PUMP

COMPONENT_ATTRIBUTE_CODE	COMPONENT_TYPE	N
23N	NO	17043
23Y	YES	10425

Table 27

Table 28Line Leak Detector Pump Shutoff: Coarsened Regulatory Compliance Mapping

CODE	COMPONENT_TYPE	N	Coarsened_Category	Federal_Status	Federal_Citation	PA_Status	PA_Citation
23Y	YES	10425	Automatic Shutoff	Compliant: Best Practice	§280.44(a) shutoff OR alarm	Compliant	§245.445(2)(i)
23N	NO	17043	Alarm Only / Manual	Compliant: If alarm triggers	§280.44(a) shutoff OR alarm	Compliant if alarm	§245.445(2)(i)

2.5.2 Coarsened Regulatory Mapping: LLD Pump Shutoff

2.6 Pump/Delivery System

2.6.1 Raw Frequency Table

Table 29

Table 30Component Universe: PUMP/DELIVERY SYSTEM

COMPONENT_ATTRIBUTE_CODE	COMPONENT_TYPE	N
4A	SUCTION: CHECK VALVE AT PUMP	11641
4B	SUCTION: CHECK VALVE AT TANK	3899
4C	PRESSURE	25845
4D	GRAVITY FED	201
4E	NONE	1110

Table 31

Table 32 Pump/Delivery System: Coarsened Regulatory Compliance Mapping

CODE	COMPONENT_TYPE	N	Coarsened_Category	Federal_Status	Federal_Citation	PA_Status	PA_Citation
4C	PRESSURE	25845	Pressurized	Requires: ALLD + LTT or IM	§280.41(b)(1)(i); §280.44(a)	Requires ALLD	§245.445(2)
4C	PRESSURE	NA	Pressurized	Post-4/11/16: ALLD + IM	§280.41(b)(2)(i)	Post-12/22/18: + IM	§245.445(1)
4A	SUCTION: CHECK VALVE AT PUMP	11641	Suction (Safe Suction Eligible)	May qualify Safe Suction	§280.41(b)(1)(ii)(C) (D)	May qualify	§245.445(3)
4B	SUCTION: CHECK VALVE AT TANK	3899	Suction (NOT Safe Suction)	Does NOT meet Safe Suction	Fails §280.41(b)(1)(ii)(D)	Does NOT meet	§245.445(3)
4B	SUCTION: CHECK VALVE AT TANK	NA	Suction (NOT Safe Suction)	Requires: LTT every 3 yrs OR monthly	§280.41(b)(1)(ii)	LTT or monthly	§245.445(3)
4D	GRAVITY FED	201	Gravity	No pumping = Limited RD options	§280.41(b)	Limited RD options	§245.445
4E	NONE	1110	No Delivery System	N/A - Verify tank use	N/A	N/A	N/A

2.6.2 Coarsened Regulatory Mapping: Pump/Delivery System

2.7 Piping Flexible Connectors

2.7.1 Raw Frequency Table

Table 33

Table 34Component Universe: Piping Flexible Connectors

COMPONENT_ATTRIBUTE_CODE	COMPONENT_TYPE	N
88	Other (Compliant)	225
99	Other (Noncompliant)	4
PFLXA	Unprotected Metallic Components (incl wrapped or coated)	478
PFLXB	Cathodically Protected, Metallic	2465
PFLXC	Flexible Coupling w/ Protected Metallic Ends	53
PFLXD	Completely Inside Containment Sump, Secondary Pipe or Liner	4816
PFLXE	Completely Jacketed w/ Sealed Boot	1596
PFLXF	Not in Contact w/ Ground	976
PFLXX	None	197
UNK	Unknown	336

Table 35

Table 36 Piping Flexible Connectors: Coarsened Regulatory Compliance Mapping

CODE	COMPONENT_TYPE	N	Coarsened_Category	Federal_Status	Federal_Citation	PA_Status	PA_Citation
PFLXD	Completely Inside Containment Sump/Secondary	4816	Secondary Containment	Compliant (All Vintages)	§280.20; §280.43(g)	Compliant	§245.422
PFLXE	Completely Jacketed w/ Sealed Boot	1596	Secondary Containment	Compliant (All Vintages)	§280.20(b)	Compliant	§245.422
PFLXF	Not in Contact w/ Ground	976	Above Ground	N/A - Not UG piping	§280.20(b) applies to UG	N/A	§245.422
PFLXB	Cathodically Protected, Metallic	2465	Metallic (CP)	Legacy: Compliant	§280.20(b)(2)	Legacy: Compliant	§245.422(a)(2)
PFLXC	Flexible Coupling w/ Protected Metallic Ends	53	Metallic (CP)	Legacy: Compliant	§280.20(b)(2)	Legacy: Compliant	§245.422(a)(2)
PFLXA	Unprotected Metallic (incl wrapped/coated)	478	Metallic (Unprotected)	Legacy: HIGH RISK	§280.21(c) req CP	Legacy: HIGH RISK	§245.422(b)
PFLXA	Unprotected Metallic (incl wrapped/coated)	NA	Metallic (Unprotected)	Post-4/11/16: NON-COMPLIANT	§280.20(b)(2) req CP	Post-12/22/18: NON-COMPLIANT	§245.422(a)
88	Other (Compliant)	225	Other/Unknown	Case-by-Case	§280.20(b)(4)	Case-by-Case	§245.422
99	Other (Noncompliant)	4	Other/Unknown	Presumed Non-Compliant	§280.20(b)	Presumed Non-Compliant	§245.422
PFLXX	None	197	No Flex Connectors	N/A	N/A	N/A	N/A
UNK	Unknown	336	Data Gap	UNKNOWN - Verify	N/A	UNKNOWN - Verify	N/A

2.7.2 Coarsened Regulatory Mapping: Piping Flexible Connectors

2.8 Flex - Tank End

2.8.1 Raw Frequency Table

Table 37

Table 38Component Universe: FLEX - TANK END

COMPONENT_ATTRIBUTE_CODE	COMPONENT_TYPE	N
2699	OTHER	343
26A	UNPROTECTED METALLIC COMPONENTS (INCL WRAPPED OR COATED)	51
26B	CATHODICALLY PROTECTED, METALLIC	1676
26F	UNKNOWN	338
26I	COMPLETELY INSIDE CONTAINMENT SUMP, SECONDARY PIPE OR LINER	17133
26M	COMPLETELY JACKETED W/ SEALED BOOT	876
26N	NOT IN CONTACT W/ GROUND	1355
26X	NONE	476

Table 39

Table 40Flex - Tank End: Coarsened Regulatory Compliance Mapping

CODE	COMPONENT_TYPE	N	Coarsened_Category	Federal_Status	Federal_Citation	PA_Status	PA_Citation
26I	COMPLETELY INSIDE CONTAINMENT SUMP/SECONDARY	17133	Secondary Containment	Compliant (All Vintages)	§280.20; §280.43(g)	Compliant	§245.422
26M	COMPLETELY JACKETED W/ SEALED BOOT	876	Secondary Containment	Compliant (All Vintages)	§280.20(b)	Compliant	§245.422
26N	NOT IN CONTACT W/ GROUND	1355	Above Ground	N/A - Not UG component	§280.20(b) applies to UG	N/A	§245.422
26B	CATHODICALLY PROTECTED, METALLIC	1676	Metallic (CP)	Legacy: Compliant	§280.20(b)(2)	Legacy: Compliant	§245.422(a)(2)
26A	UNPROTECTED METALLIC (INCL WRAPPED/COATED)	51	Metallic (Unprotected)	Legacy: HIGH RISK	§280.21(c) req CP	Legacy: HIGH RISK	§245.422(b)
2699	OTHER	343	Other/Unknown	Case-by-Case	§280.20(b)(4)	Case-by-Case	§245.422
26F	UNKNOWN	338	Data Gap	UNKNOWN - Verify	N/A	UNKNOWN - Verify	N/A
26X	NONE	476	No Tank-End Flex	N/A	N/A	N/A	N/A

2.8.2 Coarsened Regulatory Mapping: Flex - Tank End

2.9 Flex - Dispenser End

2.9.1 Raw Frequency Table

Table 41

Table 42Component Universe: FLEX - DISPENSER END

COMPONENT_ATTRIBUTE_CODE	COMPONENT_TYPE	N
2799	OTHER	190
27A	UNPROTECTED METALLIC COMPONENTS (INCL WRAPPED OR COATED)	27
27B	CATHODICALLY PROTECTED, METALLIC	1788
27F	UNKNOWN	34
27I	COMPLETELY INSIDE CONTAINMENT SUMP, SECONDARY PIPE OR LINER	16280
27M	COMPLETELY JACKETED W/ SEALED BOOT	1926
27N	NOT IN CONTACT W/ GROUND	1344
27X	NONE	763

Table 43

Table 44Flex - Dispenser End: Coarsened Regulatory Compliance Mapping

CODE	COMPONENT_TYPE	N	Coarsened_Category	Federal_Status	Federal_Citation	PA_Status	PA_Citation
27I	COMPLETELY INSIDE CONTAINMENT SUMP/SECONDARY	16280	Secondary Containment	Compliant (All Vintages)	§280.20(f); UDC	Compliant	§245.422
27M	COMPLETELY JACKETED W/ SEALED BOOT	1926	Secondary Containment	Compliant (All Vintages)	§280.20(b)	Compliant	§245.422
27N	NOT IN CONTACT W/ GROUND	1344	Above Ground	N/A - Not UG component	§280.20(b) applies to UG	N/A	§245.422
27B	CATHODICALLY PROTECTED, METALLIC	1788	Metallic (CP)	Legacy: Compliant	§280.20(b)(2)	Legacy: Compliant	§245.422(a)(2)
27A	UNPROTECTED METALLIC (INCL WRAPPED/COATED)	27	Metallic (Unprotected)	Legacy: HIGH RISK	§280.21(c) req CP	Legacy: HIGH RISK	§245.422(b)
2799	OTHER	190	Other/Unknown	Case-by-Case	§280.20(b)(4)	Case-by-Case	§245.422
27F	UNKNOWN	34	Data Gap	UNKNOWN - Verify	N/A	UNKNOWN - Verify	N/A
27X	NONE	763	No Dispenser-End Flex	N/A	N/A	N/A	N/A

2.9.2 Coarsened Regulatory Mapping: Flex - Dispenser End

2.10 AG Piping Construction & Corrosion Protection

2.10.1 Raw Frequency Table

Table 45

Error: Table file not found: 004_comp_ag_piping_construction_corrosion_prot_____

Table 46

Table 47AG Piping Construction: Coarsened Regulatory Compliance Mapping

CODE	COMPONENT_TYPE	N	Coarsened_Category	Federal_Status	Federal_Citation	PA_Status	PA_Citation
3I	DOUBLE WALL METALLIC PRIMARY	19	Secondary Containment	Compliant	§280.20(b)	Compliant	§245.422(a)
3J	DOUBLE WALL RIGID (FRP) PRIMARY	11	Secondary Containment	Compliant	§280.20(b)(1)	Compliant	§245.422(a)
3K	DOUBLE WALL FLEXIBLE PRIMARY	8	Secondary Containment	Compliant	§280.20(b)(1)	Compliant	§245.422(a)
3A	CARBON STEEL	615	Single Wall (AG)	AG: Not subject to §280.20(b)	AG piping different reqs	AG: PA Ch. 245 Subchap F	§245.501-545
3B	CATHODICALLY PROTECTED, METALLIC	72	Single Wall (CP)	AG: Best Practice	AG piping different reqs	AG: Best Practice	§245.501-545
3C	COPPER	30	Single Wall (AG)	AG: Acceptable	AG piping different reqs	AG: Acceptable	§245.501-545
3D	FIBERGLASS	40	Single Wall (AG)	AG: Non-corrodible	AG piping different reqs	AG: Acceptable	§245.501-545
3E	FLEXIBLE NON-METALLIC	29	Single Wall (AG)	AG: Non-corrodible	AG piping different reqs	AG: Acceptable	§245.501-545
3F	PVC	10	Single Wall (AG)	AG: Non-corrodible	AG piping different reqs	AG: Acceptable	§245.501-545
3L	STAINLESS STEEL	9	Single Wall (AG)	AG: Corrosion resistant	AG piping different reqs	AG: Acceptable	§245.501-545
388	OTHER (COMPLIANT)	156	Other/Unknown	Case-by-Case	N/A	Case-by-Case	§245.501-545
399	OTHER	21	Other/Unknown	Case-by-Case	N/A	Case-by-Case	§245.501-545
3G	NONE	448	No AG Piping	N/A	N/A	N/A	N/A
3H	PIPING MODIFICATION	5	Maintenance Record	Repair Record Only	§280.33	Repair Record	§245.433

2.10.2 Coarsened Regulatory Mapping: AG Piping Construction

3 Spill & Overfill Prevention

3.1 Spill Prevention

3.1.1 Raw Frequency Table

Table 48

Table 49Component Universe: SPILL PREVENTION

COMPONENT_ATTRIBUTE_CODE	COMPONENT_TYPE	N
6D	DOUBLE WALL SPILL PREV	2564
6E	EXEMPT	512
6N	NO	5543
6S	SINGLE WALL SPILL PREV	4680
6Y	YES	29689

Table 50

Table 51 Spill Prevention: Coarsened Regulatory Compliance Mapping

CODE	COMPONENT_TYPE	N	Coarsened_Category	Federal_Status	Federal_Citation	PA_Status	PA_Citation
6Y	YES	29689	Spill Prevention Installed	Compliant	§280.20(c)(1)(i)	Compliant	§245.421(b)(6)
6D	DOUBLE WALL SPILL PREV	2564	Double Wall (Best Practice)	Compliant + Enhanced	§280.35(a)(1)(i)	Compliant + Enhanced	§245.437(a)(1)
6S	SINGLE WALL SPILL PREV	4680	Single Wall	Compliant	§280.20(c)(1)(i)	Compliant	§245.421(b)(6)
6N	NO	5543	NO Spill Prevention	NON-COMPLIANT	§280.20(c)(1)(i) required	NON-COMPLIANT	§245.421(b)(6) required
6E	EXEMPT	512	Exempt	Verify Exemption Basis	§280.20(c)(2)-(3)	Verify Basis	§245.421(b)(6)

3.1.2 Coarsened Regulatory Mapping: Spill Prevention

3.2 Overfill Prevention

3.2.1 Raw Frequency Table

Table 52

Table 53Component Universe: OVERFILL PREVENTION

COMPONENT_ATTRIBUTE_CODE	COMPONENT_TYPE	N
7A	OVERFILL ALARM	9490
7B	BALL FLOAT VALVE	2598
7E	EXEMPT	885
7N	NO	6183
7S	DROP TUBE SHUTOFF DEVICE	24814
7Y	YES	3550

Table 54

Table 55 Overfill Prevention: Coarsened Regulatory Compliance Mapping

CODE	COMPONENT_TYPE	N	Coarsened_Category	Federal_Status	Federal_Citation	PA_Status	PA_Citation
7S	DROP TUBE SHUTOFF DEVICE	24814	Automatic Shutoff (95%)	Compliant (All Vintages)	§280.20(c)(1)(ii)(A)	Compliant	§245.421(b)(7)
7A	OVERFILL ALARM	9490	High-Level Alarm (90%)	Compliant (All Vintages)	§280.20(c)(1)(ii)(B)	Compliant	§245.421(b)(7)
7Y	YES	3550	Overfill Prevention Installed	Compliant - Verify Type	§280.20(c)(1)(ii)	Compliant - Verify Type	§245.421(b)(7)
7B	BALL FLOAT VALVE	2598	Ball Float (Vent Restrictor)	Pre-10/13/15: GRANDFA-THERED	§280.20(c)(3)	Pre-12/22/18: GRANDFA-THERED	§245.421(b)(7)
7B	BALL FLOAT VALVE	NA	Ball Float (Vent Restrictor)	Post-10/13/15: PROHIBITED	§280.20(c)(3) prohibits	Post-12/22/18: PROHIBITED	§245.421(b)(7)
7B	BALL FLOAT VALVE	NA	Ball Float (Vent Restrictor)	Replacement: PROHIBITED	§280.20(c)(3)	Replacement: PROHIBITED	§245.421(b)(7)
7N	NO	6183	NO Overfill Prevention	NON-COMPLIANT	§280.20(c)(1)(ii) required	NON-COMPLIANT	§245.421(b)(7) required
7E	EXEMPT	885	Exempt	Verify Exemption Basis	§280.20(c)(2)-(3)	Verify Basis	§245.421(b)(7)

3.2.2 Coarsened Regulatory Mapping: Overfill Prevention

4 Containment Systems

4.1 UST Total Secondly Contained

4.1.1 Raw Frequency Table

Table 56

Table 57Component Universe: UST TOTAL SECONDARILY CONTAINED

COMPONENT_ATTRIBUTE_CODE	COMPONENT_TYPE	N
18N	NO	20287
18Y	YES	12244

Table 58

Table 59 UST Secondly Contained: Coarsened Regulatory Compliance Mapping

CODE	COMPONENT_TYPE	N	Coarsened_Category	Federal_Status	Federal_Citation	PA_Status	PA_Citation
18Y	YES	12244	Secondarily Contained	Compliant (All Vintages)	§280.20; §280.43(g)	Compliant	§245.421(a)
18Y	YES	NA	Secondarily Contained	REQUIRED: Post-4/11/16	§280.20 intro para	REQUIRED: Post-12/22/18	§245.421(a)
18N	NO	20287	NOT Secondarily Contained	Legacy: Acceptable	§280.41(a)(1); §280.21	Legacy: Acceptable	§245.421(b)
18N	NO	NA	NOT Secondarily Contained	Post-4/11/16: NON-COMPLIANT	§280.20 intro para	Post-12/22/18: NON-COMPLIANT	§245.421(a)

4.1.2 Coarsened Regulatory Mapping: UST Secondly Contained

4.2 Tank-Top Containment Sumps

4.2.1 Raw Frequency Table

Table 60

Table 61Component Universe: TANK-TOP CONTAINMENT SUMPS

COMPONENT_ATTRIBUTE_CODE	COMPONENT_TYPE	N
21A	AT ALL PENETRATIONS	18857
21N	NONE	7554
21S	AT SOME PENETRATIONS	1127

Table 62

Table 63 Tank-Top Containment Sumps: Coarsened Regulatory Compliance Mapping

CODE	COMPONENT_TYPE	N	Coarsened_Category	Federal_Status	Federal_Citation	PA_Status	PA_Citation
21A	AT ALL PENETRATIONS	18857	Full Coverage	Compliant (Best Practice)	§280.35; §280.12 def	Compliant	§245.437
21S	AT SOME PENETRATIONS	1127	Partial Coverage	Conditional: Legacy acceptable	§280.35	Conditional	§245.437
21S	AT SOME PENETRATIONS	NA	Partial Coverage	Post-4/11/16: May not satisfy IM	§280.43(g) req IM all penetrations	Post-12/22/18: Verify	§245.444(1)
21N	NONE	7554	No Tank-Top Sumps	Legacy: Acceptable	Not required for legacy	Legacy: Acceptable	Not required legacy
21N	NONE	NA	No Tank-Top Sumps	Post-4/11/16: Verify IM method	§280.43(g) options	Post-12/22/18: Verify	§245.444(1)

4.2.2 Coarsened Regulatory Mapping: Tank-Top Containment Sumps

4.3 Under-Dispenser Containment

4.3.1 Raw Frequency Table

Table 64

Table 65Component Universe: UNDER-DISPENSER CONTAINMENT

COMPONENT_ATTRIBUTE_CODE	COMPONENT_TYPE	N
22A	AT ALL DISPENSERS	18566
22N	NONE	8667
22S	AT SOME DISPENSERS	253

Table 66

Table 67 Under-Dispenser Containment: Coarsened Regulatory Compliance Mapping

CODE	COMPONENT_TYPE	N	Coarsened_Category	Federal_Status	Federal_Citation	PA_Status	PA_Citation
22A	AT ALL DISPENSERS	18566	Full UDC Coverage	Compliant (Best Practice)	§280.20(f)	Compliant	§245.421(b)(8)
22A	AT ALL DISPENSERS	NA	Full UDC Coverage	REQUIRED: New dispensers post-4/11/16	§280.20(f)(1)	REQUIRED: Post-12/22/18	§245.421(b)(8)
22S	AT SOME DISPENSERS	253	Partial UDC Coverage	Conditional: Legacy acceptable	§280.20(f)	Conditional	§245.421(b)(8)
22S	AT SOME DISPENSERS	NA	Partial UDC Coverage	Post-4/11/16 dispensers: Require UDC	§280.20(f)(1)	Post-12/22/18: Require UDC	§245.421(b)(8)
22N	NONE	8667	No UDC	Legacy: Acceptable	Not required pre-4/11/16	Legacy: Acceptable	Not required pre-12/22/18
22N	NONE	NA	No UDC	Post-4/11/16 dispensers: NON-COMPLIANT	§280.20(f)(1) requires	Post-12/22/18: NON-COMPLIANT	§245.421(b)(8)

4.3.2 Coarsened Regulatory Mapping: Under-Dispenser Containment

5 Vapor Recovery Systems

5.1 Vapor Recovery (Summary)

5.1.1 Raw Frequency Table

Table 68

Table 69Component Universe: VAPOR RECOVERY

COMPONENT_ATTRIBUTE_CODE	COMPONENT_TYPE	N
11A	STAGE I INSTALLED	3693
11B	STAGE II INSTALLED	89
11C	STAGE I AND STAGE II INSTALLED	774
11D	NONE	4494

Table 70

Table 71 Vapor Recovery: Coarsened Regulatory Compliance Mapping

CODE	COMPONENT_TYPE	N	Coarsened_Category	Federal_Status	Federal_Citation	PA_Status	PA_Citation
11A	STAGE I INSTALLED	3693	Stage I Only	Clean Air Act (not 40 CFR 280)	42 U.S.C. §7511a(b)(3)	25 Pa. Code Ch. 129	\$129.82
11B	STAGE II INSTALLED	89	Stage II Only	Clean Air Act (not 40 CFR 280)	42 U.S.C. §7511a(b)(3)	25 Pa. Code Ch. 129	\$129.82
11C	STAGE I AND STAGE II INSTALLED	774	Stage I + II	Clean Air Act (not 40 CFR 280)	42 U.S.C. §7511a(b)(3)	25 Pa. Code Ch. 129	\$129.82
11D	NONE	4494	No Vapor Recovery	May be acceptable - check area	Air quality area-dependent	Check county status	\$129.82

5.1.2 Coarsened Regulatory Mapping: Vapor Recovery

5.2 Stage I Vapor Recovery

5.2.1 Raw Frequency Table

Table 72

Table 73Component Universe: STAGE I VAPOR RECOVERY

COMPONENT_ATTRIBUTE_CODE	COMPONENT_TYPE	N
19A	COAX	8099
19B	2 POINT	13101
19N	NONE OR INCOMPLETE	12382
2I	Double wall, metallic primary	1

Table 74

Table 75 Stage I Vapor Recovery: Coarsened Regulatory Compliance Mapping

CODE	COMPONENT_TYPE	N	Coarsened_Category	Federal_Status	Federal_Citation	PA_Status	PA_Citation
19A	COAX	8099	Coaxial System	CAA Area-Dependent	42 U.S.C. §7511a(b)(3)	\$129.82 Area-Dependent	25 Pa. Code §129.82
19B	2 POINT	13101	Two-Point System	CAA Area-Dependent	42 U.S.C. §7511a(b)(3)	\$129.82 Area-Dependent	25 Pa. Code §129.82
19N	NONE OR INCOMPLETE	12382	No/Incomplete Stage I	Check if required in area	42 U.S.C. §7511a(b)(3)	Check county status	25 Pa. Code §129.82
2I	Double wall, metallic primary	1	Data Error - Piping Code	Data Quality Issue	N/A	Data Quality Issue	N/A

5.2.2 Coarsened Regulatory Mapping: Stage I Vapor Recovery

5.3 Stage II Vapor Recovery

5.3.1 Raw Frequency Table

Table 76

Table 77Component Universe: STAGE II VAPOR RECOVERY

COMPONENT_ATTRIBUTE_CODE	COMPONENT_TYPE	N
20A	COMPLETE BALANCE SYSTEM	623
20B	COMPLETE ASSIST SYSTEM	2256
20C	UG PIPING ONLY	6248
20D	DECOMMISSIONED	2359
20N	NONE	21258

Table 78

Table 79 Stage II Vapor Recovery: Coarsened Regulatory Compliance Mapping

CODE	COMPONENT_TYPE	N	Coarsened_Category	Federal_Status	Federal_Citation	PA_Status	PA_Citation
20A	COMPLETE BALANCE SYSTEM	623	Balance System	LARGELY OBSOLETE	EPA ORVR Waiver 2012	Decommissioning allowed	25 Pa. Code §129.82
20B	COMPLETE ASSIST SYSTEM	2256	Assist System	LARGELY OBSOLETE	EPA ORVR Waiver 2012	Decommissioning allowed	25 Pa. Code §129.82
20C	UG PIPING ONLY	6248	Partial Infrastructure	Infrastructure for Stage II	N/A - Equipment not active	Infrastructure only	25 Pa. Code §129.82
20D	DECOMMISSIONED	2359	Decommissioned	Compliant with waiver	EPA ORVR Waiver	Compliant	25 Pa. Code §129.82
20N	NONE	21258	No Stage II	Generally acceptable now	EPA ORVR Waiver	Generally acceptable	25 Pa. Code §129.82

5.3.2 Coarsened Regulatory Mapping: Stage II Vapor Recovery

6 Appendix: Key Regulatory Dates Reference

Table 80: Key Regulatory Dates: Federal and Pennsylvania UST Requirements

Date	Event	Federal_Citation	PA_Citation
December 22, 1988	Original UST regulations published	53 FR 37082	Act 32 of 1989
December 22, 1998	Compliance deadline for existing tanks	53 FR 37082	25 Pa. Code Ch. 245
July 15, 2015	2015 Final Rule published	80 FR 41566	N/A
October 13, 2015	2015 Final Rule EFFECTIVE DATE	80 FR 41566	N/A
October 13, 2015	Ball float valve PROHIBITION begins	§280.20(c)(3)	§245.421(b)(7)
April 11, 2016	Secondary containment REQUIRED (new/replaced)	§280.20 intro	N/A
October 13, 2018	Walkthrough, testing, training deadlines	§280.35, §280.36, §280.243	N/A
December 22, 2018	PA adopts 2015 federal requirements	N/A	48 Pa.B. 7875
December 22, 2018	PA secondary containment effective	N/A	§245.421(a)

7 Appendix: Citation URLs

7.1 Federal Sources

- **40 CFR Part 280 (eCFR):** <https://www.ecfr.gov/current/title-40/chapter-I/subchapter-I/part-280>
- **2015 Final Rule (Federal Register):** <https://www.federalregister.gov/documents/2015/07/15/2015-15914/revising-underground-storage-tank-regulations-revisions-to-existing-requirements-and-new>
- **EPA UST Technical Compendium:** <https://www.epa.gov/ust/underground-storage-tank-technical-compendium-about-2015-ust-regulation>
- **EPA MUSTs for USTs Guide:** https://www.epa.gov/sites/default/files/2015-12/documents/musts_for_usts.pdf

7.2 Pennsylvania Sources

- **25 Pa. Code Chapter 245:** <https://www.pacodeandbulletin.gov/Display/pacode?file=/secure/pacode/data/025/chapter245/>
- **25 Pa. Code Subchapter E (UST Technical Standards):** <https://www.pacodeandbulletin.gov/Display/pacode?file=/secure/pacode/data/025/subchapterE/>
- **PA DEP Storage Tanks:** <https://www.pa.gov/agencies/dep/programs-and-services/land/storage-tanks/underground-storage-tanks>
- **USTIF:** <https://ustif.pa.gov/>
- **25 Pa. Code Chapter 977 (USTIF):** <https://www.pacodeandbulletin.gov/Display/pacode?file=/secure/pacode/data/025/chapter977/>

8 Tank Upgrades & Retrofits

8.1 Tank Upgrade

8.1.1 Raw Frequency Table

Table 81

Table 82Component Universe: TANK UPGRADE

COMPONENT_ATTRIBUTE_CODE	COMPONENT_TYPE	N
10A	TANK WAS RETROFITTED WITH CATHODIC PROTECTION	1689
10B	TANK WAS RETROFITTED WITH LINING	859
10C	TANK WAS RETROFITTED WITH RIGID BLADDER (EX. PHOENIX SYS)	4

Table 83

Table 84 Tank Upgrade: Coarsened Regulatory Compliance Mapping

CODE	COMPONENT_TYPE	N	Coarsened_Category	Federal_Status	Federal_Citation	PA_Status	PA_Citation
10A	TANK WAS RETROFITTED WITH CATHODIC PROTECTION	1689	CP Retrofit	Legacy Upgrade: Compliant	§280.21(b)(2)	Legacy Upgrade: Compliant	§245.421(b)
10A	TANK WAS RETROFITTED WITH CATHODIC PROTECTION	NA	CP Retrofit	Must meet §280.31 monitoring	§280.31(b)-(c); 3-yr test	Must meet monitoring	§245.432
10B	TANK WAS RETROFITTED WITH LINING	859	Interior Lining	Legacy Upgrade: Compliant	§280.21(b)(1)	Legacy Upgrade: Compliant	§245.421(b)
10B	TANK WAS RETROFITTED WITH LINING	NA	Interior Lining	Inspection: 10 yrs, then 5 yrs	§280.21(b)(1)(ii)	Inspection required	§245.421(b)
10C	TANK WAS RETROFITTED WITH RIGID BLADDER (EX. PHOENIX SYS)	4	Bladder System	Legacy Upgrade: Conditional	§280.21(b)(1)(iii); §280.20(a)(5)	Conditional	§245.421(b)

8.1.2 Coarsened Regulatory Mapping: Tank Upgrade

9 Emergency Generator USTs

9.1 Emergency Generator

9.1.1 Raw Frequency Table

Table 85

Table 86Component Universe: EMERGENCY GENERATOR

COMPONENT_ATTRIBUTE_CODE	COMPONENT_TYPE	N
25N	NO - EMER GEN	21543
25Y	YES - EMER GEN	678

Table 87

Table 88 Emergency Generator USTs: Coarsened Regulatory Compliance Mapping

CODE	COMPONENT_TYPE	N	Coarsened_Category	Federal_Status	Federal_Citation	PA_Status	PA_Citation
25Y	YES - EMER GEN	678	Emergency Generator UST	Subject to §280.10(a)(1) exemption provisions	§280.10(a)(1)(ii)	Deferred Compliance	§245.403(b)
25Y	YES - EMER GEN	NA	Emergency Generator UST	Install 11/10/07: Comply by 12/21/2020	§280.252(a)(1)	Comply by 12/21/2020	§245.403(b)(1)
25Y	YES - EMER GEN	NA	Emergency Generator UST	Install 11/11/07-12/22/18: Comply by 12/22/2019	§280.252(a)(2)	Comply by 12/22/2019	§245.403(b)(2)
25Y	YES - EMER GEN	NA	Emergency Generator UST	Install after 12/22/18: Comply at install	§280.252(a)(3)	Comply at install	§245.403(b)(3)
25N	NO - EMER GEN	21543	Not Emergency Generator	Standard UST requirements apply	§280.20 et seq.	Standard requirements	§245.401 et seq.

9.1.2 Coarsened Regulatory Mapping: Emergency Generator USTs

10 Administrative & Permitting

10.1 Fire Marshal Permit

10.1.1 Raw Frequency Table

Table 89

Table 90Component Universe: FIRE MARSHAL PERMIT

COMPONENT_ATTRIBUTE_CODE	COMPONENT_TYPE	N
9A	ISSUED PRIOR TO AUGUST 5, 1989	3316
9B	ISSUED ON OR AFTER AUGUST 5, 1989	1288
9C	NO PERMIT OBTAINED	3709
9D	TANKS NOT REGULATED BY FIRE MARSHAL	268

Table 91

Table 92 Fire Marshal Permit: Coarsened Regulatory Compliance Mapping

CODE	COMPONENT_TYPE	N	Coarsened_Category	Federal_Status	Federal_Citation	PA_Status	PA_Citation
9A	ISSUED PRIOR TO AUGUST 5, 1989	3316	Pre-Act 32 Permit	N/A (State admin)	N/A	Legacy Permit	Act 32 of 1989
9A	ISSUED PRIOR TO AUGUST 5, 1989	NA	Pre-Act 32 Permit	N/A	N/A	May lack Ch. 245 compliance Standard	§245.411
9B	ISSUED ON OR AFTER AUGUST 5, 1989	1288	Post-Act 32 Permit	N/A (State admin)	N/A	Permit REQUIRED	§245.411; Act 32
9C	NO PERMIT OBTAINED	3709	No Permit	Federal: NO permit req	40 CFR 280 no permit req	PA: Permit REQUIRED	§245.411(a)
9C	NO PERMIT OBTAINED	NA	No Permit	N/A	N/A	VIOLATION if in PA jurisdiction	§245.411(a)
9D	TANKS NOT REGULATED BY FIRE MARSHAL	268	Exempt from FM	N/A	N/A	Verify exemption basis	§245.1(b)

10.1.2 Coarsened Regulatory Mapping: Fire Marshal Permit

10.2 Registration Certificate

10.2.1 Raw Frequency Table

Table 93

Table 94Component Universe: REGISTRATION CERTIFICATE

COMPONENT_ATTRIBUTE_CODE	COMPONENT_TYPE	N
8N	NO	1397
8Y	YES	11677

Table 95

Table 96Registration Certificate: Coarsened Regulatory Compliance Mapping

CODE	COMPONENT_TYPE	N	Coarsened_Category	Federal_Status	Federal_Citation	PA_Status	PA_Citation
8Y	YES	11677	Registered	Federal: Notification req	§280.22; §280.34	PA: Registration required	§245.411; §245.412
8Y	YES	NA	Registered	N/A	N/A	USTIF eligible (if current)	§977.31(a)(3)
8N	NO	1397	NOT Registered	Federal: VIOLATION	§280.22 requires notification	PA: VIOLATION	§245.411(a)
8N	NO	NA	NOT Registered	Cannot operate legally	§280.22	USTIF INELIGIBLE	§977.31(a)(3)

10.2.2 Coarsened Regulatory Mapping: Registration Certificate

11 Appendix: Compliance Status Decision Tree

UST Compliance Status Decision Framework

Step 1: Determine Installation/Replacement Date

- Pre-December 22, 1998: Subject to upgrade requirements (§280.21)
- December 22, 1998 - April 10, 2016: 'Legacy' system rules
- April 11, 2016 - Present (Federal) / December 22, 2018 - Present (PA): Secondary containment REQUIRED

Step 2: For Post-April 11, 2016 Installations

- Tank: Must be double-wall with interstitial monitoring
- Piping: Must be double-wall with interstitial monitoring
- Dispenser: Must have under-dispenser containment (UDC)
- Exception: Safe suction piping meeting ALL 5 criteria (§280.41(b)(1)(ii))

Step 3: For Legacy Installations (Pre-April 11, 2016)

- Single-wall tanks: Acceptable with monthly release detection
- Single-wall piping: Acceptable with ALLD (pressurized) or LTT/monitoring (suction)
- Ball float valve: Acceptable if installed before October 13, 2015
- Upgrades (CP, lining): Must meet ongoing inspection requirements

Step 4: Verify Administrative Compliance

- Registration current? (§245.411)
- Annual fees paid? (§977.31(a)(2))
- Certified installers used? (§245.101-141)
- Operator training current? (§280.243)

12 Appendix: USTIF Eligibility Checklist

Per 25 Pa. Code §977.31, eligibility for USTIF coverage requires ALL of the following:

Table 97: USTIF Eligibility Requirements (25 Pa. Code §977.31)

Requirement	Citation	Component_Link
Claimant is owner, operator, landowner, or certified installer/inspector	§977.31(a)(1)	N/A
Underground Storage Tank Indemnification Fund fee current at time of release	§977.31(a)(2)	Registration Certificate
Tank currently registered with DEP	§977.31(a)(3)	Registration Certificate (8Y)
Permits and certifications obtained before tank installation	§977.31(a)(4)	Fire Marshal Permit (9A/9B)
Confirmed release occurred on/after February 1, 1994	§977.31(a)(5)	N/A
Claimant cooperates with Fund and DEP	§977.31(a)(6)	N/A
Notification to Fund within 60 days of release discovery	§977.31(a)(7)	N/A

Coverage Limits (25 Pa. Code §977.33):

- Maximum per tank per occurrence: \$1,500,000
- Annual aggregate: \$1,500,000
- Deductible: \$5,000 per tank (scales with tank count per §245.707)

Deductible Scale (25 Pa. Code §245.707):

Tanks	Deductible
1-6	\$5,000
7-12	\$10,000
13-18	\$15,000
19-24	\$20,000
25-30	\$25,000