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Annual Report on External Radiation Monitoring for Calendar Year 2019, Paducah Gaseous Diffusion Plant, Paducah, Kentucky

FOUR RIVERS NUCLEAR PARTNERSHIP, LLC

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Annual Report on External Radiation Monitoring for Calendar Year 2019, Paducah Gaseous Diffusion Plant, Paducah, Kentucky

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U.S. DEPARTMENT OF ENERGY
Office of Environmental Management

Prepared by
FOUR RIVERS NUCLEAR PARTNERSHIP, LLC,
managing the
Deactivation and Remediation Project at the
Paducah Gaseous Diffusion Plant
under Contract DE-EM0004895

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TABLES

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ACRONYMS

CY	calendar year
DOE	U.S. Department of Energy
E	effective dose
E_{50}	committed effective dose
EMP	Environmental Monitoring Plan
OSL	optically stimulated luminescence
PGDP	Paducah Gaseous Diffusion Plant
TED	total effective dose
TLD	thermoluminescent dosimeter
WKWMA	West Kentucky Wildlife Management Area

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EXECUTIVE SUMMARY

U.S. Department of Energy (DOE) Order 458.1 establishes a radiation protection standard for members of the public. This standard requires that exposure of members of the public to radiation sources as a consequence of all routine DOE activities shall not cause, within a calendar year (CY), a total effective dose (TED) greater than 100 millirem (mrem). Monitoring of several media is conducted at select locations near the Paducah Gaseous Diffusion Plant (PGDP), in accordance with CP2-ES-0006, *Environmental Monitoring Plan Fiscal Year 2019, Paducah Gaseous Diffusion Plant, Paducah, Kentucky*, (EMP) to confirm that this DOE standard is met.

Program requirements for the annual external gamma radiation monitoring are outlined in the EMP. This program provides for the measurement of deep dose from gamma and neutron radiation. Effective dose is the sum of deep dose from gamma radiation and deep dose from neutron radiation reported in units of mrem.

Results for external gamma and neutron radiation monitoring conducted in CY 2019 are summarized in this report. External gamma and neutron radiation monitoring consisted of quarterly placement, collection, and analysis of environmental thermoluminescent dosimeters (TLDs) and optically stimulated luminescence dosimeters. This information will be used to calculate TED, which will be presented in the CY 2019 Annual Site Environmental Report.

Monitoring results for CY 2019 indicate that 17 locations out of 51 were above the annualized measured background dose. These 17 locations were consistently the areas with the highest measured exposures throughout the monitoring period. A majority of these locations were adjacent to or in close proximity to the PGDP security fence in the vicinity of uranium hexafluoride storage cylinders. Because security protocols prohibited the public from gaining prolonged access to the PGDP Limited Area boundary fence in CY 2019, the potential radiation doses calculated at or in close proximity to the fence are not representative of the actual public dose. For CY 2019, TLD-14, which is near Harmony Cemetery, located north of the plant security fence and south of Ogden Landing Road, represents the nearest location routinely accessible by the public within the DOE Reservation. Measurements at this location indicated dose measurements were at or below naturally occurring measured background dose at Paducah. For CY 2019, TLD-40, which is located on the DOE Reservation boundary within the DOE leased West Kentucky Wildlife Management Area off of Dyke Road, indicated the highest external radiation dose above background off the DOE reservation. Measurements at this location were approximately 30% (calculated as annual dose at measurement location/annual background dose = 104 mrem/80 mrem) above naturally occurring background levels. In addition, the radiation exposure for the maximally exposed individual, a member of the public at the nearest local residence, was found to be equivalent to naturally occurring background, with the additional dose due to PGDP activities being insignificant.

Based on the results of measurements in areas accessible to the public or near the closest local residence, measured external radiation levels were found to be equivalent to naturally occurring background dose. Therefore, the effective dose received by a member of the public from DOE operations is considered to be negligible.

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1. INTRODUCTION

U.S. Department of Energy (DOE) Order 458.1 establishes a radiation protection standard for members of the public. This order requires that exposure of members of the public to radiation sources as a consequence of all routine DOE activities shall not cause, within a calendar year (CY), a total effective dose (TED) greater than 100 millirem (mrem). One exposure pathway of concern for DOE operations at the Paducah Gaseous Diffusion Plant (PGDP) is direct external radiation exposure. External radiation exposure is defined as exposure attributed to radioactive sources outside the body.

CP2-ES-0006, *Environmental Monitoring Plan, Fiscal Year 2019, Paducah Gaseous Diffusion Plant, Paducah, Kentucky*, establishes the DOE program for monitoring external radiation at areas readily accessible to members of the public. The external gamma radiation exposure monitoring program has the following five objectives:

1. Calculate the effective dose (E) to the maximally exposed individual member of the public;

2. Calculate the E to a member of the public in areas freely accessible to members of the public;

3. Calculate the E to a member of the public at the Paducah Site boundary;

4. Establish the dose potentially received by a member of the public visiting or passing through accessible portions of the DOE Reservation; and

5. Establish the radiation dose potentially received by a member of the public from direct exposure to DOE operations at the boundary of the PGDP perimeter fence.

In addition, the results stated in this report are presented using terms that are consistent with those found in DOE Order 458.1.

TED is the sum of E and committed effective dose (E_{50}). E_{50} is the dose received from internally deposited radionuclides and is addressed in the Annual Site Environmental Report. E is the dose directly attributed to external radiation exposure. This document summarizes E.

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2. METHODOLOGY

The external gamma and neutron radiation monitoring program is designed to provide data on external radiation exposure from DOE operations to members of the public. The primary factor in selecting the monitoring locations was the potential for a member of the public to be exposed to external radiation. Secondary factors in selecting monitoring locations were accessibility and representative exposure, potentially received by members of the public, and area monitoring for individuals passing through the DOE site.

Environmental thermoluminescent dosimeters (TLDs) with a calcium fluoride and lithium fluoride matrix were placed at the monitoring locations and collected and analyzed quarterly for a period of one year. When the TLDs were collected, the next quarter's TLDs were placed at the same locations when possible. A map of the locations is provided in Appendix A, and the monitoring locations are described in Appendix B. Locations TLD-22, TLD-54, TLD-85, TLD-86, TLD-87, TLD-88, TLD-89, TLD-90, TLD-91, TLD-92, TLD-93, TLD-94, and TLD-95 are considered to be background locations (i.e., locations presumably unaffected by PGDP operations or other site-specific radiation sources).

Environmental Model 110 TLDs were received from Mirion Technologies of Irvine, CA, to monitor for gamma radiation, and optically stimulated luminescence (OSL) dosimeters were received from Landauer to monitor for neutron radiation. TLDs were kept in their individual, flexible protective packaging and placed in wide-mouth, plastic sample bottles when deployed to the monitoring location. A lid was screwed on each bottle, and a nylon wire tie was wound around each bottle (under the lid) to secure it to a fence or other fixed structure. The plastic packaging and sample bottle provide a sturdy weather-resistant package that does not significantly attenuate gamma radiation (i.e., induce a negative bias on the measurement).

One TLD per quarterly sampling event was designated as a field blank and was carried to all monitoring locations during placement and collection of the TLDs. One control TLD (i.e., trip blank TLD) was retained in the sampling field office and then used as a transit blank accompanying the TLDs when they were shipped off-site for analysis. A total of 64 gamma TLDs and 7 neutron TLDs/OSLs representing 65 locations each quarter, including background and trip blank locations, was placed, as described in the entry tables in Appendix B. In most cases, the TLDs were secured at a height of approximately 3–4 ft aboveground.

Coordinates for monitoring locations were determined using a differential global positioning system and data were entered into the Paducah Site geographic information system. No dosimeters were placed in radiologically contaminated areas.

Appendix A contains a map of the sample locations. The dosimeters were placed, collected, and shipped for analysis on the dates indicated in Appendix B. Based on process knowledge from historical surveys and the siting of dosimeters outside the bounds of radiological contamination areas, the dosimeters are noncontaminated and nonregulated for the purposes of handling and shipping (i.e., contamination levels are below DOE release criteria and U.S. Department of Transportation levels for regulated materials). Analytical results are found in Appendix C.

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3. RESULTS

Complete laboratory analysis reports for each quarter are included in Appendix C.

3.1 FIRST QUARTER RESULTS

The gamma radiation dose time for the first quarter of CY 2019 was approximately 83 days. Sample results ranged from 17–460 mrem. The background samples ranged from 19–25 mrem. The mean background dose was 22 mrem.

The field blank measured a dose of 15 mrem and the trip blank a dose of 14 mrem. These readings were indistinguishable from background, likely due to storage inside lead shielding where they were kept. Table 1 identifies locations with quarterly gamma doses above the quarterly mean background dose.

Table 1. Locations with Quarterly Gamma Doses above Background for the 1st Quarter

Location	Effective Dose
TLD-1	170
TLD-2	235
TLD-5	26
TLD-7	32
TLD-13	23
TLD-14	23
TLD-16	26
TLD-25	24
TLD-30	25
TLD-35	28
TLD-38	24
TLD-40	28
TLD-50	42
TLD-53	110
TLD-60	292
TLD-61	460
TLD-67	25
TLD-70	47
TLD-71	46
TLD-72	23
TLD-73	23
TLD-75	24
TLD-78	24
TLD-81	102
TLD-82	31
TLD-83	51

There were no locations with positive neutron doses for the first quarter.

A majority of the gamma dosimeter locations with statistically significant values are located at or in close proximity to the PGDP security fence that is in adjacent to DOE uranium hexafluoride (UF_6) cylinder storage yards.

3.2 SECOND QUARTER RESULTS

The gamma radiation dose time for the second quarter of CY 2019 was approximately 89 days. Sample results ranged from 14–447 mrem. The background samples ranged from 15–19 mrem. The mean background dose was 16 mrem.

The field blank measured a dose of 11 mrem and the transit blank a dose of 12 mrem. These readings were indistinguishable from background, likely due to storage inside lead shielding where they were kept. Table 2 identifies locations with quarterly gamma doses above the quarterly mean background dose.

Table 2. Locations with Quarterly Gamma Doses above Background for the 2nd Quarter

Location	Effective Dose
TLD-1	203
TLD-2	276
TLD-5	20
TLD-7	28
TLD-13	20
TLD-16	20
TLD-25	27
TLD-35	25
TLD-37	17
TLD-38	18
TLD-40	22
TLD-50	32
TLD-53	101
TLD-60	300
TLD-61	447
TLD-66	19
TLD-67	18
TLD-68	19
TLD-70	47
TLD-71	42
TLD-74	20
TLD-75	18
TLD-76	17
TLD-77	17
TLD-78	21
TLD-79	17
TLD-81	96
TLD-82	26
TLD-83	61

There were no locations with positive neutron doses for the second quarter.

A majority of the gamma dosimeter locations with statistically significant values are located at or in close proximity to the PGDP security fence that is adjacent to DOE UF_6 cylinder storage yards.

3.3 THIRD QUARTER RESULTS

The gamma radiation dose time for the third quarter of CY 2019 was approximately 92 days. Sample results ranged from 14–467 mrem. The background samples ranged from 17–22 mrem. The mean background dose was 19 mrem.

The field blank measured a dose of 12 mrem and the transit blank a dose of 13 mrem. These readings were indistinguishable from background, likely due to storage inside lead shielding where they were kept. Table 3 identifies locations with quarterly gamma doses above the quarterly mean background dose.

Table 3. Locations with Quarterly Gamma Doses above Background for the 3rd Quarter

Location	Effective Dose
TLD-1	172
TLD-2	247
TLD-7	27
TLD-13	20
TLD-16	21
TLD-25	26
TLD-30	20
TLD-35	27
TLD-40	25
TLD-50	41
TLD-53	86
TLD-60	292
TLD-61	467
TLD-67	20
TLD-68	20
TLD-70	45
TLD-71	38
TLD-74	21
TLD-75	22
TLD-78	23
TLD-81	81
TLD-82	27
TLD-83	60

There were no locations with positive neutron doses for the third quarter.

A majority of the gamma dosimeter locations with statistically significant values are located at or in close proximity to the PGDP security fence that is adjacent to DOE UF_6 cylinder storage yards.

3.4 FOURTH QUARTER RESULTS

The gamma radiation dose time for the fourth quarter of CY 2019 was approximately 99 days. Sample results ranged from 17–563 mrem. The background samples ranged from 20–24 mrem. The mean background dose was 22 mrem.

The field blank measured a dose of 13 mrem, and the transit blank a dose of 12 mrem. These readings were indistinguishable from background, likely due to storage inside lead shielding where they were kept. Table 4 identifies locations with quarterly gamma doses above the quarterly mean background dose.

Table 4. Locations with Quarterly Gamma Doses above Background for the 4th Quarter

Location	Effective Dose
TLD-1	234
TLD-2	279
TLD-5	24
TLD-7	30
TLD-13	26
TLD-16	26
TLD-25	35
TLD-30	24
TLD-35	28
TLD-38	23
TLD-40	28
TLD-50	51
TLD-53	116
TLD-60	380
TLD-61	563
TLD-67	25
TLD-70	50
TLD-71	40
TLD-72	23
TLD-74	26
TLD-78	26
TLD-81	107
TLD-82	27
TLD-83	68

There were no locations with positive neutron doses for the fourth quarter.

A majority of the gamma locations with statistically significant values are located at or in close proximity to the PGDP security fence that is adjacent to DOE UF_6 cylinder storage yards.

3.5 ANNUALIZED RESULTS

There were no positive neutron results for any monitoring period during CY 2019, thus analysis of the annual neutron dose was not required.

Annual gamma dose rates for CY 2019 for the locations were calculated. Dose results for all four quarters were summed for each location and adjusted (annualized) to account for the number of days in the field, varying from 365 (see Appendix D). The adjustment was calculated by adding the four quarters' results and multiplying the sum by 365, divided by the actual total days TLDs were in the field. The mean annual background E was determined to be 80.08 mrem. The mean background was subtracted from the annualized E to obtain a net annual E, attributed to PGDP operations for CY 2019, for each location.

To determine those data points that were statistically above background, the standard deviation of the background measurements was calculated using a normal distribution, yielding a result of 3.79 mrem. Results greater than three standard deviations from the mean background measurement (i.e., 91 mrem) are considered to be above background with 99.7% confidence. Due to the significance of these measurements, a high level of confidence historically has been applied to these statistical calculations in order to ensure doses to the public from plant-related activities are reported accurately and to reduce the potential for reporting of "false positives." Locations with E in excess of the mean background at 99.7% confidence were TLD-1, TLD-2, TLD-7, TLD-16, TLD-25, TLD-35, TLD-40 TLD-50, TLD-53, TLD-60, TLD-61, TLD-70, TLD-71, TLD-78, TLD-81, TLD-82, and TLD-83. These locations are in proximity to DOE UF_6 cylinder storage yards with the exception of TLD-16 and TLD-78.

Table 5 presents the gamma dosimeter locations where the annualized total dose (mrem) was found to exceed the background with 99.7% confidence. Annual total dose is based on 24 hours per day/365 days per year.

Table 5. Gamma TLD Locations with Results above Background

Location	Annualized Effective Dose (mrem)	Mean Background Plus Three Standard Deviations (mrem)	Average Background (mrem)	Net Annual Dose (mrem)
TLD-1	783	91	80	703
TLD-2	1,043	91	80	963
TLD-7	118	91	80	38
TLD-16*	94	91	80	14
TLD-25	113	91	80	33
TLD-35	109	91	80	29
TLD-40	104	91	80	24
TLD-50	167	91	80	87
TLD-53	415	91	80	335
TLD-60	1,271	91	80	1,191
TLD-61	1,948	91	80	1,868
TLD-70	190	91	80	110
TLD-71	167	91	80	87
TLD-78	95	91	80	15
TLD-81	388	91	80	308
TLD-82	112	91	80	32
TLD-83	241	91	80	161

NOTE: For purposes of this report, all dose measurements at these locations are assumed to result from DOE operations.
*TLD at this location is at the West Kentucky Wildlife Management Area (WKWMA) Clubhouse. TLDs between this location and the site (TLD-80 and TLD 5) did not have a dose that exceeded background. The cause of this elevated dose is unknown, but it is conservatively assumed to result from DOE operations.

3.6 ANNUALIZED RESULTS FOR 2018 COMPARED TO 2019

As in CY 2019, CY 2018 had no positive neutron results during any monitoring quarter.

Table 6 presents the results of a comparison between the annualized total gamma dose results for CY 2018 and for CY 2019. No new locations were added or discontinued in 2019. The locations with E in excess of background were consistent between 2018 and 2019. No areas previously identified with elevated dose rates in 2018 had decreased dose rates below background at a statistically significant level (greater than 3 standard deviations above the mean background and greater than 5% lower than the previous year) in 2019. Seven areas with dose rates below background in 2018 had elevated dose rates at a statistically significant level (greater than 3 standard deviations above the mean background and greater than 5% higher than the previous year) in 2019. Thirty-three locations remained statistically consistent (± 5%) between 2018 and 2019. Radiation dose rates are subject to change as a result of DUF_6 plant operations such as UF_6 relocation that may explain the dose increases and decreases discussed above.

Table 6. Effective Annual Gamma Dose of Common Monitoring Locations for CY 2018 and CY 2019

Common Location	2018 Annualized Effective Dose (mrem)	2019 Annualized Effective Dose (mrem)	Increase or Decrease from 2018 to 2019	% Change
TLD-1	**813**	**783**	**-30**	**-3.69**
TLD-2	**994**	**1,043**	**49**	**4.93**
TLD-3	87	76	-11	-12.6
TLD-4	81	74	-7	-8.64
TLD-5	87	89	2	2.30
TLD-6	73	71	-2	-2.74
TLD-7	**109**	**118**	**9**	**8.26**
TLD-9	73	72	-1	-1.37
TLD-12	78	74	-4	-5.13
TLD-13	85	89	4	4.71
TLD-14	74	74	0	0.00
TLD-15	66	64	-2	-3.03
TLD-16	**95**	**94**	**-1**	**-1.05**
TLD-19	74	74	0	0.00
TLD-25	**118**	**113**	**-5**	**-4.24**
TLD-30	81	85	4	4.94
TLD-35	**108**	**109**	**1**	**0.93**
TLD-37	83	77	-6	-7.23
TLD-38	88	83	-5	-5.68
TLD-40	**101**	**104**	**3**	**2.97**
TLD-46	70	75	5	7.14
TLD-50	**173**	**167**	**-6**	**-3.47**
TLD-52	73	71	-2	-2.74
TLD-53	**394**	**415**	**21**	**5.33**
TLD-58	66	64	-2	-3.03
TLD-59	66	69	3	4.55
TLD-60	**1,180**	**1,271**	**91**	**7.71**
TLD-61	**2,375**	**1,948**	**-427**	**-17.98**
TLD-62	66	72	6	9.09

Table 6. Total Annual Gamma Dose of Common Monitoring Locations for CY 2018 and CY 2019 (Continued)

Common Location	2018 Annualized Effective Dose (mrem)	2019 Annualized Effective Dose (mrem)	Increase or Decrease from 2018 to 2019	% Change
TLD-63	65	66	1	1.54
TLD-64	66	69	3	4.55
TLD-65	65	72	7	10.77
TLD-66	81	79	-2	-2.47
TLD-67	89	88	-1	-1.12
TLD-68	80	80	0	0.00
TLD-69	66	69	3	4.55
TLD-70	**187**	**190**	**3**	**1.60**
TLD-71	**138**	**167**	**29**	**21.01**
TLD-72	81	80	-1	-1.23
TLD-73	73	75	2	2.74
TLD-74	92	89	-3	-3.26
TLD-75	86	86	0	0.00
TLD-76	83	75	-8	-9.64
TLD-77	77	75	-2	-2.60
TLD-78	**94**	**95**	**1**	**1.06**
TLD-79	80	75	-5	-6.25
TLD-80	82	79	-3	-3.66
TLD-81	**359**	**388**	**29**	**8.08**
TLD-82	**110**	**112**	**2**	**1.82**
TLD-83	**201**	**241**	**40**	**19.9**
TLD-84	74	70	-4	-5.41

NOTE: The locations that are **bolded** are where the annualized total mrem was above the maximum background with 99% confidence. Highlighted cells are those dosimeter locations closest to the perimeter of the DUF_6 facility or operations.

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4. ANALYSIS

E is a calculated quantity, expressed in rem, developed by the International Commission on Radiation Protection for purposes of radiation protection. The E is assumed to be related to the risk of a radiation-induced cancer or a severe hereditary effect. It takes into account (1) the absorbed doses that will be delivered to the separate organs or tissues of the body during the lifetime of an individual due to intakes of radioactive materials; (2) the absorbed doses due to irradiation by external sources; (3) the relative effectiveness of different radiation types in inducing cancers or severe hereditary effects; (4) the susceptibility of individual organs to develop a radiation-related cancer or severe hereditary effect; (5) considerations of the relative importance of fatal and non-fatal effects; and (6) the average years of life lost from a fatal health effect. Thus, the E is a quantity calculated by multiplying the equivalent dose received by every significantly irradiated tissue in the body by a respective tissue weighting factor (this factor reflects the risk of radiation-induced cancer to that tissue) and summing together the individual tissue results to obtain the E. Such a dose, in theory, carries with it the same risk of cancer as would an equal equivalent dose delivered uniformly to the whole body (Health Physics Society, PS-005, 2009). The TLDs used are designed to measure the dose due to external gamma radiation. The OSLs used are designed to measure the dose due to external neutron radiation. The vendors use industry standard conversions to calculate the E received from the external exposure. As such, the results from the analysis of the TLDs are presented in units of E (mrem). DOE's limiting values for members of the public are in units of TED (DOE Order 458.1).

Table 7 provides calculated values of E rate in mrem/hour for those locations with results statistically above background based on the net annual gamma doses determined and reported in Table 5 divided by the number of hours per year (or 8,760 hours). Additionally, Table 7 provides the average net dose rate determined from this data.

Table 7. Net Annual Gamma Effective Doses

Location	Net Annual Effective Dose (mrem)	Net Dose Rate (mrem/hour)
TLD-1	703	0.080
TLD-2	963	0.110
TLD-7	38	0.004
TLD-16	14	0.002
TLD-25	33	0.004
TLD-35	29	0.003
TLD-40	24	0.003
TLD-50	87	0.010
TLD-53	335	0.038
TLD-60	1,191	0.136
TLD-61	1,868	0.213
TLD-70	110	0.013
TLD-71	87	0.010
TLD-78	15	0.002
TLD-81	308	0.035
TLD-82	32	0.004
TLD-83	161	0.018
		Avg. = 0.040

Table 8 provides calculated values of equivalent dose in mrem/hour for annual neutron doses as determined by neutron monitoring locations and data reported in Appendix E and Appendix F.

Table 8. Neutron Effective Doses

Location	Annual Neutron Effective Dose (mrem)	Neutron Dose Rate (mrem/hour)
TLD-2	0	0.000
TLD-3	0	0.000
TLD-50	0	0.000
TLD-65	0	0.000
TLD-68	0	0.000
TLD-81	0	0.000
TLD-83	0	0.000
		Avg. = 0.000

Historic surveys of the plant perimeter fence indicate that the TLDs are located in the areas where the maximum doses are likely to occur. Since the fall of 2001, security controls have been in place to restrict public access to the DOE Reservation. Provisions remain in place to prohibit regular public access to areas adjacent to the limited area security fence with a Property Protection Area boundary fence added in CY 2019. As such, the locations listed in Table 7 and Table 8 were not accessible regularly to the public in CY 2019 with exception of TLD-16, TLD-40, and TLD-78. The external radiation exposures at the locations not listed in Table 7, although accessible to the public, were not above background with 99.7% confidence. Calculation of a maximum reasonable dose, assuming that a member of the public spends 80 hours at the location of highest measured dose along the property protection area security fence at TLD-40, determined that a dose of 0.24 mrem (0.003 mrem/hour (from Table 7) × 80 hours) would be received. The 80-hour time frame is the same amount of time used in previous annual external exposure reports at PGDP in determining this dose value and is conservative compared to using a recommended 1/40 occupancy factor for Transient (outside areas used only for pedestrian or vehicular) Occupancy (ANSI/HPS N43.3, 2008). Both TLD-16 and TLD-78 locations had lower external doses than TLD-40, and had TLD locations between them and security fence, with external radiation exposures not statically different than background. The DOE contribution of E from plant-derived gamma and neutron radiation that a member of the public received visiting or passing through accessible portions of the DOE Reservation (outside the PGDP security fence) was calculated by taking the average of the net gamma exposure rates in Table 7 plus average neutron exposure in Table 8 multiplied by an occupancy factor of 80 hours per year for an outdoor site visitor. An outdoor site visitor would receive 3 mrem (0.040 mrem/hour × 80 hours) a year as worst case, which is well below the 100 mrem limit for CY 2019.

Historically, the two locations with the highest measured exposures (TLD-1 and TLD-2) are approximately 1,800 and 600 ft, respectively, from the nearest locations off the DOE property boundary. TLD-1 and TLD-2 both are in close proximity to the PGDP security perimeter fence in the vicinity of UF_6 cylinder storage yards. The nearest off-reservation measurement locations are found within land owned by the Commonwealth of Kentucky and are designated as part of the WKWMA. No residences or businesses are located in the WKWMA. The nearest private residences to TLD-1 and TLD-2 are approximately 6,500 and 5,500 ft away, respectively.

In CY 2009, security restrictions were eased to allow regular public access to Harmony Cemetery located at TLD-14. The annual dose to a member of public visiting the cemetery at TLD-14 statistically was equivalent to the average background in CY 2019. While this location is located physically closer to the plant than the residences described above, the time spent annually at the cemetery is much less than is postulated for a resident; therefore, for purposes of calculation, the maximally exposed member of the

general public continues to reside at these residences. The measurement locations that are closer to TLD-1 and TLD-2 than the nearest residents did not yield external radiation exposures that statistically were different from background. As the dose is inversely proportional to the distance from the source, the E to the maximally exposed individual at the two public residences nearest TLD-1 and TLD-2 also is not different from background.

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5. CONCLUSIONS

The public does not have regular access to the PGDP Limited Area boundary fence; therefore, the radiation doses measured at the Limited Area boundary fence are not applicable to members of the public. Calculation of a worst case dose, assuming that a member of the public spends 80 hours (80-hour time frame is the same amount of time used in previous annual external exposure reports at PGDP) at the location of highest measured dose along the property protective area boundary security fence at TLD-40, determined that a dose of 0.24 mrem would be received. This is 400 times less than the DOE public dose limit of 100 mrem/yr. Due to the PGDP security protocols, no members of the public regularly access areas adjacent to the Limited Area security fence. The external radiation doses measured by TLDs in areas accessible to the public were slightly above background; therefore, the E potentially received by a member of the public passing through accessible portions of the DOE Reservation would receive 3 mrem a year in a worst case scenario. In 2019, TLD-14 and TLD-40 represented the closest locations that would be accessible to the public. TLD-14 is near Harmony Cemetery, located north of the plant security fence and south of Ogden Landing Road. Measurements at this location indicated external radiation doses statistically equivalent to background radiation level. In 2019, TLD-40 located on the DOE Reservation boundary within the DOE leased WKWMA area off of Dyke Road indicated the highest external radiation dose measured to be slightly above background levels. The maximally exposed individual at the private residences also was calculated to be at background levels. Based on the results of the gamma and neutron radiation dose measurements made during CY 2019, the E to the maximally exposed individual member of the public from DOE operations was below the applicable DOE limit of 100 mrem within a year, in accordance with DOE Order 458.1.

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APPENDIX A

MAP OF MONITORING LOCATIONS

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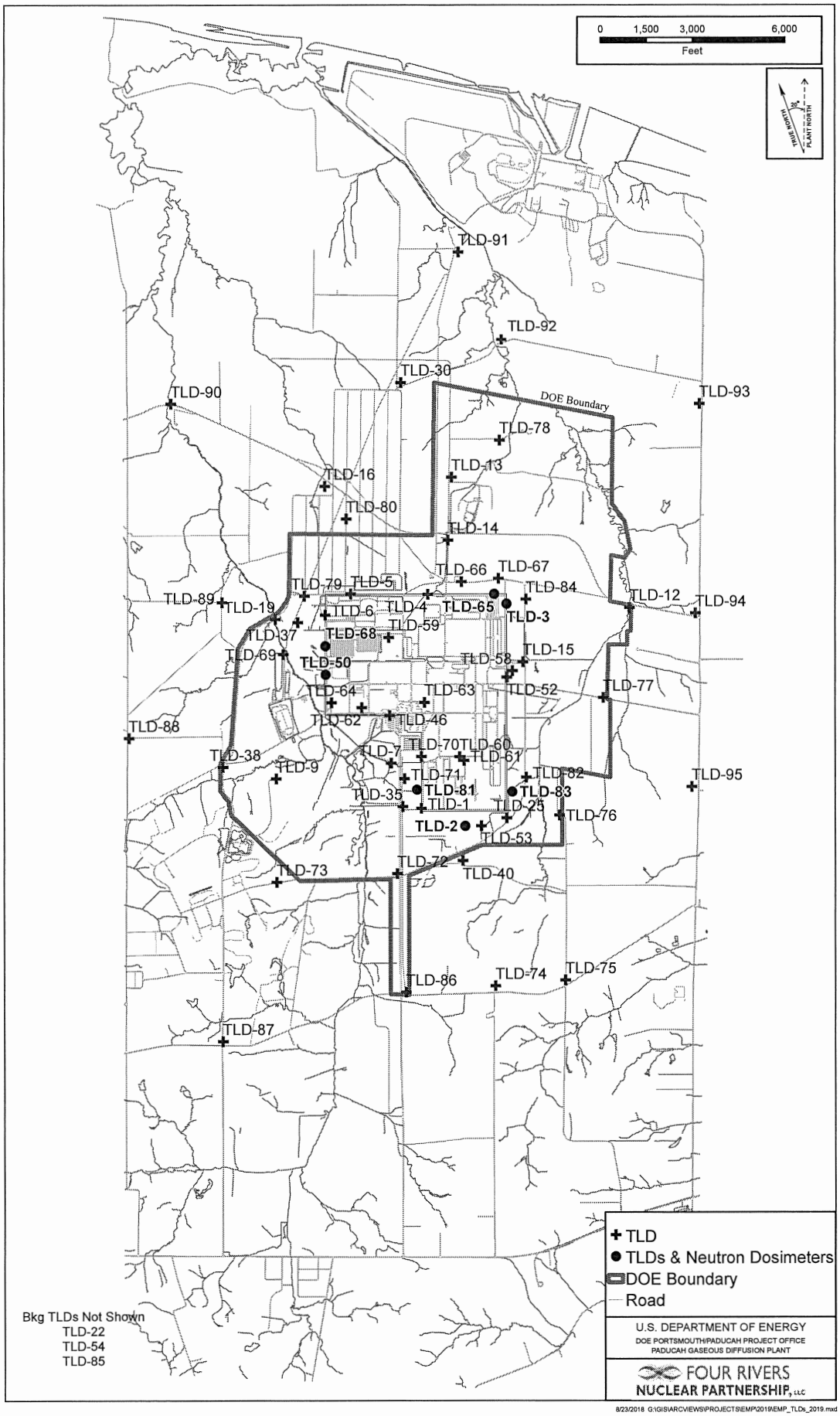

Figure C.17. Environmental Dosimeter Locations

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APPENDIX B

TLD PLACEMENT AND COLLECTION

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1st Quarter CY 2019 TLD Location Information

Date/Time Issued/Badge ID	Issued By	Date/Time Collected	Collected By	Location Name	Description	NorthLong	West or East Lat	Xcoord	Ycoord	Comments
01/10/2019 08:34 6132-625	JW	4/3/2019 10:00	JW	TLD-1	PGDP security fence west of C-745-M near intersection of Patrol Road and Alabama Avenue near pole 21-20. Outside fence behind DuF6 dirt pile	N 37 06 16.66	W 088 48 55.18	-4172	-5856	N/A
01/10/2019 08:20 6136-626 2882	JW	4/3/2019 9:40	JW	TLD-2	PGDP security fence south of C-745-T near pole T20-6J. South Cylinder Yard perimeter fence	N 37 06 02.15	W 088 48 43.07	-2740	-6427	N/A
01/14/2019 10:45 6137-627 2883	JW	4/4/2019 10:45	JW	TLD-3	PGDP security fence east of C-745-H near pole 23-31. Perimeter fence NE corner	N 37 07 04.17	W 088 47 57.21	-1399	739	N/A
01/10/2019 13:57 6138-628	JW	4/3/2019 11:26	JW	TLD-4	North PGDP security fence near North-South Diversion Ditch.	N 37 07 15.74	W 088 48 25.56	-3957	1052	N/A
01/10/2019 14:22 6139-629	JW	4/3/2019 11:17	JW	TLD-5	North PGDP security fence north of C-747-A near pole T53A1P26G. North perimeter fence between lagoon	N 37 07 24.38	W 088 48 54.58	-6464	1068	N/A
01/10/2019 09:16 6140-630	JW	4/3/2019 11:07	JW	TLD-6	West PGDP security fence west of C-746-P1 near pole 22-4. 612 perimeter fence.	N 37 07 20.85	W 088 49 07.22	-7303	382	N/A
01/10/2019 08:51 6141-631	JW	4/3/2019 10:28	JW	TLD-7	PGDP perimeter fence adjacent to Curlee Road near entrance to DOE building (C-103). Perimeter fence across from entrance to DOE bldg.	N 37 06 29.15	W 088 49 02.49	-5153	-4400	N/A
01/10/2019 12:51 6142-632	JW	4/3/2019 15:14	JW	TLD-9	Northeast corner of fence of old KOW water treatment plant, near Monitoring Well 309. Gate to MW305	N 37 06 37.12	W 088 49 48.11	-8901	-4907	N/A
01/10/2019 11:36 6143-633	JW	4/3/2019 14:06	JW	TLD-12	Institutional controls fence near Monitoring Well 191 where Little Bayou Creek crosses Hwy 358. MW191, Little Bayou & Ogden Landing Rd.	N 37 06 49.62	W 088 47 11.44	2588	626	N/A
01/10/2019 11:53 6144-634	JW	4/3/2019 14:10	JW	TLD-13	West fence of C-746-U landfill near entrance gate	N 37 07 48.17	W 088 48 00.61	-3182	4825	N/A

1st Quarter CY 2019 TLD Location Information

Date/Time Issued/Badge ID	Issued By	Date/Time Collected	Collected By	Location Name	Description	NorthLong	West or East Lat	Xcoord	Ycoord	Comments
01/10/2019 11:51 6145-635	JW	4/3/2019 9:01	JW	TLD-14	Institutional controls fence along North-South Diversion Ditch on west side of 14th street extension near Highway 358 (K003). Fence at North South ditch, north of MW353	N 37 07 29.75	W 088 48 10.58	-3302	2798	N/A
01/10/2019 07:52 6146-636	JW	4/3/2019 8:06	JW	TLD-15	Northeast corner of C-755 fence behind C-755-D	N 37 06 45.01	W 088 47 58.91	-864	-1129	N/A
01/10/2019 12:16 6147-637	JW	4/3/2019 14:39	JW	TLD-16	WKWMA Clubhouse on northwest corner porch post. On porch WKWMA Headquarters.	N 37 07 59.44	W 088 48 49.76	-7311	4533	N/A
01/10/2019 12:41 6148-638	JW	4/3/2019 15:05	JW	TLD-19	Passed pond on right "A" sign next to MW 426	N 37 07 24.43	W 088 49 33.11	-9398	2	N/A
01/10/2019 10:39 6149-639	JW	4/3/2019 13:13	JW	TLD-22	Outside of the fence of the locked air sampling station at the rear corner of the Bethel Cumberland Presbyterian Church Cemetery	N 37 00 05.36	W 088 52 36.29	-8159	-46801	N/A
01/10/2019 08:07 6150-640	JW	4/3/2019 9:24	JW	TLD-25	On power line tower nearest Dykes Road southeast of C-745-T	N 37 06 00.02	W 088 48 26.49	-1401	-6172	N/A
01/10/2019 12:13 6151-641	JW	4/3/2019 14:32	JW	TLD-30	Take the road by the PGDP landfills, drive past Monitoring Well 98, turn left at three-way, Monitoring Well 235 intersection at Tract 7 sign. The TLD is hung on the inside of the sign. Boldry School Rd., Tract 7 sign, west of MW381	N 37 08 21.060	W 088 45 09.060	-4836	7876	N/A
01/10/2019 08:49 6152-642	JW	4/3/2019 10:25	JW	TLD-35	Outfall 017 off of Plant Access Road. Outfall 017 DuF6 laydown yard	N 37 06 21.480	W 088 49 03.960	-4773	-5806	N/A
01/10/2019 09:13 6153-643	JW	4/3/2019 11:03	JW	TLD-37	KPDES Outfall 001 behind Vortec facility. K001	N 37 07 18.600	W 088 49 15.660	-8202	138	N/A
01/10/2019 12:49 6154-644	JW	4/3/2019 15:10	JW	TLD-38	Five-Points Creek with concrete bridge, on tree behnd 2A sign.	N 37 06 43.320	W 088 50 09.000	-10630	-4528	N/A

1st Quarter CY 2019 TLD Location Information

Date/Time Issued/Badge ID	Issued By	Date/Time Collected	Collected By	Location Name	Description	NorthLong	West or East Lat	Xcoord	Ycoord	Comments
01/10/2019 08:11 6155-645	JW	4/3/2019 9:27	JW	TLD-40	Turn north on Kelly Road off Woodville Road, go about 1/2 mile on Kelly road and turn left, go about 1/2 miles, TLD placed in trees on left. Orange sign on blocked road, east of 57 off Dykes Rd.	N 37 05 52.200	W 088 48 52.20	-2818	-7551	N/A
01/10/2019 08:55 6156-646	JW	4/3/2019 10:31	JW	TLD-46	Truck entrance at receiving C-720	N 37 06 44.700	W 088 49 00.120	-5198	-2865	NA
01/10/2019 09:05 6157-647 2884	JW	4/3/2019 10:56	JW	TLD-50	West Patrol Road fence across from C-745-A	N 37 07 02.88	W 088 49.15.18	-7287	-1547	N/A
01/10/2019 07:54 6158-648	JW	4/3/2019 8:11	JW	TLD-52	East Patrol Road fence across from C-745-E.	N 37 06 42.18	W 088 48.07.20	-1397	-1628	N/A
01/10/2019 08:18 6159-649	JW	4/3/2019 9:45	JW	TLD-53	Security fence at southeast corner of C-745-T Yard. Down fence line away from TLD-2.	N 37 06 00.42	W 088 48.37.02	-2220	-6423	N/A
01/10/2019 10:00 6160-650	KA	4/3/2019 12:49	KA	TLD-54	Residence; Jalusian Trail	N 57 87 72.16	E 23 93 13.48	45296	-25254	N/A
01/10/2019 07:50 6161-651	JW	4/3/2019 7:57	JW	TLD-58	West Central C-755 Complex	N 59 07 98.00	E 22 88 70.74	-1209	-1422	N/A
01/09/2019 14:40 6162-652	JW	4/4/2019 10:16	JW	TLD-59	C-752A Break Area	N 59 15 61.62	E 22 78 55.79	-5234	-339	N/A
01/09/2019 14:30 6163-653	JW	4/3/2019 13:55	JW	TLD-60	C-333A Light Pole on Fence Pole #16	N 59 02 07.10	E 22 80 71.62	-2919	-4199	N/A
01/09/2019 14:33 6164-654	JW	4/3/2019 14:05	JW	TLD-61	West of C-746Q Light Pole #14	N 59 01 58.14	E 22 80 98.35	-2778	-4315	N/A
01/09/2019 13:05 6165-655	JW	4/3/2019 14:00	JW	TLD-62	C-743 Trailer Complex Light Pole #336,behind Trailer #3.	N 59 10 20.18	E 22 73 49.81	-6111	-2607	N/A
01/09/2019 14:47 6166-656	JW	4/4/2019 10:08	JW	TLD-63	C-412 HP Break Trailer	N 59 08 36.46	E 22 79 46.95	-4069	-2435	N/A
01/10/2019 09:30 6167-657	JW	4/3/2018 11:38	JW	TLD-64	C-764 T-6 Trailer	N 59 11 77.55	E 22 70 88.88	-7098	-2447	N/A
01/10/2019 13:44 6168-658 2885	JW	4/3/2019 9:16	JW	TLD-65	Located O/S of North Security fence North of C-745H Cylinder Yard; South of C-762 Laydown Yard	N 37 07 08.54386	W 088 48 00.45376	-1795	1062	N/A
01/10/2019 11:49 6169-659	JW	4/3/2019 8:59	JW	TLD-66	Located on tree @Southeast corner of New Harmony Cemetery; adjacent to last concrete barrier & large metal post	N 37 07 15.80859	W 088 48 11.08836	-2856	1457	N/A

1st Quarter CY 2019 TLD Location Information

Date/Time Issued/Badge ID	Issued By	Date/Time Collected	Collected By	Location Name	Description	NorthLong	West or East Lat	Xcoord	Ycoord	Comments
01/10/2019 11:46 6170-660	JW	4/3/2019 8:57	JW	TLD-67	Located on "No Trespassing" sign North side of Dykes Rd next to Security Fence North of C-762 Laydown yard	N 37 07 12.70502	W 088 47 56.75697	-1658	1560	N/A
01/10/2019 09:07 6171-661 2886	JW	4/3/2019 11:01	JW	TLD-68	West Security Fence West of C-745B Cylinder Yard & Southeast of Vortec Site	N 37 07 11.60797	W 088 49 11.43416	-7302	-617	N/A
01/10/2019 09:00 6172-662	JW	4/3/2019 10:49	JW	TLD-69	Wooden utility pole (T12-15 H) next to gravel road @Northeast corner of pond North of C-611	N 37 07 13.70394	W 088 49 28.37928	-8664	-888	N/A
01/10/2019 08:46 6173-663	JW	4/3/2019 10:18	JW	TLD-70	O/S of West Security Fence Southeast of C-333 midway between C810 parking area & North DuF6 Security Fence	N 37 06 27.82855	W 088 48 50.25203	-4173	-4189	N/A
01/10/2019 8:43 6174-664	JW	4/3/2019 10:10	JW	TLD-71	O/S of West Security Fence of DuF6 under security light, Northeast of wooden utility pole (11056 KU 78487)	N 37 06 23.05971	W 088 48 59.65074	-4723	-4903	N/A
01/10/2019 09:39 6175-665	JW	4/3/2019 9:55	JW	TLD-72	North Side of Air Monitoring Station AMD57, Northwest of Post 57	N 37 05 55.32798	W 088 49 15.28582	-4952	-7972	N/A
01/10/2019 12:56 6176-666	JW	4/3/2019 15:20	JW	TLD-73	Eastern "Railroad Crossing" sign @train tracks on Acid Road	N 37 06 06.14205	W 088 50 02.01070	-8883	-8241	N/A
01/10/2019 1104 6177-667	JW	4/3/2019 13:30	JW	TLD-74	Located on "Warning Siren" sign @turnoff North of Magruder & Woodville intersection	N 37 05 10.96196	W 088 48 53.61411	-1765	-11586	N/A
01/10/2019 11:09 6178-668	JW	4/3/2019 13:36	JW	TLD-75	Located on "Warning Siren" sign @North of Kelley Rd & Woodville Rd intersection	N 37 05 04.94525	W 088 48 26.65157	496	-11409	N/A
01/10/2019 11:14 6179-669	JW	4/3/2019 13:40	JW	TLD-76	Located on "Tract A" sign below power lines southside of Kelley Rd in sharp curve between Woodville & McCaw Rds	N 37 05 55.05466	W 088 48 06.27328	310	-6082	N/A
01/10/2019 11:19 6180-670	JW	4/3/2019 13:45	JW	TLD-77	Located on "Warning Siren" sign North side of McCaw Rd east of Kelley Rd intersection	N 37 06 25.46598	W 088 47 33.66599	1737	-2287	N/A
01/10/2019 11:57 6181-671	JW	4/3/2019 14:15	JW	TLD-78	Northeast Corner of C-746U Landfill Security Fence	N 37 07 54.00752	W 088 47 37.45924	-1622	6020	N/A

1st Quarter CY 2019 TLD Location Information

Date/Time Issued/Badge ID	Issued By	Date/Time Collected	Collected By	Location Name	Description	NorthLong	West or East Lat	Xcoord	Ycoord	Comments
01/10/2019 09:22 6182-672	JW	4/3/2019 11:11	JW	TLD-79	Located on left post of the "Wildlife Management" gate on New Waterline Rd Southwest of Plant gate 41A west of C-612	N 37 07 28.86304	W 88 49 12.50003	-7981	993	N/A
01/10/2019 12:22 6183-673	JW	4/3/2019 14:38	JW	TLD-80	Located on "Cattle" gate west of MW 453 & MW 454 on gravel rd east of New Waterline Rd	N 37 07 47.29850	W 088 48 46.10944	-6612	3477	N/A
01/10/2019 08:35 6185-675 2887	JW	4/3/2019 10:06	JW	TLD-81	Southeast corner of DuF6 security fence next to gate V1 East of New Waterline East of C1100	N 37 06 18.33947	W 088 48 56.42591	-4314	-5262	N/A
01/10/2019 07:58 6186-676	JW	4/3/2019 8:19	JW	TLD-82	Short pole East of Dykes Rd North of Outfall 13	N 37 06 10.13175	W 088 48 13.53048	-765	-4851	N/A
01/10/2019 08:01 6187-677 2888	JW	4/3/2019 8:36	JW	TLD-83	Large metal power pole West of Dykes Rd South of Outfall 13	N 37 06 07.30640	W 088 48 20.71726	-1214	-5319	N/A
01/10/2019 14:05 6188-678	JW	4/3/2019 8:54	JW	TLD-84	Located @MW496 on the East Side of Dykes Rd	N 37 07 03.50589	W 088 47 49.26485	-769	894	N/A
01/09/2019 17:00 6189-679	SO	4/3/2019 10:35	SO	TLD-85	Residence; corner of Springwell and Buckner Lane	N 37 03 27.9036	W 088 40 43.9638	39082	-7750	N/A
01/10/2019 10:59 6190-680	JW	4/3/2019 13:26	JW	TLD-86	Plant Entrance, Gravel Construction Rd. Right side on orange warning signal sign	N 37° 5' 18.8622"	W 088 49 28.2282	-4676	-11794	N/A
01/10/2019 13:01 6191-681	JW	4/3/2019 14:25	JW	TLD-87	KOW Entrance north of Woodville Rd north of Kevil Eagles. Right side on orange warning signal sign	N 37 05 24.2802	W 088 50 43.9548	-10629	-13381	N/A
01/10/2019 12:35 6192-682	JW	4/3/2019 14:59	JW	TLD-88	Bethel Church Road KOW entrance. North of Massay Rd, right side on yellow post	N 37 07 05.4876	W 088 50 37.9608	-13677	-3597	N/A
01/10/2019 12:32 6193-683	JW	4/3/2019 14:50	JW	TLD-89	Bobo Rd, off of Bethel Church Rd. Continue east 200 yds past end of asphalt. At intersection on orange warning signal sign	N 37 07 35.9976	W 088 49 44.3922	-10657	788	N/A
01/10/2019 12:20 6194-684	JW	4/3/2019 14:46	JW	TLD-90	Bridge on Ogden Landing Rd east of Lamb's garage. On NE corner of bridge on contaminated creek sign	N 37 08 54.6714	W 088 47 27.2472	-12310	7182	N/A

1st Quarter CY 2019 TLD Location Information

Date/Time Issued/Badge ID	Issued By	Date/Time Collected	Collected By	Location Name	Description	NorthLong	West or East Lat	Xcoord	Ycoord	Comments
01/10/2019 12:09 6195-685	JW	4/3/2019 14:26	JW	TLD-91	Boldry School Rd on KOW at Shawnee plant entrance. On cattle gate road on hill, right side	N 37 08 40.9884	W 088 49 36.5232	-2952	12069	N/A
01/10/2019 12:01 6196-686	JW	4/3/2019 14:20	JW	TLD-92	First left road past C-746-U Landfill,cross Iron Bridge, on ICM-01 Notice Sign across from MW 133	N 37 08 23.18	W 088 47 25.41	9125	-1717	N/A
01/10/2019 11:29 6197-687	JW	4/3/2019 13:58	JW	TLD-93	MW 100, North on Metropolis Lake Rd past railroad tracks on left side on Well bollard	N 37 08 09.0744	W 088 46 50.9304	4874	7186	N/A
01/10/2019 11:33 6198-688	JW	4/3/2019 14:04	JW	TLD-94	Residence; corner of Ogden Landing Rd & Metropolis Lake Rd	N 37 05 48.9294	W 088 47 12.4332	4740	436	N/A
01/10/2019 11:22 6199-689	JW	4/3/2019 13:50	JW	TLD-95	West McCracken Health Clinic, Metropolis Lake Rd. On Light Pole in SW corner of parking lot	N 37 06 40.5468	W 088 46 47.2872	4617	-5167	N/A
01/10/2019 16:00 6200-690	JW	4/4/2019 10:20	JW	TLD-FB	Taken along while placing and collecting all other samples - stored in "lead box" at C-101 Dosimetry office	N/A	N/A	NA	NA	N/A
01/09/2018 07:00 6201-691	JW	4/3/2019 7:00	JW	TLD-TB	Stored in "lead box" at C-101 Dosimetry office	N/A	N/A	NA	NA	N/A
6202-692	JW	N/A	N/A	SPARE	Lead Box in C-101 Dosimetry office	N/A	N/A	N/A	N/A	N/A
6203-693	JW	N/A	N/A	SPARE	Lead Box in C-101 Dosimetry office	N/A	N/A	N/A	N/A	N/A
6204-694	JW	N/A	N/A	SPARE	Lead Box in C-101 Dosimetry office	N/A	N/A	N/A	N/A	N/A
6205-695	JW	N/A	N/A	SPARE	Lead Box in C-101 Dosimetry office	N/A	N/A	N/A	N/A	N/A
6206-696	JW	N/A	N/A	SPARE	Lead Box in C-101 Dosimetry office	N/A	N/A	N/A	N/A	N/A
6133-621	JW	N/A	N/A	SPARE	Lead Box in C-101 Dosimetry office	N/A	N/A	N/A	N/A	N/A
6134-622	JW	N/A	N/A	SPARE	Lead Box in C-101 Dosimetry office	N/A	N/A	N/A	N/A	N/A
6135-623	JW	N/A	N/A	SPARE	Lead Box in C-101 Dosimetry office	N/A	N/A	N/A	N/A	N/A
6131-624	JW	N/A	N/A	SPARE	Lead Box in C-101 Dosimetry office	N/A	N/A	N/A	N/A	N/A

2nd Quarter CY 2019 TLD Location Information

Date/Time Issued/Badge ID	Issued By	Date/Time Collected	Collected By	Location Name	Description	NorthLong	West or East Lat	Xcoord	Ycoord	Comments
04/03/2019 10:00 7994-625	JW	7/1/2019 9:18	JW	TLD-1	PGDP security fence west of C-745-M near intersection of Patrol Road and Alabama Avenue near pole 21-20. Outside fence behind DuF6 dirt pile	N 37 06 16.66	W 088 48 55.18	-4172	-5856	N/A
04/03/2019 09:40 7998-626 2882	JW	7/1/2019 8:56	JW	TLD-2	PGDP security fence south of C-745-T near pole T20-6J. South Cylinder Yard perimeter fence	N 37 06 02.15	W 088 48 43.07	-2740	-6427	N/A
04/04/2019 10:45 7999-627 2883	JW	7/1/2019 8:12	JW	TLD-3	PGDP security fence east of C-745-H near pole 23-31. Perimeter fence NE corner	N 37 07 04.17	W 088 47 57.21	-1399	739	N/A
04/03/2019 11:26 8000-628	JW	7/1/2019 12:01	JW	TLD-4	North PGDP security fence near North-South Diversion Ditch.	N 37 07 15.74	W 088 48 25.56	-3957	1052	N/A
04/03/2019 11:17 8001-629	JW	7/1/2019 11:49	JW	TLD-5	North PGDP security fence north of C-747-A near pole T53A1P26G. North perimeter fence between lagoon	N 37 07 24.38	W 088 48 54.58	-6464	1068	N/A
04/03/2019 11:07 8002-630	JW	7/1/2019 11:35	JW	TLD-6	West PGDP security fence west of C-746-P1 near pole 22-4. 612 perimeter fence.	N 37 07 20.85	W 088 49 07.22	-7303	382	N/A
04/03/2019 10:28 8003-631	JW	7/1/2019 9:40	JW	TLD-7	PGDP perimeter fence adjacent to Curlee Road near entrance to DOE building (C-103). Perimeter fence across from entrance to DOE bldg.	N 37 06 29.15	W 088 49 02.49	-5153	-4400	N/A
04/03/2019 15:14 8004-632	JW	7/1/2019 15:25	JW	TLD-9	Northeast corner of fence of old KOW water treatment plant, near Monitoring Well 309. Gate to MW305	N 37 06 37.12	W 088 49 48.11	-8901	-4907	N/A
04/03/2019 14:06 8005-633	JW	7/1/2019 14:13	JW	TLD-12	Institutional controls fence near Monitoring Well 191 where Little Bayou Creek crosses Hwy 358. MW191, Little Bayou & Ogden Landing Rd.	N 37 06 49.62	W 088 47 11.44	2588	626	N/A
04/03/2019 14:10 8006-634	JW	7/1/2019 14:19	JW	TLD-13	West fence of C-746-U landfill near entrance gate	N 37 07 48.17	W 088 48 00.61	-3182	4825	N/A

2nd Quarter CY 2019 TLD Location Information

Date/Time Issued/Badge ID	Issued By	Date/Time Collected	Collected By	Location Name	Description	NorthLong	West or East Lat	Xcoord	Ycoord	Comments
04/03/2019 09:01 8007-635	JW	7/1/2019 8:05	JW	TLD-14	Institutional controls fence along North-South Diversion Ditch on west side of 14th street extension near Highway 358 (K003). Fence at North South ditch, north of MW353	N 37 07 29.75	W 088 48 10.58	-3302	2798	N/A
04/03/2019 08:06 8008-636	JW	7/1/2019 7:49	JW	TLD-15	Northeast corner of C-755 fence behind C-755-D	N 37 06 45.01	W 088 47 58.91	-864	-1129	N/A
04/03/2019 14:39 8009-637	JW	7/1/2019 14:52	JW	TLD-16	WKWMA Clubhouse on northwest corner porch post. On porch WKWMA Headquarters.	N 37 07 59.44	W 088 48 49.76	-7311	4533	N/A
04/03/2019 15:05 8010-638	JW	7/1/2019 15:16	JW	TLD-19	Passed pond on right "A" sign next to MW 426	N 37 07 24.43	W 088 49 33.11	-9398	2	N/A
04/03/2019 13:13 8011-639	JW	7/1/2019 10:51	JW	TLD-22	Outside of the fence of the locked air sampling station at the rear corner of the Bethel Cumberland Presbyterian Church Cemetery	N 37 00 05.36	W 088 52 36.29	-8159	-46801	N/A
04/03/2019 09:24 8012-640	JW	7/1/2019 8:46	JW	TLD-25	On power line tower nearest Dykes Road southeast of C-745-T	N 37 06 00.02	W 088 48 26.49	-1401	-6172	N/A
04/03/2019 14:32 8013-641	JW	7/1/2019 14:42	JW	TLD-30	Take the road by the PGDP landfills, drive past Monitoring Well 98, turn left at three-way, Monitoring Well 235 intersection at Tract 7 sign. The TLD is hung on the inside of the sign. Boldry School Rd., Tract 7 sign, west of MW381	N 37 08 21.060	W 088 45 09.060	-4836	7876	N/A
04/03/2019 10:25 8014-642	JW	7/1/2019 9:34	JW	TLD-35	Outfall 017 off of Plant Access Road. Outfall 017 DuF6 laydown yard	N 37 06 21.480	W 088 49 03.960	-4773	-5806	N/A
04/03/2019 11:03 8015-643	JW	7/1/2019 11:27	JW	TLD-37	KPDES Outfall 001 behind Vortec facility. K001	N 37 07 18.600	W 088 49 15.660	-8202	138	N/A
04/03/2019 15:10 8016-644	JW	7/1/2019 15:22	JW	TLD-38	Five-Points Creek with concrete bridge, on tree behnd 2A sign.	N 37 06 43.320	W 088 50 09.000	-10630	-4528	N/A

2nd Quarter CY 2019 TLD Location Information

Date/Time Issued/Badge ID	Issued By	Date/Time Collected	Collected By	Location Name	Description	NorthLong	West or East Lat	Xcoord	Ycoord	Comments
04/03/2019 09:27 8017-645	JW	7/1/2019 8:50	JW	TLD-40	Turn north on Kelly Road off Woodville Road, go about 1/2 mile on Kelly road and turn left, go about 1/2 miles, TLD placed in trees on left. Orange sign on blocked road, east of 57 off Dykes Rd.	N 37 05 52.200	W 088 48 52.20	-2818	-7551	N/A
04/03/2019 10:31 8018-646	JW	7/1/2019 9:43	JW	TLD-46	Truck entrance at receiving C-720	N 37 06 44.700	W 088 49 00.120	-5198	-2865	NA
04/03/2019 10:56 8019-647 2884	JW	7/1/2019 11:14	JW	TLD-50	West Patrol Road fence across from C-745-A	N 37 07 02.88	W 088 49.15.18	-7287	-1547	N/A
04/03/2019 08:11 8020-648	JW	7/1/2019 7:43	JW	TLD-52	East Patrol Road fence across from C-745-E.	N 37 06 42.18	W 088 48.07.20	-1397	-1628	N/A
04/03/2019 09:45 8021-649	JW	7/1/2019 9:01	JW	TLD-53	Security fence at southeast corner of C-745-T Yard. Down fence line away from TLD-2.	N 37 06 00.42	W 088 48.37.02	-2220	-6423	N/A
04/03/2019 12:49 8022-650	KA	7/1/2019 10:25	KA	TLD-54	Residence; Jalusian Trail	N 57 87 72.16	E 23 93 13.48	45296	-25254	N/A
04/03/2019 07:57 8023-651	JW	7/1/2019 7:41	JW	TLD-58	West Central C-755 Complex	N 59 07 98.00	E 22 88 70.74	-1209	-1422	N/A
04/04/2019 10:16 8024-652	JW	7/1/2019 13:00	JW	TLD-59	C-752A Break Area	N 59 15 61.62	E 22 78 55.79	-5234	-339	N/A
04/03/2019 13:55 8025-653	JW	7/1/2019 13:14	JW	TLD-60	C-333A Light Pole on Fence Pole #16	N 59 02 07.10	E 22 80 71.62	-2919	-4199	N/A
04/03/2019 14:05 8026-654	JW	7/1/2019 13:13	JW	TLD-61	West of C-746Q Light Pole #14	N 59 01 58.14	E 22 80 98.35	-2778	-4315	N/A
04/03/2019 14:00 8027-655	JW	7/1/2019 12:55	JW	TLD-62	C-743 Trailer Complex Light Pole #336,behind Trailer #3.	N 59 10 20.18	E 22 73 49.81	-6111	-2607	N/A
04/04/2019 10:08 8028-656	JW	7/1/2019 13:09	JW	TLD-63	C-412 HP Break Trailer	N 59 08 36.46	E 22 79 46.95	-4069	-2435	N/A
04/03/2019 11:38 8029-657	JW	7/1/2019 12:13	JW	TLD-64	C-764 T-6 Trailer	N 59 11 77.55	E 22 70 88.88	-7098	-2447	N/A
04/03/2019 09:16 8030-658 2885	JW	7/1/2019 8:20	JW	TLD-65	Located O/S of North Security fence North of C-745H Cylinder Yard; South of C-762 Laydown Yard	N 37 07 08.54386	W 088 48 00.45376	-1795	1062	N/A
04/03/2019 08:59 8031-659	JW	7/1/2019 8:00	JW	TLD-66	Located on tree @Southeast corner of New Harmony Cemetery; adjacent to last concrete barrier & large metal post	N 37 07 15.80859	W 088 48 11.08836	-2856	1457	N/A

2nd Quarter CY 2019 TLD Location Information

Date/Time Issued/Badge ID	Issued By	Date/Time Collected	Collected By	Location Name	Description	NorthLong	West or East Lat	Xcoord	Ycoord	Comments
4/03/2019 08:57 8032-660	JW	7/1/2019 7:58	JW	TLD-67	Located on "No Trespassing" sign North side of Dykes Rd next to Security Fence North of C-762 Laydown yard	N 37 07 12.70502	W 088 47 56.75697	-1658	1560	N/A
04/03/2019 11:01 8033-661 2886	JW	7/1/2019 11:17	JW	TLD-68	West Security Fence West of C-745B Cylinder Yard & Southeast of Vortec Site	N 37 07 11.60797	W 088 49 11.43416	-7302	-617	N/A
04/03/2019 10:49 8034-662	JW	7/1/2019 9:50	JW	TLD-69	Wooden utility pole (T12-15 H) next to gravel road @Northeast corner of pond North of C-611	N 37 07 13.70394	W 088 49 28.37928	-8664	-888	N/A
04/03/2019 10:18 8035-663	JW	7/1/2019 9:27	JW	TLD-70	O/S of West Security Fence Southeast of C-333 midway between C810 parking area & North DuF6 Security Fence	N 37 06 27.82855	W 088 48 50.25203	-4173	-4189	N/A
4/03/2019 10:10 8036-664	JW	7/1/2019 9:24	JW	TLD-71	O/S of West Security Fence of DuF6 under security light, Northeast of wooden utility pole (11056 KU 78487)	N 37 06 23.05971	W 088 48 59.65074	-4723	-4903	N/A
04/03/2019 09:55 8037-665	JW	7/1/2019 9:14	JW	TLD-72	North Side of Air Monitoring Station AMD57, Northwest of Post 57	N 37 05 55.32798	W 088 49 15.28582	-4952	-7972	N/A
04/03/2019 15:20 8038-666	JW	7/1/2019 15:28	JW	TLD-73	Eastern "Railroad Crossing" sign @train tracks on Acid Road	N 37 06 06.14205	W 088 50 02.01070	-8883	-8241	N/A
04/03/2019 13:30 8039-667	JW	7/1/2019 13:45	JW	TLD-74	Located on "Warning Siren" sign @turnoff North of Magruder & Woodville intersection	N 37 05 10.96196	W 088 48 53.61411	-1765	-11586	N/A
04/03/2019 13:36 8040-668	JW	7/1/2019 13:48	JW	TLD-75	Located on "Warning Siren" sign @North of Kelley Rd & Woodville Rd intersection	N 37 05 04.94525	W 088 48 26.65157	496	-11409	N/A
04/03/2019 13:40 8041-669	JW	7/1/2019 13:53	JW	TLD-76	Located on "Tract A" sign below power lines southside of Kelley Rd in sharp curve between Woodville & McCaw Rds	N 37 05 55.05466	W 088 48 06.27328	310	-6082	N/A
04/03/2019 13:45 8042-670	JW	7/1/2019 13:58	JW	TLD-77	Located on "Warning Siren" sign North side of McCaw Rd east of Kelley Rd intersection	N 37 06 25.46598	W 088 47 33.66599	1737	-2287	N/A
04/03/2019 14:15 8043-671	JW	7/1/2019 14:23	JW	TLD-78	Northeast Corner of C-746U Landfill Security Fence	N 37 07 54.00752	W 088 47 37.45924	-1622	6020	N/A

2nd Quarter CY 2019 TLD Location Information

Date/Time Issued/Badge ID	Issued By	Date/Time Collected	Collected By	Location Name	Description	NorthLong	West or East Lat	Xcoord	Ycoord	Comments
04/03/2019 11:11 8044-672	JW	7/1/2019 11:42	JW	TLD-79	Located on left post of the "Wildlife Management" gate on New Waterline Rd Southwest of Plant gate 41A west of C-612	N 37 07 28.86304	W 88 49 12.50003	-7981	993	N/A
04/03/2019 14:38 8045-673	JW	7/1/2019 14:50	JW	TLD-80	Located on "Cattle" gate west of MW 453 & MW 454 on gravel rd east of New Waterline Rd	N 37 07 47.29850	W 088 48 46.10944	-6612	3477	N/A
04/03/2019 10:06 8046-674 2887	JW	7/1/2019 9:21	JW	TLD-81	Southeast corner of DuF6 security fence next to gate V1 East of New Waterline East of C1100	N 37 06 18.33947	W 088 48 56.42591	-4314	-5262	N/A
04/03/2019 08:19 8047-675	JW	7/1/2019 8:32	JW	TLD-82	Short pole East of Dykes Rd North of Outfall 13	N 37 06 10.13175	W 088 48 13.53048	-765	-4851	N/A
04/03/2018 08:36 8048-676 2888	JW	7/1/2019 8:40	JW	TLD-83	Large metal power pole West of Dykes Rd South of Outfall 13	N 37 06 07.30640	W 088 48 20.71726	-1214	-5319	N/A
04/03/2019 08:54 8049-677	JW	7/1/2019 7:55	JW	TLD-84	Located @MW496 on the East Side of Dykes Rd	N 37 07 03.50589	W 088 47 49.26485	-769	894	N/A
04/03/2019 10:35 8050-678	SO	7/1/2019 17:00	SO	TLD-85	Residence; corner of Springwell and Buckner Lane	N 37 03 27.9036	W 088 40 43.9638	39082	-7750	N/A
04/03/2019 13:26 8051-679	JW	7/1/2019 13:39	JW	TLD-86	Plant Entrance, Gravel Construction Rd. Right side on orange warning signal sign	N 37° 5' 18.8622"	W 088 49 28.2282	-4676	-11794	N/A
04/03/2019 14:25 8052-680	JW	7/1/2019 15:34	JW	TLD-87	KOW Entrance north of Woodville Rd north of Kevil Eagles. Right side on orange warning signal sign	N 37 05 24.2802	W 088 50 43.9548	-10629	-13381	N/A
04/03/2019 14:59 8053-681	JW	7/1/2019 15:11	JW	TLD-88	Bethel Church Road KOW entrance. North of Massay Rd, right side on yellow post	N 37 07 05.4876	W 088 50 37.9608	-13677	-3597	N/A
04/03/2019 14:50 8054-682	JW	7/1/2019 15:09	JW	TLD-89	Bobo Rd, off of Bethel Church Rd. Continue east 200 yds past end of asphalt. At intersection on orange warning signal sign	N 37 07 35.9976	W 088 49 44.3922	-10657	788	N/A
04/03/2019 14:46 8055-683	JW	7/1/2019 15:07	JW	TLD-90	Bridge on Ogden Landing Rd east of Lamb's garage. On NE corner of bridge on contaminated creek sign	N 37 08 54.6714	W 088 47 27.2472	-12310	7182	N/A

2nd Quarter CY 2019 TLD Location Information

Date/Time Issued/Badge ID	Issued By	Date/Time Collected	Collected By	Location Name	Description	NorthLong	West or East Lat	Xcoord	Ycoord	Comments
04/03/2019 14:26 8056-684	JW	7/1/2019 14:37	JW	TLD-91	Boldry School Rd on KOW at Shawnee plant entrance. On cattle gate road on hill, right side	N 37 08 40.9884	W 088 49 36.5232	-2952	12069	N/A
04/03/2019 14:20 8057-685	JW	7/1/2019 14:30	JW	TLD-92	First left road past C-746-U Landfill,cross Iron Bridge, on ICM-01 Notice Sign across from MW 133	N 37 08 23.18	W 088 47 25.41	9125	-1717	N/A
04/03/2019 13:58 8058-686	JW	7/1/2019 14:07	JW	TLD-93	MW 100, North on Metropolis Lake Rd past railroad tracks on left side on Well bollard	N 37 08 09.0744	W 088 46 50.9304	4874	7186	N/A
04/03/2019 14:04 8059-687	JW	7/1/2019 14:12	JW	TLD-94	Residence; corner of Ogden Landing Rd & Metropolis Lake Rd	N 37 05 48.9294	W 088 47 12.4332	4740	436	N/A
04/03/2019 13:50 8060-688	JW	7/1/2019 14:02	JW	TLD-95	West McCracken Health Clinic, Metropolis Lake Rd. On Light Pole in SW corner of parking lot	N 37 06 40.5468	W 088 46 47.2872	4617	-5167	N/A
04/04/2019 10:20 8061-689	JW	7/1/2019 15:40	JW	TLD-FB	Taken along while placing and collecting all other samples - stored in "lead box" at C-101 Dosimetry office	N/A	N/A	NA	NA	N/A
04/03/2019 07:00 8062-690	JW	7/1/2019 7:00	JW	TLD-TB	Stored in "lead box" at C-101 Dosimetry office	N/A	N/A	NA	NA	N/A
8063-691	JW	N/A	N/A	SPARE	Lead Box in C-101 Dosimetry office	N/A	N/A	N/A	N/A	N/A
8064-692	JW	N/A	N/A	SPARE	Lead Box in C-101 Dosimetry office	N/A	N/A	N/A	N/A	N/A
8065-693	JW	N/A	N/A	SPARE	Lead Box in C-101 Dosimetry office	N/A	N/A	N/A	N/A	N/A
8066-694	JW	N/A	N/A	SPARE	Lead Box in C-101 Dosimetry office	N/A	N/A	N/A	N/A	N/A
8067-695	JW	N/A	N/A	SPARE	Lead Box in C-101 Dosimetry office	N/A	N/A	N/A	N/A	N/A
8068-696	JW	N/A	N/A	SPARE	Lead Box in C-101 Dosimetry office	N/A	N/A	N/A	N/A	N/A
7995-621	JW	N/A	N/A	SPARE	Lead Box in C-101 Dosimetry office	N/A	N/A	N/A	N/A	N/A
7996-622	JW	N/A	N/A	SPARE	Lead Box in C-101 Dosimetry office	N/A	N/A	N/A	N/A	N/A
7997-623	JW	N/A	N/A	SPARE	Lead Box in C-101 Dosimetry office	N/A	N/A	N/A	N/A	N/A

2nd Quarter CY 2019 TLD Location Information

Date/Time Issued/Badge ID	Issued By	Date/Time Collected	Collected By	Location Name	Description	NorthLong	West or East Lat	Xcoord	Ycoord	Comments
7993-624	JW	N/A	N/A	SPARE	Lead Box in C-101 Dosimetry office	N/A	N/A	N/A	N/A	N/A

3rd Quarter CY 2019 TLD Location Information

Date/Time Issued/Badge ID	Issued By	Date/Time Collected	Collected By	Location Name	Description	NorthLong	West or East Lat	Xcoord	Ycoord	Comments
07/01/2019 09:18 9694-625	JW	10/1/2019 13:31	JW	TLD-1	PGDP security fence west of C-745-M near intersection of Patrol Road and Alabama Avenue near pole 21-20. Outside fence behind DuF6 dirt pile	N 37 06 16.66	W 088 48 55.18	-4172	-5856	N/A
07/01/2019 08:56 9698-626 2882	JW	10/1/2019 13:11	JW	TLD-2	PGDP security fence south of C-745-T near pole T20-6J. South Cylinder Yard perimeter fence	N 37 06 02.15	W 088 48 43.07	-2740	-6427	N/A
07/01/2019 08:12 9699-627 2883	JW	10/1/2019 12:36	JW	TLD-3	PGDP security fence east of C-745-H near pole 23-31. Perimeter fence NE corner	N 37 07 04.17	W 088 47 57.21	-1399	739	N/A
07/01/2019 12:01 9700-628	JW	10/1/2019 14:29	JW	TLD-4	North PGDP security fence near North-South Diversion Ditch.	N 37 07 15.74	W 088 48 25.56	-3957	1052	N/A
7/01/2019 11:49 9701-629	JW	10/1/2019 14:22	JW	TLD-5	North PGDP security fence north of C-747-A near pole T53A1P26G. North perimeter fence between lagoon	N 37 07 24.38	W 088 48 54.58	-6464	1068	N/A
07/01/2019 11:35 9702-630	JW	10/1/2019 14:13	JW	TLD-6	West PGDP security fence west of C-746-P1 near pole 22-4. 612 perimeter fence.	N 37 07 20.85	W 088 49 07.22	-7303	382	N/A
07/01/2019 09:40 9703-631	JW	10/1/2019 13:48	JW	TLD-7	PGDP perimeter fence adjacent to Curlee Road near entrance to DOE building (C-103). Perimeter fence across from entrance to DOE bldg.	N 37 06 29.15	W 088 49 02.49	-5153	-4400	N/A
07/01/2019 15:25 9704-632	JW	10/2/2019 8:58	JW	TLD-9	Northeast corner of fence of old KOW water treatment plant, near Monitoring Well 309. Gate to MW305	N 37 06 37.12	W 088 49 48.11	-8901	-4907	N/A
07/01/2019 14:13 9705-633	JW	10/1/2019 15:18	JW	TLD-12	Institutional controls fence near Monitoring Well 191 where Little Bayou Creek crosses Hwy 358. MW191, Little Bayou & Ogden Landing Rd.	N 37 06 49.62	W 088 47 11.44	2588	626	N/A
07/01/2019 14:19 9706-634	JW	10/1/2019 15:22	JW	TLD-13	West fence of C-746-U landfill near entrance gate	N 37 07 48.17	W 088 48 00.61	-3182	4825	N/A

3rd Quarter CY 2019 TLD Location Information

Date/Time Issued/Badge ID	Issued By	Date/Time Collected	Collected By	Location Name	Description	NorthLong	West or East Lat	Xcoord	Ycoord	Comments
07/01/2019 08:05 9707-635	JW	10/1/2019 12:29	JW	TLD-14	Institutional controls fence along North-South Diversion Ditch on west side of 14th street extension near Highway 358 (K003). Fence at North South ditch, north of MW353	N 37 07 29.75	W 088 48 10.58	-3302	2798	N/A
07/01/2019 07:49 9708-636	JW	10/1/2019 10:26	JW	TLD-15	Northeast corner of C-755 fence behind C-755-D	N 37 06 45.01	W 088 47 58.91	-864	-1129	N/A
07/01/2019 14:52 9709-637	JW	10/1/2019 15:48	JW	TLD-16	WKWMA Clubhouse on northwest corner porch post. On porch WKWMA Headquarters.	N 37 07 59.44	W 088 48 49.76	-7311	4533	N/A
07/01/2019 15:16 9710-638	JW	10/1/2019 16:08	JW	TLD-19	Passed pond on right "A" sign next to MW 426	N 37 07 24.43	W 088 49 33.11	-9398	2	N/A
07/01/2019 10:51 9711-639	JW	10/1/2019 9:00	JW	TLD-22	Outside of the fence of the locked air sampling station at the rear corner of the Bethel Cumberland Presbyterian Church Cemetery	N 37 00 05.36	W 088 52 36.29	-8159	-46801	N/A
07/01/2019 08:46 9712-640	JW	10/1/2019 12:59	JW	TLD-25	On power line tower nearest Dykes Road southeast of C-745-T	N 37 06 00.02	W 088 48 26.49	-1401	-6172	N/A
07/01/2019 14:42 9713-641	JW	10/1/2019 15:40	JW	TLD-30	Take the road by the PGDP landfills, drive past Monitoring Well 98, turn left at three-way, Monitoring Well 235 intersection at Tract 7 sign. The TLD is hung on the inside of the sign. Boldry School Rd., Tract 7 sign, west of MW381	N 37 08 21.060	W 088 45 09.060	-4836	7876	N/A
07/01/2019 09:34 9714-642	JW	10/1/2019 13:45	JW	TLD-35	Outfall 017 off of Plant Access Road. Outfall 017 DuF6 laydown yard	N 37 06 21.480	W 088 49 03.960	-4773	-5806	N/A
07/01/2019 11:27 9715-643	JW	10/1/2019 14:10	JW	TLD-37	KPDES Outfall 001 behind Vortec facility. K001	N 37 07 18.600	W 088 49 15.660	-8202	138	N/A
07/01/2019 15:22 9716-644	JW	10/2/2019 8:55	JW	TLD-38	Five-Points Creek with concrete bridge, on tree behnd 2A sign.	N 37 06 43.320	W 088 50 09.000	-10630	-4528	N/A

3rd Quarter CY 2019 TLD Location Information

Date/Time Issued/Badge ID	Issued By	Date/Time Collected	Collected By	Location Name	Description	NorthLong	West or East Lat	Xcoord	Ycoord	Comments
07/01/2019 08:50 9717-645	JW	10/1/2019 13:03	JW	TLD-40	Turn north on Kelly Road off Woodville Road, go about 1/2 mile on Kelly road and turn left, go about 1/2 miles, TLD placed in trees on left. Orange sign on blocked road, east of 57 off Dykes Rd.	N 37 05 52.200	W 088 48 52.20	-2818	-7551	N/A
07/01/2019 09:43 9718-646	JW	10/1/2019 13:51	JW	TLD-46	Truck entrance at receiving C-720	N 37 06 44.700	W 088 49 00.120	-5198	-2865	NA
07/01/2019 11:14 9719-647 2884	JW	10/1/2019 14:04	JW	TLD-50	West Patrol Road fence across from C-745-A	N 37 07 02.88	W 088 49.15.18	-7287	-1547	N/A
07/01/2019 07:43 9720-648	JW	10/1/2019 10:36	JW	TLD-52	East Patrol Road fence across from C-745-E.	N 37 06 42.18	W 088 48.07.20	-1397	-1628	N/A
07/01/2019 09:01 9721-649	JW	10/1/2019 13:15	JW	TLD-53	Security fence at southeast corner of C-745-T Yard. Down fence line away from TLD-2.	N 37 06 00.42	W 088 48.37.02	-2220	-6423	N/A
07/01/2019 10:25 9722-650	KA	10/1/2019 9:30	KA	TLD-54	Residence; Jalusian Trail	N 57 87 72.16	E 23 93 13.48	45296	-25254	N/A
07/01/2019 07:41 9723-651	JW	10/1/2019 10:18	JW	TLD-58	West Central C-755 Complex	N 59 07 98.00	E 22 88 70.74	-1209	-1422	N/A
07/01/2019 13:00 9724-652	JW	10/1/2019 9:52	JW	TLD-59	C-752A Break Area	N 59 15 61.62	E 22 78 55.79	-5234	-339	N/A
07/01/2019 13:14 9725-653	JW	10/1/2019 10:03	JW	TLD-60	C-333A Light Pole on Fence Pole #16	N 59 02 07.10	E 22 80 71.62	-2919	-4199	N/A
07/01/2019 13:13 9726-654	JW	10/1/2019 10:06	JW	TLD-61	West of C-746Q Light Pole #14	N 59 01 58.14	E 22 80 98.35	-2778	-4315	N/A
07/01/2019 12:55 9727-655	JW	10/1/2019 9:43	JW	TLD-62	C-743 Trailer Complex Light Pole #336,behind Trailer #3.	N 59 10 20.18	E 22 73 49.81	-6111	-2607	N/A
07/01/2019 13:09 9728-656	JW	10/1/2019 9:59	JW	TLD-63	C-412 HP Break Trailer	N 59 08 36.46	E 22 79 46.95	-4069	-2435	N/A
07/01/2019 12:13 9729-657	JW	10/1/2019 14:35	JW	TLD-64	C-764 T-6 Trailer	N 59 11 77.55	E 22 70 88.88	-7098	-2447	N/A
07/01/2019 08:20 9730-658 2885	JW	10/1/2019 12:41	JW	TLD-65	Located O/S of North Security fence North of C-745H Cylinder Yard; South of C-762 Laydown Yard	N 37 07 08.54386	W 088 48 00.45376	-1795	1062	N/A
07/01/2019 08:00 9731-659	JW	10/1/2019 12:24	JW	TLD-66	Located on tree @Southeast corner of New Harmony Cemetery; adjacent to last concrete barrier & large metal post	N 37 07 15.80859	W 088 48 11.08836	-2856	1457	N/A

3rd Quarter CY 2019 TLD Location Information

Date/Time Issued/Badge ID	Issued By	Date/Time Collected	Collected By	Location Name	Description	NorthLong	West or East Lat	Xcoord	Ycoord	Comments
07/01/2019 07:58 9732-660	JW	10/1/2019 10:43	JW	TLD-67	Located on "No Trespassing" sign North side of Dykes Rd next to Security Fence North of C-762 Laydown yard	N 37 07 12.70502	W 088 47 56.75697	-1658	1560	N/A
07/01/2019 11:17 9733-661 2886	JW	10/1/2019 14:08	JW	TLD-68	West Security Fence West of C-745B Cylinder Yard & Southeast of Vortec Site	N 37 07 11.60797	W 088 49 11.43416	-7302	-617	N/A
07/01/2019 09:50 9734-662	JW	10/1/2019 13:57	JW	TLD-69	Wooden utility pole (T12-15 H) next to gravel road @Northeast corner of pond North of C-611	N 37 07 13.70394	W 088 49 28.37928	-8664	-888	N/A
07/01/2019 09:27 9735-663	JW	10/1/2019 13:42	JW	TLD-70	O/S of West Security Fence Southeast of C-333 midway between C810 parking area & North DuF6 Security Fence	N 37 06 27.82855	W 088 48 50.25203	-4173	-4189	N/A
07/01/2019 09:24 9736-664	JW	10/1/2019 13:39	JW	TLD-71	O/S of West Security Fence of DuF6 under security light, Northeast of wooden utility pole (11056 KU 78487)	N 37 06 23.05971	W 088 48 59.65074	-4723	-4903	N/A
07/01/2019 09:14 9737-665	JW	10/1/2019 13:27	JW	TLD-72	North Side of Air Monitoring Station AMD57, Northwest of Post 57	N 37 05 55.32798	W 088 49 15.28582	-4952	-7972	N/A
07/01/2019 15:28 9738-666	JW	10/2/2019 9:31	JW	TLD-73	Eastern "Railroad Crossing" sign @train tracks on Acid Road	N 37 06 06.14205	W 088 50 02.01070	-8883	-8241	N/A
07/01/2019 13:45 9739-667	JW	10/1/2019 14:53	JW	TLD-74	Located on "Warning Siren" sign @turnoff North of Magruder & Woodville intersection	N 37 05 10.96196	W 088 48 53.61411	-1765	-11586	N/A
07/01/2019 13:48 9740-668	JW	10/1/2019 14:56	JW	TLD-75	Located on "Warning Siren" sign @North of Kelley Rd & Woodville Rd intersection	N 37 05 04.94525	W 088 48 26.65157	496	-11409	N/A
07/01/2019 13:53 9741-669	JW	10/1/2019 15:00	JW	TLD-76	Located on "Tract A" sign below power lines southside of Kelley Rd in sharp curve between Woodville & McCaw Rds	N 37 05 55.05466	W 088 48 06.27328	310	-6082	N/A
07/01/2019 13:58 9742-670	JW	10/1/2019 15:03	JW	TLD-77	Located on "Warning Siren" sign North side of McCaw Rd east of Kelley Rd intersection	N 37 06 25.46598	W 088 47 33.66599	1737	-2287	N/A
07/01/2019 14:23 9743-671	JW	10/1/2019 15:26	JW	TLD-78	Northeast Corner of C-746U Landfill Security Fence	N 37 07 54.00752	W 088 47 37.45924	-1622	6020	N/A

3rd Quarter CY 2019 TLD Location Information

Date/Time Issued/Badge ID	Issued By	Date/Time Collected	Collected By	Location Name	Description	NorthLong	West or East Lat	Xcoord	Ycoord	Comments
07/01/2019 11:42 9744-672	JW	10/1/2019 14:16	JW	TLD-79	Located on left post of the "Wildlife Management" gate on New Waterline Rd Southwest of Plant gate 41A west of C-612	N 37 07 28.86304	W 88 49 12.50003	-7981	993	N/A
07/01/2019 14:50 9745-673	JW	10/1/2019 15:46	JW	TLD-80	Located on "Cattle" gate west of MW 453 & MW 454 on gravel rd east of New Waterline Rd	N 37 07 47.29850	W 088 48 46.10944	-6612	3477	N/A
07/01/2019 09:21 9746-674 2887	JW	10/1/2019 13:33	JW	TLD-81	Southeast corner of DuF6 security fence next to gate V1 East of New Waterline East of C1100	N 37 06 18.33947	W 088 48 56.42591	-4314	-5262	N/A
07/01/2019 08:32 9747-675	JW	10/1/2019 12:51	JW	TLD-82	Short pole East of Dykes Rd North of Outfall 13	N 37 06 10.13175	W 088 48 13.53048	-765	-4851	N/A
07/01/2019 08:40 9748-676 2888	JW	10/1/2019 12:54	JW	TLD-83	Large metal power pole West of Dykes Rd South of Outfall 13	N 37 06 07.30640	W 088 48 20.71726	-1214	-5319	N/A
07/01/2019 07:55 9749-677	JW	10/1/2019 10:41	JW	TLD-84	Located @MW496 on the East Side of Dykes Rd	N 37 07 03.50589	W 088 47 49.26485	-769	894	N/A
07/01/2019 17:00 9750-678	SO	10/1/2019 17:00	SO	TLD-85	Residence; corner of Springwell and Buckner Lane	N 37 03 27.9036	W 088 40 43.9638	39082	-7750	N/A
07/01/2019 13:39 9751-679	JW	10/1/2019 14:50	JW	TLD-86	Plant Entrance, Gravel Construction Rd. Right side on orange warning signal sign	N 37° 5' 18.8622"	W 088 49 28.2282	-4676	-11794	N/A
07/01/2019 15:34 9752-680	JW	10/2/2019 8:45	JW	TLD-87	KOW Entrance north of Woodville Rd north of Kevil Eagles. Right side on orange warning signal sign	N 37 05 24.2802	W 088 50 43.9548	-10629	-13381	N/A
07/01/2019 15:11 9753-681	JW	10/1/2019 16:03	JW	TLD-88	Bethel Church Road KOW entrance. North of Massay Rd, right side on yellow post	N 37 07 05.4876	W 088 50 37.9608	-13677	-3597	N/A
07/01/2019 15:09 9754-682	JW	10/1/2019 16:01	JW	TLD-89	Bobo Rd, off of Bethel Church Rd. Continue east 200 yds past end of asphalt. At intersection on orange warning signal sign	N 37 07 35.9976	W 088 49 44.3922	-10657	788	N/A
07/01/2019 15:07 9755-683	JW	10/1/2019 15:59	JW	TLD-90	Bridge on Ogden Landing Rd east of Lamb's garage. On NE corner of bridge on contaminated creek sign	N 37 08 54.6714	W 088 47 27.2472	-12310	7182	N/A

3rd Quarter CY 2019 TLD Location Information

Date/Time Issued/Badge ID	Issued By	Date/Time Collected	Collected By	Location Name	Description	NorthLong	West or East Lat	Xcoord	Ycoord	Comments
07/01/2019 14:37 9756-684	JW	10/1/2019 15:36	JW	TLD-91	Boldry School Rd on KOW at Shawnee plant entrance. On cattle gate road on hill, right side	N 37 08 40.9884	W 088 49 36.5232	-2952	12069	N/A
07/01/2019 14:30 9757-685	JW	10/1/2019 15:31	JW	TLD-92	First left road past C-746-U Landfill,cross Iron Bridge, on ICM-01 Notice Sign across from MW 133	N 37 08 23.18	W 088 47 25.41	9125	-1717	N/A
07/01/2019 14:07 9758-686	JW	10/1/2019 15:12	JW	TLD-93	MW 100, North on Metropolis Lake Rd past railroad tracks on left side on Well bollard	N 37 08 09.0744	W 088 46 50.9304	4874	7186	N/A
07/01/2019 14:12 9759-687	JW	10/1/2019 15:16	JW	TLD-94	Residence; corner of Ogden Landing Rd & Metropolis Lake Rd	N 37 05 48.9294	W 088 47 12.4332	4740	436	N/A
07/01/2019 14:02 9760-688	JW	10/1/2019 15:06	JW	TLD-95	West McCracken Health Clinic, Metropolis Lake Rd. On Light Pole in SW corner of parking lot	N 37 06 40.5468	W 088 46 47.2872	4617	-5167	N/A
07/01/2019 15:40 9761-689	JW	10/2/2019 9:45	JW	TLD-FB	Taken along while placing and collecting all other samples - stored in "lead box" at C-101 Dosimetry office	N/A	N/A	NA	NA	N/A
07/01/2019 07:00 9762-690	JW	10/1/2019 7:00	JW	TLD-TB	Stored in "lead box" at C-101 Dosimetry office	N/A	N/A	NA	NA	N/A
9763-691	JW	N/A	N/A	SPARE	Lead Box in C-101 Dosimetry office	N/A	N/A	N/A	N/A	N/A
9764-692	JW	N/A	N/A	SPARE	Lead Box in C-101 Dosimetry office	N/A	N/A	N/A	N/A	N/A
9765-693	JW	N/A	N/A	SPARE	Lead Box in C-101 Dosimetry office	N/A	N/A	N/A	N/A	N/A
9766-694	JW	N/A	N/A	SPARE	Lead Box in C-101 Dosimetry office	N/A	N/A	N/A	N/A	N/A
9767-695	JW	N/A	N/A	SPARE	Lead Box in C-101 Dosimetry office	N/A	N/A	N/A	N/A	N/A
9768-696	JW	N/A	N/A	SPARE	Lead Box in C-101 Dosimetry office	N/A	N/A	N/A	N/A	N/A
9695-621	JW	N/A	N/A	SPARE	Lead Box in C-101 Dosimetry office	N/A	N/A	N/A	N/A	N/A
9696-622	JW	N/A	N/A	SPARE	Lead Box in C-101 Dosimetry office	N/A	N/A	N/A	N/A	N/A
9697-623	JW	N/A	N/A	SPARE	Lead Box in C-101 Dosimetry office	N/A	N/A	N/A	N/A	N/A

3rd Quarter CY 2019 TLD Location Information

Date/Time Issued/Badge ID	Issued By	Date/Time Collected	Collected By	Location Name	Description	NorthLong	West or East Lat	Xcoord	Ycoord	Comments
9693-624	JW	N/A	N/A	SPARE	Lead Box in C-101 Dosimetry office	N/A	N/A	N/A	N/A	N/A

4th Quarter CY 2019 TLD Location Information

Date/Time Issued/Badge ID	Issued By	Date/Time Collected	Collected By	Location Name	Description	NorthLong	West or East Lat	Xcoord	Ycoord	Comments
10/01/2019 13:31 1479-625	JW	1/8/2020 9:45	AW	TLD-1	PGDP security fence west of C-745-M near intersection of Patrol Road and Alabama Avenue near pole 21-20. Outside fence behind DuF6 dirt pile	N 37 06 16.66	W 088 48 55.18	-4172	-5856	N/A
10/01/2019 13:11 1482-626 2882	JW	1/8/2020 9:30	AW	TLD-2	PGDP security fence south of C-745-T near pole T20-6J. South Cylinder Yard perimeter fence	N 37 06 02.15	W 088 48 43.07	-2740	-6427	N/A
10/01/2019 12:36 1483-627 2883	JW	1/8/2020 8:18	AW	TLD-3	PGDP security fence east of C-745-H near pole 23-31. Perimeter fence NE corner	N 37 07 04.17	W 088 47 57.21	-1399	739	N/A
10/01/2019 14:29 1484-628	JW	1/8/2020 12:47	AW	TLD-4	North PGDP security fence near North-South Diversion Ditch.	N 37 07 15.74	W 088 48 25.56	-3957	1052	N/A
10/01/2019 14:22 1485-629	JW	1/8/2020 12:41	AW	TLD-5	North PGDP security fence north of C-747-A near pole T53A1P26G. North perimeter fence between lagoon	N 37 07 24.38	W 088 48 54.58	-6464	1068	N/A
10/01/2019 14:13 1486-630	JW	1/8/2020 12:28	AW	TLD-6	West PGDP security fence west of C-746-P1 near pole 22-4. 612 perimeter fence.	N 37 07 20.85	W 088 49 07.22	-7303	382	N/A
10/01/2019 13:48 1487-631	JW	1/8/2020 10:11	AW	TLD-7	PGDP perimeter fence adjacent to Curlee Road near entrance to DOE building (C-103). Perimeter fence across from entrance to DOE bldg.	N 37 06 29.15	W 088 49 02.49	-5153	-4400	N/A
10/02/2019 08:58 1488-632	JW	1/8/2020 15:03	AW	TLD-9	Northeast corner of fence of old KOW water treatment plant, near Monitoring Well 309. Gate to MW305	N 37 06 37.12	W 088 49 48.11	-8901	-4907	N/A
10/01/2019 15:18 1489-633	JW	1/8/2020 13:53	AW	TLD-12	Institutional controls fence near Monitoring Well 191 where Little Bayou Creek crosses Hwy 358. MW191, Little Bayou & Ogden Landing Rd.	N 37 06 49.62	W 088 47 11.44	2588	626	N/A
10/01/2019 15:22 1490-634	JW	1/8/2020 14:02	AW	TLD-13	West fence of C-746-U landfill near entrance gate	N 37 07 48.17	W 088 48 00.61	-3182	4825	N/A

4th Quarter CY 2019 TLD Location Information

Date/Time Issued/Badge ID	Issued By	Date/Time Collected	Collected By	Location Name	Description	NorthLong	West or East Lat	Xcoord	Ycoord	Comments
10/01/2019 12:29 1491-635	JW	1/8/2020 8:08	AW	TLD-14	Institutional controls fence along North-South Diversion Ditch on west side of 14th street extension near Highway 358 (K003). Fence at North South ditch, north of MW353	N 37 07 29.75	W 088 48 10.58	-3302	2798	N/A
10/01/2019 10:26 1492-636	JW	1/8/2020 7:56	AW	TLD-15	Northeast corner of C-755 fence behind C-755-D	N 37 06 45.01	W 088 47 58.91	-864	-1129	N/A
10/01/2019 15:48 1493-637	JW	1/8/2020 14:35	AW	TLD-16	WKWMA Clubhouse on northwest corner porch post. On porch WKWMA Headquarters.	N 37 07 59.44	W 088 48 49.76	-7311	4533	N/A
10/01/2019 16:08 1494-638	JW	1/8/2020 14:54	AW	TLD-19	Passed pond on right "A" sign next to MW 426	N 37 07 24.43	W 088 49 33.11	-9398	2	N/A
10/01/2019 09:00 1495-639	JW	1/9/2020 9:03	AW	TLD-22	Outside of the fence of the locked air sampling station at the rear corner of the Bethel Cumberland Presbyterian Church Cemetery	N 37 00 05.36	W 088 52 36.29	-8159	-46801	N/A
10/01/2019 12:59 1496-640	JW	1/8/2020 9:17	AW	TLD-25	On power line tower nearest Dykes Road southeast of C-745-T	N 37 06 00.02	W 088 48 26.49	-1401	-6172	N/A
10/01/2019 15:40 1497-641	JW	1/8/2020 14:25	AW	TLD-30	Take the road by the PGDP landfills, drive past Monitoring Well 98, turn left at three-way, Monitoring Well 235 intersection at Tract 7 sign. The TLD is hung on the inside of the sign. Boldry School Rd., Tract 7 sign, west of MW381	N 37 08 21.060	W 088 45 09.060	-4836	7876	N/A
10/01/2019 13:45 1498-642	JW	1/8/2020 10:06	AW	TLD-35	Outfall 017 off of Plant Access Road. Outfall 017 DuF6 laydown yard	N 37 06 21.480	W 088 49 03.960	-4773	-5806	N/A
10/01/2019 14:10 1499-643	JW	1/8/2020 10:45	AW	TLD-37	KPDES Outfall 001 behind Vortec facility. K001	N 37 07 18.600	W 088 49 15.660	-8202	138	N/A
10/02/2019 08:55 1500-644	JW	1/8/2020 15:00	AW	TLD-38	Five-Points Creek with concrete bridge, on tree behnd 2A sign.	N 37 06 43.320	W 088 50 09.000	-10630	-4528	N/A

4th Quarter CY 2019 TLD Location Information

Date/Time Issued/Badge ID	Issued By	Date/Time Collected	Collected By	Location Name	Description	NorthLong	West or East Lat	Xcoord	Ycoord	Comments
10/01/2019 13:03 1501-645	JW	1/8/2020 9:19	AW	TLD-40	Turn north on Kelly Road off Woodville Road, go about 1/2 mile on Kelly road and turn left, go about 1/2 miles, TLD placed in trees on left. Orange sign on blocked road, east of 57 off Dykes Rd.	N 37 05 52.200	W 088 48 52.20	-2818	-7551	N/A
10/01/2019 13:51 1502-646	JW	1/8/2020 10:13	AW	TLD-46	Truck entrance at receiving C-720	N 37 06 44.700	W 088 49 00.120	-5198	-2865	NA
10/01/2019 14:04 1503-647 2884	JW	1/8/2020 10:36	AW	TLD-50	West Patrol Road fence across from C-745-A	N 37 07 02.88	W 088 49.15.18	-7287	-1547	N/A
10/01/2019 10:36 1504-648	JW	1/8/2020 7:42	AW	TLD-52	East Patrol Road fence across from C-745-E.	N 37 06 42.18	W 088 48.07.20	-1397	-1628	N/A
10/01/2019 13:15 1505-649	JW	1/8/2020 9:35	AW	TLD-53	Security fence at southeast corner of C-745-T Yard. Down fence line away from TLD-2.	N 37 06 00.42	W 088 48.37.02	-2220	-6423	N/A
10/01/2019 09:30 1506-650	KA	1/8/2020 15:41	KA	TLD-54	Residence; Jalusian Trail	N 57 87 72.16	E 23 93 13.48	45296	-25254	N/A
10/01/2019 10:18 1507-651	JW	1/8/2020 7:50	AW	TLD-58	West Central C-755 Complex	N 59 07 98.00	E 22 88 70.74	-1209	-1422	N/A
10/01/2019 09:52 1508-652	JW	1/7/2020 14:33	AW	TLD-59	C-752A Break Area	N 59 15 61.62	E 22 78 55.79	-5234	-339	N/A
10/01/2019 10:03 1509-653	JW	1/7/2020 13:55	AW	TLD-60	C-333A Light Pole on Fence Pole #16	N 59 02 07.10	E 22 80 71.62	-2919	-4199	N/A
10/01/2019 10:06 1510-654	JW	1/7/2020 14:00	AW	TLD-61	West of C-746Q Light Pole #14	N 59 01 58.14	E 22 80 98.35	-2778	-4315	N/A
10/01/2019 09:43 1511-655	JW	1/7/2020 15:40	AW	TLD-62	C-743 Trailer Complex Light Pole #336,behind Trailer #3.	N 59 10 20.18	E 22 73 49.81	-6111	-2607	N/A
10/01/2019 09:59 1512-656	JW	1/7/2020 14:20	AW	TLD-63	C-412 HP Break Trailer	N 59 08 36.46	E 22 79 46.95	-4069	-2435	N/A
10/01/2019 14:35 1513-657	JW	1/8/2020 13:05	AW	TLD-64	C-764 T-6 Trailer	N 59 11 77.55	E 22 70 88.88	-7098	-2447	N/A
10/01/2019 12:41 1514-658 2885	JW	1/8/2020 8:54	AW	TLD-65	Located O/S of North Security fence North of C-745H Cylinder Yard; South of C-762 Laydown Yard	N 37 07 08.54386	W 088 48 00.45376	-1795	1062	N/A
10/01/2019 12:24 1515-659	JW	1/8/2020 8:05	AW	TLD-66	Located on tree @Southeast corner of New Harmony Cemetery; adjacent to last concrete barrier & large metal post	N 37 07 15.80859	W 088 48 11.08836	-2856	1457	N/A

4th Quarter CY 2019 TLD Location Information

Date/Time Issued/Badge ID	Issued By	Date/Time Collected	Collected By	Location Name	Description	NorthLong	West or East Lat	Xcoord	Ycoord	Comments
10/01/2019 10:43 1516-660	JW	1/8/2020 8:03	AW	TLD-67	Located on "No Trespassing" sign North side of Dykes Rd next to Security Fence North of C-762 Laydown yard	N 37 07 12.70502	W 088 47 56.75697	-1658	1560	N/A
10/01/2019 14:08 1517-661 2886	JW	1/8/2020 10:37	AW	TLD-68	West Security Fence West of C-745B Cylinder Yard & Southeast of Vortec Site	N 37 07 11.60797	W 088 49 11.43416	-7302	-617	N/A
10/01/2019 13:57 1518-662	JW	1/8/2020 10:25	AW	TLD-69	Wooden utility pole (T12-15 H) next to gravel road @Northeast corner of pond North of C-611	N 37 07 13.70394	W 088 49 28.37928	-8664	-888	N/A
10/01/2019 13:42 1519-663	JW	1/8/2020 10:03	AW	TLD-70	O/S of West Security Fence Southeast of C-333 midway between C810 parking area & North DuF6 Security Fence	N 37 06 27.82855	W 088 48 50.25203	-4173	-4189	N/A
10/01/2019 13:39 1520-664	JW	1/8/2020 9:58	AW	TLD-71	O/S of West Security Fence of DuF6 under security light, Northeast of wooden utility pole (11056 KU 78487)	N 37 06 23.05971	W 088 48 59.65074	-4723	-4903	N/A
10/01/2019 13:27 1521-665	JW	1/8/2020 9:43	AW	TLD-72	North Side of Air Monitoring Station AMD57, Northwest of Post 57	N 37 05 55.32798	W 088 49 15.28582	-4952	-7972	N/A
10/02/2019 09:31 1522-666	JW	1/8/2020 15:08	AW	TLD-73	Eastern "Railroad Crossing" sign @train tracks on Acid Road	N 37 06 06.14205	W 088 50 02.01070	-8883	-8241	N/A
10/01/2019 14:53 1523-667	JW	1/8/2020 13:22	AW	TLD-74	Located on "Warning Siren" sign @turnoff North of Magruder & Woodville intersection	N 37 05 10.96196	W 088 48 53.61411	-1765	-11586	N/A
10/01/2019 14:56 1524-668	JW	1/8/2020 13:26	AW	TLD-75	Located on "Warning Siren" sign @North of Kelley Rd & Woodville Rd intersection	N 37 05 04.94525	W 088 48 26.65157	496	-11409	N/A
10/01/2019 15:00 1525-669	JW	1/8/2020 13:32	AW	TLD-76	Located on "Tract A" sign below power lines southside of Kelley Rd in sharp curve between Woodville & McCaw Rds	N 37 05 55.05466	W 088 48 06.27328	310	-6082	N/A
10/01/2019 15:03 1526-670	JW	1/8/2020 13:36	AW	TLD-77	Located on "Warning Siren" sign North side of McCaw Rd east of Kelley Rd intersection	N 37 06 25.46598	W 088 47 33.66599	1737	-2287	N/A
10/01/2019 15:26 1527-671	JW	1/8/2020 14:05	AW	TLD-78	Northeast Corner of C-746U Landfill Security Fence	N 37 07 54.00752	W 088 47 37.45924	-1622	6020	N/A

4th Quarter CY 2019 TLD Location Information

Date/Time Issued/Badge ID	Issued By	Date/Time Collected	Collected By	Location Name	Description	NorthLong	West or East Lat	Xcoord	Ycoord	Comments
10/01/2019 14:16 1528-672	JW	1/8/2020 12:30	AW	TLD-79	Located on left post of the "Wildlife Management" gate on New Waterline Rd Southwest of Plant gate 41A west of C-612	N 37 07 28.86304	W 88 49 12.50003	-7981	993	N/A
10/01/2019 15:46 1529-673	JW	1/8/2020 14:30	AW	TLD-80	Located on "Cattle" gate west of MW 453 & MW 454 on gravel rd east of New Waterline Rd	N 37 07 47.29850	W 088 48 46.10944	-6612	3477	N/A
10/01/2019 13:33 1530-674 2887	JW	1/8/2020 9:48	AW	TLD-81	Southeast corner of DuF6 security fence next to gate V1 East of New Waterline East of C1100	N 37 06 18.33947	W 088 48 56.42591	-4314	-5262	N/A
10/01/2019 12:51 1531-675	JW	1/8/2020 9:07	AW	TLD-82	Short pole East of Dykes Rd North of Outfall 13	N 37 06 10.13175	W 088 48 13.53048	-765	-4851	N/A
10/01/2019 12:54 1532-676 2888	JW	1/8/2020 9:13	AW	TLD-83	Large metal power pole West of Dykes Rd South of Outfall 13	N 37 06 07.30640	W 088 48 20.71726	-1214	-5319	N/A
10/01/2019 10:41 1533-677	JW	1/8/2020 7:59	AW	TLD-84	Located @MW496 on the East Side of Dykes Rd	N 37 07 03.50589	W 088 47 49.26485	-769	894	N/A
10/01/2019 17:00 1534-678	SO	1/8/2020 10:20	SO	TLD-85	Residence; corner of Springwell and Buckner Lane	N 37 03 27.9036	W 088 40 43.9638	39082	-7750	N/A
10/01/2019 14:50 1535-679	JW	1/8/2020 13:18	AW	TLD-86	Plant Entrance, Gravel Construction Rd. Right side on orange warning signal sign	N 37° 5' 18.8622"	W 088 49 28.2282	-4676	-11794	N/A
10/02/2019 08:45 1536-680	JW	1/8/2020 15:14	AW	TLD-87	KOW Entrance north of Woodville Rd north of Kevil Eagles. Right side on orange warning signal sign	N 37 05 24.2802	W 088 50 43.9548	-10629	-13381	N/A
10/01/2019 16:03 1537-681	JW	1/8/2020 14:48	AW	TLD-88	Bethel Church Road KOW entrance. North of Massay Rd, right side on yellow post	N 37 07 05.4876	W 088 50 37.9608	-13677	-3597	N/A
10/01/2019 16:01 1538-682	JW	1/8/2020 14:45	AW	TLD-89	Bobo Rd, off of Bethel Church Rd. Continue east 200 yds past end of asphalt. At intersection on orange warning signal sign	N 37 07 35.9976	W 088 49 44.3922	-10657	788	N/A
10/01/2019 15:59 1539-683	JW	1/8/2020 14:38	AW	TLD-90	Bridge on Ogden Landing Rd east of Lamb's garage. On NE corner of bridge on contaminated creek sign	N 37 08 54.6714	W 088 47 27.2472	-12310	7182	N/A

4th Quarter CY 2019 TLD Location Information

Date/Time Issued/Badge ID	Issued By	Date/Time Collected	Collected By	Location Name	Description	NorthLong	West or East Lat	Xcoord	Ycoord	Comments
10/01/2019 15:36 1540-684	JW	1/8/2020 14:20	AW	TLD-91	Boldry School Rd on KOW at Shawnee plant entrance. On cattle gate road on hill, right side	N 37 08 40.9884	W 088 49 36.5232	-2952	12069	N/A
10/01/2019 15:31 1541-685	JW	1/9/2020 9:30	AW	TLD-92	First left road past C-746-U Landfill,cross Iron Bridge, on ICM-01 Notice Sign across from MW 133	N 37 08 23.18	W 088 47 25.41	9125	-1717	N/A
10/01/2019 15:12 1542-686	JW	1/8/2020 14:46	AW	TLD-93	MW 100, North on Metropolis Lake Rd past railroad tracks on left side on Well bollard	N 37 08 09.0744	W 088 46 50.9304	4874	7186	N/A
10/01/2019 15:16 1543-687	JW	1/8/2020 13:51	AW	TLD-94	Residence; corner of Ogden Landing Rd & Metropolis Lake Rd	N 37 05 48.9294	W 088 47 12.4332	4740	436	N/A
10/01/2019 15:06 1544-688	JW	1/8/2020 13:40	AW	TLD-95	West McCracken Health Clinic, Metropolis Lake Rd. On Light Pole in SW corner of parking lot	N 37 06 40.5468	W 088 46 47.2872	4617	-5167	N/A
10/02/2019 09:45 1545-689	JW	1/9/2020 9:45	AW	TLD-FB	Taken along while placing and collecting all other samples - stored in "lead box" at C-101 Dosimetry office	N/A	N/A	NA	NA	N/A
10/01/2019 07:00 1546-690	JW	1/7/2020 13:40	AW	TLD-TB	Stored in "lead box" at C-101 Dosimetry office	N/A	N/A	NA	NA	N/A
1547-691	JW	N/A	N/A	SPARE	Lead Box in C-101 Dosimetry office	N/A	N/A	N/A	N/A	N/A
1548-692	JW	N/A	N/A	SPARE	Lead Box in C-101 Dosimetry office	N/A	N/A	N/A	N/A	N/A
1549-693	JW	N/A	N/A	SPARE	Lead Box in C-101 Dosimetry office	N/A	N/A	N/A	N/A	N/A
1550-694	JW	N/A	N/A	SPARE	Lead Box in C-101 Dosimetry office	N/A	N/A	N/A	N/A	N/A
1551-695	JW	N/A	N/A	SPARE	Lead Box in C-101 Dosimetry office	N/A	N/A	N/A	N/A	N/A
1552-696	JW	N/A	N/A	SPARE	Lead Box in C-101 Dosimetry office	N/A	N/A	N/A	N/A	N/A
1480-622	JW	N/A	N/A	SPARE	Lead Box in C-101 Dosimetry office	N/A	N/A	N/A	N/A	N/A
1481-623	JW	N/A	N/A	SPARE	Lead Box in C-101 Dosimetry office	N/A	N/A	N/A	N/A	N/A
1478-624	JW	N/A	N/A	SPARE	Lead Box in C-101 Dosimetry office	N/A	N/A	N/A	N/A	N/A

APPENDIX C

TLD ANALYTICAL DATA

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Dosimetry Services Division
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Fax. (949) 296-1144
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Global Dosimetry Solutions Environmental Report

Account	98365 Four Rivers Nuclear Partnership, LLC
Location	00000LAT
Monitoring Period	1/1/2019
Process	0242242

Badge Number	Name	Exposure mR*
	CONTROL	15
	CONTROL	15
621	ENVIRONMENTAL	16
622	ENVIRONMENTAL	14
623	ENVIRONMENTAL	14
624	ENVIRONMENTAL	14
625	ENVIRONMENTAL	170
626	ENVIRONMENTAL	235
627	ENVIRONMENTAL	21
628	ENVIRONMENTAL	19
629	ENVIRONMENTAL	26
630	ENVIRONMENTAL	18
631	ENVIRONMENTAL	32
632	ENVIRONMENTAL	20
633	ENVIRONMENTAL	21
634	ENVIRONMENTAL	23
635	ENVIRONMENTAL	23
636	ENVIRONMENTAL	17
637	ENVIRONMENTAL	26
638	ENVIRONMENTAL	20
639	ENVIRONMENTAL	23
640	ENVIRONMENTAL	24
641	ENVIRONMENTAL	25

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Location	00000LAT
Monitoring Period	1/1/2019
Process	0242242

Badge Number	Name	Exposure mR*
642	ENVIRONMENTAL	28
643	ENVIRONMENTAL	21
644	ENVIRONMENTAL	24
645	ENVIRONMENTAL	28
646	ENVIRONMENTAL	21
647	ENVIRONMENTAL	42
648	ENVIRONMENTAL	19
649	ENVIRONMENTAL	110
650	ENVIRONMENTAL	21
651	ENVIRONMENTAL	19
652	ENVIRONMENTAL	20
653	ENVIRONMENTAL	292
654	ENVIRONMENTAL	460
655	ENVIRONMENTAL	22
656	ENVIRONMENTAL	18
657	ENVIRONMENTAL	18
658	ENVIRONMENTAL	21
659	ENVIRONMENTAL	20
660	ENVIRONMENTAL	25
661	ENVIRONMENTAL	19
662	ENVIRONMENTAL	20
663	ENVIRONMENTAL	47
664	ENVIRONMENTAL	46

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Location	00000LAT
Monitoring Period	1/1/2019
Process	0242242

Badge Number	Name	Exposure mR*
665	ENVIRONMENTAL	23
666	ENVIRONMENTAL	23
667	ENVIRONMENTAL	22
668	ENVIRONMENTAL	24
669	ENVIRONMENTAL	21
670	ENVIRONMENTAL	20
671	ENVIRONMENTAL	24
672	ENVIRONMENTAL	20
673	ENVIRONMENTAL	22
674	ENVIRONMENTAL	14
675	ENVIRONMENTAL	102
676	ENVIRONMENTAL	31
677	ENVIRONMENTAL	51
678	ENVIRONMENTAL	20
679	ENVIRONMENTAL	19
680	ENVIRONMENTAL	21
681	ENVIRONMENTAL	21
682	ENVIRONMENTAL	24
683	ENVIRONMENTAL	24
684	ENVIRONMENTAL	21
685	ENVIRONMENTAL	24
686	ENVIRONMENTAL	19
687	ENVIRONMENTAL	23

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Location	00000LAT
Monitoring Period	1/1/2019
Process	0242242

Badge Number	Name	Exposure mR*
688	ENVIRONMENTAL	25
689	ENVIRONMENTAL	25
690	ENVIRONMENTAL	15
691	ENVIRONMENTAL	14
692	ENVIRONMENTAL	14
693	ENVIRONMENTAL	13
694	ENVIRONMENTAL	14
695	ENVIRONMENTAL	14
696	ENVIRONMENTAL	11

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Global Dosimetry Solutions Environmental Report

Account	98365 Four Rivers Nuclear Partnership, LLC
Location	00000LAT
Monitoring Period	4/1/2019
Process	0243034

Badge Number	Name	Exposure mR*
	CONTROL	12
	CONTROL	12
621	ENVIRONMENTAL	10
622	ENVIRONMENTAL	12
623	ENVIRONMENTAL	11
624	ENVIRONMENTAL	11
625	ENVIRONMENTAL	203
626	ENVIRONMENTAL	276
627	ENVIRONMENTAL	14
628	ENVIRONMENTAL	16
629	ENVIRONMENTAL	20
630	ENVIRONMENTAL	15
631	ENVIRONMENTAL	28
632	ENVIRONMENTAL	16
633	ENVIRONMENTAL	15
634	ENVIRONMENTAL	20
635	ENVIRONMENTAL	15
636	ENVIRONMENTAL	15
637	ENVIRONMENTAL	20
638	ENVIRONMENTAL	16
639	ENVIRONMENTAL	17
640	ENVIRONMENTAL	27
641	ENVIRONMENTAL	16

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Account	98365 Four Rivers Nuclear Partnership, LLC
Location	00000LAT
Monitoring Period	4/1/2019
Process	0243034

Badge Number	Name	Exposure mR*
642	ENVIRONMENTAL	25
643	ENVIRONMENTAL	17
644	ENVIRONMENTAL	18
645	ENVIRONMENTAL	22
646	ENVIRONMENTAL	15
647	ENVIRONMENTAL	32
648	ENVIRONMENTAL	15
649	ENVIRONMENTAL	101
650	ENVIRONMENTAL	19
651	ENVIRONMENTAL	13
652	ENVIRONMENTAL	14
653	ENVIRONMENTAL	300
654	ENVIRONMENTAL	447
655	ENVIRONMENTAL	14
656	ENVIRONMENTAL	14
657	ENVIRONMENTAL	16
658	ENVIRONMENTAL	16
659	ENVIRONMENTAL	19
660	ENVIRONMENTAL	18
661	ENVIRONMENTAL	19
662	ENVIRONMENTAL	14
663	ENVIRONMENTAL	47
664	ENVIRONMENTAL	42

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Global Dosimetry Solutions Environmental Report

Account	98365 Four Rivers Nuclear Partnership, LLC
Location	00000LAT
Monitoring Period	4/1/2019
Process	0243034

Badge Number	Name	Exposure mR*
665	ENVIRONMENTAL	16
666	ENVIRONMENTAL	15
667	ENVIRONMENTAL	20
668	ENVIRONMENTAL	18
669	ENVIRONMENTAL	17
670	ENVIRONMENTAL	17
671	ENVIRONMENTAL	21
672	ENVIRONMENTAL	17
673	ENVIRONMENTAL	16
674	ENVIRONMENTAL	96
675	ENVIRONMENTAL	26
676	ENVIRONMENTAL	61
677	ENVIRONMENTAL	14
678	ENVIRONMENTAL	16
679	ENVIRONMENTAL	16
680	ENVIRONMENTAL	16
681	ENVIRONMENTAL	18
682	ENVIRONMENTAL	16
683	ENVIRONMENTAL	15
684	ENVIRONMENTAL	17
685	ENVIRONMENTAL	15
686	ENVIRONMENTAL	16
687	ENVIRONMENTAL	17

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Global Dosimetry Solutions Environmental Report

Account	98365 Four Rivers Nuclear Partnership, LLC
Location	00000LAT
Monitoring Period	4/1/2019
Process	0243034

Badge Number	Name	Exposure mR*
688	ENVIRONMENTAL	16
689	ENVIRONMENTAL	11
690	ENVIRONMENTAL	12
691	ENVIRONMENTAL	13
692	ENVIRONMENTAL	10
693	ENVIRONMENTAL	13
694	ENVIRONMENTAL	11
695	ENVIRONMENTAL	12
696	ENVIRONMENTAL	11

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Global Dosimetry Solutions Environmental Report

Account	98365 Four Rivers Nuclear Partnership, LLC
Location	00000LAT
Monitoring Period	7/1/2019
Process	0243969

Badge Number	Name	Exposure mR*
	CONTROL	15
	CONTROL	13
621	ENVIRONMENTAL	13
622	ENVIRONMENTAL	12
623	ENVIRONMENTAL	12
624	ENVIRONMENTAL	12
625	ENVIRONMENTAL	172
626	ENVIRONMENTAL	247
627	ENVIRONMENTAL	18
628	ENVIRONMENTAL	18
629	ENVIRONMENTAL	19
630	ENVIRONMENTAL	18
631	ENVIRONMENTAL	27
632	ENVIRONMENTAL	16
633	ENVIRONMENTAL	19
634	ENVIRONMENTAL	20
635	ENVIRONMENTAL	15
636	ENVIRONMENTAL	15
637	ENVIRONMENTAL	21
638	ENVIRONMENTAL	17
639	ENVIRONMENTAL	18
640	ENVIRONMENTAL	26
641	ENVIRONMENTAL	20

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Account	98365 Four Rivers Nuclear Partnership, LLC
Location	00000LAT
Monitoring Period	7/1/2019
Process	0243969

Badge Number	Name	Exposure mR*
642	ENVIRONMENTAL	27
643	ENVIRONMENTAL	19
644	ENVIRONMENTAL	18
645	ENVIRONMENTAL	25
646	ENVIRONMENTAL	18
647	ENVIRONMENTAL	41
648	ENVIRONMENTAL	18
649	ENVIRONMENTAL	86
650	ENVIRONMENTAL	22
651	ENVIRONMENTAL	14
652	ENVIRONMENTAL	16
653	ENVIRONMENTAL	292
654	ENVIRONMENTAL	467
655	ENVIRONMENTAL	16
656	ENVIRONMENTAL	17
657	ENVIRONMENTAL	17
658	ENVIRONMENTAL	18
659	ENVIRONMENTAL	19
660	ENVIRONMENTAL	20
661	ENVIRONMENTAL	20
662	ENVIRONMENTAL	16
663	ENVIRONMENTAL	45
664	ENVIRONMENTAL	38

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Account	98365 Four Rivers Nuclear Partnership, LLC
Location	00000LAT
Monitoring Period	7/1/2019
Process	0243969

Badge Number	Name	Exposure mR*
665	ENVIRONMENTAL	18
666	ENVIRONMENTAL	17
667	ENVIRONMENTAL	21
668	ENVIRONMENTAL	22
669	ENVIRONMENTAL	17
670	ENVIRONMENTAL	17
671	ENVIRONMENTAL	23
672	ENVIRONMENTAL	19
673	ENVIRONMENTAL	19
674	ENVIRONMENTAL	81
675	ENVIRONMENTAL	27
676	ENVIRONMENTAL	60
677	ENVIRONMENTAL	16
678	ENVIRONMENTAL	18
679	ENVIRONMENTAL	17
680	ENVIRONMENTAL	20
681	ENVIRONMENTAL	19
682	ENVIRONMENTAL	20
683	ENVIRONMENTAL	17
684	ENVIRONMENTAL	19
685	ENVIRONMENTAL	20
686	ENVIRONMENTAL	17
687	ENVIRONMENTAL	17

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Account	98365 Four Rivers Nuclear Partnership, LLC
Location	00000LAT
Monitoring Period	7/1/2019
Process	0243969

Badge Number	Name	Exposure mR*
688	ENVIRONMENTAL	21
689	ENVIRONMENTAL	12
690	ENVIRONMENTAL	13
691	ENVIRONMENTAL	13
692	ENVIRONMENTAL	13
693	ENVIRONMENTAL	12
694	ENVIRONMENTAL	12
695	ENVIRONMENTAL	11
696	ENVIRONMENTAL	13

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Account	98365 Four Rivers Nuclear Partnership, LLC
Location	00000LAT
Monitoring Period	10/1/2019
Process	0244792

Badge Number	Name	Exposure mR*
	CONTROL	12
	CONTROL	12
622	ENVIRONMENTAL	11
623	ENVIRONMENTAL	11
624	ENVIRONMENTAL	11
625	ENVIRONMENTAL	234
626	ENVIRONMENTAL	279
627	ENVIRONMENTAL	22
628	ENVIRONMENTAL	21
629	ENVIRONMENTAL	24
630	ENVIRONMENTAL	20
631	ENVIRONMENTAL	30
632	ENVIRONMENTAL	20
633	ENVIRONMENTAL	19
634	ENVIRONMENTAL	26
635	ENVIRONMENTAL	21
636	ENVIRONMENTAL	17
637	ENVIRONMENTAL	26
638	ENVIRONMENTAL	21
639	ENVIRONMENTAL	23
640	ENVIRONMENTAL	35
641	ENVIRONMENTAL	24
642	ENVIRONMENTAL	28

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Account	98365 Four Rivers Nuclear Partnership, LLC
Location	00000LAT
Monitoring Period	10/1/2019
Process	0244792

Badge Number	Name	Exposure mR*
643	ENVIRONMENTAL	20
644	ENVIRONMENTAL	23
645	ENVIRONMENTAL	28
646	ENVIRONMENTAL	21
647	ENVIRONMENTAL	51
648	ENVIRONMENTAL	19
649	ENVIRONMENTAL	116
650	ENVIRONMENTAL	21
651	ENVIRONMENTAL	18
652	ENVIRONMENTAL	19
653	ENVIRONMENTAL	380
654	ENVIRONMENTAL	563
655	ENVIRONMENTAL	20
656	ENVIRONMENTAL	17
657	ENVIRONMENTAL	18
658	ENVIRONMENTAL	17
659	ENVIRONMENTAL	21
660	ENVIRONMENTAL	25
661	ENVIRONMENTAL	22
662	ENVIRONMENTAL	19
663	ENVIRONMENTAL	50
664	ENVIRONMENTAL	40
665	ENVIRONMENTAL	23

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Account	98365 Four Rivers Nuclear Partnership, LLC
Location	00000LAT
Monitoring Period	10/1/2019
Process	0244792

Badge Number	Name	Exposure mR*
666	ENVIRONMENTAL	20
667	ENVIRONMENTAL	26
668	ENVIRONMENTAL	22
669	ENVIRONMENTAL	20
670	ENVIRONMENTAL	21
671	ENVIRONMENTAL	26
672	ENVIRONMENTAL	19
673	ENVIRONMENTAL	22
674	ENVIRONMENTAL	107
675	ENVIRONMENTAL	27
676	ENVIRONMENTAL	68
677	ENVIRONMENTAL	20
678	ENVIRONMENTAL	22
679	ENVIRONMENTAL	23
680	ENVIRONMENTAL	22
681	ENVIRONMENTAL	21
682	ENVIRONMENTAL	23
683	ENVIRONMENTAL	22
684	ENVIRONMENTAL	22
685	ENVIRONMENTAL	21
686	ENVIRONMENTAL	20
687	ENVIRONMENTAL	23
688	ENVIRONMENTAL	24

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Location	00000LAT
Monitoring Period	10/1/2019
Process	0244792

Badge Number	Name	Exposure mR*
689	ENVIRONMENTAL	13
690	ENVIRONMENTAL	12
691	ENVIRONMENTAL	11
692	ENVIRONMENTAL	12
693	ENVIRONMENTAL	11
694	ENVIRONMENTAL	12
695	ENVIRONMENTAL	12
696	ENVIRONMENTAL	11

*- No control exposures have been subtracted, and only element, reader and fade corrections have been made.

+ - Unusual element result observed. D - Element damaged and cannot be evaluated.

REP4109_0

Environmental Dosimeter Report
From 01/01/2019 to 12/31/2019

Participant Name, Number	TLD Location	Begin wear date	End wear date	Dosimeter Type	Total Neutron	Fast Neutron	Thermal Neutron
VISITOR,02882	TLD-2	1/1/2019	3/31/2019	Neutron	M	M	M
VISITOR,02883	TLD-3	1/1/2019	3/31/2019	Neutron	M	M	M
VISITOR,02884	TLD-50	1/1/2019	3/31/2019	Neutron	M	M	M
VISITOR,02885	TLD-65	1/1/2019	3/31/2019	Neutron	M	M	M
VISITOR,02886	TLD-68	1/1/2019	3/31/2019	Neutron	M	M	M
VISITOR,02887	TLD-81	1/1/2019	3/31/2019	Neutron	M	M	M
VISITOR,02888	TLD-83	1/1/2019	3/31/2019	Neutron	M	M	M
VISITOR,02882	TLD-2	4/1/2019	6/30/2019	Neutron	M	M	M
VISITOR,02883	TLD-3	4/1/2019	6/30/2019	Neutron	M	M	M
VISITOR,02884	TLD-50	4/1/2019	6/30/2019	Neutron	M	M	M
VISITOR,02885	TLD-65	4/1/2019	6/30/2019	Neutron	M	M	M
VISITOR,02886	TLD-68	4/1/2019	6/30/2019	Neutron	M	M	M
VISITOR,02887	TLD-81	4/1/2019	6/30/2019	Neutron	M	M	M
VISITOR,02888	TLD-83	4/1/2019	6/30/2019	Neutron	M	M	M
VISITOR,02882	TLD-2	7/1/2019	9/30/2019	Neutron	M	M	M
VISITOR,02883	TLD-3	7/1/2019	9/30/2019	Neutron	M	M	M
VISITOR,02884	TLD-50	7/1/2019	9/30/2019	Neutron	M	M	M
VISITOR,02885	TLD-65	7/1/2019	9/30/2019	Neutron	M	M	M
VISITOR,02886	TLD-68	7/1/2019	9/30/2019	Neutron	M	M	M
VISITOR,02887	TLD-81	7/1/2019	9/30/2019	Neutron	M	M	M
VISITOR,02888	TLD-83	7/1/2019	9/30/2019	Neutron	M	M	M
VISITOR,02882	TLD-2	10/1/2019	12/31/2019	Neutron	M	M	M
VISITOR,02883	TLD-3	10/1/2019	12/31/2019	Neutron	M	M	M
VISITOR,02884	TLD-50	10/1/2019	12/31/2019	Neutron	M	M	M
VISITOR,02885	TLD-65	10/1/2019	12/31/2019	Neutron	M	M	M
VISITOR,02886	TLD-68	10/1/2019	12/31/2019	Neutron	M	M	M
VISITOR,02887	TLD-81	10/1/2019	12/31/2019	Neutron	M	M	M
VISITOR,02888	TLD-83	10/1/2019	12/31/2019	Neutron	M	M	M

Minimal Dose Equivalent Reported: Dose equivalents below the minimum measurable quantity for the current monitoring period are recorded as "M".

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APPENDIX D

ENVIRONMENTAL TLD DATA

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CY 2019 Environmental TLD Data

TLD Location Number	Quarter 1						Quarter 2						Quarter 3						Quarter 4						Total Monitored Effective Dose (mrem)	Total Exposure Days	Annualized Effective Dose (mrem)	Net Annualized Effective Dose (mrem)	Net Annualized mrem/day	Net Annualized mrem/hour
	TLD Location Number	Start	End	Exposure Days	Effective Dose (mrem)	Normalized Effective Dose/day	TLD Location Number	Start	End	Exposure Days	Effective Dose (mrem)	Normalized Effective Dose/day	TLD Location Number	Start	End	Exposure Days	Effective Dose (mrem)	Normalized Effective Dose/day	TLD Location Number	Start	End	Exposure Days	Effective Dose (mrem)	Normalized Effective Dose/day						
1	1	1/10/2019	4/3/2019	83	170	2.05	1	4/3/2019	7/1/2019	89	203	2.28	1	7/1/2019	10/1/2019	92	172	1.87	1	10/1/2019	1/8/2020	99	234	2.36	779	363	783	703	1.927	0.080
2	2	1/10/2019	4/3/2019	83	235	2.83	2	4/3/2019	7/1/2019	89	276	3.10	2	7/1/2019	10/1/2019	92	247	2.68	2	10/1/2019	1/8/2020	99	279	2.82	1037	363	1043	963	2.638	0.110
3	3	1/14/2019	4/4/2019	80	21	0.26	3	4/4/2019	7/1/2019	88	14	0.16	3	7/1/2019	10/1/2019	92	18	0.20	3	10/1/2019	1/8/2020	99	22	0.22	75	359	76	-4	-0.010	0.000
4	4	1/10/2019	4/3/2019	83	19	0.23	4	4/3/2019	7/1/2019	89	16	0.18	4	7/1/2019	10/1/2019	92	18	0.20	4	10/1/2019	1/8/2020	99	21	0.21	74	363	74	-6	-0.015	-0.001
5	5	1/10/2019	4/3/2019	83	26	0.31	5	4/3/2019	7/1/2019	89	20	0.22	5	7/1/2019	10/1/2019	92	19	0.21	5	10/1/2019	1/8/2020	99	24	0.24	89	363	89	9	0.026	0.001
6	6	1/10/2019	4/3/2019	83	18	0.22	6	4/3/2019	7/1/2019	89	15	0.17	6	7/1/2019	10/1/2019	92	18	0.20	6	10/1/2019	1/8/2020	99	20	0.20	71	363	71	-9	-0.024	-0.001
7	7	1/10/2019	4/3/2019	83	32	0.39	7	4/3/2019	7/1/2019	89	28	0.31	7	7/1/2019	10/1/2019	92	27	0.29	7	10/1/2019	1/8/2020	99	30	0.30	117	363	118	38	0.103	0.004
8	9	1/10/2019	4/3/2019	83	20	0.24	9	4/3/2019	7/1/2019	89	16	0.18	9	7/1/2019	10/2/2019	93	16	0.17	9	10/2/2019	1/8/2020	98	20	0.20	72	363	72	-8	-0.021	-0.001
9	12	1/10/2019	4/3/2019	83	21	0.25	12	4/3/2019	7/1/2019	89	15	0.17	12	7/1/2019	10/1/2019	92	19	0.21	12	10/1/2019	1/8/2020	99	19	0.19	74	363	74	-6	-0.015	-0.001
10	13	1/10/2019	4/3/2019	83	23	0.28	13	4/3/2019	7/1/2019	89	20	0.22	13	7/1/2019	10/1/2019	92	20	0.22	13	10/1/2019	1/8/2020	99	26	0.26	89	363	89	9	0.026	0.001
11	14	1/10/2019	4/3/2019	83	23	0.28	14	4/3/2019	7/1/2019	89	15	0.17	14	7/1/2019	10/1/2019	92	15	0.16	14	10/1/2019	1/8/2020	99	21	0.21	74	363	74	-6	-0.015	-0.001
12	15	1/10/2019	4/3/2019	83	17	0.20	15	4/3/2019	7/1/2019	89	15	0.17	15	7/1/2019	10/1/2019	92	15	0.16	15	10/1/2019	1/8/2020	99	17	0.17	64	363	64	-16	-0.043	-0.002
13	16	1/10/2019	4/3/2019	83	26	0.31	16	4/3/2019	7/1/2019	89	20	0.22	16	7/1/2019	10/1/2019	92	21	0.23	16	10/1/2019	1/8/2020	99	26	0.26	93	363	94	14	0.037	0.002
14	19	1/10/2019	4/3/2019	83	20	0.24	19	4/3/2019	7/1/2019	89	16	0.18	19	7/1/2019	10/1/2019	92	17	0.18	19	10/1/2019	1/8/2020	99	21	0.21	74	363	74	-6	-0.015	-0.001
15	22	1/10/2019	4/3/2019	83	23	0.25	22	4/3/2019	7/1/2019	89	17	0.19	22	7/1/2019	10/1/2019	92	18	0.20	22	10/1/2019	1/9/2020	100	23	0.23	81	364	81	1	0.003	0.000
16	25	1/10/2019	4/3/2019	83	24	0.29	25	4/3/2019	7/1/2019	89	27	0.30	25	7/1/2019	10/1/2019	92	26	0.28	25	10/1/2019	1/8/2020	99	35	0.35	112	363	113	33	0.089	0.004
17	30	1/10/2019	4/3/2019	83	25	0.30	30	4/3/2019	7/1/2019	89	16	0.18	30	7/1/2019	10/1/2019	92	20	0.22	30	10/1/2019	1/8/2020	99	24	0.24	85	363	85	5	0.015	0.001
18	35	1/10/2019	4/3/2019	83	28	0.34	35	4/3/2019	7/1/2019	89	25	0.28	35	7/1/2019	10/1/2019	92	27	0.29	35	10/1/2019	1/8/2020	99	28	0.28	108	363	109	29	0.078	0.003
19	37	1/10/2019	4/3/2019	83	21	0.25	37	4/3/2019	7/1/2019	89	17	0.19	37	7/1/2019	10/1/2019	92	19	0.21	37	10/1/2019	1/8/2020	99	20	0.20	77	363	77	-3	-0.007	0.000
20	38	1/10/2019	4/3/2019	83	24	0.29	38	4/3/2019	7/1/2019	89	18	0.20	38	7/1/2019	10/2/2019	93	18	0.19	38	10/2/2019	1/8/2020	98	23	0.23	83	363	83	3	0.009	0.000
21	40	1/10/2019	4/3/2019	83	28	0.34	40	4/3/2019	7/1/2019	89	22	0.25	40	7/1/2019	10/1/2019	92	25	0.27	40	10/1/2019	1/8/2020	99	28	0.28	103	363	104	24	0.065	0.003
22	46	1/10/2019	4/3/2019	83	21	0.25	46	4/3/2019	7/1/2019	89	15	0.17	46	7/1/2019	10/1/2019	92	18	0.20	46	10/1/2019	1/8/2020	99	21	0.21	75	363	75	-5	-0.013	-0.001
23	50	1/10/2019	4/3/2019	83	42	0.51	50	4/3/2019	7/1/2019	89	32	0.36	50	7/1/2019	10/1/2019	92	41	0.45	50	10/1/2019	1/8/2020	99	51	0.52	166	363	167	87	0.238	0.010
24	52	1/10/2019	4/3/2019	83	19	0.23	52	4/3/2019	7/1/2019	89	15	0.17	52	7/1/2019	10/1/2019	92	18	0.20	52	10/1/2019	1/8/2020	99	19	0.19	71	363	71	-9	-0.024	-0.001
25	53	1/10/2019	4/3/2019	83	110	1.33	53	4/3/2019	7/1/2019	89	101	1.13	53	7/1/2019	10/1/2019	92	86	0.93	53	10/1/2019	1/8/2020	99	116	1.17	413	363	415	335	0.919	0.038
26	54	1/10/2019	4/3/2019	83	21	0.25	54	4/3/2019	7/1/2019	89	19	0.21	54	7/1/2019	10/1/2019	92	22	0.24	54	10/1/2019	1/8/2020	99	21	0.21	83	363	83	3	0.009	0.000
28	58	1/10/2019	4/3/2019	83	19	0.23	58	4/3/2019	7/1/2019	89	13	0.15	58	7/1/2019	10/1/2019	92	14	0.15	58	10/1/2019	1/8/2020	99	18	0.18	64	363	64	-16	-0.043	-0.002
29	59	1/9/2019	4/4/2019	85	20	0.24	59	4/4/2019	7/1/2019	88	14	0.16	59	7/1/2019	10/1/2019	92	16	0.17	59	10/1/2019	1/7/2020	98	19	0.19	69	363	69	-11	-0.029	-0.001
30	60	1/9/2019	4/3/2019	84	292	3.48	60	4/3/2019	7/1/2019	89	300	3.37	60	7/1/2019	10/1/2019	92	292	3.17	60	10/1/2019	1/7/2020	98	380	3.88	1264	363	1271	1191	3.263	0.136
31	61	1/9/2019	4/3/2019	84	460	5.48	61	4/3/2019	7/1/2019	89	447	5.02	61	7/1/2019	10/1/2019	92	467	5.08	61	10/1/2019	1/7/2020	98	563	5.74	1937	363	1948	1868	5.117	0.213
32	62	1/9/2019	4/3/2019	84	22	0.26	62	4/3/2019	7/1/2019	89	14	0.16	62	7/1/2019	10/1/2019	92	16	0.17	62	10/1/2019	1/7/2020	98	20	0.20	72	363	72	-8	-0.021	-0.001
33	63	1/9/2019	4/4/2019	85	18	0.21	63	4/4/2019	7/1/2019	88	14	0.16	63	7/1/2019	10/1/2019	92	17	0.18	63	10/1/2019	1/7/2020	98	17	0.17	66	363	66	-14	-0.037	-0.002
34	64	1/10/2019	4/3/2019	83	18	0.22	64	4/3/2019	7/1/2019	89	16	0.18	64	7/1/2019	10/1/2019	92	17	0.18	64	10/1/2019	1/8/2020	99	18	0.18	69	363	69	-11	-0.029	-0.001
35	65	1/10/2019	4/3/2019	83	21	0.25	65	4/3/2019	7/1/2019	89	16	0.18	65	7/1/2019	10/1/2019	92	18	0.20	65	10/1/2019	1/8/2020	99	17	0.17	72	363	72	-8	-0.021	-0.001
36	66	1/10/2019	4/3/2019	83	20	0.24	66	4/3/2019	7/1/2019	89	19	0.21	66	7/1/2019	10/1/2019	92	19	0.21	66	10/1/2019	1/8/2020	99	21	0.21	79	363	79	-1	-0.002	0.000
37	67	1/10/2019	4/3/2019	83	25	0.30	67	4/3/2019	7/1/2019	89	18	0.20	67	7/1/2019	10/1/2019	92	20	0.22	67	10/1/2019	1/8/2020	99	25	0.25	88	363	88	8	0.023	0.001
38	68	1/10/2019	4/3/2019	83	19	0.23	68	4/3/2019	7/1/2019	89	19	0.21	68	7/1/2019	10/1/2019	92	20	0.22	68	10/1/2019	1/8/2020	99	22	0.22	80	363	80	0	0.001	0.000
39	69	1/10/2019	4/3/2019	83	20	0.24	69	4/3/2019	7/1/2019	89	14	0.16	69	7/1/2019	10/1/2019	92	16	0.17	69	10/1/2019	1/8/2020	99	19	0.19	69	363	69	-11	-0.029	-0.001
40	70	1/10/2019	4/3/2019	83	47	0.57	70	4/3/2019	7/1/2019	89	47	0.53	70	7/1/2019	10/1/2019	92	45	0.49	70	10/1/2019	1/8/2020	99	50	0.51	189	363	190	110	0.301	0.013
41	71	1/10/2019	4/3/2019	83	46	0.55	71	4/3/2019	7/1/2019	89	42	0.47	71	7/1/2019	10/1/2019	92	38	0.41	71	10/1/2019	1/8/2020	99	40	0.40	166	363	167	87	0.238	0.010
42	72	1/10/2019	4/3/2019	83	23	0.28	72	4/3/2019	7/1/2019	89	16	0.18	72	7/1/2019	10/1/2019	92	18	0.20	72	10/1/2019	1/8/2020	99	23	0.23	80	363	80	0	0.001	0.000
43	73	1/10/2019	4/3/2019	83	23	0.28	73	4/3/2019	7/1/2019	89	15	0.17	73	7/1/2019	10/2/2019	93	17	0.18	73	10/2/2019	1/8/2020	98	20	0.20	75	363	75	-5	-0.013	-0.001
44	74	1/10/2019	4/3/2019	83	22	0.27	74	4/3/2019	7/1/2019	89	20	0.22	74	7/1/2019	10/1/2019	92	21	0.23	74	10/1/2019	1/8/2020	99	26	0.26	89	363	89	9	0.026	0.001
45	75	1/10/2019	4/3/2019	83	24	0.29	75	4/3/2019	7/1/2019	89	18	0.20	75	7/1/2019	10/1/2019	92	22	0.24	75	10/1/2019	1/8/2020	99	22	0.22	86	363	86	6	0.018	0.001
46	76	1/10/2019	4/3/2019	83	21	0.25	76	4/3/2019	7/1/2019	89	17	0.19	76	7/1/2019	10/1/2019	92	17	0.18	76	10/1/2019	1/8/2020	99	20	0.20	75	363	75	-5	-0.013	-0.001
47	77	1/10/2019	4/3/2019	83	20	0.24	77	4/3/2019	7/1/2019	89	17	0.19	77	7/1/2019	10/1/2019	92	17	0.18	77	10/1/2019	1/8/2020	99	21	0.21	75	363	75	-5	-0.013	-0.001
48	78	1/10/2019	4/3/2019	83	24	0.29	78	4/3/2019	7/1/2019	89	21	0.24	78	7/1/2019	10/1/2019	92	23	0.25	78	10/1/2019	1/8/2020	99	26	0.26	94	363	95	15	0.040	0.002
49	79	1/10/2019	4/3/2019	83	20	0.24	79	4/3/2019	7/1/2019	89	17	0.19	79	7/1/2019	10/1/2019	92	19	0.21	79	10/1/2019	1/8/2020	99	19	0.19	75	363	75	-5	-0.013	-0.001
50	80	1/10/2019	4/3/2019	83	22	0.27	80	4/3/2019	7/1/2019	89	16	0.18	80	7/1/2019	10/1/2019	92	19	0.21	80	10/1/2019	1/8/2020	99	22	0.22	79	363	79	-1	-0.002	0.000
51	81	1/10/2019	4/3/2019	83	102	1.23	81	4/3/2019	7/1/2019	89	96	1.08	81	7/1/2019	10/1/2019	92	81	0.88	81	10/1/2019	1/8/2020	99	107	1.08	386	363	388	308	0.844	0.035
52	82	1/10/2019	4/3/2019	83	31	0.37	82	4/3/2019	7/1/2019	89	26	0.29	82	7/1/2019	10/1/2019	92	27	0.29	82	10/1/2019	1/8/2020	99	27	0.27	111	363	112	32	0.087	0.004
53	83	1/10/2019	4/3/2019	83	51	0.61	83	4/3/2019	7/1/2019	89	61	0.69	83	7/1/2019	10/1/2019	92	60	0.65	83	10/1/2019	1/8/2020	99	68	0.69	240	363	241	161	0.442	0.018
54	84	1/10/2019	4/3/2019	83	20	0.24	84	4/3/2019	7/1/2019	89	14	0.16	84	7/1/2019	10/1/2019	92	16	0.17	84	10/1/2019	1/8/2020	99	20	0.20	70	363	70	-10	-0.026	-0.001
55	85	1/9/2019	4/3/2019	84	19	0.23	85	4/3/2019	7/1/2019	89	16	0.18	85	7/1/2019	10/1/2019	92	18	0.20	85	10/1/2019	1/8/2020	99	22	0.22	75	364	75	-5	-0.013	-0.001
56	86	1/10/2019	4/3/2019	83	21	0.25	86	4/3/2019	7/1/2019	89	16	0.18	86	7/1/2019	10/1/2019	92	17	0.18	86	10/1/2019	1/8/2020	99	23	0.23	77	363	77	-3	-0.007	0.000
57	87	1/10/2019	4/3/2019	83	21	0.25	87	4/3/2019	7/1/2019	89	16	0.18	87	7/1/2019	10/2/2019	93	20	0.22	87	10/2/2019	1/8/2020	98	22	0.22	79	363	79	-1	-0.002	0.000
58	88	1/10/2019	4/3/2019	83	24	0.29	88	4/3/2019	7/1/2019	89	18	0.20	88	7/1/2019	10/1/2019	92	19	0.21	88	10/1/2019	1/8/2020	99	21	0.21	82	363	82	2	0.007	0.000
59	89	1/10/2019	4/3/2019	83	24	0.29	89	4/3/2019	7/1/2019	89	16	0.18	89	7/1/2019	10/1/2019	92	20	0.22	89	10/1/2019	1/8/2020	99	23	0.23	83	363	83	3	0.009	0.000
60	90	1/10/2019	4/3/2019	83	21	0.25	90	4/3/2019	7/1/2019	89	15	0.17	90	7/1/2019	10/1/2019	92	17	0.18	90	10/1/2019	1/8/2020	99	22	0.22	75	363	75	-5	-0.013	-0.001
61	91	1/10/2019	4/3/2019	83	24	0.29	91	4/3/2019	7/1/2019	89	17	0.19	91	7/1/2019	10/1/2019	92	19	0.21	91	10/1/2019	1/8/2020	99	22	0.22	82	363	82	2	0.007	0.000
62	92	1/10/2019	4/3/2019	83	19	0.23	92	4/3/2019	7/1/2019	89	15	0.17	92	7/1/2019	10/1/2019	92	20	0.22	92	10/1/2019	1/9/2020	100	21	0.21	75	364	75	-5	-0.013	-0.001
63	93	1/10/2019	4/3/2019	83	23	0.28	93	4/3/2019	7/1/2019	89	16	0.18	93	7/1/2019	10/1/2019	92	17	0.18	93	10/1/2019	1/8/2020	99	20	0.20	76	363	76	-4	-0.010	0.000
64	94	1/10/2019	4/3/2019	83	25	0.30	94	4/3/2019	7/1/2019	89	17	0.19	94	7/1/2019	10/1/2019	92	17	0.18	94	10/1/2019	1/8/2020	99	23	0.23	82	363	82	2	0.007	0.000
65	95	1/10/2019	4/3/2019	83	25	0.30	95	4/3/2019	7/1/2019	89	16	0.18	95	7/1/2019	10/1/2019	92	21	0.23	95	10/1/2019	1/8/2020	99	24	0.24	86	363	86	6	0.018	0.001
66	FB	1/10/2019	4/4/2019	84	15	0.18	FB	4/4/2019	7/1/2019	88	11	0.13	FB	7/1/2019	10/2/2019	93	12	0.13	FB	10/2/2019	1/9/2020	99	13	0.13	51	364	51	-29	-0.079	-0.003
67	TB	1/9/2019	4/3/2019	84	14	0.17	TB	4/3/2019	7/1/2019	89	12	0.13	TB	7/1/2019	10/1/2019	92	13	0.14	TB	10/1/2019	1/7/2020	98	12	0.12	51	363	51	-29	-0.079	-0.003

Background Locations	Annualized Effective Dose
22	81.22
54	83.46
85	75.21
86	77.42
87	79.44
88	82.45
89	83.46
90	75.41
91	82.45
92	75.21
93	76.42
94	82.45
95	86.47
Average Bkg DDE	80.08
3 sigma	11.36
Lower Range	68.72
Upper Range	91.44
Standard Deviation	3.79

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APPENDIX E

NEUTRON AREA DOSIMETER DATA

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Environmental Dosimeter Report
From 01/01/2019 to 12/31/2019

Participant Name, Number	TLD Location	Begin wear date	End wear date	Dosimeter Type	Total Neutron	Fast Neutron	Thermal Neutron
VISITOR,02882	TLD-2	1/1/2019	3/31/2019	Neutron	M	M	M
VISITOR,02883	TLD-3	1/1/2019	3/31/2019	Neutron	M	M	M
VISITOR,02884	TLD-50	1/1/2019	3/31/2019	Neutron	M	M	M
VISITOR,02885	TLD-65	1/1/2019	3/31/2019	Neutron	M	M	M
VISITOR,02886	TLD-68	1/1/2019	3/31/2019	Neutron	M	M	M
VISITOR,02887	TLD-81	1/1/2019	3/31/2019	Neutron	M	M	M
VISITOR,02888	TLD-83	1/1/2019	3/31/2019	Neutron	M	M	M
VISITOR,02882	TLD-2	4/1/2019	6/30/2019	Neutron	M	M	M
VISITOR,02883	TLD-3	4/1/2019	6/30/2019	Neutron	M	M	M
VISITOR,02884	TLD-50	4/1/2019	6/30/2019	Neutron	M	M	M
VISITOR,02885	TLD-65	4/1/2019	6/30/2019	Neutron	M	M	M
VISITOR,02886	TLD-68	4/1/2019	6/30/2019	Neutron	M	M	M
VISITOR,02887	TLD-81	4/1/2019	6/30/2019	Neutron	M	M	M
VISITOR,02888	TLD-83	4/1/2019	6/30/2019	Neutron	M	M	M
VISITOR,02882	TLD-2	7/1/2019	9/30/2019	Neutron	M	M	M
VISITOR,02883	TLD-3	7/1/2019	9/30/2019	Neutron	M	M	M
VISITOR,02884	TLD-50	7/1/2019	9/30/2019	Neutron	M	M	M
VISITOR,02885	TLD-65	7/1/2019	9/30/2019	Neutron	M	M	M
VISITOR,02886	TLD-68	7/1/2019	9/30/2019	Neutron	M	M	M
VISITOR,02887	TLD-81	7/1/2019	9/30/2019	Neutron	M	M	M
VISITOR,02888	TLD-83	7/1/2019	9/30/2019	Neutron	M	M	M
VISITOR,02882	TLD-2	10/1/2019	12/31/2019	Neutron	M	M	M
VISITOR,02883	TLD-3	10/1/2019	12/31/2019	Neutron	M	M	M
VISITOR,02884	TLD-50	10/1/2019	12/31/2019	Neutron	M	M	M
VISITOR,02885	TLD-65	10/1/2019	12/31/2019	Neutron	M	M	M
VISITOR,02886	TLD-68	10/1/2019	12/31/2019	Neutron	M	M	M
VISITOR,02887	TLD-81	10/1/2019	12/31/2019	Neutron	M	M	M
VISITOR,02888	TLD-83	10/1/2019	12/31/2019	Neutron	M	M	M

Minimal Dose Equivalent Reported: Dose equivalents below the minimum measurable quantity for the current monitoring period are recorded as "M".

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APPENDIX F

NEUTRON AREA DOSIMETER REPORT

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SWIFT & STANLEY INC
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Received Date / Reported Date	2019-04-12 / 2019-04-18
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The following dose calculation algorithms were used for assessing the reported doses

Dosimeter Model	Dosimeter Type	Algorithm Version
InLight	Whole Body	00101
CR-39--Thermal	Whole Body	03001

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Technical: (800) 438-3241

Radiation Dosimetry Report

Account : 711723 Subaccount: 8018823 Series: DAR

Participant Number	Name		Dosimeter	Use	Rad. Type	Rad. Quality	Equivalent Dose (mrem) for Periods Shown Below												Inception Date	Serial Number
							Period Shown Below			Quarter to Date			Year to Date			Lifetime to Date				
	ID Number	Birth Date					Whole Body	Lens	Skin	Whole Body	Lens	Skin	Whole Body	Lens	Skin	Whole Body	Lens	Skin		
For Monitoring Period:							2018-01-01 to 2018-12-31			QUARTER 1			2018			LIFETIME				
	Average Control Dose		L02TN				**72**	**72**	**72**											
03384	24		L02TN	WHBODY	*		**M**	**M**	**M**	M	M	M	M	M	M	M	M	M	2018/01	XA01515024V
03413	53		L02TN	WHBODY	*		**M**	**M**	**M**	M	M	M	M	M	M	M	M	M	2018/01	XA02331418G
For Monitoring Period:							2019-01-01 to 2019-03-31			QUARTER 1			2019			LIFETIME				
00DAR	CONTROL		L02TN	CNTRL																XA00825385E
	Control Dose Used		L02TN				**10**	**10**	**10**											
02882	Area		L02TN	AREA	P		**181**	**181**	**178**										2018/01	XA00824660L
					P	H	**181**	**181**	**178**											
					N	T	**M**	**M**	**M**											
					N	F	**M**	**M**	**M**											
02883	Area		L02TN	AREA	P		**8**	**8**	**8**										2018/01	XA00824911I
					P		**8**	**8**	**8**											
					N	T	**M**	**M**	**M**											
					N	F	**M**	**M**	**M**											
02884	Area		L02TN	AREA	P		**16**	**15**	**14**										2018/01	XA00825301U
					P		**16**	**15**	**14**											
					N	T	**M**	**M**	**M**											
					N	F	**M**	**M**	**M**											
02885	Area		L02TN	AREA	P		**5**	**5**	**5**										2018/01	XA00824989V
					P		**5**	**5**	**5**											
					N	T	**M**	**M**	**M**											
					N	F	**M**	**M**	**M**											
02886	Area		L02TN	AREA	P		**6**	**6**	**6**										2018/01	XA00825139F
					P		**6**	**6**	**6**											
					N	T	**M**	**M**	**M**											
					N	F	**M**	**M**	**M**											

* - Standard background control rate used for control subtraction

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The following dose calculation algorithms were used for assessing the reported doses

Dosimeter Model	Dosimeter Type	Algorithm Version
InLight	Whole Body	00101
CR-39--Thermal	Whole Body	03001

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Radiation Dosimetry Report

Account : 711723 Subaccount: 8018823 Series: DAR

Participant Number	Name		Dosimeter	Use	Rad. Type	Rad. Quality	Equivalent Dose (mrem) for Periods Shown Below												Inception Date	Serial Number
							Period Shown Below			Quarter to Date			Year to Date			Lifetime to Date				
	ID Number	Birth Date					Whole Body	Lens	Skin	Whole Body	Lens	Skin	Whole Body	Lens	Skin	Whole Body	Lens	Skin		
For Monitoring Period:							2019-01-01 to 2019-03-31			QUARTER 1			2019			LIFETIME				
02887	Area		L02TN	AREA	P		**70**	**70**	**70**										2018/01	XA008259919
					P	H	**70**	**70**	**70**											
					N	T	**M**	**M**	**M**											
					N	F	**M**	**M**	**M**											
02888	Area		L02TN	AREA	P		**42**	**42**	**41**										2018/01	XA00825051V
					P		**42**	**42**	**41**											
					N	T	**M**	**M**	**M**											
					N	F	**M**	**M**	**M**											

* - Standard background control rate used for control subtraction

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The following dose calculation algorithms were used for assessing the reported doses

Dosimeter Model	Dosimeter Type	Algorithm Version
InLight	Whole Body	00101
CR-39--Thermal	Whole Body	03001

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Radiation Dosimetry Report

Account : 711723 Subaccount: 8018823 Series: DAR

Participant Number	Name		Dosimeter	Use	Rad. Type	Rad. Quality	Equivalent Dose (mrem) for Periods Shown Below												Inception Date	Serial Number
							Period Shown Below			Quarter to Date			Year to Date			Lifetime to Date				
	ID Number	Birth Date					Whole Body	Lens	Skin	Whole Body	Lens	Skin	Whole Body	Lens	Skin	Whole Body	Lens	Skin		
For Monitoring Period:							2019-04-01 to 2019-06-30			QUARTER 2			2019			LIFETIME				
00DAR	CONTROL		L02TN	CNTRL																XA00664342J
	Control Dose Used		L02TN				**13**	**13**	**13**											
02882	Area		L02TN	AREA	P		**261**	**261**	**258**										2018/01	XA00548100W
					P	H	**261**	**261**	**258**											
					N	T	**M**	**M**	**M**											
					N	F	**M**	**M**	**M**											
02883	Area		L02TN	AREA	P		**7**	**7**	**7**										2018/01	XA02494969J
					P		**7**	**7**	**7**											
					N	T	**M**	**M**	**M**											
					N	F	**M**	**M**	**M**											
02884	Area		L02TN	AREA	P		**27**	**27**	**27**										2018/01	XA01008489B
					P		**27**	**27**	**27**											
					N	T	**M**	**M**	**M**											
					N	F	**M**	**M**	**M**											
02885	Area		L02TN	AREA			**M**	**M**	**M**										2018/01	XA02072616A
02886	Area		L02TN	AREA	P		**11**	**11**	**11**										2018/01	XA018337929
					P		**11**	**11**	**11**											
					N	T	**M**	**M**	**M**											
					N	F	**M**	**M**	**M**											
02887	Area		L02TN	AREA	P		**72**	**72**	**69**										2018/01	XA02305225R
					P	M	**72**	**72**	**69**											
					N	T	**M**	**M**	**M**											
					N	F	**M**	**M**	**M**											

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The following dose calculation algorithms were used for assessing the reported doses

Dosimeter Model	Dosimeter Type	Algorithm Version
InLight	Whole Body	00101
CR-39--Thermal	Whole Body	03001

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Radiation Dosimetry Report

Account : 711723 Subaccount: 8018823 Series: DAR

Participant Number	Name		Dosimeter	Use	Rad. Type	Rad. Quality	Equivalent Dose (mrem) for Periods Shown Below												Inception Date	Serial Number
							Period Shown Below			Quarter to Date			Year to Date			Lifetime to Date				
	ID Number	Birth Date					Whole Body	Lens	Skin	Whole Body	Lens	Skin	Whole Body	Lens	Skin	Whole Body	Lens	Skin		
For Monitoring Period:							2019-04-01 to 2019-06-30			QUARTER 2			2019			LIFETIME				
02888	Area		L02TN	AREA	P		**33**	**33**	**33**										2018/01	XA02537605B
					P		**33**	**33**	**33**											
					N	T	**M**	**M**	**M**											
					N	F	**M**	**M**	**M**											

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The following dose calculation algorithms were used for assessing the reported doses

Dosimeter Model	Dosimeter Type	Algorithm Version
InLight	Whole Body	00101
CR-39--Thermal	Whole Body	03001

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Radiation Dosimetry Report

Account : 711723 Subaccount: 8018823 Series: DAR

Participant Number	Name		Dosimeter	Use	Rad. Type	Rad. Quality	Equivalent Dose (mrem) for Periods Shown Below												Inception Date	Serial Number
							Period Shown Below			Quarter to Date			Year to Date			Lifetime to Date				
	ID Number	Birth Date					Whole Body	Lens	Skin	Whole Body	Lens	Skin	Whole Body	Lens	Skin	Whole Body	Lens	Skin		
For Monitoring Period:							2019-07-01 to 2019-09-30			QUARTER 3			2019			LIFETIME				
00DAR	CONTROL		L02TN	CNTRL																XA00788457X
	Control Dose Used		L02TN				**12**	**12**	**12**											
02882	Area		L02TN	AREA	P		**273**	**273**	**268**										2018/01	XA00533196I
					P	H	**273**	**273**	**268**											
					N	T	**M**	**M**	**M**											
					N	F	**M**	**M**	**M**											
02883	Area		L02TN	AREA	P		**9**	**9**	**9**										2018/01	XA00756451H
					P		**9**	**9**	**9**											
					N	T	**M**	**M**	**M**											
					N	F	**M**	**M**	**M**											
02884	Area		L02TN	AREA	P		**36**	**36**	**36**										2018/01	XA00039468A
					P		**36**	**36**	**36**											
					N	T	**M**	**M**	**M**											
					N	F	**M**	**M**	**M**											
02885	Area		L02TN	AREA			**M**	**M**	**M**										2018/01	XA02731133Q
02886	Area		L02TN	AREA	P		**8**	**7**	**7**										2018/01	XA011416994
					P		**8**	**7**	**7**											
					N	T	**M**	**M**	**M**											
					N	F	**M**	**M**	**M**											
02887	Area		L02TN	AREA	P		**77**	**77**	**73**										2018/01	XA02538542E
					P	M	**77**	**77**	**73**											
					N	T	**M**	**M**	**M**											
					N	F	**M**	**M**	**M**											

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Page	2 of 2
Analytical Work Order / QC Release	1929700003 / CHA
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The following dose calculation algorithms were used for assessing the reported doses

Dosimeter Model	Dosimeter Type	Algorithm Version
InLight	Whole Body	00101
CR-39--Thermal	Whole Body	03001

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Radiation Dosimetry Report

Account : 711723 Subaccount: 8018823 Series: DAR

Participant Number	Name		Dosimeter	Use	Rad. Type	Rad. Quality	Equivalent Dose (mrem) for Periods Shown Below												Inception Date	Serial Number
							Period Shown Below			Quarter to Date			Year to Date			Lifetime to Date				
	ID Number	Birth Date					Whole Body	Lens	Skin	Whole Body	Lens	Skin	Whole Body	Lens	Skin	Whole Body	Lens	Skin		
For Monitoring Period:							2019-07-01 to 2019-09-30			QUARTER 3			2019			LIFETIME				
02888	Area		L02TN	AREA	P		**29**	**28**	**27**										2018/01	XA00877892X
					P		**29**	**28**	**27**											
					N	T	**M**	**M**	**M**											
					N	F	**M**	**M**	**M**											

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Page	8 of 9
Analytical Work Order / QC Release	2003000050 / LCA
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The following dose calculation algorithms were used for assessing the reported doses

Dosimeter Model	Dosimeter Type	Algorithm Version
InLight	Whole Body	00101
CR-39--Thermal	Whole Body	03001

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Radiation Dosimetry Report

Account : 711723 Subaccount: 8018823 Series: DAR

Participant Number	Name / ID Number / Birth Date	Dosimeter	Use	Rad. Type	Rad. Quality	Period Shown Below: Whole Body	Period Shown Below: Lens	Period Shown Below: Skin	Quarter to Date: Whole Body	Quarter to Date: Lens	Quarter to Date: Skin	Year to Date: Whole Body	Year to Date: Lens	Year to Date: Skin	Lifetime to Date: Whole Body	Lifetime to Date: Lens	Lifetime to Date: Skin	Inception Date	Serial Number
For Monitoring Period:						2019-01-01 to 2019-12-31			QUARTER 1			2019			LIFETIME				
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]		[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	2019/12	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]		[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	2019/12	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]		[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	2019/12	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]		[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	2019/12	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]		[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	2019/12	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]		[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	2019/12	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]		[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	2019/12	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]		[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	2019/12	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]		[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	2019/12	[redacted]
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For Monitoring Period:						2019-10-01 to 2019-12-31			QUARTER 4			2019			LIFETIME				
00DAR	CONTROL	L02TN	CNTRL																XA01787907R
	Control Dose Used	L02TN				**15**	**15**	**15**											
02882	Area	L02TN	AREA	P		**276**	**276**	**272**										2018/01	XA024777218
				P	H	**276**	**276**	**272**											
				N	T	**M**	**M**	**M**											
				N	F	**M**	**M**	**M**											
02883	Area	L02TN	AREA	P		**8**	**8**	**8**										2018/01	XA02708632H
				P		**8**	**8**	**8**											
				N	T	**M**	**M**	**M**											
				N	F	**M**	**M**	**M**											

* - Standard background control rate used for control subtraction

This report must not be used to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government.

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Received Date / Reported Date	2020-02-03 / 2020-02-28
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The following dose calculation algorithms were used for assessing the reported doses

Dosimeter Model	Dosimeter Type	Algorithm Version
InLight	Whole Body	00101
CR-39--Thermal	Whole Body	03001

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Radiation Dosimetry Report

Account : 711723 Subaccount: 8018823 Series: DAR

Participant Number	Name		Dosimeter	Use	Rad. Type	Rad. Quality	Equivalent Dose (mrem) for Periods Shown Below												Inception Date	Serial Number
							Period Shown Below			Quarter to Date			Year to Date			Lifetime to Date				
	ID Number	Birth Date					Whole Body	Lens	Skin	Whole Body	Lens	Skin	Whole Body	Lens	Skin	Whole Body	Lens	Skin		
For Monitoring Period:							2019-10-01 to 2019-12-31			QUARTER 4			2019			LIFETIME				
02884	Area		L02TN	AREA	P		**29**	**29**	**32**										2018/01	XA02229564C
					P		**29**	**29**	**32**											
					N	T	**M**	**M**	**M**											
					N	F	**M**	**M**	**M**											
02885	Area		L02TN	AREA	P		**5**	**5**	**5**										2018/01	XA012980972
					P		**5**	**5**	**5**											
					N	T	**M**	**M**	**M**											
					N	F	**M**	**M**	**M**											
02886	Area		L02TN	AREA	P		**8**	**8**	**8**										2018/01	XA017622488
					P		**8**	**8**	**8**											
					N	T	**M**	**M**	**M**											
					N	F	**M**	**M**	**M**											
02887	Area		L02TN	AREA	P		**89**	**89**	**88**										2018/01	XA01013437N
					P	H	**89**	**89**	**88**											
					N	T	**M**	**M**	**M**											
					N	F	**M**	**M**	**M**											
02888	Area		L02TN	AREA	P		**25**	**25**	**24**										2018/01	XA025335867
					P		**25**	**25**	**24**											
					N	T	**M**	**M**	**M**											
					N	F	**M**	**M**	**M**											

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* - Standard background control rate used for control subtraction

Radiation Dosimetry Report

Annual Radiation Exposure Limits (mrem) :

Whole body, blood forming organs, gonads	5,000
Lens of Eye	15,000
Extremities and Skin	50,000
Fetal (Gestation period)	500
General Public	100

Based on the US NRC Regulations, Title 10, Part 20, Code of Federal Regulations and adopted by many states. Certain state and other regulatory agencies may adhere to different limits.
Control Dosimeter: A control dosimeter is included with each shipment of dosimeters for monitoring radiation exposure received during transit. At the customer's facility, store the control in a radiation free area during the wear period.
Minimal Dose Equivalent Reported: Dose equivalents below the minimum measurable quantity for the current monitoring period are recorded as "M." The minimal reporting levels vary by the dosimeter type and radiation quality. "SL" is an elective option for the minimal dose equivalent reported where exposures less than 10 mrem report as "SL" (excludes fetal dosimeters), and/or exposures at or more than 10 mrem begin reporting at 10 mrem and report in increments of 10 mrem.

Dosimeter Type	M (DDE,LDE,SDE)	M (SDE Only)	SL
Luxel+®	1	-	10
InLight®	5	-	10
Whole Body Beta	-	10	10
U Ring	-	30	-
Neutrak® Neutron Fast	20	-	-
Neutrak® Neutron Thermal/Fast	10	-	-
Saturn Ring	-	10	10

Special Calculations: Special dose calculations can be applied to radiation workers who wear lead aprons.
EDE 1 - two dosimeters: one worn at the waist level under lead apron and one worn at the collar level outside lead apron. 1.5 (Waist DDE) + 0.04 (Collar DDE) = Assigned Deep Dose Equivalent.
EDE 2 - one dosimeter: one worn at the collar level outside lead apron. 0.3 (Collar DDE) = Assigned Deep Dose Equivalent.
EDE 122 - one dosimeter: one worn at the collar level outside lead apron. Collar DDE / 5.6 = Assigned Deep Dose Equivalent.
Calc3 - Lens of Eye dosimeter. 0.5 (Lens of Eye LDE) = Assigned Lens of Eye Dose Equivalent.
Lens.175 - Lens of Eye dosimeter. 0.175 (Lens of Eye LDE) = Assigned Lens of Eye Dose Equivalent.
EDE1-NTC EDE1 without Thyroid Collar assigned deep dose equivalent = 0.06 × (collar dose - waist dose) + waist dose
EDE1-TC EDE1 with Thyroid Collar assigned deep dose equivalent = 0.02 × (collar dose - waist dose) + waist dose
The "ASSIGNED" line follows all of the original whole body dosimeter doses with the EDE 1 or EDE 2 calculation results or LANDAUER's standard Dose Assessment Protocol (deep and shallow whole body dose from the highest reading whole body dosimeter, lens dose from dosimeter closest to the eye).

Ring Dosimeter Reading: Ring dosimeter readings report as a shallow dose.

Fetal Dosimeter: A declared pregnant worker will possess a fetal exposure on an extra page of the report based upon the whole body dosimeter worn closest to the fetus. The fetal dose is reported for the current wear period, plus the estimated dose from conception to declaration (if provided by customer), and the total dose from declaration to present.

Use	Description	Use	Description
AREA	Area Monitor	OEXTRM	Other Extremity
CHEST	Chest	OWHBDY	Other Whole Body
CNTRL	Control	RANKLE	Right Ankle
COLLAR	Collar	RFINGR	Right Hand Ring
EYE	Eye	RUARM	Right Upper Arm
FETAL	Fetal	RULEG	Right Upper Leg
LANKLE	Left Ankle	RWRIST	Right Wrist
LFINGR	Left Hand Ring	SPCPUR	Special Purpose
LUARM	Left Upper Arm	UPBACK	Upper Back
LULEG	Left Upper Leg	WAIST	Waist
LWBACK	Lower Back	WHBODY	Whole Body
LWRIST	Left Wrist		

Code	Radiation Quality Description (Type and/or Energy)
B	beta
BH	beta high energy, e.g. Strontium, Phosphorus
BL	beta low energy e.g. Thallium, Krypton
BS	Strontium beta
BT	Thallium beta
BU	Uranium beta
BN	beta, neutron mixture
NF	neutron fast
NT	neutron thermal
P	photon (x or gamma ray)
PB	photon, beta mixture
PBN	photon, beta, neutron mixture
PH	photon high energy greater than 200 keV
PL	photon low energy less than 40 keV
PM	photon medium energy 40 keV to 200 keV
PN	photon, neutron mixture

First Line Explanation
Participant Number: Unique number assigned by LANDAUER.
Name: Participant to whom the dosimeter is assigned.
Dosimeter: Badge type according to radiation monitoring needs.

Dosimeter	Code	Type of Radiation Monitored				
		Photons			Neutrons	
		X	Gamma	Beta	Fast	Thermal
InLight Model 2	L02NN	Yes	Yes	Yes		
InLight Model 2J	L02JN	Yes	Yes	Yes	Yes	
InLight Model 2T	L02TN	Yes	Yes	Yes	Yes	Yes
Luxel+	Pa	Yes	Yes	Yes		
Luxel+	Ja	Yes	Yes	Yes	Yes	
Luxel+	Ta	Yes	Yes	Yes	Yes	Yes
Luxel+ Escort	Pa	Yes	Yes			
Neutrak	N				Yes	
Neutrak	E				Yes	Yes
Ring, Single TLD	U or S	Yes	Yes	Yes		

Deep, Eye and Shallow Dose Equivalents: Deep dose equivalent (DDE) applies to external whole body exposure at a tissue depth of 1 cm (1000 mg/cm^2).
Eye dose equivalent (LDE) applies to external exposure of the lens at a tissue depth of 0.3 cm (300 mg/cm^2).
Shallow dose equivalent (SDE) applies to the external exposure of the skin or extremity at a tissue depth of 0.007 cm (7 mg/cm^2) averaged over an area 1 cm^2.

Deep, eye and shallow dose equivalents report for the time frame indicated by "For Monitoring Period." These doses represent the dose received only for the account/subaccount specified. Individual radiation component results and combined totals report in separate lines.

Quarterly accumulated results reflect total dose received within a calendar 3-months time frame and the customer defined start day. (Note: Quarterly accumulated columns are eliminated for bimonthly service or display "Not applicable.") Year to date accumulation totals dose received from the beginning of the current year to report date. Lifetime accumulation totals all dose received from inception date of dosimeter service to report date, and could include earlier dose history if supplied by customer. Reported quarterly, annual and lifetime dose accumulations represent the doses totaling from all account/subaccount dosimeters to be reported at the customer level.

Inception Date: The date LANDAUER began keeping dosimeter records for a given dosimeter for a badging participant on the current customer.

Serial Number: Dosimeter serial number.

Second Line Explanation
Participant's personal information consisting of ID number and birth date. This information can be suppressed on "Duplicate and Original Reports" for privacy and/or posting needs.

Notes: Text messages explaining any abnormalities or comments. The notes with message appears on a separate line below all dosimeter exposure information.

U.S. Patents
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