

ENGINEERING DESIGN FILE

EDF No.: EDF-6332 EDF Rev. No.: 0 Project File No.: 22091

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|--|-----|--|-----------------|------|
| APAD SUPPORT CALCULATIONS FOR REVISED SOURCE TERM FOR TAN V-TANKS | | | | |
| 1. Title: REMEDIATION | | | | |
| 2. Index Codes: Building/Type <u>TAN V-tanks</u> SSC ID <u>V-tank Consolidated Waste</u> Site Area <u>WAG 1, OU 1-10</u> | | | | |
| 3. NPH Performance Category: _____ or <input checked="" type="checkbox"/> N/A | | | | |
| 4. EDF Safety Category: _____ or <input checked="" type="checkbox"/> N/A SCC Safety Category: _____ or <input checked="" type="checkbox"/> N/A | | | | |
| 5. Summary: This EDF documents the support calculations for projection potential air emissions as well as ambient concentrations for potential air pollutants from the V-Tanks treatment process. This EDF utilizes the same methodology and air modeling as APAD 04-53. This EDF is based upon 95% UCL concentrations extracted from EDF-6326. Constituents are divided into carcinogens, non-carcinogens, radionuclides and CAA significant pollutants. This EDF confirms that the revised source term for the consolidated V-tanks waste stream does not change the previous determination documented in APAD 04-53 that this process meets the requirements for a Level I.b exemption under IDAPA 58.01.01.210 and is exempt from air permitting considerations. | | | | |
| 6. Review (R) and Approval (A) and Acceptance (Ac) Signatures: (See instructions for definitions of terms and significance of signatures.) | | | | |
| | R/A | Typed Name/Organization | Signature | Date |
| Performer/Author | N/A | David L. Eaton | See eDAR 301898 | |
| Technical Checker | R | David Tyson | See eDAR 301898 | |
| Technical Checker | R | Harrison Orr | See eDAR 301898 | |
| Approver | A | David Nickelson Project Engineer | See eDAR 301898 | |
| Requestor (if applicable) | Ac | James Jessmore Cost Account Manager | See eDAR 301898 | |
| | | | | |
| | | | | |
| Doc. Control | | | | |
| 7. Distribution: (Name and Mail Stop) | | Harrison Orr | | |
| 8. Does document contain sensitive unclassified information? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, what category: _____ | | | | |
| 9. Can document be externally distributed? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | | | | |
| 10. Uniform File Code: 6101 Disposition Authority: ENV2-f-2-a Permanent – Cut off at Record Retention Period: close of review | | | | |
| 11. For QA Records Classification Only: <input checked="" type="checkbox"/> Lifetime <input type="checkbox"/> Nonpermanent <input type="checkbox"/> Permanent APAD is a determination for Documenting Item and activity to which the QA Record apply: compliance | | | | |
| 12. NRC related? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No | | | | |

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Rev. 11

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| APAD SUPPORT CALCULATIONS FOR REVISED SOURCE TERM FOR TAN V-TANKS | | | |
| 1. Title: | REMEDIATION | | |
| 2. Index Codes: | | | |
| Building/Type | <u>TAN V-tanks</u> | SSC ID <u>V-tank Consolidated Waste</u> | Site Area <u>WAG 1, OU 1-10</u> |
| 13. Registered Professional Engineer's Stamp (if required) | | | |

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Design Basis for Preparation of Air Permitting Applicability Determination for the V-Tanks Treatment System

The following calculations provide the design basis for the determination of air pollution control needs. The 90% UCL concentrations were taken from the draft EDF-6326 "Revised Source Term Inventory for the V-Tank Waste." This same EDF also documents the mass of the consolidated waste stream to be 45,987 kg.

Projected Non-Carcinogenic Emission Rate

The projected non-carcinogenic emission rate is based on potentially emitting all non-carcinogenic contaminants within one 48-hour period. Therefore the 90% UCL concentration for each contaminant is multiplied by the mass of waste to be treated (45,987 kg), divided by 48 hours, and converted to pounds. This information is then combined with ISC-Prime modeling results used in APAD 04-53 from September of 2004 to produce predicted ambient concentrations at the nearest point of public access (Highway 33). These predicted ambient concentrations were then confirmed to be below the IDAPA Acceptable Air Concentration.

Example:

Aluminum

$$6.40E2 \text{ mg/kg} \times 45987 \text{ kg} \times 2.2046 \text{ lbs/mg} / 48 \text{ hours} = 1.35 \text{ lbs/hour per 48 hour operating period.}$$

$$1.35 \text{ lb/hr/48hrs} \times 0.0082 \text{ mg/m}^3 \text{ per lb/hr} = 1.11E-2 \text{ mg/m}^3$$

| 2005 APAD TAN V-TANKS NON-CARCINOGENS | | | | | | | |
|---------------------------------------|----------------|-----------------|-----------------------|----------------|-----------------------------|-----------------|---------------------------|
| POLLUTANT | 95%UCL (mg/kg) | Total Mass (lb) | Emissions lb/hr/48 hr | IDAPA EL lb/hr | Modeled Ambient Conc. mg/m3 | IDAPA AAC mg/m3 | LESS THAN IDAPA EL OR AAC |
| Al | 6.40E+02 | 6.49E+01 | 1.35E+00 | 6.67E-01 | 1.11E-02 | 5.00E-01 | Y |
| Cr | 3.93E+02 | 3.98E+01 | 8.30E-01 | 3.30E-02 | 6.80E-03 | 2.50E-02 | Y |
| Fe | 3.55E+03 | 3.60E+02 | 7.50E+00 | 3.30E-02 | 6.15E-02 | 2.50E-01 | Y |
| Mg | 2.12E+03 | 2.15E+02 | 4.49E+00 | 6.67E-01 | 3.68E-02 | 5.00E-01 | Y |
| Mn | 9.90E+02 | 1.00E+02 | 2.09E+00 | 3.30E-01 | 1.71E-02 | 2.50E-01 | Y |
| Si | 1.62E+04 | 1.64E+03 | 3.42E+01 | 6.67E-01 | 2.81E-01 | 5.00E-01 | Y |
| Sb | 2.51E+00 | 2.55E-01 | 5.30E-03 | 3.30E-02 | 4.35E-05 | 2.50E-02 | Y |
| Ba | 3.89E+01 | 3.94E+00 | 8.21E-02 | 3.30E-02 | 6.73E-04 | 2.50E-02 | Y |
| Fluoride | 1.52E+01 | 1.54E+00 | 3.21E-02 | 1.67E-01 | 2.63E-04 | 1.25E-01 | Y |
| Hg | 1.01E+02 | 1.03E+01 | 2.14E-01 | 3.00E-03 | 1.76E-03 | 2.50E-03 | Y |
| Se | 1.09E+00 | 1.10E-01 | 2.29E-03 | 1.30E-02 | 1.88E-05 | 1.00E-02 | Y |
| Ag | 2.80E+01 | 2.84E+00 | 5.91E-02 | 7.00E-03 | 4.84E-04 | 5.00E-03 | Y |
| Zn | 4.16E+02 | 4.22E+01 | 8.79E-01 | 6.67E-01 | 7.21E-03 | 5.00E-01 | Y |
| Co | 7.55E-01 | 7.65E-02 | 1.59E-03 | 3.30E-03 | 1.31E-05 | 2.50E-03 | Y |
| Cu | 4.61E+01 | 4.68E+00 | 9.74E-02 | 1.30E-02 | 7.99E-04 | 1.00E-02 | Y |
| Sn | 3.61E+00 | 3.66E-01 | 7.63E-03 | 1.33E-01 | 6.26E-05 | 1.00E-01 | Y |
| TCE | 5.90E+03 | 5.98E+02 | 1.25E+01 | 1.79E+01 | 1.02E-01 | 1.35E+01 | Y |
| TCA | 2.83E+02 | 2.87E+01 | 5.99E-01 | 1.27E+02 | 4.91E-03 | 9.55E+01 | Y |
| acetone | 1.40E+02 | 1.42E+01 | 2.96E-01 | 1.19E+02 | 2.43E-03 | 8.90E+01 | Y |
| carbon disulfide | 2.17E+01 | 2.20E+00 | 4.59E-02 | 2.00E+00 | 3.76E-04 | 1.50E+00 | Y |
| 2-butanone | 7.51E+01 | 7.61E+00 | 1.59E-01 | 3.93E+01 | 1.30E-03 | 2.95E+01 | Y |
| 1,2-dichloropropane | 2.51E+01 | 2.55E+00 | 5.31E-02 | 2.31E+01 | 4.35E-04 | 1.74E+01 | Y |

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|---------------------------|----------|----------|----------|----------|----------|----------|---|
| bromoform | 5.01E+01 | 5.08E+00 | 1.06E-01 | 3.33E-01 | 8.68E-04 | 2.50E-01 | Y |
| 2-hexanone | 5.01E+01 | 5.08E+00 | 1.06E-01 | 1.33E+00 | 8.68E-04 | 1.00E+00 | Y |
| toluene | 4.31E+01 | 4.37E+00 | 9.10E-02 | 2.50E+01 | 7.46E-04 | 1.88E+01 | Y |
| chlorobenzene | 1.22E+01 | 1.24E+00 | 2.58E-02 | 2.33E+01 | 2.11E-04 | 1.75E+01 | Y |
| ethylbenzene | 2.17E+01 | 2.20E+00 | 4.59E-02 | 2.90E+01 | 3.76E-04 | 2.18E+01 | Y |
| styrene | 2.51E+01 | 2.55E+00 | 5.30E-02 | 6.67E+00 | 4.35E-04 | 1.00E+00 | Y |
| cis-1,2-dichloroethylene | 1.20E+01 | 1.21E+00 | 2.53E-02 | 5.27E+01 | 2.07E-04 | 3.95E+01 | Y |
| xylene | 2.17E+01 | 2.20E+00 | 4.59E-02 | 2.90E+01 | 3.76E-04 | 2.18E+01 | Y |
| Naphthalene | 3.93E+02 | 3.98E+01 | 8.30E-01 | 3.33E+00 | 6.80E-03 | 2.50E+00 | Y |
| 1,2,4-trichlorobenzene | 3.44E+03 | 3.49E+02 | 7.26E+00 | 2.47E+00 | 5.96E-02 | 1.85E+00 | Y |
| 1,4-dichlorobenzene | 9.66E+02 | 9.79E+01 | 2.04E+00 | 3.00E+01 | 1.67E-02 | 2.25E+01 | Y |
| di-n-butylphthalate | 4.17E+00 | 4.23E-01 | 8.82E-03 | 3.33E-01 | 7.23E-05 | 2.50E-01 | Y |
| phenol | 5.01E+00 | 5.08E-01 | 1.06E-02 | 1.27E+00 | 8.68E-05 | 9.50E-01 | Y |
| 2,4,5-trichlorophenol | 2.36E+01 | 2.39E+00 | 4.98E-02 | ---- | 4.08E-04 | 1.60E-03 | Y |
| 2-chlorophenol | 7.49E+01 | 7.59E+00 | 1.58E-01 | 3.30E-02 | 1.30E-03 | 2.50E-02 | Y |
| 2-nitroaniline | 2.84E+01 | 2.88E+00 | 6.00E-02 | 2.00E-01 | 4.92E-04 | 1.50E-01 | Y |
| 3-nitroaniline | 1.32E+02 | 1.34E+01 | 2.78E-01 | 2.00E-01 | 2.28E-03 | 1.50E-01 | Y |
| 4-nitroaniline | 1.96E+01 | 1.99E+00 | 4.15E-02 | 2.00E-01 | 3.40E-04 | 1.50E-01 | Y |
| di-n-octylphthalate | 1.22E+01 | 1.23E+00 | 2.57E-02 | 3.33E-01 | 2.11E-04 | 2.50E-01 | Y |
| diethylphthalate | 9.12E+00 | 9.24E-01 | 1.93E-02 | 3.33E-01 | 1.58E-04 | 2.50E-01 | Y |
| dimethylphthalate | 1.21E+01 | 1.23E+00 | 2.56E-02 | 3.33E-01 | 2.10E-04 | 2.50E-01 | Y |
| hexachlorocyclopentadiene | 2.51E+01 | 2.55E+00 | 5.31E-02 | 7.00E-03 | 4.35E-04 | 5.00E-03 | Y |
| isophorone | 1.21E+01 | 1.23E+00 | 2.56E-02 | 1.87E+00 | 2.10E-04 | 1.40E+00 | Y |
| nitrobenzene | 5.01E+01 | 5.08E+00 | 1.06E-01 | 3.33E-01 | 8.68E-04 | 2.50E-01 | Y |
| pentachlorophenol | 2.84E+01 | 2.88E+00 | 6.00E-02 | 3.30E-02 | 4.92E-04 | 2.50E-02 | Y |
| pyridine | 1.21E+01 | 1.23E+00 | 2.57E-02 | 1.00E+00 | 2.10E-04 | 7.50E-01 | Y |

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Projected Carcinogenic Emission Rate

The projected carcinogenic emission rate is based on potentially emitting all carcinogenic contaminants over a one-year time frame. Therefore the 90% UCL concentration for each contaminant is multiplied by the volume of waste to be treated (45987 kg), divided by 8760 hours (24 hrs x 365 days), and converted to pounds. This information is then combined with ISC-Prime modeling results used in APAD 04-53 from September of 2004 to produce predicted ambient concentrations at the INL boundary. These predicted ambient concentrations were then confirmed to be below the IDAPA Acceptable Air Concentration for Carcinogens.

Example:

Arsenic

$$1.14 \text{ mg/kg} \times 45987 \text{ kg} \times 2.2046 \text{ lbs/mg} / 8760 \text{ hours} = 1.32\text{E-}5 \text{ lbs / hour / annual}$$

$$1.32 \text{ E-}5 \text{ lbs/hour/annual} \times 0.0082 \text{ mg/m}^3 \text{ per lb/hr} = 9.38\text{E-}8 \text{ ug/m}^3$$

| 2005 APAD TAN V-TANKS CARCINOGENS | | | | | | | |
|-----------------------------------|-----------------|-----------------|------------------------|----------------|-----------------------------|------------------|----------------------------|
| POLLUTANT | 95% UCL (mg/kg) | Total Mass (lb) | Emissions lb/hr/Annual | IDAPA EL lb/hr | Modeled Ambient Conc. ug/m3 | IDAPA AACC ug/m3 | Less than IDAPA EL OR AACC |
| As | 1.14E+00 | 1.16E-01 | 1.32E-05 | 1.50E-06 | 9.38E-08 | 2.30E-04 | Y |
| Be | 2.37E+00 | 2.40E-01 | 2.74E-05 | 2.80E-05 | 1.95E-07 | 4.20E-03 | Y |
| Cd | 6.78E+00 | 6.88E-01 | 7.85E-05 | 3.70E-06 | 5.57E-07 | 5.60E-04 | Y |
| Ni | 3.41E+01 | 3.46E+00 | 3.95E-04 | 2.70E-05 | 2.80E-06 | 4.20E-03 | Y |
| Aroclor-1260 | 2.37E+01 | 2.40E+00 | 2.74E-04 | 6.60E-05 | 1.95E-06 | 1.00E-02 | Y |
| Aroclor-1254 | 2.47E-02 | 2.50E-03 | 2.86E-07 | 6.60E-05 | 2.03E-09 | 1.00E-02 | Y |
| TCE | 5.90E+03 | 5.98E+02 | 6.83E-02 | 5.10E-04 | 4.85E-04 | 7.70E-01 | Y |
| PCE | 2.35E+02 | 2.38E+01 | 2.72E-03 | 1.30E-01 | 1.93E-05 | 2.10E+00 | Y |
| vinyl chloride | 1.22E+01 | 1.23E+00 | 1.41E-04 | 9.40E-04 | 9.99E-07 | 1.40E-01 | Y |
| methylene chloride | 2.54E+01 | 2.57E+00 | 2.94E-04 | 1.60E-03 | 2.08E-06 | 2.40E-01 | Y |
| 1,1-dichloroethylene | 1.06E+02 | 1.07E+01 | 1.23E-03 | 1.30E-04 | 8.71E-06 | 2.00E-02 | Y |
| 1,1-dichloroethane | 1.06E+01 | 1.07E+00 | 1.22E-04 | 2.50E-04 | 8.69E-07 | 3.80E-02 | Y |
| chloroform | 1.21E+01 | 1.23E+00 | 1.41E-04 | 2.80E-04 | 9.98E-07 | 4.30E-02 | Y |
| 1,2-dichloroethane | 2.52E+01 | 2.55E+00 | 2.91E-04 | 2.50E-04 | 2.07E-06 | 3.80E-02 | Y |
| carbon tetrachloride | 2.17E+01 | 2.20E+00 | 2.51E-04 | 4.40E-04 | 1.79E-06 | 6.70E-02 | Y |
| 1,1,2-trichloroethane | 1.22E+01 | 1.24E+00 | 1.41E-04 | 4.20E-04 | 1.00E-06 | 6.20E-02 | Y |
| benzene | 2.51E+01 | 2.55E+00 | 2.91E-04 | 8.00E-04 | 2.06E-06 | 1.20E-01 | Y |
| 1,1,2,2-tetrachloroethane | 1.22E+01 | 1.24E+00 | 1.41E-04 | 1.10E-05 | 1.00E-06 | 1.70E-02 | Y |
| bis(2-ethylhexyl)phthalate | 5.52E+02 | 5.59E+01 | 6.38E-03 | 2.80E-02 | 4.53E-05 | 4.20E+00 | Y |
| 2,4,6-trichlorophenol | 1.52E+01 | 1.54E+00 | 1.76E-04 | 1.20E-03 | 1.25E-06 | 1.80E-01 | Y |
| benzo(a)pyrene | 1.09E+03 | 1.10E+02 | 1.26E-02 | 2.00E-06 | 8.95E-05 | 3.00E-04 | Y |
| hexachlorobenzene | 1.21E+01 | 1.23E+00 | 1.41E-04 | 1.30E-05 | 9.98E-07 | 2.00E-03 | Y |
| hexachlorobutadiene | 1.22E+01 | 1.23E+00 | 1.41E-04 | 3.30E-04 | 9.99E-07 | 5.00E-02 | Y |
| hexachloroethane | 1.22E+01 | 1.23E+00 | 1.41E-04 | 1.70E-03 | 1.00E-06 | 2.50E-01 | Y |
| bis(2-chloroethyl)ether | 1.21E+01 | 1.23E+00 | 1.41E-04 | 2.00E-05 | 9.98E-07 | 3.00E-03 | Y |

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Projected Radionuclide Emission Rate

The projected radionuclide emission rate is based on potentially emitting a 0.001 fraction of each solid or liquid radionuclide and 1.000 fraction for each gaseous radionuclide (tritium). These emission factors are documented by EPA in 40 CFR 61 Appendix D, "Methods for Estimating Radionuclide Emissions". Therefore the 90% UCL concentration for each radionuclide is multiplied by the volume of waste to be treated (45987 kg) and then multiplied by the appropriate emission factor. An EPA CAP 88 modeling run is then used to determine an appropriate unit Ci dose for each of the radionuclides. The maximally exposed individual was determined to be near the site boundary approximately 12100 m NE of TAN. A copy of the modeling can be found in APAD 04-53. The radionuclide potential annual dose is totaled and confirmed to be below 0.1 mr/yr.

Example: Pu239/240

$$1.51E0 \text{ nCi/g} \times 45987 \text{ kg} \times 1000 \text{ g/kg} \times 1\text{Ci}/1E9\text{nCi} \times .001 \text{ (emission factor)} = 6.96E-5 \text{ Ci/yr/annual}$$

$$6.96E-5 \text{ Ci/yr/annual} \times 3.74 \text{ mrem/Ci} = 2.6E-4 \text{ potential annual dose.}$$

| 2005 APAD TAN V-TANKS RADIONUCLIDES | | | | | | |
|-------------------------------------|-----------------|--------------|-----------------|----------------------------|---------------------------------|-------------------------------|
| Radionuclide | 95% UCL (nCi/g) | Total Curies | Emission Factor | Potential Emissions Curies | Modeled Unit Ci Dose mrem/yr/Ci | Potential Annual Dose mrem/yr |
| Pu-238 | 4.24E+00 | 1.95E-01 | 0.001 | 1.95E-04 | 3.46E+00 | 6.74E-04 |
| Pu-239/240 | 1.51E+00 | 6.96E-02 | 0.001 | 6.96E-05 | 3.74E+00 | 2.60E-04 |
| Am-241 | 2.36E+00 | 1.09E-01 | 0.001 | 1.09E-04 | 5.74E+00 | 6.23E-04 |
| Cm-242 | 9.73E-03 | 4.47E-04 | 0.001 | 4.47E-07 | 1.86E-01 | 8.32E-08 |
| Cm-243/244 | 7.36E-01 | 3.39E-02 | 0.001 | 3.39E-05 | 3.85E+00 | 1.30E-04 |
| Np-237 | 8.31E-03 | 3.82E-04 | 0.001 | 3.82E-07 | 5.24E+00 | 2.00E-06 |
| U-233/234 | 9.36E+00 | 4.30E-01 | 0.001 | 4.30E-04 | 1.42E+00 | 6.11E-04 |
| U-235 | 5.87E-02 | 2.70E-03 | 0.001 | 2.70E-06 | 1.33E+00 | 3.59E-06 |
| U-238 | 3.46E-02 | 1.59E-03 | 0.001 | 1.59E-06 | 1.25E+00 | 1.99E-06 |
| Sr-90 | 3.42E+03 | 1.57E+02 | 0.001 | 1.57E-01 | 4.77E-02 | 7.49E-03 |
| Ag-108m | 2.60E-01 | 1.19E-02 | 0.001 | 1.19E-05 | 6.69E-01 | 7.99E-06 |
| Ag-110m | 4.88E-01 | 2.24E-02 | 0.001 | 2.24E-05 | 1.41E-02 | 3.16E-07 |
| Ce-144 | 3.38E+00 | 1.55E-01 | 0.001 | 1.55E-04 | 5.57E-03 | 8.65E-07 |
| Co-58 | 5.12E-01 | 2.35E-02 | 0.001 | 2.35E-05 | 1.68E-03 | 3.95E-08 |
| Co-60 | 4.42E+02 | 2.03E+01 | 0.001 | 2.03E-02 | 6.91E-02 | 1.40E-03 |
| Cs-134 | 2.84E-01 | 1.30E-02 | 0.001 | 1.30E-05 | 3.79E-02 | 4.94E-07 |
| Cs-137 | 1.89E+03 | 8.68E+01 | 0.001 | 8.68E-02 | 7.29E-02 | 6.33E-03 |
| Eu-152 | 5.29E+00 | 2.43E-01 | 0.001 | 2.43E-04 | 6.63E-02 | 1.61E-05 |
| Eu-154 | 7.15E+00 | 3.29E-01 | 0.001 | 3.29E-04 | 5.34E-02 | 1.76E-05 |
| Eu-155 | 8.37E-01 | 3.85E-02 | 0.001 | 3.85E-05 | 2.35E-03 | 9.05E-08 |
| Mn-54 | 1.84E-01 | 8.46E-03 | 0.001 | 8.46E-06 | 4.40E-03 | 3.72E-08 |
| Nb-95 | 1.19E+00 | 5.46E-02 | 0.001 | 5.46E-05 | 1.59E-03 | 8.68E-08 |
| Ra-226 | 7.45E-01 | 3.43E-02 | 0.001 | 3.43E-05 | 2.12E-01 | 7.27E-06 |
| Ru-103 | 4.33E+00 | 1.99E-01 | 0.001 | 1.99E-04 | 5.76E-04 | 1.15E-07 |
| Ru-106 | 3.58E+00 | 1.65E-01 | 0.001 | 1.65E-04 | 8.45E-03 | 1.39E-06 |
| Sb-125 | 1.44E+00 | 6.63E-02 | 0.001 | 6.63E-05 | 7.24E-03 | 4.80E-07 |
| Zn-65 | 4.61E-01 | 2.12E-02 | 0.001 | 2.12E-05 | 1.35E-02 | 2.86E-07 |
| Zr-95 | 1.06E+00 | 4.88E-02 | 0.001 | 4.88E-05 | 1.20E-03 | 5.85E-08 |

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| I-129 | 1.84E-02 | 8.45E-04 | 0.001 | 8.45E-07 | 2.75E-01 | 2.32E-07 |
| Ni-63 | 2.68E+02 | 1.23E+01 | 0.001 | 1.23E-02 | 1.40E-04 | 1.72E-06 |
| Tritium | 2.78E+01 | 1.28E+00 | 1.000 | 1.28E+00 | 1.39E-05 | 1.78E-05 |
| K-40 | 4.56E-05 | 2.10E-06 | 0.001 | 2.10E-09 | 5.46E-02 | 1.14E-10 |
| Th-228 | 5.91E-06 | 2.72E-07 | 0.001 | 2.72E-10 | 2.53E+00 | 6.88E-10 |
| Th-230 | 6.94E-06 | 3.19E-07 | 0.001 | 3.19E-10 | 2.53E+00 | 8.07E-10 |
| Total Dose mrem/yr | | | | | | 1.69E-02 |

Projected Potentially Significant Emissions Rate

The projected emission rate for significant pollutants is based on potentially emitting all of each pollutant within a one year time frame. Therefore the 90% UCL concentration for each pollutant is multiplied by the volume of waste to be treated (45987 kg) and then converted to tons/year. The tons/year is then confirmed to be below the significance level of IDAPA 58.01.01.6.92.

Example:

Lead

$$7.80E1 \text{ mg/kg} \times 45987 \text{ kg} \times 2.2046 \text{ lbs/mg} \times 1 \text{ ton}/2000 \text{ lbs} = 3.96E-3 \text{ tons/year}$$

| 2005 APAD POTENTIAL V-TANK EMISSIONS COMPARED TO IDAPA 58.01.01.6.92 SIGNIFICANT EMISSION RATES | | | | | | |
|---|-----------------|------------------------|-----------------|------------------|---------------------------------|-------------------------------|
| Pollutant | 95% UCL (mg/kg) | Total Constituent (lb) | Emissions lb/hr | Emissions ton/yr | IDAPA Significance Limit ton/yr | Less than Significance Limit? |
| Be | 2.37E+00 | 0.2 | 2.74E-05 | 1.20E-04 | 4.00E-04 | YES |
| Pb | 7.80E+01 | 7.9 | 9.03E-04 | 3.96E-03 | 6.00E-01 | YES |
| Hg | 1.01E+02 | 10.3 | 1.17E-03 | 5.14E-03 | 1.00E-01 | YES |

Conclusion

The emissions levels modeled above and compared to IDAPA 58.01.01.585 and 586 confirm that the results of the new source term evaluation do not change the original conclusion of APAD 04-53 that this source meets the requirements of a Level I.b exemption under IDAPA 58.01.01.210. See attached worksheet.

Reference

APAD 04-53 "Air Permitting Applicability Determination for the TAN V-Tanks" September 2004

EDF-6326 "Revised Source Term Inventory for the V-Tank Waste," October 2005

40 CFR 61 Appendix D, "Methods for Estimating Radionuclide Emissions"

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Created by: Harrison Orr/Dave Eator/RAD: No

Enter Date:10/19/05

APAD SUPPORT CALCULATIONS FOR REVISED SOURCE TERM FOR TAN V-TANKS REMEDIATION

Section 1

Primary Source(s) Screen

INITIAL DECISION MATRIX (A "YES" to any of the below, the source may require permitting)

Does the source equal or exceed one hundred (100) tons per year of any regulated air pollutant.

YES NO

Will the source cause an increase in the emissions that equals or exceeds the significant emissions rates set out in the definition of significant at Section 006.

YES NO

Will the source cause or significantly contribute to a violation of an ambient air quality standard, based upon the applicable air quality models, data bases, and other requirements of 40 CFR Part 51, Appendix W.

No modeling is required for those sources listed at Subsection 222.02

YES NO N/A

Is the source is not part of a proposed new major facility or part of a proposed major modification.

YES NO

Section 2

Applicable Source Exemption Documentation

CATEGORY I EXEMPTION

Below Regulatory Concern. The maximum capacity of the source to emit an air pollutant under its physical and operational design considering limitations on emissions such as air pollution control equipment, restrictions on hours of operation and restrictions on the type and amount of material combusted, stored or processed shall be less than ten percent (10%) of the significant emission rates set out in the definition of significant at Section 006

YES NO N/A

Radionuclides. The source shall have potential emissions that are less than one percent (1%) of the applicable radionuclides standard in 40 CFR Part 61, Subpart H.

See screens as appropriate.

YES NO N/A

CATEGORY II EXEMPTION

Choose one of the following exempt source types:

Laboratory equipment used exclusively for chemical and physical analyses, research or education, including, but not limited to, ventilating and exhaust systems for laboratory hoods. To qualify for this exemption, the source shall:(5-1-94)

Section 3

Applicable Source Exemption Documentation, Toxics

Below Regulatory Concern

The source qualifies for a BRC exemption if the uncontrolled emission rate (refer to Section 210) for all toxic air pollutants emitted by the source is less than or equal to ten percent (10%) of all applicable screening emission levels listed in Sections 585 and 586.

YES NO N/A

Level I Exemption

a. The uncontrolled emission rate (refer to Section 210) for all toxic air pollutants shall be less than or equal to all applicable screening emission levels listed in Sections 585 and 586; or

YES NO N/A

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b. The uncontrolled ambient concentration (refer to Section 210) for all toxic air pollutants at the point of compliance shall be less than or equal to all applicable acceptable ambient concentrations.

YES NO N/A

Level II Exemption

a. The uncontrolled ambient concentration at the point of compliance (refer to Section 210) for all toxic air pollutants emitted by the source shall be less than or equal to all applicable acceptable ambient concentrations listed in Sections 585 and 586; and

b. If the owner or operator installs and operates control equipment that is not otherwise required to qualify for an exemption and the controlled emission rate (refer to Section 210) of the source for all toxic air pollutants is less than or equal to ten percent (10%) of all applicable screening emission levels listed in Sections 585 and 586.

YES NO N/A

Level III Exemption

a. The uncontrolled ambient concentration at the point of compliance (refer to Section 210) for all toxic air pollutants emitted by the source shall be less than or equal to all applicable acceptable ambient concentrations listed in Sections 585 and 586; and

b. The controlled emission rate (refer to Section 210) for all toxic air pollutants emitted by the source shall be less than or equal to all applicable screening emission levels listed in Sections 585 and 586.

YES NO N/A