Environmental Defense Institute

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Comprehensive Review of Test Area North CERCLA Cleanup Plan at the Idaho National Laboratory

Submitted by
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On behalf of the Environmental Defense Institute

Amended
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Revision B

I. Summary

This Environmental Defense Institute (EDI) report is a review of the Department of Energy (DOE), Idaho Department of Environmental Quality (IDEQ) and Environmental Protection Agency (EPA) Comprehensive Environmental Response Compensation and Liabilities Act (CERCLA) cleanup plan for Test Area North (TAN) at the Idaho National Laboratory (INL). Attachment A provides attorney David McCoy and EDI board member comments for the record.

The DOE's Revised Proposed Plan for Waste Area Group 1 - Test Area North (TAN) dated November 1998, [1] the New Proposed April 2003 remediation Plan, [2] and Five-Year Review of CERCLA Response Actions 2010-2014 [3] contain major discrepancies with the Comprehensive Remedial Investigation / Feasibility Investigation Report data and other internal INL waste characterization report data on TAN [4] These data discrepancies are in the range of many orders-of-magnitude.

Fundamentally, any treatment plan and applied technology for remediation must be based on reliable waste stream data. Otherwise, DOE will face another fiasco that occurred at the INL Pit-9 waste treatment program that was eventually terminated because of (among other reasons) inadequate waste characterization. An issue stressed in the comments below, and apparently ignored by DOE and the regulators, is that **both** the TAN V-Tank liquid and the sludge (tank heels) and contaminated soil must be include in the calculus of determining an appropriate remediation treatment technology and the selection of waste disposal sites.

Additionally, the 2003 Plan fails to address all the tanks and other "buried" TAN waste issues. Only four of the V-Tanks are addressed (30,400 gal.) when there are at least six V-Tanks (additional 100,000 gal.) and other TAN waste discharge sites with major radioactive and hazardous waste contaminates.

[1] Proposed Plan for Waste Area Group 1 - Test Area North INL, December 1998, DOE Idaho Operations Office.

[2] New Proposed Plan for the V-Tanks Contents (TSF-09 and TSF-18) at Test Area North, Operable Unit 1-10, USDOE Idaho Operations Office, April 2003.

[3] Five-Year Review of CERCLA Response Actions at the Idaho National Laboratory Site Fiscal Years 2010-2014, December 2015, DOE/ID-11513 Rev.0.

[4] DOE 1998 Data refers to the following reports cited here and DOE's 1998 Tan Remediation Plan ;

(a); Work Plan for Waste Area Group 1, Operable Unit 1-10, Comprehensive Remedial Investigation / Feasibility Study, Idaho National Engineering Laboratory, US Department of Energy Idaho Operations Office, DOE-ID-10527, March 1996. Vol I, RI/FS

(b); Comprehensive Remedial Investigation / Feasibility Study for the Test Area North Operable Unit 1-10, Idaho National Engineering Laboratory, US Department of Energy Idaho Operations Office, DOE-ID-10557, November 1997. (RI/FS)

(c); Field Sampling Plan for Operable Unit 1-10: Test Area North, D. L. Michael, Lockheed Idaho Technologies Company, Idaho National Engineering Laboratory, March 1996, INEL-95/0304, Vol. III RI/FS.

(d) Federal Register, May 26, 1998, Part II, Environmental Protection Agency, 40 CFR Parts 148 to 271, Land Disposal Restrictions Phase IV Final Rule.

These crucial issues add to the public's skepticism about DOE's veracity to tell the truth about its radioactive and hazardous waste crisis, in addition to the regulators willingness to adequately enforce the law that if appropriately applied, would appear to prohibit disposal of this waste on the INL site as DOE plans.

Therefore, the Idaho Department of Environmental Quality (IDEQ) and the Environmental Protection Agency (EPA) as regulators (in keeping with the Settlement Agreement that included "alpha emitting mixed low-level waste" be shipped to a geologic repository out of Idaho), [5] must not allow this remediation program to proceed until DOE provides credible justification for the radically reduced waste stream characterization data, and the regulators offer credible analysis that the waste treatment and disposal will comply with all environmental regulations. Moreover, the public must then be fully appraised via a new revised Plan, so that informed decisions can be made concerning the remediation alternatives.

II. TAN V-Tank Contaminates of Concern

This discussion is an amalgam of previous (12/98) Environmental Defense Institute comments on TAN with current (4/03) remediation plan Comments in addition to EDI comments on the INL CERCLA Disposal Facility (ICDF) because of overlaps of Operational Units (OU), and DOE's intent to dump the TAN waste at the ICDF. Due to the long half-life of the radionuclides and the no-half-life of hazardous chemicals of concern at TAN, there is no credible reason that in the intervening four years there has been any reduction in the waste due to "decay." [6]

The 2003 TAN plan contains data is radically (orders of magnitude) inconsistent with earlier DOE data. Neither DOE nor the regulators offer any evidence justifying these crucial data discrepancies.

The 2003 Plan notes the maximum concentration for V-Tanks 1,2,3, and 9, are compared to DOE's 1998 data on the same tanks for a few select contaminates in the Table A below.

[5] Settlement Agreement in United States v. Batt, No.CV-91-0065-S-EJL, page 6. Alpha emitting Low-level waste includes waste containing transuranics, generating greater than 10 nano curie per gram (nCi/g).

[6] Most of the major volatile organic compounds (VOC) are also dense non-aqueous phase liquid (DNAPL) which settle to the bottom of the tank liquids so few would be expected to vaporize out the tank vents over a short period of time.

Table A (see footnote # 1)

Maximum Individual Tank Contaminate	**EPA Standard #**	**DOE Data 1998 Liquid**	**DOE Data 1998 Sludge**	**DOE Data 2003**
Antimony	0.006 mg/kg	-	308 mg/kg	11.5 mg/kg
Arsenic	0.01 mg/kg	-	12.4 mg/kg	3.45 mg/kg
Barium	2.0 mg/kg	2,320 mg/kg	600 mg/kg	299 mg/kg
Cadmium	0.005 mg/kg	330 mg/kg	71.7 mg/kg	22.7 mg/kg
Chromium	0.1 mg/kg	286 mg/kg	3,770 mg/kg	1,880 mg/kg
Lead	250 mg/kg	81.7 mg/kg	3,190 mg/kg	454 mg/kg
Cesium-137	200 pCi/L	12,500,000 pCi/L	6,370,000 pCi/g 6,370 nCi/g	4,480 nCi/g
Strontium	8 pCi/L	250,000,000 pCi/L	7,070,000 pCi/g 7,070 nCi/g	5,180 nCi/g
Total transuranics V-Tanks 1,2,3,&9 including plutonium, americium, curium and neptunium	15 pCi/L (for drinking water); * 100 nCi/g (for TRU disposal)	275,406 pCi/L	42,716 pCi/g 42.831 nCi/g	26.4 nCi/g

Notes for Above Table A

* It has been a long-standing criticism of the regulators to allow DOE in joint publications to offer contaminate units different than those in the regulations (MCL) and not to present side-by-side those MCL's with samples in DOE publication data tables. This data unit issue confuses the public and exacerbates distrust.

The above EPA Maximum Contaminate Level (MCL) Drinking Waste Standards are offered here only to provide perspective on how hazardous the TAN wastes are. See 40 CFR 141.61, 141.62, 141.66.

Since DOE plans to dump V-Tank highly contaminated soils into the tank to absorb the liquid portion of the tank contents, this will add to the total tank contaminate levels. Addition of soil to dilute the concentration of the waste is expressively prohibited in RCRA (40 CFR 268.3). The 2003 Plan acknowledges transuranic waste in the V-Tanks at 26.4 nCi/g (page 6) which is 2 ½ times higher than the greater than 10 nCi/g waste acceptance restriction for the ICDF. [7]

Additionally, a credible argument can be made that **both** the tank liquid and the sludge must be combined to determine if the waste elevates to the category of transuranic waste. The regulatory definition of transuranic radioactive waste is 100 nano curies per gram (nCi/g) of elements with an atomic number greater than 92 (i.e. above uranium) that also have a half-life greater than 20 years. [8] The above table shows major discrepancies in the sampling data and also suggests that this waste is at the very least "alpha low-level" or "transuranic waste" (assuming inclusion of both liquid and sludge (tank heels) and therefore, cannot be disposed of at INL as DOE plans at the ICDF. See discussion below on TAN waste disposal.

Federal Court Justice Edward Lodge issued a ruling on March 31, 2003 that found in favor of the State of Idaho's contention that a 1995 Settlement Agreement/Consent Order stipulates the removal of all buried transuranic waste from INL. This ruling ends a long-standing legal battle between the State and the Department of Energy over what waste was included in the Agreement. Judge Lodge's ruling states:

"The express language of the [Settlement] agreement, when taken as a whole, expressly requires that all transuranic waste be removed from INL. The parties specifically define transuranic waste without any limitation as to its location within INL nor any limitation to amount. Thus the Court is able to unequivocally state that in viewing the document in the light most favorable to the United States, the plain language of Paragraph B.1 [of the Settlement Agreement] clearly represents the parties intent at the time the agreement was drafted that the United States remove all transuranic waste located at INL." [9]

Additionally, the 2003 TAN Plan fails to address **all the V tanks** and other "buried" TAN waste issues. Only four of the V-Tanks are addressed in the 2003 Plan when there are at least six V-Tanks with major radioactive and hazardous waste contaminates. V-Tanks 1, 2, 3, 9, 13, and 14 volumes are 130,400 gallons. [DOE/ID-10557, Vol. IV, page 9-14] See table B below.

Unfortunately, the TAN plan still fails to provide remedial solutions that meet Applicable or Relevant and Appropriate Requirements (ARAR). Transuranic (TRU) or Greater than Class C LLW (as defined by statute) cannot be dumped at the INL CERCLA Disposal Facility (ICDF)

[7] There are two categories of waste containing transuranics; 1.) waste containing transuranic elements in concentrations greater than 10 but less than 100 nCi/g is called alpha low-level waste. Prior to 1984 DOE called this material transuranic waste, but then unilaterally and arbitrarily changed it to alpha LLW; 2.) currently, waste containing transuranics in concentrations greater than 100 nCi/g is classified transuranic (TRU) waste.

[8] Also see 10 CFR 61.55(a)(7) sum of the fractions rule for mixtures of radionuclides, and (a)(8) Determination of concentrations in wastes.

[9] Settlement Agreement in United States v. Batt, No.CV-91-0065-S-EJL.

under current waste acceptance criteria (WAC) restrictions or Nuclear Regulatory Commission regulations on radioactive waste dumps because they must go to a geologic repository. [10] The ICDF itself is questionably in compliance with current regulations. See section III below. The Plans offers no substantive information about discrepancy of the maximum contamination levels related to individual Operational Units (OU). Consequently, the general public is effectively denied essential information upon which to make their own determination of whether the preferred alternatives were appropriate.

The Plan claims to be "the comprehensive" CERCLA investigation into TAN. This is not a "comprehensive" Plan because the ANP Cask Storage Pad, the Area 10 HTRE Reactor Vessel Burial Site, and the TAN Pool have been excluded.

An example of DOE/ID's myopic approach is the Test Area North (TAN) Comprehensive Plan's alternative of insitu (in place) vitrification (ISV) of the mixed hazardous/radioactive waste tanks. In 1996, the Oak Ridge National Laboratory (ORNL) tried the same insitu remediation approach despite public challenges to environmental law violations. The ORNL insitu project exploded putting workers and the public at extreme risk. The TAN tank waste characterization is similar to the buried waste in ORNL's insitu project.

Actually, the lessons learned are as much site related as they are complex wide related. INL tried an ISV project a few years ago and it exploded as well, and the containment tent got fried (burned up). Similar failed ISV projects can also be found at DOE's Hanford site. Tragically, the IDEQ and EPA, as regulators fail to inform the public about these failed ISV projects, and a member of the public may (based on inadequate information) conclude that ISV is a viable remedial technology for INL.

Table B

TAN V-Tank Site	Contaminate	Concentration	Reference
V-1 Tank Liquid (TSF-09/18)	STP Lists Liquid and Sludge	MLLW	STP @ 6-3
	Cobalt-60	101,000 pCi/l	(a) Table A-6-10
	Cs-134	16,900 pCi/l	(a) Table A-6-10
	Cs-137	12,500,000 pCi/l	(a) Table A-6-10
	Europium-152	83,800 pCi/l	(a) Table A-6-10
	Europium-154	93,800 pCi/l	(a) Table A-6-10
	Plutonium-238 (liquid) (sediment)	7,030 pCi/l 103 pCi/g	(c) page 15-17

[10] 10 CFR 61.56

	Plutonium-239 (liquid) (sediment)	3,400 pCi/l 95.8 pCi/g	(c) page 15-17
V-1 Tank Liquid (TSF-09/18) Con't			
	Americium-241 (liquid) (sediment)	9,230 pCi/l 230 pCi/g	(c) page 15-17
	Gross Beta	16,100,000 pCi/l	(c) 59
	Gross Gamma	24,300,000 pCi/l	(c)59
	Gross Alpha	19,800 pCi/l	(c) 59
	Tritium	11,800,000 pCi/l	(a) Table A-6-10
	Total Strontium	1,840,000 pCi/l	(a) Table A-6-10
	Total Activity Liquid Sediment	 40,400,000 pCi/L 15,000,000 pCi/g	(c) 59
V-1 Tank Liquid (TSF-09/18) continued inorganic contaminates	Mercury Barium Cadmium Chromium Lead Silver	0.842 mg/l 2,320 mg/kg 330 mg/kg 286 mg/kg 81.7 mg/kg 18 mg/kg	Likely Exceeds UTS mercury @ 0.15 mg/l barium @ 7.6 mg/l Cadmium @ .19 Lead @ .37 Silver @ .30 (a) Table A-6-10 & 11
Organic Contaminates	Tetrachloroethene Trichloroethene	1,800 mg/kg 23 mg/kg	Exceed LDR UTS (a) Table A-6-11
	Vinyl Chloride 1,1 Dichloroethene Chloroform 1,2 dichloroethene Carbontetrachloride Benzene Chlorobenzene		All Exceed LDR UTS (c) 8 through 12

Tank V-2 TSF-09/18	STP Lists Liquid and Sludge	MLLW	STP @ 6-3
	Cobalt-60	10,500 pCi/l	(a) A-6-10
	Cesium-137	20,200,000 pCi/l	(a) A-6-10
	Strontium-90	1,450,000 pCi/l	(a) A-6-10
Tank V-2 TSF-09/18 (con't)			
	Gross Beta	23,400,000 pCi/l	(a) A-6-10
	Gross Gamma	38,500,000 pCi/l	(c)59
	Plutonium-238 (liquid) (sediment)	63.9 pCi/L 103.0 pCi/g	(c) page 15-17
	Americium-241(liquid) (Sediment)	18.6 pCi/L 84.0 pCi/g	(c) page 15-17
Tank V-2 (continued) TSF-09/18	Gross Alpha	84.9 pCi/l	(c) 59
	Total Activity Liquid Sediment	 1,090,000 pCi/L 13,000,000 pCi/g	(c) 59
	Trichloroethene Tetrachloroethene Cadmium Vinyl Chloride	All four chemicals/metals Exceed TCLP	(c) 8 through 12
	1,2-Dichloroethane Carbon tetrachloride Benzene	All three chemicals at the TCLP level	(c) 8 through 12
	18 Hazardous Chemicals	Exceed Universal Treatment Standards	(b) 10-44 40 CFR 268.48

V-3 Tank (TSF-09/18)	STP lists	MLLW	STP @ 6-3
	Plutonium-238 (liquid) (Sediment)	33.5 pCi/L 384.0 pCi/g	(c) page 15-17
	Plutonium-239(sediment)	31.1 pCi/g	(c) page 15-17
	Americium-241 (liquid) (Sediment)	30.0 pCi/L 206.0 pCi/g	(c) page 15-17
V-3 Tank (TSF-09/18) con't	Uranium-233/234	13,300 pCi/l	(b) A-83
	Strontium-90	12,300,000 pCi/l	"
	Cobalt-60	14,800 pCi/l	"
	Cesium-137	4,230,000 pCi/l	"
	Ruthenium-103	13,600 pCi/l	"
	Tritium	6,090,000 pCi/l	"
V-3 Tank (TSF-09/18) Continued	Nickel-63	205,000 pCi/l	"
	Gross Beta	28,300,000 pCi/l	(c) 59
	Gross Gamma	2,230,000 pCi/l	(c) 59
	Total Activity Liquid Sediment	 30,500,000 pCi/L 28,000,000 pCi/g	(c) 59
	Trichloroethene Tetrachloroethene Vinyl Chloride	All three chemicals/metals Exceed TCLP	(c) 8 through 12
	1,2-Dichloroethane Carbon tetrachloride Benzene	All three chemicals at the TCLP level	(c) 8 through 12

	18 Hazardous Chemicals	Exceed LDR Universal Treatment Standards	(b) 10-44 40 CFR 268.48
V-9 Tank (TSF-09/18)	STP Lists Liquid and Sludge	MLLW	STP @ 6-3
	Americium-241(liquid) (Sediment)	40,200 pCi/l 5,700 pCi/g	(b) A-91 (c) page 15-17
	Plutonium-238(liquid) (Sediment)	170,000 pCi/l 28,600 pCi/g	(b) A-91 (c) page 15-17
V-9 Tank (TSF-09/18) Continued	Plutonium-239/240(Liq.) (Sediment)	45,300 pCi/l 7,180 pCi/g	(b) A-91 (c) page 15-17
	Uranium-233	12,400 pCi/l	(b) A-91
	Uranium-234	211,000 pCi/l	(b) A-91
	Uranium-235	6,900 pCi/l	(b) A-91
	Uranium-236	3,260 pCi/l	(b) A-91
	Uranium-238	972 pCi/l	(b) A-91
	Cesium-137	6,370,000 pCi/g	(b) A-91
	Tritium	353,000,000 pCi/l	(b) A-91
	Total Strontium	250,000,000 pCi/l	(b) A-91
V-9 Tank (TSF-09/18) Continued	Cerium-244	5,210 pCi/l	(b) A-91
	Cobalt-60	1,160,000 pCi/l	(b) A-91

	Total Activity Liquid Sediment	 603,918,070 pCi/L 14,225,396 pCi/g	(b) A-91
	26 hazardous chemicals/metals	Exceed UTS Treatment Standards	(b) 10-44 40 CFR 268.48
PM-2A TSF-26 V-13 Tank	50,000 gallon tank	STP lists Liquids and Sludge as MLLW	STP @ 6-3
	Cobalt-60	45,900,000 pCi/l	(c) 31
	Europium-154	93,000,000 pCi/l	(c) 31
	Cesium-137	2,900,000,000 pCi/l	(c) 31
	Strontium-90	2,850,000,000 pCi/l	(c) 31
	Cesium-134	18,100,000 pCi/l	(c) 31
PM-2A TSF-26 V-13 Tank (continued)	Total Activity Curies	41,380,000,000,000 pico curies 41.38 curies	(c) 31
	31 Hazardous Chemicals/metals	Exceed UTS Treatment Standards	(b) 10-28 to 31 40 CFR 268.48
PMA-2M TSF-26 V-14 Tank	50,000 Gallon Tank	TSP Lists Liquid and Sludge as MLLW	STP @ 6-3
	Cobalt-60	191,000,000 pCi/l	(c) 31
	Cesium-134	2,000,000 pCi/l	(c) 31
	Cesium-137	9,420,000,000 pCi/l	(c) 31
	Europium-154	17,200,000 pCi/l	(c) 31
	Strontium-90	9,260,000,000 pCi/l	(c) 31
	Total Activity Curies	25,900,000,000 pico curies 25.96 curies	(c) 31
	33 hazardous chemicals/metals	Exceed UTS Treatment Standards	(b) 10-28 to 31 40 CFR 268.48
V- Tank soil	STP lists as MLLW	54,120 pCi/g	RE-P-80-090 @6

Sources for above table:

DOE 1998 Data refers to the following reports cited here and DOE's 1998 Tan Remediation Plan

(a); Work Plan for Waste Area Group 1, Operable Unit 1-10, Comprehensive Remedial Investigation / Feasibility Study, Idaho National Engineering Laboratory, US Department of Energy Idaho Operations Office, DOE-ID-10527, March 1996. Vol I, RI/FS

(b); Comprehensive Remedial Investigation / Feasibility Study for the Test Area North Operable Unit 1-10, Idaho National Engineering Laboratory, US Department of Energy Idaho Operations Office, DOE-ID-10557, November 1997. (RI/FS)

(c); Field Sampling Plan for Operable Unit 1-10: Test Area North, D. L. Michael, Lockheed Idaho Technologies Company, Idaho National Engineering Laboratory, March 1996, INEL-95/0304, Vol.III RI/FS..

(d) Federal Register, May 26, 1998, Part II, Environmental Protection Agency, 40 CFR Parts 148 to 271, Land Disposal Restrictions Phase IV Final Rule

Acronyms:

LDR = Land Disposal Restrictions (40 CFR 148 through 271)
TCLP = Toxicity Characteristic Leachate Procedure (40 CFR 148 through 271)
UTS = Universal Treatment Standards (40 CFR 148 through 271)
PRG = Preliminary Remediation Goals (EPA cleanup goals based on risk values 12/18/96)
STP = INL Site Treatment Plan generated by statute requirement of the Federal Facility Compliance Act

For more information see Environmental Defense Institute's Comments on Proposed Test Area North Cleanup Plan, December 1998, available on EDI's Website, publications link.

TAN Waste Injection Well Data [11]

There are four waste injection wells at TAN: 1. TSF-05 (used 1955-1972); 2. IET (used 1956 to mid-1960s and a few years around 1978: 3. WRRTF -05 (used 1957-1984): 4. LOFT-04 (1957-1980). [12] Table 2-2 (below) is a complete list of injection well **TSF-05** the OU 1-07B COCs in the ROD Amendment (DOE-ID 2001). Contaminants of concern and cleanup goals in Operable Unit 1-07B decision documents (derived from DOE-ID 2001).

[11] Five-Year Review of CERCLA Response Actions at the Idaho National Laboratory Site Fiscal Years 2010-2014, December 2015, DOE/ID-11513 Rev.0, pg. 2-8.

[12] INEEL Subregional Conceptual Model Report, Volume 3, September n2003, INEEL/EXT-03-01169, Rev.2

Contaminant of Concern	Maximum Historical Concentrations[a]	Cleanup Goal[b]
Volatile Organic Compounds	(µg/L)	(µg/L)
TCE	12,000–32,000	5
PCE	110	5
cis-1,2-DCE	3,200–7,500	70
trans-1,2-DCE	1,300–3,900	100
Radionuclides	(pCi/L)	(pCi/L)
Tritium	14,900–15,300[c]	20,000
Sr-90	530–1,880	8
Cs-137 (TSF-05 injection well only)	1,600–2,150	119[d]
U-234 (TSF-05 injection well only)	5.2–7.7[c]	27[e]

a. Concentration range is taken from measured concentrations at the TSF-05 injection well. Source: *Fiscal Year 1999 Groundwater Monitoring Annual Report Test Area North, Operable Unit 1-07B* (INEEL 2000).

b. Cleanup goals are based on the federal drinking water standards. The cumulative risk of contaminants must be less than 10^{-4}, and the hazard index must be less than 1.

c. Maximum concentrations of tritium and U-234 are below federal drinking water standards, and baseline risk calculations indicate a cancer risk of 3E-06. While this risk is smaller than 10^{-4}, both tritium and U-234 are included as COCs as a comprehensive plume management strategy.

d. The cleanup goal for Cs-137 was the proposed MCL at the time of the 1995 ROD signature. The current MCL for Cs-137 is 200 pCi/L.

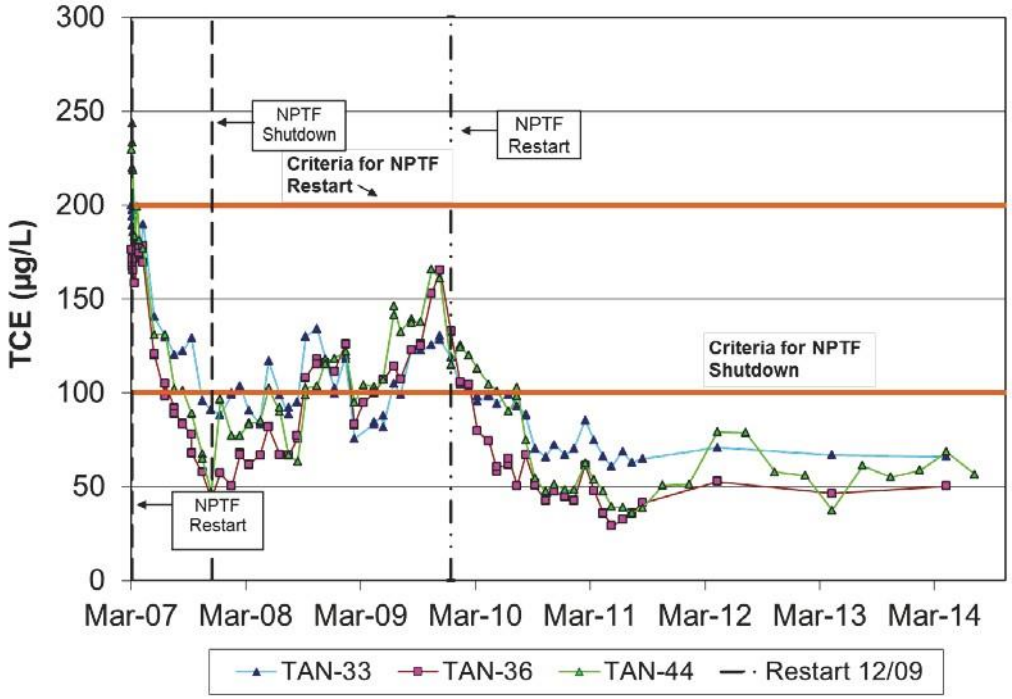
e. The cleanup goal for U-234 is from the 2001 ROD Amendment (DOE-ID 2001). COC contaminant of concern

f. DCE dichloroethene

Acronyms:
MCL maximum contaminant level
PCE tetrachloroethene
ROD Record of Decision
TCE trichloroethene

Contaminant	Maximum Contaminant Level	1E-05 Risk-Based Level[a]
Trichloroethene	5 µg/L	4.4 µg/L
Tetrachloroethene	5 µg/L	97 µg/L
Cis-1,2-dichloroethene	70 µg/L	280 µg/L
Trans-1,2-dichloroethene	100 µg/L	860 µg/L
Vinyl chloride	2 µg/L	0.15 µg/L
Strontium-90	8 pCi/L	Not applicable

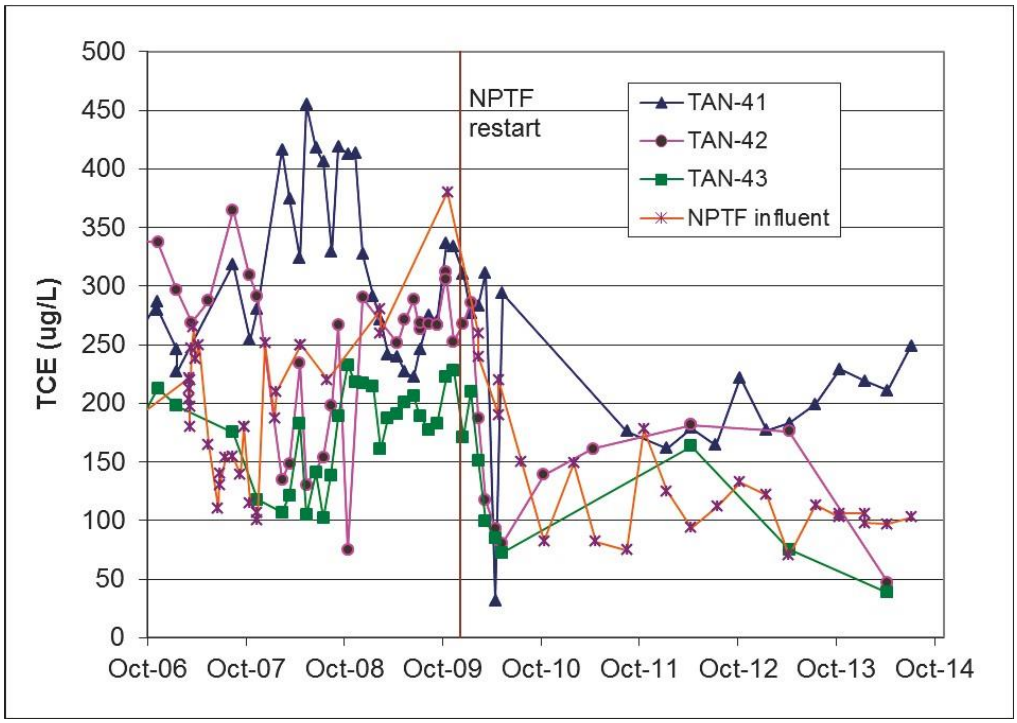
a. From TAN Monitoring Plan (DOE-ID 2013b).



Trichloroethene (TCE) Contaminates present in groundwater wells; TAN-33, TAN-36, TAN-44 [13]

[13] Five-Year Review of CERCLA Response Actions at the Idaho National Laboratory Site Fiscal Years 2010-2014, December 2015, DOE/ID-11513 Rev.0, pg. 2-23.

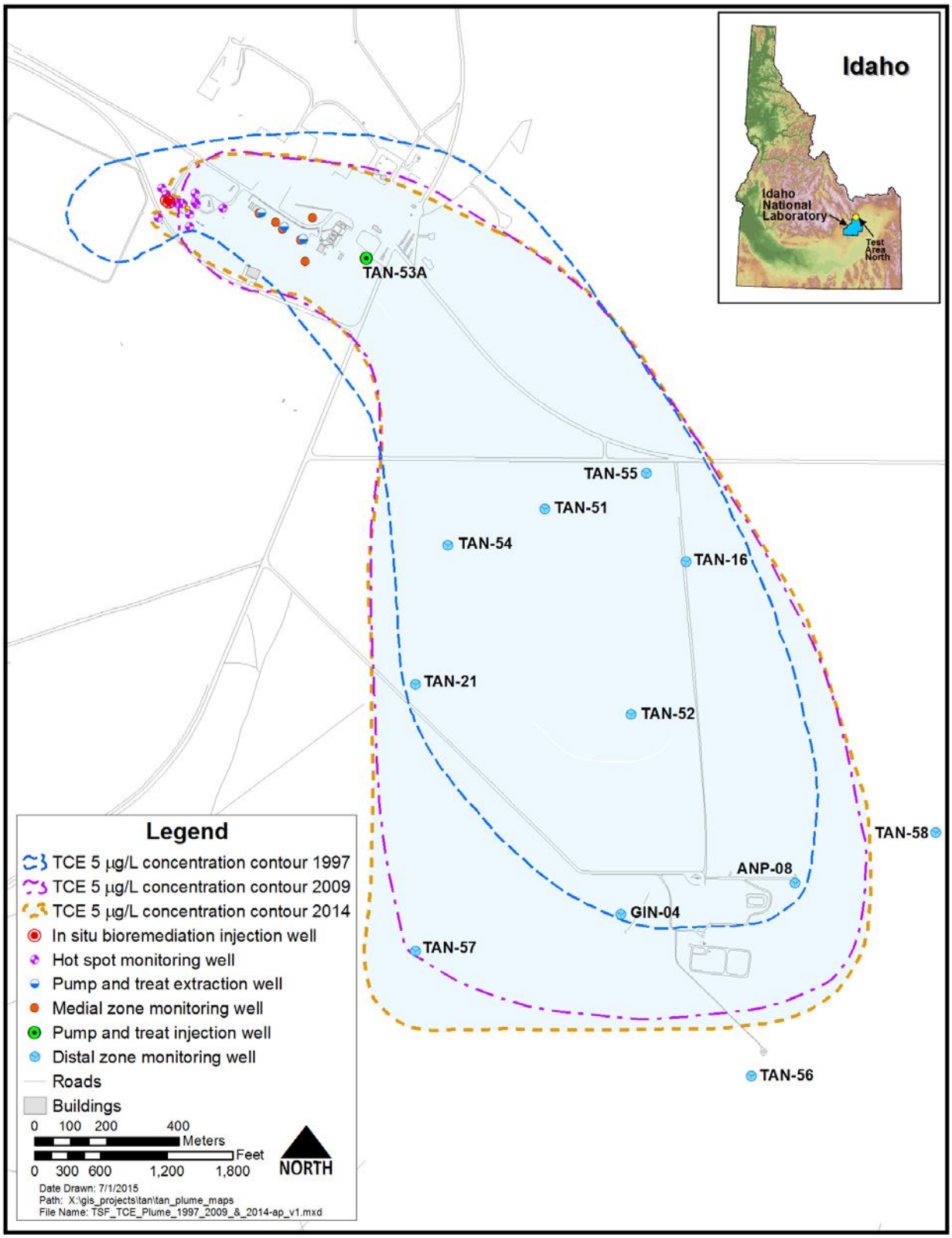
TAN Groundwater Monitoring Data for TCE [14]



Trichloroethene (TCE) Contaminates present in groundwater wells;
TAN-41, TAN-42, TAN-43. Maximum Contaminate Level = 5 ug/L

The below figure graphically shows the expansion of TCE from 1997 to 2014 in the Test Area North (TAN) groundwater contaminate plume. [15] An estimated 35,000 gal. (132,489 L) of TCE and a total of 53.53 Curies of radioactivity have been disposed in the TSF-05 well. [16]

[14] Five-Year Review of CERCLA Response Actions at the Idaho National Laboratory Site Fiscal Years 2010-2014, December 2015, DOE/ID-11513 Rev.0, pg. 2-24.
[15] IBID. pg. 2-4
[16] INEEL/EXT-03-01169, Rev.2, pg. 3-2.


Idaho
Idaho National Laboratory
Test Area North
TAN-53A
TAN-55
TAN-51
TAN-54
TAN-16
TAN-21
TAN-52
TAN-58
ANP-08
GIN-04
TAN-57
TAN-56
Legend
TCE 5 µg/L concentration contour 1997
TCE 5 µg/L concentration contour 2009
TCE 5 µg/L concentration contour 2014
In situ bioremediation injection well
Hot spot monitoring well
Pump and treat extraction well
Medial zone monitoring well
Pump and treat injection well
Distal zone monitoring well
Roads
Buildings
0 100 200 400
Meters
0 300 600 1,200 1,800
Feet
NORTH
Date Drawn: 7/1/2015
Path: X:\gis_projects\tan\tan_plume_maps
File Name: TSF_TCE_Plume_1997_2009_&_2014-ap_v1.mxd

"Disposal of contaminants to the TSF-05 disposal well resulted in an immediate release to the Snake River Plain Aquifer. Continued disposal also resulted in accumulation of sludge and contaminants in the aquifer around the disposal well. This sludge has provided an attenuated release of organic and radionuiclide comtaminants from the secondary source. Further discussion of the secondary source sludge remaining in the TSF-05 is discussed in the factors controlling release section." [17]

TAN WRRTF-05 Injection Well

"Water Reactor Research Test Facility (WRRTF)-05, also known as the WRRTF injection well or the Low Power Test Facility (LPTF) disposal well, was drilled in 1957. It is located about 280 ft. south of WRRTF. The well is 313 ft. deep and has a 10-in. diameter casing. In March 1984 the well became blocked and was taken out of service (Frederick et al. 1998). It was grouted and abandoned in September 1984 (Kaminski et al. 1994).

"Wastewater disposals to WRRTF-05 included discharges of treated sanitary waste from 1957 to 1981 and discharges of liquid chemical waste from 1957 to 1984. The wastewater sources included waste softening activities and cooling water from boilers (Frederick 1998). In addition, based on facility operations, the well is thought to have received cooling water effluent, boiler blowdown, sanitary waste, small amounts of process wastewaters, and materials from laboratories and process drains. There are also indications that hydrazine from facility operations was disposed in the well. There is no evidence of large volumes of concentrated wastes being disposed of to this well (Kaminski et al. 1994).

"Inventory information is known for contaminants listed in Table 3-3. TAN groundwater plume contour plots show the origination of chloride and sulfate plumes around the WRRTF injection well, separate from the plumes originating from TSF-05. Contours of 100, 50, and 20 mg/L for chloride and 40 and 30 mg/L for sulfate indicate the distribution of the injected wastewater from the injection well (Bukowski et al. 1998b, Wymore et al. 2000). Cobalt-60 and turbine oil were documented as being released in 1969 and 1967, respectively (Frederick et al. 1998).

Table 3-3. Estimated amount of contaminants injected into WRRTF-05.

Contaminant	Estimated Amount Injected
Chloride	21,821 lb.
Phosphate	709 lb.
Sodium	16,447 lb.
Sulfate	6,029 lb.
Sulfite	1,005 lb.
Cobalt-60	50 mCi
Turbine Oil	56 gal

[17] INEEL/EXT-03-01169, Rev.2, pg. 3-3.

TAN Groundwater Cesium-137 Monitoring [18]

"Cesium-137 occurs in wells TAN-25, TAN-37A, TAN-37B, TAN-1861, and TSF-05B in concentrations above the proposed MCL in the Record of Decision of 119 pCi/L and the current derived MCL of 200 pCi/L in TSF wells, and have **gradually increased** since the start of ISB rebound test." [DOE/ID-11513, pg. 2-25]

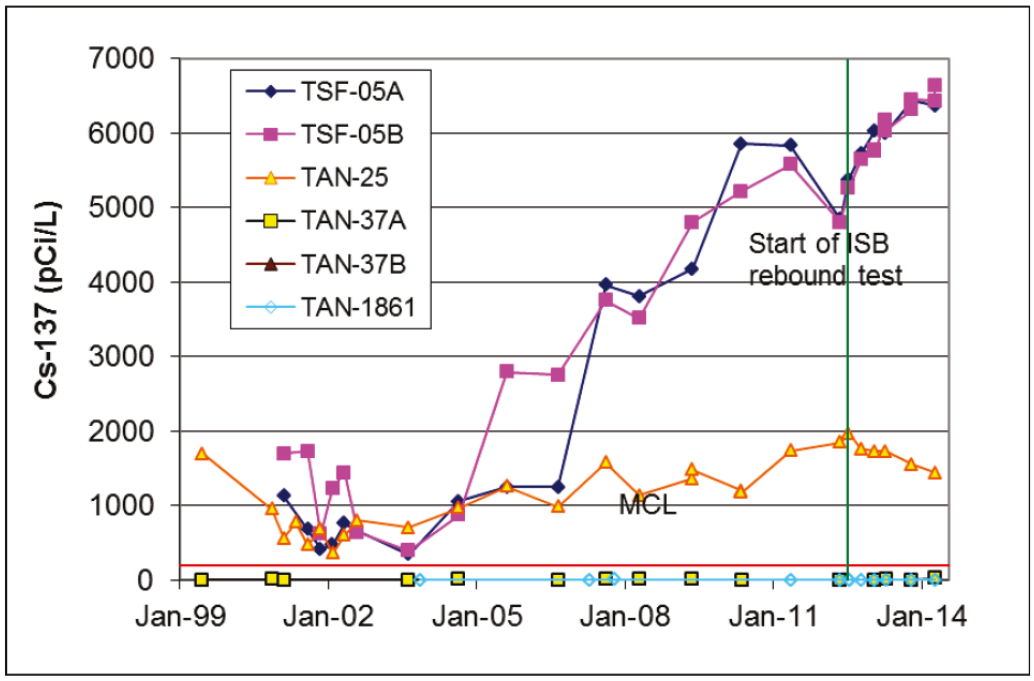


Figure 2-17. Cesium-137 concentrations in radionuclide monitoring wells (2000 to 2014).

[18] Five-Year Review of CERCLA Response Actions at the Idaho National Laboratory Site Fiscal Years 2010-2014, December 2015, DOE/ID-11513 Rev.0, pg. 2-28.

TAN Groundwater Strontium-90 (Sr-90) Monitoring [19]
EPS's Maximum Concentration Limit is 8 pCi/L

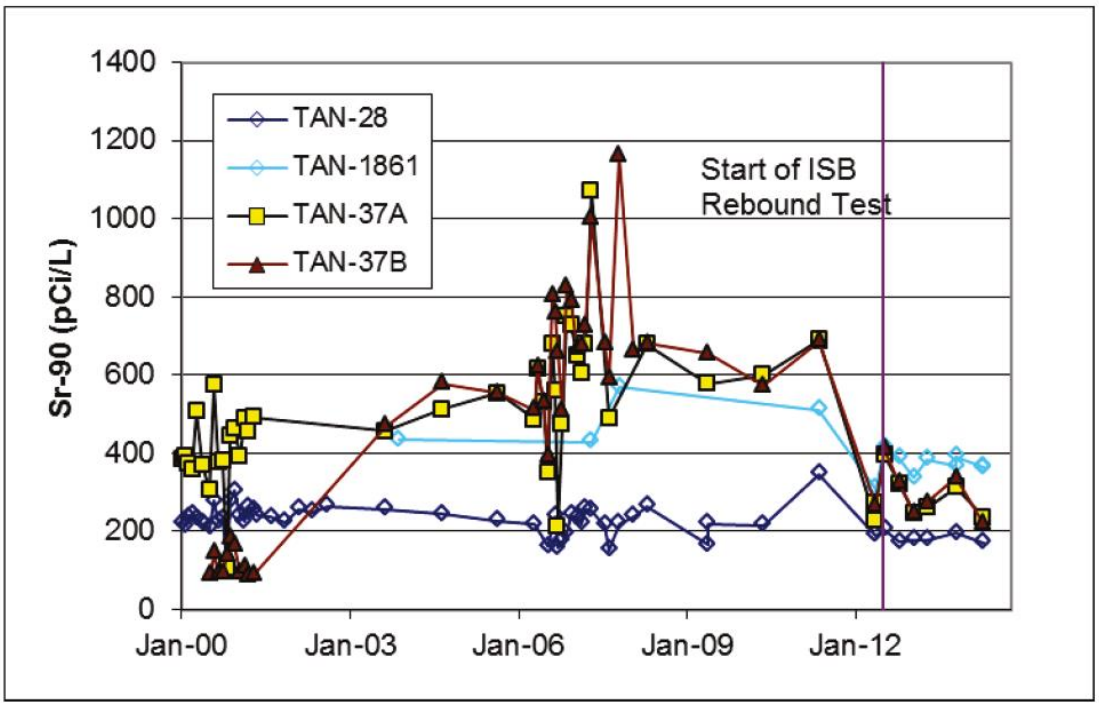


Figure 2-20. Strontium-90 concentrations in monitoring wells located near source and downgradient from the residual source (2000 to present).

[19] Five-Year Review of CERCLA Response Actions at the Idaho National Laboratory Site Fiscal Years 2010-2014, December 2015, DOE/ID-11513 Rev.0, Page 2-30.

Attachment--A

Comments of David B. McCoy
for the Department of Energy (DOE)
New Proposed Plan for the V-Tanks Contents (TSF-09 and TSF-18)
at Test Area North, Operable Unit 1-10 (April 2003)

In dealing with the V Tank wastes with its proposed plan, the Department of Energy (DOE) has attempted to bifurcate the CERCLA aspects from the RCRA aspects evolving the CERCLA plan without first giving due consideration to RCRA requirements. The hazardous wastes contained in the Idaho Nation Engineering and Environmental Laboratory (AINEEL@) Test Area North (ATAN@) V Tanks clearly are RCRA listed and characteristic wastes. Thus, the compliance with applicable or relevant and appropriate requirements (ARARs) cannot be met unless the plan is in compliance with RCRA standards applicable to generators of hazardous waste, owners and operators and land disposal restrictions.

The CERCLA plan ignores RCRA requirements at the outset by not taking into account the fact that RCRA waste cannot be diluted to reduce material to achieve a level below EPA concentration limits to achieve land disposal. 40 CFR 268.3. Such dilution is being used for the V-Tank wastes in the form of addition of soils and grout materials to reduce the RCRA wastes to levels that would allow land disposal at the INEEL CERCLA Disposal Facility (AICDF@). In order to properly consider the V Tank wastes under RCRA requirements, the levels of hazardous constituents must be considered *prior to* the dilution of those wastes by the addition of soils whether contaminated or not, and/or addition of grout.

Levels of radioactive and other contaminants in the V-9 Tank are much higher in concentration than the V-1, 2 or 3 Tanks. Although not set out in the proposed plan, the V-9 Tank, which may contain the highest levels of radioactive contaminants in RCRA mixed waste form should be considered individually in order to contain the transuranics and prevent them from being dumped by land disposal over the Snake River Aquifer where the transuranics will enter the groundwater and aquifer and Snake River.

The additional V Tanks in building 616 have not been described in the proposed plan and there is a question as to how much transuranic concentration, if any, may be present there in addition to V Tanks 1, 2, 3 and 9. Not presenting the full scope of the TAN V Tank problem for public review is a major weakness in the current proposed plan.

The proposed plan intends to send transuranic waste to the ICDF. Transuranic waste is not

approved for land disposal. Concentration of transuranics are at a high level of 26.4 nCi/g within the V Tank system. The plan proposes, without specifically bringing it to the attention of the public, to reduce this concentration below 10 nCi/g by 1) flushing the contents of all the tanks together into a mass; 2) addition of soil wastes, and; 3) addition of grout. The specific facts to justify the reduction of concentration of transuranics to permissible levels have not been set forth. In any case there is a dilution of the waste to accomplish this task.

No notice of the proposed ICDF activity to dispose of TAN V Tank wastes including transuranics within the INEEL floodplain has been given in the Federal Register as required by 10 CFR 1022 et seq. See, 10 CFR 1022.2(a), 1022.3(3), and1022.4 (q).

Although the transuranics might be removed from the TAN site, the transuranics will not be removed from the INEEL site and thus long term effectiveness is not high as claimed in the proposed plan. The long term effectiveness of protection of health and the environment is not achieved because the transuranics are not being removed from the INEEL site if disposed of at the ICDF which lies above the Snake River Aquifer and is within the 100-year flood zone at INEEL. The contamination of the aquifer over the long term by transuranics constitutes an irreversible and irretrievable commitment of resources which must clearly be set forth in an environmental impact statement and in the decision to grant a license or permit authorizing such commitment of resources. No environmental impact statement for INEEL sets forth this irretrievable and irreversible commitment of resources to contamination by transuranics coming from TAN. A recent federal court order interpreting the 1995 Batt Agreement requires removal of all transuranics from INEEL.

The National Environmental Protection Act (NEPA) requirements have not been satisfied. DOE is required, to the extent possible, to accommodate the requirements of Executive Orders 11988 and 11990 through applicable DOE NEPA procedures. 10 CFR 1022.2(2)(b). No Environmental Impact Statement has been performed prior to the construction of the ICDF. CERCLA allows for cleanup, but it is not contemplated within CERCLA that an entire facility for cleanup can be constructed without an Environmental Impact Statement.

The plan states (p.6) that the long range land use plan for Test Area North is for non-nuclear industrial facilities. This statement is erroneous because on July 15, 2002, the DOE announced a Mission Change for the entire INEEL for nuclear research and development including the building of commercial nuclear power stations at the site. This Mission Change statement has not been factored into the current proposed plan for the TAN V Tanks. Nor has there been any Environmental Impact Statement addressing the Mission Change even though substantial federal resources are currently being committed to the new mission of INEEL for nuclear industrial activities which could continue into the foreseeable and distant future.

These written comments are submitted in addition to any oral comments made by myself at the Public Meeting of April 30, 2003 at Idaho Falls, Idaho.

David B. McCoy