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ENGINEERING CHANGE NOTICE

Page 1 of 2

1. ECN № 622126

Proj. ECN

2. ECN Category (mark one)	3. Originator's Name, Organization, MSIN, and Telephone No.	3a. USQ Required?	4. Date
Supplemental [] Direct Revision [x] Change ECN [] Temporary [] Standby [] Supersedure [] Cancel/Void []	Scott N. Luke, WAE/ES (01821), H6-23, 372-1667	[] Yes [X] No	3/17/95
	5. Project Title/No./Work Order No. R3B27	6. Bldg./Sys./Fac. No. 2727-S NRDWS Facility	7. Approval Designator NA
	8. Document Numbers Changed by this ECN (includes sheet no. and rev.) WHC-SD-EN-TI-242, Rev. OA	9. Related ECN No(s). NA	10. Related PO No. NA

11a. Modification Work	11b. Work Package No.	11c. Modification Work Complete	11d. Restored to Original Condition (Temp. or Standby ECN only)
[] Yes (fill out Blk. 11b) [X] No (NA Blks. 11b, 11c, 11d)	NA	NA Cog. Engineer Signature & Date	NA Cog. Engineer Signature & Date

12. Description of Change

Incorporate Ecology comments through the initiation of Revision OB changes to the following pages as shown: Cover Page (add rev number); TOC (delete sections 3.1.1 and 3.1.2); 1 (introduce Appendix E); 3 (revise Table 1); 4 (refer to Appendix A data); 5 (revise Figure 1); 13, 15 and 18 (revise Appendix A table numbers as referenced in text); 26 (revise reference WHC, 1992a); T1-11 (add B07562 sample results); T2-29 and T2-39 (added U data qualifier to sample B07560 results); and, Appendix E (add pages Ei, Eii, E1-5).

13a. Justification (mark one)

Criteria Change	[X]	Design Improvement	[]	Environmental	[]	Facility Deactivation	[]
As-Found	[]	Facilitate Const	[]	Const. Error/Omission	[]	Design Error/Omission	[]

13b. Justification Details

NA

14. Distribution (include name, MSIN, and no. of copies)

See attached distribution sheet.

RELEASE STAMP

OFFICIAL RELEASE BY WHC DATE MAR 29 1995

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A-7900-013-1

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ENGINEERING CHANGE NOTICE

1. ECN (use no. from pg. 1): 622126

15. Design Verification Required	16. Cost Impact				17. Schedule Impact (days)	
	ENGINEERING		CONSTRUCTION			
[] Yes	Additional	[] $	Additional	[] $	Improvement	[]
[X] No	Savings	[] $	Savings	[] $	Delay	[]

18. Change Impact Review: Indicate the related documents (other than the engineering documents identified on Side 1) that will be affected by the change described in Block 12. Enter the affected document number in Block 19.

SDD/DD	[]	Seismic/Stress Analysis	[]	Tank Calibration Manual	[]
Functional Design Criteria	[]	Stress/Design Report	[]	Health Physics Procedure	[]
Operating Specification	[]	Interface Control Drawing	[]	Spares Multiple Unit Listing	[]
Criticality Specification	[]	Calibration Procedure	[]	Test Procedures/Specification	[]
Conceptual Design Report	[]	Installation Procedure	[]	Componerrt Index	[]
Equipment Spec.	[]	Maintenance Procedure	[]	ASME Coded Item	[]
Const. Spec.	[]	Engineering Procedure	[]	Human Factor Consideration	[]
Procurement Spec.	[]	Operating Instruction	[]	Computer Software	[]
Vendor Information	[]	Operating Procedure	[]	Electric Circuit Schedule	[]
OM Manual	[]	Operational Safety Requirement	[]	ICRS Procedure	[]
FSAR/SAR	[]	IEFD Drawing	[]	Process Control Manual/Plan	[]
Safety Equipment List	[]	Cell Arrangement Drawing	[]	Process Flow Chart	[]
Radiation Work Permit	[]	Essential Material Specification	[]	Purchase Requisition	[]
Environmental Impact Statement	[]	Fac. Proc. Samp. Schedule	[]	Tickler File	[]
Environmental Report	[]	Inspection Plan	[]		[]
Environmental Permit	[]	Inventory Adjustment Request	[]		[]

19. Other Affected Documents: (NOTE: Documents listed below will not be revised by this ECN.) Signatures below indicate that the signing organization has been notified of other affected documents listed below.

Document Number/Revision	Document Number/Revision	Document Number Revision
NA		

20. Approvals

	Signature	Date		Signature	Date
OPERATIONS AND ENGINEERING			ARCHITECT-ENGINEER		
Cog. Eng. S.N. Luke	S.N. Luke	3/27/95	PE		
Cog. Mgr. F.A. Ruck	F.A. Ruck	3/27/95	QA		
QA			Safety		
Safety			Design		
Environ.			Environ.		
Other			Other		
			DEPARTMENT OF ENERGY		
			Signature or a Control Number that tracks the Approval Signature		
			ADDITIONAL		

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RECORD OF REVISION	(1) Document Number WHC-SD-EN-TI-242	Page 1

(2) Title
2727-S Nonradioactive Dangerous Waste Storage Facility Clean Closure Evaluation Report

CHANGE CONTROL RECORD

(3) Revision	(4) Description of Change - Replace, Add, and Delete Pages	Authorized for Release	
		(5) Cog. Engr.	(6) Cog. Mgr. Date
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0B RS	Page changes in accordance with ECN 622126: Cover page, TOC, 1, 3, 4, 5, 13, 15, 18, 26, T1-11, T2-29, T2-39, [New Appendix E] E-i, E-ii, E-1, E-2, E-3, E-4, E-5.	3/27/95	3/27/95

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WHC-SD-EN-TI-242
Revision 0B

2727-S Nonradioactive Dangerous Waste Storage Facility Clean Closure Evaluation Report

Prepared for the U.S. Department of Energy
Office of Environmental Restoration and
Waste Management

Westinghouse
Hanford Company Richland, Washington

Hanford Operations and Engineering Contractor for the
U.S. Department of Energy under Contract DE-AC06-87RL10930

Approved for Public Release

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SUPPORTING DOCUMENT

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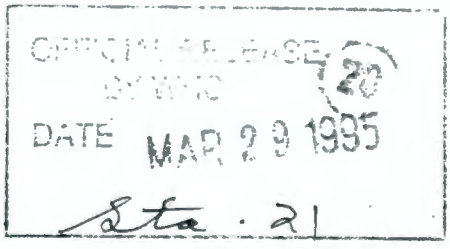
2727-S Nonradioactive Dangerous Waste Storage Facility	Name: S. N. Luke Signature Organization/Charge Code 01821 /R3B27

7. Abstract

This report presents the analytical results of 2727-S NRDWS Facility closure verification sampling and compares sampling results to clean closure cleanup levels.

8. RELEASE STAMP



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2727-S NONRADIOACTIVE DANGEROUS WASTE STORAGE FACILITY CLEAN CLOSURE EVALUATION REPORT

1.0 INTRODUCTION

This section identifies the purpose, scope, and format of this report. Comments received from Ecology on Revision 0A of this report have been incorporated into this revision as Appendix E.

1.1 SITE SETTING

The 2727-S Nonradioactive Dangerous Waste Storage (NRDWS) Facility was a *Resource Conservation and Recovery Act of 1976* interim status treatment, storage, and disposal (TSD) unit located in the 200 West Area of the Hanford Site. This TSD unit stored containerized (drummed), nonradioactive dangerous waste. Soil sampling of the 2727-S NRDWS Facility for purposes of unit closure began in August 1992 in accordance with the 2727-S NRDWS Facility Closure Plan, Revision 3 (DOE-RL 1988a) and was completed in September 1992.

To avoid extensive sampling, Revision 3 of the closure plan reflected an agreement with the Washington State Department of Ecology (Ecology) to dispose of unit structures and of the first 6 inches of soil immediately beneath the structures as WT02, Washington State dangerous waste. Closure verification sampling consisted of sampling substructure soils that would remain after demolition and after the planned soil removal (Ecology 1991). Sampling was performed prior to site demolition to prevent disturbing the underlying soil.

Demolition of the metal building and concrete storage pad that constituted the TSD unit structure began immediately upon the completion of sampling. Removal to an offsite landfill of the bulk of demolition waste and waste soils was completed in September 1992. Demolition debris and containerized, nonregulated waste soils remain at the site. To conclude physical closure, the site requires only final disposition of the containerized soils and demolition debris, and site restoration (i.e., regrading and revegetation).

1.2 PURPOSE AND SCOPE

This report presents the analytical results of 2727-S NRDWS Facility closure verification soil sampling and compares these results to clean closure criteria. The results of this comparison will determine if clean closure of the unit is regulatorily achievable.

This report also serves to notify regulators that concentrations of some analytes at the site exceed sitewide background threshold levels (DOE-RL 1993b) and/or the limits of quantitation (LOQ). These levels were established within the closure plan (DOE-RL 1988a) as the initial cleanup levels for this unit. Constituents exceeding these initial levels are identified in Section 2.0.

Maxima and 95/95 Reference Thresholds for Hanford Sitewide Soil Background.[1] (sheet 1 of 2)

Analyte	Detection limits		95/95 threshold (mg/kg)	Maximum concentration (mg/kg)	Sample with maximum concentration
	LOD	LOQ			
Aluminum	21.8	66.1	15,100	28,800	Topsoil, playa, E-7
Antimony	15.7	52.2	NC	31	Volcanic ash*
Arsenic	N/A	N/A	9.0	27.7	Topsoil,juniper, e-3
Barium	0.87	2.7	175	480	Volcanic ash*
Beryllium	N/A	N/A	1.8	10	Volcanic ash*
Cadmium	0.24	0.79	NC	11	Volcanic ash*
Calcium	175	470	24,600	105,000	Topsoil, greasewood, E-2
Chromium	1.1	3.0	28	320	Ringold FM*
Cobalt	0.88	2.9	19	110	Volcanic ash*
Copper	2.1	6.2	30	61	Volcanic ash*
Iron	75.7	236	38,200	68,100	Ringold FM
Lead	N/A	N/A	14.9	74.1	Topsoil,juniper, E-3
Magnesium	18.4	57.9	9,160	32,300	Topsoil, greasewood, E-2
Manganese	0.63	1.8	583	1,110	Topsoil, playa, E-7
Mercury	N/A	N/A	1.3	3.8	Random samples, #15
Nickel	2.4	7.7	25	200	Ringold FM*
Potassium	135	451	3,090	7,900	Topsoil, playa, E-7
Selenium	N/A	N/A	NC	6	Random samples, #15
Silver	2.1	4.5	2.1	14.6	Random samples, #6
Sodium	50.6	140	1,390	6,060	

Table 1. Summary Data Location and Analytical Methods for 2727-S NRDWS Facility Soil Sampling.

Constituent group	Analytical method[a]	Appendix A, data summary tables	Comparison tables
VOC	SW-846, 8240	AT-1	T-2
Semi-VOC	SW-846, 8270	AT-2	T-3
Organochlorine pesticides/PCBs	SW-846, 8080	AT-3	T-4
Herbicides	SW-846, 8150	AT-3	T-5
Organophosphorus pesticides	SW-846, 8140	AT-3	[c]
Metals	SW-846, 6010 (ICP metals); 7000[b] series (TCL metals)	AT-4	T-6
Other Inorganics	SW-846, 9010 (cyanide); EPA 350.3 (ammonia); SW-846, 9030 (sulfide); EPA 300.0 (all others)	AT-5	T-7

Notes:
ICP = Inductively Coupled Plasma. TCL = Target Compound List.
PCB = Polychlorinated Biphenyl. VOC = Volatile Organic Compound.
[a]SAF = Sampling Authorization Form.
[b]Source: S-Cubed Laboratory Summary Sheets (SAF Number 92-262 and SAF Number 92-309).
[c]SW-846 Method: 7060 (arsenic); 7421 (lead); 7740 (selenium); 7841 (thallium); 7470 (mercury); (EPA 1990).
No detections.

closure at the listed concentration. However, to account for possible inconsistencies in the normal order of restrictiveness, e.g., polycyclic aromatic hydrocarbon (PAH) detections (Section 2.2.1), all columns in the tables will be completed where information is available. Appendix D presents the standards against which results above detection are compared.

1.4 SCREENING CRITERIA

The primary criteria for evaluating analyte detections are background thresholds and health-based cleanup levels where available. Analyte concentrations were first compared to the Hanford Site background study 95/95 background thresholds (Appendix B). However, other Hanford Site study sampling results were considered, including the results of judgmental (nonrandom) sampling.

Results above background or for which there is no Hanford Site Background threshold, were then compared to MTCA health-based cleanup levels (WAC 173-340) under which the unit can clean close in accordance with WAC 173-303-610. The comparison was first to cleanup levels identified in MTCA 173-340-740, Table 2, Method A Cleanup Levels--Soil. Use of Method A cleanup levels can be approved by Ecology when using Method B cleanup levels as the clean closure criteria (Ecology 1993). Results not applicable to Table 2 or exceeding Table 2 values were then compared to residential, health-based levels calculated using WAC 173-340-740 Method B formulas. The Method B cleanup level for carcinogenicity and for toxicity were calculated where toxicological information was available.

Where sitewide background thresholds (DOE-RL 1993b) and/or health-based data were not available, secondary criteria such as local background, EPA guidelines, laboratory data qualifiers and practical quantitation limit (PQL) were considered in evaluating concentrations. The application of these secondary criteria will be explained where used.

1.5 SAMPLING REQUIRED BY THE CLOSURE PLAN

Sampling was performed as indicated in Table 2, Revision 3A, of the closure plan. The closure plan required 26 samples identified within the plan as verification samples. Analytes of interest for this sampling are shown in Appendix G, Table G-1, of the closure plan and are as specified in Sampling Authorization Form (SAF), SAF Number 92-262 (OSM 1992a). Sample location and depth are shown in Figure 1.

Of the 26 samples, 23 were verification samples and 3 were local background samples. The 26 samples required by the closure plan were numbered B07531 through B07560 by the Hanford Environmental Information System (HEIS) (WHC 1990). Two blanks were also included: trip blank B07531 and equipment blank B07540. The three local background samples were numbered B07557, B07558, and B07559. These were taken along the facility perimeter fence beyond the area impacted by facility operations.

Laboratory analysis of all samples was performed offsite by S-Cubed analytical laboratories. The laboratory analytical method and the location of summary data within this report are shown in Table 1. Samples were exempt from radiation release surveys thereby allowing direct shipment to the offsite laboratory (Lindsey 1993). Sample analytical results were verified and validated by Westinghouse Hanford Company's Office of Sample Management, which is now known as Hanford Analytical Services Management.

Information pertaining to samples required by the closure plan is retained by Hanford Analytical Services Management under SAF Number 92-262. Copies of S-Cubed laboratory Form 1 Data Sheets, S-Cubed laboratory narrative, and the Westinghouse Hanford Company validation report for these samples, have already been submitted to Ecology (DOE-RL 1993a).

1.6 OTHER SAMPLING PERFORMED IN SUPPORT OF CLOSURE ACTIVITIES

One soil sample was taken in support of closure activities that was not indicated in the closure plan. Sample B07562 (and trip blank B07561) (Figure 1) was taken as the result of minor leakage of an oil-like fluid onto site soils during TSD demolition. Analytes of interest for this sampling were agreed to with Ecology at the time of the spill and are specified in SAF Number 92-309 (OSM 1992b). Analytical results for detected VOAs and inorganics are summarized in Appendix A, Tables 1 and 4, respectively.

This sample was analyzed, the results validated, and laboratory data were transmitted to Ecology (DOE-RL 1993a) as with other site sampling. All information pertaining to this sampling is retained by Hanford Analytical Services Management under SAF Number 92-309.

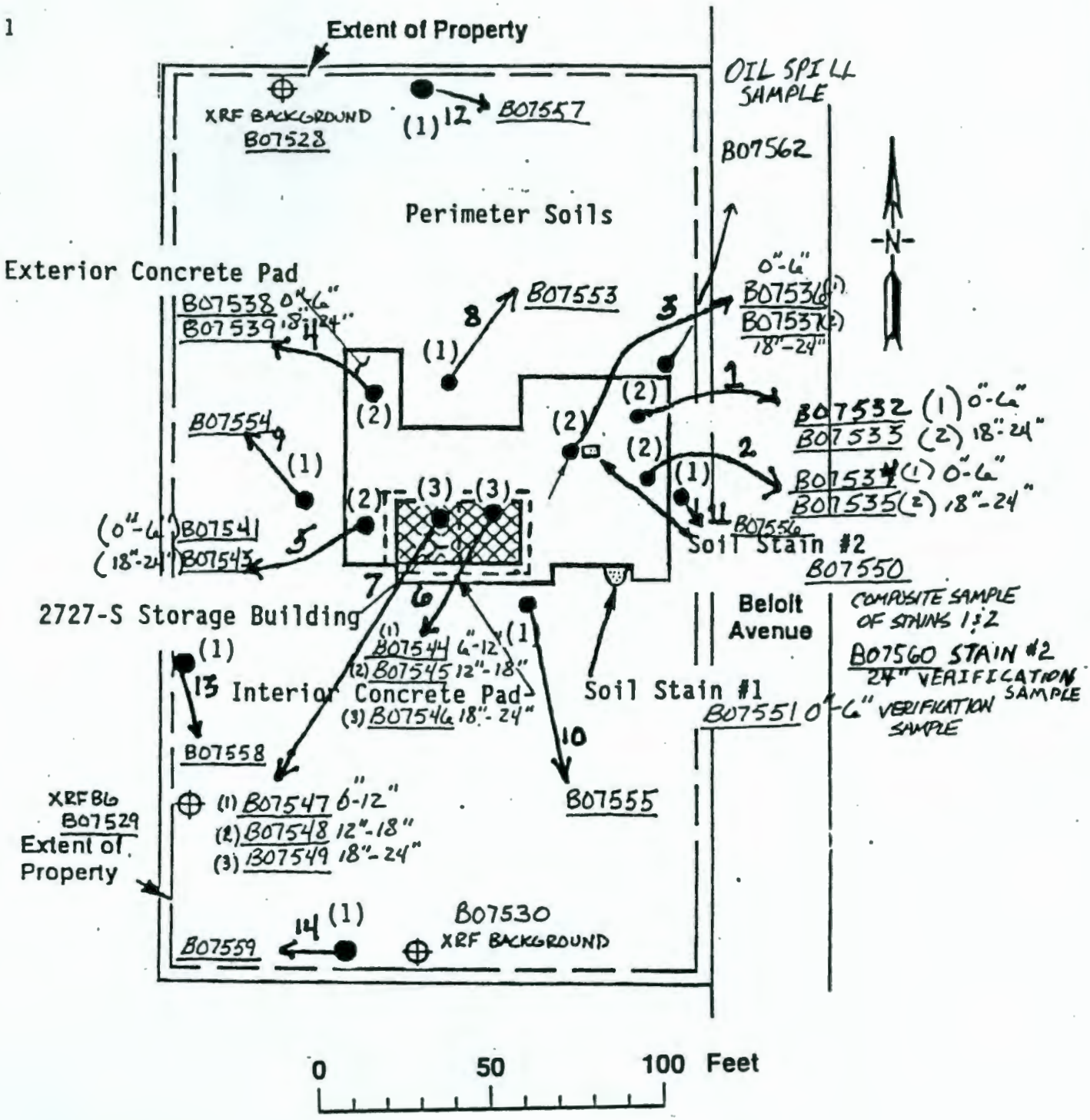

Figure 1. Location and Depth of 2727-S NRDWS Facility Soil Samples.

2.3.1 Reported Organochlorine Pesticide/PCBs

There were no PCB detections. The only organochlorine pesticide reported above detection was 4,4'-DDT. 4,4'-DDT was reported in five samples. The listed concentrations in Table 4 were given a J qualifier during data validation as being estimated values because of high matrix spike (MS)/matrix spike duplicate percent recovery (OSM 1992a). The detected concentrations were also low, being either near or below the PQL of 8 ppb for 4,4'-DDT.

Table 4. Detected Organochlorine Pesticide/PCB Analytes.

HEIS No.	Detected analyte				>PQL[b]	MTCA method A & B cleanup levels[b]		
	Name	CAS No.	Conc. µg/kg (ppb)	Qualifier code[a]		>A	>B	
							>Carc	>Tox
B07532	4,4'-DDT	50-29-3	4.61	J	No	No	No	No
B07550	4,4'-DDT		5.26	P,J	No	No	No	No
B07551	4,4'-DDT		6.34	P,J	No	No	No	No
B07552	4,4'-DDT		8.26	P,J	No	No	No	No
B07560	4,4'-DDT		4.71	J	No	No	No	No

Notes:
MTCA = Model Toxics Control Act.
[a]PQL = Practical Quantitation Limit (EPA 1990).
[b]Organic qualifier code: J = Estimated, P = Concentration given is the lower of the two gas chromatograph/mass spectrometry columns (EPA 1991).
Appendix D of this report provides MTCA Method A and B toxicity and carcinogenicity soil cleanup levels and PQL values.

2.3.2 Organochlorine Pesticide/PCB Concentrations Regarding Clean Closure

Laboratory analysis for organochlorine pesticide/PCBs detected only 4,4'-DDT, and then only at low, estimated concentrations. No 4,4'-DDT concentration exceeds the MTCA Method B residential health-based cleanup levels for toxicity or carcinogenicity. Therefore, organochlorine pesticide/PCB concentrations do not represent an impediment to clean closure.

2.4 HERBICIDE DATA SUMMARY

This section identifies and reconciles by sample number herbicide concentrations indicated in Appendix A, Table AT-3 as above detection.

No.	Comments/Response	Concurrence

Requirement: Provide this comparison within the closure plan.

Response: The equivalency of a RCRA corrective action and a CERCLA remedial action as past practice processes is identified in the TPA Action Plan, Figure 7-2. Although the basis and rationale for integrating RCRA TSD unit closures and CERCLA remedial actions has been established, no implementing procedure is in place. Consequently, the equivalency of the RCRA TSD unit closure process with these past practice processes is nowhere identified and must be established to regulator satisfaction via this closure plan. Section 5.5 of the TPA Action Plan identifies the need for closely associated TSDs and past-practice units to work together by assigning TSDs to OUs (TPA Action Plan, Appendix B) and establishing a lead regulatory agency (TPA Action Plan, Appendix C) to manage the combined units' activities.

Text change(s): The verbiage "and interchangeable" will be deleted from lines 26 and 27.

5) Line # 29-33. Using MTCA methods A-C to establish Health Based Limits (HBL) for RCRA corrective action is very similar to using HSBRAM to establish acceptable risk numbers for a CERCLA remedial action. Therefore, it is incorrect to view this as a difference between RCRA and CERCLA waste unit management.

Response: Note: This TSD unit closure is not a RCRA corrective action because the 300 APT TSD is not a past-practice unit.

Both MTCA and HSBRAM are similar in that they establish similarly calculated cleanup levels for nonradioactive contaminants based on unit risk. However, only the MTCA Method B formulas establishing clean closure levels have been adopted into WAC 173-303-610 governing RCRA TSD unit closures. WAC 173-303-610 does not invoke MTCA formulas for any other level of closure. As indicated in closure plan section 6.1.2.3, only the RCRA Permit (Section II.K.3) invokes the use of MTCA in the establishment of "modified" closure HBLs.

2.5 INORGANIC ANALYTE DATA SUMMARY

This section identifies, by sample number, inorganic analyte concentrations (primarily metals) indicated in Appendix A, Table AT-4 as above detection and as exceeding Hanford Site background threshold values (Appendix B, where available).

2.5.1 Screening Criteria

As with other analytes, inorganic concentrations were initially compared against Hanford Site background threshold values (DOE/RL 1993B). For some inorganic carcinogens (e.g., arsenic and beryllium), the calculated MTCA Method B residential, cleanup level is below the sitewide threshold value. In such cases, the cleanup level is assumed to be natural background as determined by the Hanford Sitewide background threshold. Therefore, arsenic or beryllium detections, which were all below their respective background thresholds of 9 ppm and 1.8 ppm, will require no further evaluation.

The results of local background sampling, taken as a portion of closure verification sampling, have been considered where Hanford Site background threshold values have not been calculated and where toxicological [reference dose (RfD) or carcinogenic potency factor (CPF)] information is not available to calculate health-based cleanup levels.

In cases where the highest detected concentration is B qualified, the analyte will be listed at Table 6 only once at the highest concentration. The B qualifier is used when the reported value has been obtained from a reading above instrument detection limit (IDL) but below contract laboratory program required detection limit (CRDL) (EPA 1991). Although B qualified data are usable, they represent concentrations below levels contractually required to be quantifiable and are below MTCA B cleanup levels. Tin is listed only at its highest concentration because all tin concentrations are B qualified. Some boron and cadmium detections were also B qualified; however, with these analytes, the B qualified data were not the highest reported concentrations.

2.5.2 Reported Analytes

Some inorganic analytes were so frequently reported that they will be addressed in Table 6 at only their highest concentration. This will demonstrate that even at their highest concentrations, none of these analytes exceed MTCA Method B residential health-based cleanup levels. Less commonly reported analytes will be individually addressed in Table 6. Silicon is not listed in Table 6 but is narratively addressed.

2.5.2.1 Frequently Reported Inorganic Analytes. Tin, boron, strontium, silver, and silicon were each reported in virtually every soil sample, including local background samples. These analytes, except silicon which is narratively addressed, are listed in Table 6 only at their highest reported concentration. Of the analytes addressed in Table 6, only silver has a Hanford Site background threshold as an initial comparison value. All but

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DER-1	.WA	166,560	11-02-93	11:24a	DER-W	.	105,053	08-06-93 04:08p
EC	.	14,874	01-14-94	09:30a	EC-REV	.KWC	17,852	01-11-94 11:24a
EC-SUMP	.	11,195	01-03-94	09:46a	EQV_CONC.	DSI	8,753	08-31-93 10:46a
HERB	.TBL	6,822	05-25-93	11:51a	HITS	.FAR	4,529	09-17-92 04:41p
HITS-1	.FAR	6,796	10-08-92	04:11p	INORG	.TBL	73,887	08-18-93 03:37p
INTRO	.DER	4,208	05-27-93	03:37p	MACTEC	.	2,577	05-24-94 10:31a
MACTEC	.RCR	8,483	06-09-94	08:08a	MACTEC-W.	RCR	9,939	06-08-94 10:12a
NODRT	.2EC	29,596	02-21-95	04:15p	PEST-PCB.	TBL	6,807	05-25-93 11:46a
PHOSPEST.	TBL	7,299	05-25-93	11:35a	SD-EN-TI.	242	178,963	03-15-95 09:57a
SEMI-VOA.	TBL	7,175	05-25-93	11:28a	SSGUZ	.	7,143	03-24-93 09:06a
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SWE-DES	.DTF	9,646	05-05-93	09:40a	TOXSOURC.		5,643	01-26-94 01:42p
VOA	.TBL	15,885	05-25-93	11:06a				

individually listed in Table 6. Except for one J qualified zinc result, concentrations of these analytes were not qualified during validation. All of these analytes have toxicity-related health-based cleanup levels (Appendix D).

Cadmium and antimony do not have calculated Hanford Site background thresholds. However, they do have toxicity-related health-based cleanup levels (Appendix D). Of the three cadmium concentrations, only B07538 exceeded local background (by less than 1 ppm); B07560 was J qualified (estimated); and, B07532 was B qualified (>IDL but <CRDL). Both antimony concentrations were J qualified (estimated) and exceeded local background by less than 2 ppm.

Selenium (Se) and thallium (Tl) results are not considered in this report. Neither of these have a calculated Hanford Site background threshold. All selenium and thallium data for the samples required by the closure plan (B07531 through B07560) were rejected (R qualified) during sample validation because of 0% MS recovery. The selenium and thallium concentrations for oil-spill sample B07562 were not rejected but were reported by the laboratory as below detection.

2.5.3 Inorganic Analyte Concentrations Regarding Clean Closure

Of the frequently reported inorganic analytes (including metals) (Section 2.5.2.1), most concentrations were reported only near detection levels. All except silicon were listed in Table 6 but only at their highest concentration. Silicon was narratively justified. Only at their highest did any of these concentrations exceed local background. Boron, silicon, and tin are not EPA listed hazardous substances (40 CFR 261) nor WAC dangerous waste constituents (WAC 173-303) and can be considered innocuous at levels found in 2727-S soils. The concentrations of analytes listed in Table 6 do not exceed MTCA Method B residential cleanup levels and therefore do not represent an impediment to clean closure.

Of the less frequently detected inorganic analytes (Section 2.5.2.2), all above sitewide background thresholds were individually listed in Table 6. None of these analytes exceeded either MTCA Method A levels, where applicable, or MTCA Method B residential cleanup levels and therefore do not represent an impediment to clean closure.

2.6 OTHER INORGANICS DATA SUMMARY

This section identifies, by sample number, analyte concentrations (primarily anions) indicated in Appendix A, Table AT-5 as being above detection. The constituents shown in Appendix A, Table AT-5, are fluoride, chloride, nitrate, bromide, nitrite, ortho-phosphate, sulfate, ammonia, cyanide (total), and sulfide. These analytes are all anions except ammonia, which is a compound. Analytes were reported above detection when the concentration exceeded the method detection limit (MDL) shown on laboratory summary sheets for individual samples.

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3.0 CONCLUSIONS

This section presents report conclusions regarding clean closure of the 2727-S NRDWS Facility. This section also addresses the fate of containerized, nonregulated waste soils previously stored at the 2727-S site.

3.1 FATE OF CONTAINERIZED SOILS AT THE 2727-S NRDWS FACILITY SITE

Containerized, nonregulated waste soils and debris from unit demolition were stored at the 2727-S site until 12/30/94. This material consisted of four 55-gallon drums of waste soils from stained soil areas No. 1 and No. 2 (Figure 1); one 55 gallon drum containing a small quantity of poly-bagged absorbent and waste soil from the cleanup of a very small oil-spill area (Figure 1); and, several small bore piping remnants as the source of the above spill.

The four drums of soil are represented by composite soil sample B07550 and the polybagged soils and small bore piping are represented by soil sample B07562. All of this material has been characterized as nonregulated waste soils based on application of the WAC 173-303 waste designation processes to B07550 and B07562 sample analytical results (WHC 1993a; WHC 1993b).

All of these soils and debris were removed from the site and disposed of as nondangerous waste on December 30, 1994, in accordance with the requirements of controlled manual, *Environmental Compliance* (WHC-CM-7-5).

3.2 REPORT POSITION REGARDING CLEAN CLOSURE OF THE 2727-S NRDWS FACILITY

The findings and conclusions presented in this report are based on the analytical results of 2727-S NRDWS Facility TSD unit closure verification sampling.

This sampling identified relatively few analyte concentrations above detection (Appendix A). No organophosphate pesticides or PCBs were detected. Most of the reported concentrations were only slightly above detection levels. Where Hanford Site background threshold values (Appendix B) were available, detections were generally screened out from requiring further consideration. Organic analyte (VOC, semi-VOC, organochlorine pesticide, herbicide) detections were dismissed because of low concentrations, due to their status as common laboratory contaminants, and due to their not exceeding MTCA Method B residential health-based cleanup levels. Inorganic analytes, including metals and anions, reported above detection were dismissed as not exceeding Hanford Sitewide background threshold levels as not representing in situ soils, as being essentially reflective of local 2727-S background, or as being common soil constituents not recognized as hazardous substances or dangerous waste constituents. Further, no concentrations exceeded its respective MTCA Method B residential health-based cleanup levels, where available.

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The 2727-S NRDWS Facility TSD soil analytical results indicate that unit soils contain no contamination at concentrations that could cause site soils to be regulated as dangerous waste or that exceed MTCA (WAC 173-340) Method A and/or Method B residential, health-based cleanup levels (Appendix D). Residential cleanup standards are stringent for closure of 200 West Area units such as the 2727-S NRDWS Facility, however, their use illustrates the low level of contamination at the 2727-S site. Consequently, under the provisions of WAC 173-303-610, this unit qualifies for clean closure without further sampling, removal, or decontamination of unit soils.

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Summary of Volatile Organic Compound Analytical Results for the 2727-S NRDWS Facility

Constituent	BO7560	Result	Units	Qualifier	BO7561	Result	Units	Qualifier	BO7562	Result	Units	Qualifier
1,1,1,2-Tetrachloroethane		5	ug/Kg	U	**	**	**	**	**	**	**	**
1,1,1-Trichloroethane		5	ug/Kg	U		5		U		27		U
1,1,2,2-Tetrachloroethane		5	ug/Kg	U		5		U		27		U
1,1,2-Trichloroethane		5	ug/Kg	U		5		U		27		U
1,1-Dichloroethane		5	ug/Kg	U		5		U		27		U
1,1-Dichloroethene		5	ug/Kg	U		5		U		27		U
1,2,3-Trichloropropane		5	ug/Kg	U	**	**	**	**	**	**	**	**
1,2-Dibromo-3-chloropropane		5	ug/Kg	U	**	**	**	**	**	**	**	**
1,2-Dibromoethane		5	ug/Kg	U	**	**	**	**	**	**	**	**
1,2-Dichloroethane		5	ug/Kg	U		5		U		27		U
1,2-Dichloroethene		5	ug/Kg	U		5		U		27		U
1,2-Dichloropropane		5	ug/Kg	U		5		U		27		U
1,2-Dimethylbenzene		5	ug/Kg	U	**	**	**	**	**	**	**	**
1,4-Dioxane		51	ug/Kg	U	**	**	**	**	**	**	**	**
2-Butanone		10	ug/Kg	U		3		U		27		U
2-Hexanone		10	ug/Kg	U		10		U		54		U
4-Methyl-2-pentanone		10	ug/Kg	U		19				2800		D
Acetone		14	ug/Kg	J		9		U		62		U
Acetonitrile		51	ug/Kg	U	**	**	**	**	**	**	**	**
Acrolein		51	ug/Kg	U	**	**	**	**	**	**	**	**
Acrylonitrile		51	ug/Kg	U	**	**	**	**	**	**	**	**
Allyl chloride		5	ug/Kg	U	**	**	**	**	**	**	**	**
Benzene		5	ug/Kg	U		5		U		27		U
Bromodichloromethane		5	ug/Kg	U		5		U		27		U
Bromoform		5	ug/Kg	U		5		U		27		U
Bromomethane		5	ug/Kg	U		10		U		54		U
Carbon disulfide		5	ug/Kg	U		5		U		27		U
Carbon tetrachloride		5	ug/Kg	U		5		U		27		U
Chlorobenzene		5	ug/Kg	U		10		U		54		U
Chloroethane		5	ug/Kg	U		10		U		54		U
Chloroform		5	ug/Kg	U		5		U		27		U
Chloromethane		5	ug/Kg	U		10		U		54		U
Chloroprene		510	ug/Kg	U	**	**	**	**	**	**	**	**
Dibromochloromethane		5	ug/Kg	U		5		U		27		U
Dibromomethane		5	ug/Kg	U	**	**	**	**	**	**	**	**
Dichlorodifluoromethane		5	ug/Kg	U	**	**	**	**	**	**	**	**
Ethyl cyanide		51	ug/Kg	U	**	**	**	**	**	**	**	**
Ethyl methacrylate		5	ug/Kg	U	**	**	**	**	**	**	**	**
Ethylbenzene		5	ug/Kg	U		5		U		27		U
Iodomethane		5	ug/Kg	U	**	**	**	**	**	**	**	**
Isobutyl alcohol		510	ug/Kg	U	**	**	**	**	**	**	**	**
Methacrylonitrile		51	ug/Kg	U	**	**	**	**	**	**	**	**
Methylenechloride		41	ug/Kg	J		3		U		27		U
Pentachloroethane		5	ug/Kg	U	**	**	**	**	**	**	**	**
Styrene		5	ug/Kg	U		5		U		27		U
Tetrachloroethene		5	ug/Kg	U		5		U		27		U
Toluene		5	ug/Kg	U		5		U		500		
Trichloroethene		5	ug/Kg	U		5		U		27		U
Trichloromonofluoromethane		5	ug/Kg	U	**	**	**	**	**	**	**	**
Vinyl acetate		10	ug/Kg	U		5		U		27		U
Vinyl chloride		5	ug/Kg	U		10		U		54		U
Xylenes (total)		5	ug/Kg	U		5		U		15		J
cis-1,3-Dichloropropene		5	ug/Kg	U		5		U		27		U
trans-1,3-Dichloropropene		5	ug/Kg	U		5		U		27		U
trans-1,4-dichloro-2-butene		5	ug/Kg	U	**	**	**	**	**	**	**	**

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Summary of Semi-Volatile Organic Compound Analytical Results for the 2727-S NRDWS Facility

Constituent	B07559	Results	Units	Qualifier	B07560	Results	Units	Qualifier
1,2,4,5-Tetrachlorobenzene		670	UG/KG	U		670	UG/KG	UJ
1,3,5-Trinitrobenzene		670	UG/KG	U		670	UG/KG	UJ
1,3-Dinitrobenzene		1300	UG/KG	U		1300	UG/KG	UJ
1,4-Naphthoquinone		670	UG/KG	U		670	UG/KG	UJ
1,4-Phenylenediamine		6700	UG/KG	U		6700	UG/KG	UJ
1-Naphthylamine		670	UG/KG	U		670	UG/KG	UJ
2,3,4,6-Tetrachlorophenol		670	UG/KG	U		670	UG/KG	UJ
2,6-Dichlorophenol		670	UG/KG	U		670	UG/KG	UJ
2-Naphthylamine		670	UG/KG	U		670	UG/KG	UJ
2-Picoline		1600	UG/KG	U		1600	UG/KG	UJ
5-Nitro-o-toluidine		670	UG/KG	U		670	UG/KG	UJ
A,A-Dimethylphenethylamine		2700	UG/KG	U		2700	UG/KG	UJ
Acetophenone		670	UG/KG	U		670	UG/KG	UJ
Aniline		670	UG/KG	U		670	UG/KG	UJ
Diphenylamine		670	UG/KG	U		670	UG/KG	UJ
Ethyl methanesulfonate		1300	UG/KG	U		1300	UG/KG	UJ
Hexachloropropene		670	UG/KG	U		670	UG/KG	UJ
Isodrin		330	UG/KG	U		340	UG/KG	UJ
Isosafrole		670	UG/KG	U		670	UG/KG	UJ
Methyl methacrylate		670	UG/KG	U		670	UG/KG	UJ
Methylmethanesulfonate		670	UG/KG	U		670	UG/KG	UJ
N-Nitrosodiethylamine		1300	UG/KG	U		1300	UG/KG	UJ
N-Nitrosodimethylamine		670	UG/KG	U		670	UG/KG	UJ
N-Nitrosomethylethylamine		1600	UG/KG	U		1600	UG/KG	UJ
N-Nitrosomorpholine		670	UG/KG	U		670	UG/KG	UJ
N-Nitrosopiperidine		1300	UG/KG	U		1300	UG/KG	UJ
N-Nitrosopyrrolidine		2700	UG/KG	U		2700	UG/KG	UJ
N-Nitroso-di-n-butylamine		670	UG/KG	U		670	UG/KG	UJ
O,O,O-Triethylphosphorothioa		670	UG/KG	U		670	UG/KG	UJ
O-Toluidine		670	UG/KG	U		670	UG/KG	UJ
Pentachlorobenzene		670	UG/KG	U		670	UG/KG	UJ
Phenacetin		1300	UG/KG	U		1300	UG/KG	UJ
Safrole		670	UG/KG	U		670	UG/KG	UJ

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Summary of Semi-Volatile Organic Com
Results for the 2727-S NRDWS Facility

Constituent	B07559	Results	Units	Qualifier	B07560	Results	Units	Qualifier
2-Acetylaminofluorene		1300	UG/KG	U		1300	UG/KG	UJ
3,3'-Dimethylbenzidine		670	UG/KG	U		670	UG/KG	UJ
3-Methylcholanthrene		670	UG/KG	U		670	UG/KG	UJ
4-Aminobiphenyl		1300	UG/KG	U		1300	UG/KG	UJ
4-Nitroquinoline-1-oxide		2700	UG/KG	U		2700	UG/KG	UJ
7,12-Dimethylbenz(a)anthrace		670	UG/KG	U		670	UG/KG	UJ
Aramite		1300	UG/KG	U		1300	UG/KG	UJ
Chlorobenzilate		670	UG/KG	U		670	UG/KG	UJ
Diallate		670	UG/KG	U		670	UG/KG	UJ
Dimethoate		670	UG/KG	U		670	UG/KG	UJ
Dinoseb		1300	UG/KG	U		1300	UG/KG	UJ
Disulfoton		670	UG/KG	U		670	UG/KG	UJ
Hexachlorophene		6700	UG/KG	U		6700	UG/KG	UJ
Methapyrilene		6800	UG/KG	U		6800	UG/KG	UJ
Methyl Parathion		670	UG/KG	U		670	UG/KG	UJ
Parathion		670	UG/KG	U		670	UG/KG	UJ
Pentachloronitrobenezene		1300	UG/KG	U		1300	UG/KG	UJ
Phorate		670	UG/KG	U		670	UG/KG	UJ
Pronamide		670	UG/KG	U		670	UG/KG	UJ
P-(Dimethylamino)azobenzene		670	UG/KG	U		670	UG/KG	UJ
Sulfotepp		670	UG/KG	U		670	UG/KG	UJ
Thionazin		1300	UG/KG	U		1300	UG/KG	UJ

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APPENDIX E

2727-S NONRADIOACTIVE DANGEROUS WASTE STORAGE FACILITY CLEAN CLOSURE EVALUATION REPORT COMMENT RESPONSE TABLE

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No.	Comments/Response	Concurrence
	General Ecology Comment	
	The report was logical and informative.	
	WHC Response: Thank you. The DOE/RL position regarding regulatory closure of this unit remains as stated in Section 3.2 of the Clean Closure Evaluation Report (CCER), WHC-SD-EN-TI-242, Rev. 0. That position is that this unit qualifies for clean closure under the conditions of WAC 173-303-610. Upon Ecology acceptance of the responses to the following specific comments, DOE/RL would anticipate receiving written notification from Ecology indicating that it concurs that this unit qualifies for clean closure.	
	Specific Comments	
1)	Provide Ecology with copies of the following documents that were referenced in the report or otherwise pertain to closure: • sampling field logbook (EFL-1038), • demolition field logbook (WHC-N-629 1), • sampling authorization form (SAF) 92-262 for sampling required by the closure plan, and, • SAF 92-309 for sample of the oil-spill, **WHC Response:** The requested information has been provided to Ecology as confirmed by Ecology at Unit Managers Meeting on 12/15/94.	

No.	Comments/Response	Concurrence

2) Figure 1 identifies 2 X-ray Fluorescence (XRF) locations with the same sample number, B07528. Please explain or correct Figure 1.

WHC Response: Figure 1 will be corrected by replacing the XRF sample B07528 at the south end of the unit with sample number B07530. The XRF information, as indicated in Section 4.2.3.4 of the *2727-S Nonradioactive Dangerous Waste Storage (NRDWS) Closure Plan* (the Plan), DOE/RL 88-37, Rev. 3 A, was initiated for purposes of informational field screening. The XRF samples were taken at locations where analytical samples were taken, XRF information was not used in making closure decisions and XRF results were not otherwise included in the CCER.

3. How can rejected selenium and thallium data be used to meet the requirement for such data.

WHC Response: Analytical results for selenium and thallium indicate less than 1 ppm for these constituents in all samples (0.60 to 0.65 ppm). These data were rejected by the validation process due to a surrogate spike recovery of zero. The zero recovery most likely occurred because a spike was not added to QC sample B07532MS (page 87 of the lab report). However, when a spike was added to QC sample B07540MS (page 89 of the lab report), the result indicated acceptable recovery rate for the spike.

There is no Hanford Site Background (DOE/RL 1993b) value for selenium (Se; CAS #7782-49-2) or for thallium (Tl; CAS #7440-28-0). Neither is recognized as a carcinogen by IRIS (CCER reference EPA 1988a) through assignment of a cancer potency factor (CPF). Both have an oral reference dose (RfD) that, using MTCA B formulas, can be used to calculate residential soil cleanup levels under which the unit may clean close. The residential level for selenium is 400 ppm, indicating that it is not a major concern in the environment. The residential level of thallium is 5.6 ppm for thallium.

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WHC-SD-EN-TI-242, Rev. 0B

No.	Comments/Response	Concurrence

A review of the waste inventory (Form 4 Generator Annual Dangerous Waste Report, Appendix E of the Plan) indicates that selenium was present in the waste inventory. However, given the short duration of TSD unit operations and given that this unit stored only properly containerized waste under controlled operating conditions, little likelihood exists for elevated selenium concentrations to exist in unit soils due to unit operations.

No thallium or thallium compounds are listed in the waste inventory identified in the Form 4 Generator Annual Dangerous Waste Report (Appendix E of the Plan) as having been stored at this unit.

4. Nine polycyclic aromatic hydrocarbons (PAHs) were detected in sample B07556. Although these did not individually exceed their respective PQLs or the MTCA Method A cleanup level for PAHs (1 ppm), their total PQLs when added together, could exceed the required cleanup level.

WHC Response: All PAH concentrations in surface soil sample B07556 were estimates only (i.e., J qualified by the lab and data validators did not take issue with this qualification). The results were qualified because mass spectral and retention time data identified the presence of the compounds at below contract required quantitation limits (CRQL). As such, these concentrations are usable but potentially suspect. The total of the estimated concentrations for all PAHs in this sample is 4.0 ppm, exceeding the Method A cleanup level of 1 ppm.

However, the CCER (Section 2.2.1) provides a technical basis for concluding that because PAHs are photosensitive, they could not have persisted in surface soils from the last date of waste management (1986) until the date of sampling (1992). Consequently, these PAH concentrations could not have originated from unit operations. The CCER provides an alternative hypothesis for the existence of PAH concentrations in this sample as the potential result of the sampling environment.

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WHC-SD-EN-TI-242, Rev. 0B

No.	Comments/Response	Concurrence

5. SAF 92-262 (for samples B07531-B07559) identified the use of SW-846 Method 8141 for phosphorous pesticides, however the lab narrative identified the use of method 8140. Please confirm the suitability of this substitution.

WHC Response: This substitution occurred as identified in the lab narrative. These data were J qualified (as estimated) by the validation process due to low MS/MSD recoveries in combination with high RPDs. The following phosphate/pesticides underwent analysis using method 8140:

	Residential (MTCA B)	Method 8141 PQL	Method 8140 PQL
tetraethylpyrophosphate (21646-99-1),	*NL	40.0 ppb	NL
parathion-methyl (298-00-0),	240.0 ppm	6.0 ppb	20.0 ppb
Phorate (298-02-2),	NL	2.0 ppb	101.0 ppb
disulfoton (298-04-4),	3.2 ppm	3.5 ppb	134.0 ppb
dimethoate (60-51-5),	6.0 ppm	13.5 ppb	NL

NL = Not Listed

None were detected using method 8140 which has higher PQLs than method 8141. However, as indicated in the above table, even the less sensitive method 8140 would have detected these analytes at orders of magnitude below their MTCA B cleanup levels.

6. SAF 92-262 identified the use of EPA Method 350.1 for ammonia analysis, however, the lab narrative identified the use of EPA Method 350.3. Please confirm the suitability of this substitution.

WHC Response: This substitution occurred as identified in lab narrative. This substitution is acceptable because 350.3 with a method detection limit (MDL) of 0.01 mg/L is a more sensitive method for the detection of ammonia than is 350.1 having an MDL of .03 mg/L.

No.	Comments/Response	Concurrence

7. SAF 92-262 identified the use of method EPA Method 353.2 for nitrite/nitrate analysis, however, the lab narrative infers the use of EPA Method 300.0. Please confirm the suitability of this substitution.

WHC Response: This substitution occurred as identified in the lab narrative. Based on PQL, this substitution is acceptable because 300.0 is more sensitive than 353.2 for nitrate/nitrite analysis. Method 353.2 gives total nitrogen (N) by summing NO_2 and NO_3 and has a PQL of 0.05 ug/L. Method 300.0 speciates NO_2 and NO_3 which have PQLs of 0.002 ug/L and 0.004 ug/L, respectively.

8. The data in Appendix A, Table 2, for sample B07560 (pages T2-30 and 39), is identified as estimated (J qualifier) but is not listen in text Table 3 as a detection. This is inconsistent with the format for this report which has been listing all detections in a text table.

WHC Response: All semi-volatile organics for sample B07560 were reported as undetected (U) by the lab in summary data sheets. The U was inadvertently left off of Appendix A, Table 2. The validation process qualified these data as estimated (J) which was carried on Appendix A, Table 2.

For sample B07560, pages T2-29 and T2-39 will be corrected by adding the U. Consistent with the report format for undetects, the sample results will remain unlisted in text Table 3.

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