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September 21, 2021 21-NWP-157

Brian T. Vance, Manager
Richland Operations Office
United States Department of Energy
PO Box 550, MSIN: H5-30
Richland, Washington 99352

Scott Sax, Project Manager and President
Central Plateau Cleanup Company LLC
PO Box 1464, MSIN: A7-01
Richland, Washington 99352

Re: Submittal of Hanford Facility Dangerous Waste Class 3 Permit Supplemental Information for the Class 3 Permit Modification Request for the Solid Waste Operations Complex Dangerous Waste Management Units Closure Plan Part Three

References: See page 2

Dear Brian T. Vance and Scott Sax:

This letter is a continuance of the Department of Ecology's (Ecology) Letter of Incompleteness for the Central Waste Complex-Waste Receiving and Processing Facility (CWC-WRAP) Outside Storage Areas A and B (OSA-A/B) Dangerous Waste Management Unit Closure Plans, issued in 2015 (Reference 1).

On December 1, 2020, Ecology received the United States Department of Energy's (USDOE) updated closure plans (Reference 2) to support the Class 3 Permit Modification request (Reference 3). Ecology completed the review of the supplemental information and determined the submittal is incomplete per Washington Administrative Code (WAC) 173-303-840(1)(b), as referenced by WAC 173-303-830(4)(c)(vi) (Reference 4).

Ecology is awaiting USDOE and Central Plateau Cleanup Company LLC (CPCCo) submittal of the identified information (Reference 4). In order to move forward processing the closure plans, Ecology has completed a technical evaluation of the updated OSA-A/B closure plans (Reference 2) without the information identified in Reference 4. Ecology's technical evaluation is being provided to USDOE and CPCCo formally in the enclosured Review Comment Record (RCR).

Once USDOE and CPCCo submit the required information identified in Reference 4, Ecology will review that information and finalize the completeness review. Any deficiencies with the newly submitted information will be identified at that time.

Please address Ecology comments in the RCR technical review. We would like to meet with your staff to review the RCR to give your staff the opportunity to ask clarifying questions about our comments.

If there are any questions, please contact Laura Morgan, Permit Writer, at (509) 372-7987 or laura.morgan@ecy.wa.gov, or Kelly Elsethagen, Project Manager, at (509) 372-7923 or kelly.elsethagen@ecy.wa.gov.

Sincerely,

Stephanie Schleif
Deputy Program Manager
Nuclear Waste Program

lm/jlg
Enclosure

References:

1. Letter 15-NWP-145, dated July 29, 2015, "Completeness Determination for Closure Plans Submitted for Dangerous Waste Management Units (DWMUs) in the Solid Waste Operations Complex (SWOC), Received October 24, 2013"
2. Letter 21-ESQ-0023, dated December 1, 2020, "Submittal of Hanford Facility Dangerous Waste Permit Supplemental Information for the Class 3 Permit Modification Request for the Solid Waste Operations Complex Dangerous Waste Management Units Closure Plans Part Three
3. Letter 13-ESQ-0074, dated October 11, 2013, "Response to Consent Agreement and Final Order Concerning (CAFO) the Submittal of Closure Plans for Closing Dangerous Waste Management Units (DWMUs)"
4. Letter 21-NWP-059, dated April 26, 2021, "Submittal of Hanford Facility Dangerous Waste Permit Supplemental Information for the Class 3 Permit Modification Request for Solid Waste Operations Complex Dangerous Waste Management Units Closure Plans part three"

cc: See page 3

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Ed Soto, Ecology
Dan Thompson, Ecology
Hanford Administrative Record
Hanford Facility Operating Record
Environmental Portal
CPCCo Correspondence Control
EPA Region 10 Hanford Field Office Correspondence Control
HMIS Correspondence Control
USDOE-ORP Correspondence Control
USDOE-RL Correspondence Control

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Closure Plan Comments:							
1.	Pg. H.1 Section H1	The location of OSA-A is not included in the introduction of the Closure Plan. The location is only mentioned in Section H2.2.2.1 Security Provisions.	Please include that OSA-A is located in the 200 West Area in the introduction of the Closure Plan.				
2.	Pg. H.2, Figure H-1	Container locations are not shown on the overhead photo of OSA-A.	Container locations should be shown somewhere, since they are not provided in the Part A. Management of the individual containers is an important element of closure. A diagram displaying zones reflecting the types of waste allowed for storage needs to be included.	WAC 173-303-610(3)(a)			
3.	Pg. H.3-H.6 Table H-1	Sample collection personnel need to be included in the training matrix, since this plan does not have a separate personnel training addendum.	Add sampler to the training matrix. All workers on a site undergoing closure must be discussed in the Closure Plan Training section.	WAC 173-303-330			
4.	Pg. H.7 Section H2.2.1	The second paragraph in this section states that incompatible wastes will be separated or protected from other incompatible materials. How are the wastes separated/protected from other materials?	Include more details on how the wastes are separated/protected from incompatible materials.	WAC 173-303-200			

5.	Pg. H.7-H.8 Section H2.2.-H.2.2.1 Table H-2	The Section does not address how the large containers of suspect integrity, with unknown contents, and stored relatively unprotected outdoors will be managed to ensure they "do not pose a risk to human health and the environment." A request for additional time to remove wastes from a closing DWMU must also demonstrate the owner/operator "has taken and will continue to take all steps to prevent threats to human health and the environment, including compliance with all applicable permit requirements" and that the criteria of WAC 173-303-610(4)(a)(i) or (ii) have been met. Additional information is needed in the closure plan.	Extended closure activities should document specific actions to ensure containers with poor integrity are prioritized for removal; and that enhanced inspection, corrective actions, and maintenance procedures (replacement of tarps, etc.) are in place. The process to perform corrective actions should be provided, especially in response to inspection requirements in the Agreed Order. Discuss actions if a leak is found. The Inspection Plan Major Theme Agreement 4.4.2017 Resolution: DOE provided Ecology with draft template language to be included in each unit-specific inspection plan on 3.28.17 and 4.4.17. The draft includes a schedule for remediating problems identified during inspections immediately, within 24-hours, and on a schedule for problems which cannot be resolved quickly. The draft language also states that on a unit-specific basis, each unit Addendum I will include a description of the remedy list of problems and schedule for remedy will tie back to the inspection log. The Major Themes Agreement specifies unit specific remedies to problems will be addressed. As there is no Addendum I associated with these closure plans, this information will need to be included in this closure plan. The remedy section language developed by Ecology also needs to be included in the closure plan.	WAC 173-303-610(4)(a)			

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			The inspections do not match the Hanford Federal Facility Agreement and Consent Order. A description of the inspection and corrective action for the tarps to ensure they are replaced in a timely manner also needs to be included in the closure plan. Have the containers been appropriately inspected, and the waste designated so it can be confirmed that they are stored correctly? Is secondary containment necessary for any of these containers?				
6.	Pg. H.11 Section H4	OSA-A currently stores TRUM and MLLW. An extended closure period is needed to ship these containers to another receiving treatment, storage, and disposal (TSD) facility for waste processing.	Perma-Fix needs to be identified as the only facility that can accept TRUM waste for treatment/repackaging. An estimate needs to be included of the number of large containers that can be accepted per year. It also needs to be discussed that remaining containers that cannot be accepted at Perma-Fix will be moved to indoor, compliant storage at CWC, and all containers will be removed from OSA-B by 9/30/2026.	Incomplete			

7.	Pg. H.11-H.13 Sections H.4-H4.1 Table H-3 Figure H-3	An unspecified, "extended period" cannot satisfy the requirement for the schedule. There is no documentation of an enforceable schedule to complete these activities, or a basis for the (unspecified) extended time required for removal of waste inventory, so we cannot evaluate whether it is justified. Additional comments are provided later.	The closure schedule must be specific for the various closure activities, and allow for tracking of progress. The closure schedule basis should consider availability of storage and treatment capacity in existing on-site and off-site commercial DWMU facilities, and any new units that may be permitted on-site. For OSA-A, provide a path forward that spells out what needs to be done to get the waste containers removed from the storage area (e.g. Perma-Fix). For containers with no current path forward: 1. Do you need to construct a facility that can deal with the levels of TRUM contained in the waste packages? 2. Does the waste require any further treatment to be disposed of? 3. Is the treatment available? This is all part of the discussion that must take place for closure of this DWMU to occur. That process must be discussed/documented in this closure plan. The Closure Activities Schedule needs to be discussed in further detail, and the records review for waste stored at this location needs to be included. This would include, but is not limited to: waste inventory records, container location maps or aerial photos, inspection records, any sampling data from materials with packages,	WAC 173-303-610(4)(a) WAC 173-303-610(3)(a)(vii),			

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			Waste inventory removal also needs to be added to the M-091 Schedule. Waste inventory removal must be completed by 2026, and remaining closure activities must begin right after.				
8.	Pg. H.11 Section H4 Bullet #7	The Closure Plan states, "If contamination is detected, investigate further and determine if remediation is necessary." Remediation must be conducted if contamination is found above closure performance standards, investigation does not remove contamination.	Include language in the Closure Plan confirming that remediation will be performed if contamination is found above closure performance standards.				
9.	Pg. H.12 Section H4.1 Table H-3	The Closure Plan states, "If necessary, remove contaminated environmental media…" If contaminated media is found above closure performance standards, it must be removed.	Include language in the Closure Plan confirming that remediation of contaminated environmental media must be conducted if contamination is found above closure performance standards.				

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10.	Pg. H.13 Section H4.2	Details on how the waste inventory is removed from OSA-A, and transported, treated, stored, or disposed are missing. Details on the on the type of off-site dangerous waste management units to be used are missing.	WAC 173-303-610(3)(a)(iv) requires, "A detailed description of the methods to be used during partial closures and final closure, including, but not limited to methods for removing, transporting, treating, storing, or disposing of all dangerous wastes, and identification of the type(s) of the off-site dangerous waste management units to be used, if applicable." The following information needs to be provided: A description of how waste containers are removed from OSA-A including: • Types of waste being moved and transport equipment used to remove waste containers; • Where and how containers are prepared for transport, including verification that containers are fit for transport; A description of how the waste containers will be transported to Perma-Fix Northwest for repackaging, then returned to the Hanford Site for temporary storage at the Central Waste Complex if Transuranic Mixed Waste, and eventual shipment to the Waste Isolation Pilot Plant for permanent disposal; or, if Mixed Low-Level Waste, is treated and disposed on-site or off-site at an approved land disposal unit.	Incomplete			

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11.	Pg. H.13 Section H4.2	TPA M-091-00 milestone does not include anything that "governs" removal of waste from OSA-A. The phrase "is governed by" does not accurately reflect the relationship between RCRA closure and the TPA milestones.	Modify language in section H4.2 as follows: "Removal of waste from OSA-A will be completed by September 30, 2026, in accordance with Hanford Federal Facility Agreement and Consent Order (HFFACO), Tri-Party Agreement (TPA) Milestone M-091-59." Delete the language regarding M-091-48 (due September 30, 2050) which has to do with completion of certification and offsite shipment of TRUM waste. The closure schedule itself for waste inventory removal will need to include the annual milestones in addition to the final 2026 milestone.	WAC 173-303-610(3)(a)			
12.	Pg. H.13 Section H4.2	This section mentions commercial facilities available to process containers with low grams of plutonium of CH-TRUM waste and low-dose-rate RH-TRUM waste. However, there is no further information.	Discuss the repackaging capability at Perma-Fix, limitations, through-put, etc., and how this relates to the schedule for OSA A. An estimate of the number of large containers Perma-Fix can accept within a year needs to be included in the closure plan. Language stating that remaining containers will be moved to inside storage at CWC also needs to be provided.	WAC 173-303-610(3)(a)			

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13	Pg. H.13 Section H4.3	Use of waste management records has some flaws. Most containers in OSA-A, if not all, are associated with the Waste Retrieval Project and have been designated based on "Acceptable Knowledge (AK)." Waste management records may identify constituents of concern included in the closure plan SAP, but should not be used as the sole basis for excluding any particular constituent.	Discuss more recent documentation and certainty related to AK as well as limitations using AK. Does the repackaging done at Perma-Fix Northwest provide additional information that may be (or is) used to update the waste information? Describe the process of taking information from Perma-Fix and reviewing the waste, and add it to the list of COC's. At a minimum, the entire SWOC Closure Performance Standard list will apply if the contents are not well documented.	WAC 173-303-610(3)(a)			

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14	Pg. H.14 Section H4.4	Details on decontamination of equipment used to manage waste, contaminated soil, and non-disposable sampling equipment are missing.	There needs to be more detail in the decontamination section. Even though it is expected that there will be no remaining items that require decontamination after removal of waste containers, decontamination methods should still be included in the case that contamination does occur during waste removal and soil sampling. WAC 173-303-610(3)(a)(v) requires, "A detailed description of the steps needed to remove or decontaminate all dangerous waste residues and contaminated containment system components, equipment, structures, and soils during partial and final closure, including, but not limited to, procedures for cleaning equipment and removing contaminated soils, methods for sampling and testing surrounding soils, and criteria for determining the extent of the decontamination required to satisfy the closure performance standard." Please provide the following information: - A description of decontamination procedures for equipment used to remove waste inventory or contaminated soil, and for non-disposable sampling equipment.	Incomplete			

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15	Pg. H.14 Section H4.4	The Closure Plan states, *"Contaminated soil will be removed…"* this statement as written is correct; however, it creates contradiction with the rest of the Closure Plan that states *"…if necessary…"* contaminated soil will be removed. The "if necessary" language is subjective. The entire Closure Plan needs to consistently state that contaminated soil will be removed.	Review and revise closure plan, DQO, and SAP to remove the subjective "if necessary" language, and consistently say all contaminated soil above closure performance standards will be removed.				
16	Pg. H.14 Section H4.5	"Soil will be collected after removing the overlying gravel at focused and grid sample locations."	Include more detail on how the soil will be collected and how gravel will be removed prior to sampling.				
17	Pg. H.15 Section H4.6	It is unclear what "an approved disposal facility" is.	To be consistent with the 7 closure plans, edit language to read "…appropriate land disposal unit, possibly with central accumulation as an intermediary step…"	Clarification of requirements.			

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18	Pg. H.15 Section H4.6	The Closure Plan states, "If contaminated environmental media (soil) are identified as a result of closure verification sampling (i.e., samples indicate contamination above closure performance standards), the nature and extent of contamination will be further investigated. Following further investigation, if it is determined that remediation is necessary…" As written in the closure plan describes investigation that may determine remediation of contaminated soil is not necessary; however, all contaminated soil above closure performance standards must be removed prior to clean closure verification.	Revise Closure Plan to make clear that remediation of contaminated soil above closure performance standards must be performed to verify clean closure.				
19	Pg. H.15 Section H4.6	This section explains that if remediation of contaminated soil is necessary, contaminated soil will be removed using equipment capable of removing the quantity of material required to complete removal at the area of contamination. What equipment would be used?	Include the types of equipment that would be used to remove the contaminated material. For example, you could say: "Contaminated soil will be removed using larger equipment (e.g. excavators, backhoes, bulldozers, etc.) for large areas and smaller equipment (e.g. mini-excavators, skid-steer loaders, shovels, etc.) for smaller areas." The point is to give a general description of how you will perform the soil removal and with what types of equipment.	WAC 173-303-610(3)(a)(v)			

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20	Pg. H.15 Section H4.7	There are no newly generated waste streams anticipated for the OSA-A. However, in the unlikely event that waste is generated, newly generated waste will be managed in accordance with all applicable requirements of WAC 173-303-170 through WAC 173-303-230. Once waste characterization results are received, all waste will be designated. The waste will be managed as a newly generated waste stream and either disposed of or decontaminated in accordance with WAC 173-303-610(5). Dangerous and mixed waste will be treated, if necessary, to meet land disposal restrictions in WAC 173-303-140 (which incorporates by reference 40 CFR 268), then ultimately disposed of in an appropriate land disposal unit. Management and disposal of waste generated during closure will be documented and included as part of the clean closure certification documentation (Add. H, Attachment A, Section 3.3).	Include location of where newly generated waste would be disposed of.	WAC 173-303-170 – WAC 173-303-230, -610(5), -140			
21	Pg. H.15 Section H4.7	The Closure Plan states, "There are no waste streams expected to be generated during closure activities." During closure the use of sampling materials and equipment, and PPE would be expected to generate new waste streams.	Revise Closure Plan language to include waste streams expected to be created during closure activities.				
22	Pg. H.15 Section H4.8 Bullet #2	The Closure Plan states, *"No evidence of unusual conditions exist at the closing DWMU site."* Stating *"unusual conditions"* is vague and subjective.	In the Closure Plan describe or provide examples of unusual conditions that are looked for as part of the inspection process.				

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23	Pg. H.16 Section H5	The Closure Plan states, *"Unless contamination of the soil is identified during sampling and analysis, removal of the gravel or restoration to its pre-operational appearance are not necessary."* The DQO states, *"Focused sample locations are identified through visual inspection…"* The determination of additional focused samples is dependent on the visual inspection after waste has been removed from the unit; however, only waste contamination that will leave a stain on gravel will determine the need for additional focused samples, waste contamination that has passed through the gravel to the soil below will be missed whether a stain has been left on the soil or not.	Describe how visual inspection will be performed to determine the need for focused samples if the gravel will not be removed from the unit. Describe how non-stained contaminated environmental media will be evaluated to determine the need for additional focused sampling.				
DQO Comments:							

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24	Pg. 2 Table 1	The table identifies two waste package types – large container and various – with the volume, waste type, dates, and waste codes. The plan does not provide any further information on these waste packages. Ecology is interested in the "various" containers of RCRA-regulated waste. Does "RCRA-regulated" waste type contain any waste that will be treated and shipped under the M-91 milestone?	Provide some description of the waste package types, especially the "various" waste packages. Further description would include, but not be limited to, size of package, material(s) of construction, condition of package, etc. This would also include the protective covers that are used to ensure precipitation does not get into waste packages. This plan needs to include a description of the waste that is treated and shipped under M-91 and the waste that is not under M-91.				
25	Pg. 4 Table 3, 1B, and 2B	In Table 3 the alternate outcome for sample results found above closure performance standards is "further investigation", in both scenarios remediation must be considered as a viable outcome when contaminated soil is found. Investigation of contamination does not satisfy closure.	Revise the alternative outcomes column in Table 3 of the DQO to state remediation of contaminated soils will be performed.				

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26	Pg. 4 Section 1.3	The DQO states "*A preliminary records review and visual inspection identified one area of potential contamination in the proximity of the 231-ZDR container.*" Records review and visual inspection may not provide a complete evaluation of the unit. There are constituents that may not leave stains; therefore, further review of waste placement, time at each locations, container or container cover issues, how long waste was stored without covers, container materials and condition, and waste constituents is needed. This would allow the permittee to determine focus sample placement. Table 4 states, *"Records review is needed to identify the stored waste type, location, and releases."*	Include in the DQO the location of additional focused samples and describe the evaluation used to determine these additional focused samples.				
27	Pg. 5 Section 1.5	The DQO states, *"There are no temporal boundaries, as sampling will only occur once."* Stating that sampling will only occur once does not allow for re-sampling.	Revise the language in the DQO to include re-sampling as necessary.				
28	Pg. 5 Section 1.5.1	In reference to focused sampling the DQO states, *"The horizontal boundary is 3.3 by 3.9 (11 by 13ft),"* The size of the focused sampling area makes it unclear how focused samples will be taken and what criteria are used to determine focused sample locations.	Describe how the location of focused samples will be determined within an area that is 11 by 13 ft.				

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29	Pg. 6 Table 6	The DQO states, "*This criterion is part of the three-part rule. A range of 90% to 99% of the UCL of the closure performance standard can be used depending on the model and accepted risk.* " 95% of the UCL was selected, however based on EPA guidance and Ecology's authority to ensure proper closure per WAC 173-303-610, and if complete information is known about the waste and waste management history, this value is subject to change. Given this is an unauthorized unit subject to a Consent Order and Agreed Order, storing waste in containers of questionable integrity, and with waste contents that are not 100% known, the UCL should be higher.	Describe in the DQO the decision and rationale using 95% of the UCL. The rationale should take into consideration that this is an unauthorized unit subject to a Consent Order and Agreed Order, length of time containers were stored without protective covers, container materials and condition, history of spills or releases, and the fact that container inventory is not 100% known until opened for treatment and repackaging. Increase the percentage of the UCL to 98%.				
30	Pg. 6 Table 6	The DQO states, "*The soil is presumed to be contaminated. If soil sampling results are below CPSs, then the null hypothesis is rejected, and the site is clean closed. If soil sampling results are above CPSs, then the null hypothesis is accepted, which would be an unexpected event.*" The site is considered contaminated until it is proven that it is not.	Delete the reference to an unexpected event. Revise to state something like: "*If soil sampling results are above CPSs, then the null hypothesis is accepted, and further remediation and sampling will be necessary.*"				
31	Pg. 7 Section 1.7.1.2	The DQO states, "If results are above closure performance standards, then DOE will further investigate those analytes that exceed acceptable levels."	Include in the DQO the process for remediating contaminated soil above closure performance standards.				

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32	Pg. 8 Section 1.7.3.1	The DQO states, “Thirty increments and the random selection approach were based on recommendation in the Interstate Technology & Regulatory Council ISM-1 technical guidance (ITRC, 2012, Incremental Sampling Methodology).” ISM guidance states that ISM is used for site characterization and risk assessments. Guidance does not state that ISM is valid for clean closure.	Describe the validity of using ISM for clean closure and provide regulatory examples of its use for clean closure. ISM is not acceptable for this type of closure, for the following reasons: (1) There is more than one constituent of concern, (2) ISM is usually used to characterize a site, (3) Use of this method is essentially taking “composite” samples, which is not acceptable for determining clean closure or for soil sampling.				
33	Missing from DQO	Step 4: Specify Boundaries The rationale for establishing the boundaries was not provided. Based on the sampling design, DOE is assuming the entire site is homogeneous. Characterization to determine homogeneity has not been performed to Ecology’s knowledge. Based on historical photos of waste storage locations, roadways, load/unload areas, NDA/NDE areas, don/doff areas, it is clear the site is not homogeneous and should be partitioned.	Divide the population into areas that have relatively homogeneous site use and composition.				

34	Missing from DQO	Attachment A does not include the evaluation of site homogeneity verses site heterogeneity; this evaluation is necessary to develop an efficient sampling plan.	The purpose of this step is to present alternative data collection designs that meet the requirements previously specified. • Develop the general sampling and analysis design alternatives • Document the operational details and theoretical assumptions of the selected design. In Step 7, the permittee would discuss and provide information on the areal characteristics of the unit vs hot spot sampling vs incremental sampling and discuss the rational for using one method over the other. An important point you should keep in mind is the necessity of reducing the natural variability of the population as much as possible. Dividing the population into areas that are as different as possible, yet are as homogeneous as possible within each area, is one way to reduce total variability associated with parameter estimates or other results of your study. (The planning team may have made an initial attempt at areal characterization in Step 4 of the DQO process). The areas may be physically based (areas proximal to an incinerator, septic tanks, receptor wells, underground storage tanks) or based on other factors (potential exposure, activity patterns, residences, ecological habitats, agricultural sectors, historical or future use). The advantages of areal characterization are: • Reducing the complexity of the				

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			problem by dividing it into manageable segments • Reducing the variability within strata • Improving the efficiency of sampling Describe as part of the DQO process how the determination was made to perform incremental sampling. ISM is not acceptable for this type of closure, for the following reasons: (1) There is more than one constituent of concern, (2) ISM is usually used to characterize a site, (3) Use of this method is essentially taking "composite" samples, which is not acceptable for determining clean closure or for soil sampling. The current incremental sampling appears to be based on the site being homogenous. Based on the site history, Ecology believes the site is heterogeneous and therefore grab and focused sampling would be more appropriate to determine clean closure. Divide the site into areas based on homogenous areas within the site.				
SAP Comments:							

35	Pg. 9 Section 2	The SAP states, "…EPA/240/R-02/005, Guidance on Choosing a Sampling Design for Environmental Data Collection for Use in Developing a Quality Assurance Project Plan, and Ecology Publication #94-111, Guidance for Clean Closure of Dangerous Waste Units and Facilities…" Ecology Publication #94-111 states, "Ecology expects that, generally, sampling to determine or confirm clean closure will be based on grab rather than composite samples." EPA guidance EPA/240/R-02/005, Section 10 states, "There are several fundamental ideas associated with composite sampling: *Compositing results in a physical averaging of the samples making up the composite so that:* • *Variability among similarly formed composite samples is less than the variability of the individual samples.* • *Composite sampling is naturally compatible with a study goal of estimating a population mean, while other goals may not be compatible with composite sampling, since some information is lost.* *Since composite sampling and retesting is aimed at classifying each unit, as opposed to making a statistical inference about the population represented by the sample units"*	Ecology guidance expects clean closure sampling to be based on grab samples and EPA guidance expects composite sampling to show a loss of variability and a loss of sample information, explain the decision to sample against regulatory guidance. Revise the sampling plan to include additional focused samples based on the potential for waste to migrate to the soil below. Include in the DQO a full evaluation of the placement of waste, the duration the waste was at each location, the effectiveness of the container covers, the type of waste stored, and the history of the site. Use the site evaluation to determine a new statistical grab sampling strategy.				

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36	Pg. 10 Section 2.2.1.2	This section states: "The Project Manager is also responsible for ensuring that project personnel are working to the approved closure plan and providing updates to field personnel." This sentence is misleading; it gives the impression that the SAP could be easily changed and the Project Manager will ensure the current version is in use. The 'current version' of the SAP, is the SAP that is incorporated into the Permit as part of the approved Closure Plan. Changes to the SAP require a permit modification.	For clarity and consistency with the 7 closure plans, edit text to read "…to the approved OSA-A closure plan in the permit and for providing updates to field personnel."	WAC 173-303-610			
37	Pg. 12 Section 2.2.3	The last paragraph of this sections states: "Records required by the Tri-Party Agreement (Ecology et al, 1989, *Hanford Federal Facility Agreement and Consent Order*) will be managed in accordance with the requirements therein". Records related to this closure plan must be retained in the facility operating record in accordance with Permit Condition II.I.	Please replace the sentence with the following: "Records generated during closure will be maintained in the operating record in accordance with Permit Condition II.I."	Consistency in language with other draft closure plans issued for public comment (e.g. 277-T Building).			
38	Pg. 12 Section 2.3.1	The SAP states, "This OSA-A SAP used Section 7.0 of Ecology Publication #94-111 to determine the type of sampling design for demonstrating clean closure." Ecology Publication 94-111, Section 9.4, states "Ecology will typically make decisions regarding clean closure by direct comparison of sampling data to the site specific clean closure levels."	Section 7 of Ecology Pub. #94-111 does not allow the use of incremental sampling for clean closure.				

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39	Pg. 13 Section 2.3.1.2	The SAP states, *"Grid sampling is used to search for hot spots."* Section 1.7.3 *"Incremental samples are sub-samples that will be collected, homogenized, and distributed to the sampling containers."* EPA/600/SR-92/128 states, *"One problem with compositing samples is the loss of individual sample information and concentration sensitivity due to the dilution of the samples' (i.e., a "hot spot" may be unidentifiable due to the inclusion of one increment from the "hot spot" into the composite sample with multiple increments from the "clean" background soil).* *Homogenization is not a statistical concept; however, it is used to control the variance within a sample."* Based on EPA guidance, using composite sampling to search for hot spots is problematic at best, and at worst an invalid approach.	Describe how incremental samples will accurately detect hot spots, or propose another sampling method.				

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40	Pg. 15 Section 2.3.2	The SAP states, *"The sampling design uses a grid sampling approach with focused sampling as identified by visual inspections."* The visual inspection of OSA-A performed by the permittee on August 14, 2013 states, *"A visual inspection walkdown of the CWC outdoor container storage area "A" was performed to determine if there is any evidence of spills and/or leaks from the waste packages contained dangerous waste that were and are stored at this location."* Section 2.3.3 states, *"Over time, precipitation would have caused any potential contamination from waste storage to migrate down from the loose surface gravel into the surface soil and compacted gravel below."*	As stated in the SAP, contamination from waste storage will have migrated to the compacted gravel below. Describe how focused sampling is determined by visual inspection without removing the surface gravel from the unit. When determining the amount and location of focused samples, you must consider the site history, including length of time waste was in place, type of waste, the waste container, whether secondary containment was used, location of waste, and the integrity of the waste container, as well as the integrity of the waste cover.				
41	Pg. 15 Section 2.3.2	In reference to the 30 incremental samples, the SAP states, *"Statistical analysis of grid sample data is valid if a random starting location is used and no bias is introduced."* Statistical analysis is not being run on the 30 incremental samples, statistical analysis is being performed on the 20 composite samples. The previous comment describes the potential bias in the 20 composite locations; therefore, creating a bias with the 30 incremental samples.	Revise SAP to clarify which statistical analysis is being applied to each sampling event.				

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42	Pg. 16 Figure 7	It would be helpful to know where the storage location of the waste containers is located within this sampling grid. There are aerial photographs of OSA A over several years' time. These photos need to be used to determine how to partition the area into sampling locations, selection of the grid size to be used, and finally the sample locations within the grid. Knowing the locations of waste containers stored in the area can also help determine where focused samples are taken.	Please provide a figure which overlays this grid unto the location of the stored waste containers. The grid size, number of grids, and locations of grids should reflect where waste was actually stored. This approach provides the best opportunity to find any potential contamination locations.	When sample data is in, it provides a means of seeing how the data values are related to where the waste was stored in the container storage area.			
43	Pg. 18 Section 2.3.4	The SAP states, "If sampling and analysis at the OSA-A indicate contamination above closure performance standards, then further investigation will be required. Following further investigation, if it is determined that remediation is necessary…" As stated the language in the SAP is written to infer that remediation of contaminated soil is optional (…if it is determined that remediation is necessary…), this language is non-enforceable and not acceptable in the permit.	Revise SAP to state, remediation of confirmed contaminated soil above closure performance standards must be performed to remove contaminated soil.				
44	Pg. 24 Section 2.4.1 Bullet #5	The SAP states, "Data are reasonable based on analytical methodologies." Use of the word "reasonable" is subjective and should not be used in the permit. Modification to methods need to be documented in the SAP.	Remove subjective language and clarify that all data must be based on analytical methodologies and/or approved modifications to methods.				

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45.	Pg. 25 Section 2.4.3	This paragraph does not adequately explain how the permittees will evaluate a data set with results listed as "non-detectable (ND)". Simply not entering the ND results into VSP will not provide valid, reliable results. The current version of VSP has EPA's ProUCL data evaluation built into it. However, the current version of VSP uses an earlier version of ProUCL and does not do a good statistical evaluation when the bulk of results are ND. For that reason, Ecology has asked that data evaluation also include input of data into ProUCL Version 5.1 or later, which is able to adequately evaluate data sets with many ND values.	Describe "additional statistical tools" that are currently planned to be used at OSA-A. This does not remove the ability to create new statistical tools if needed. As an example refer to "FS-1 Outdoor Container Storage Area Full Visual Sample Plan (VSP) Report to Support Clean Closure" CHPRC 1603455 Rev. 0 to see the use of additional statistical methods when dealing with ND's.				
46.	Pg. 25 Section 2.4.3	The sentence "Comparison of the maximum data value for each analyte to the closure performance standards will ensure that all individual analytes are below the action levels." This is referring to a direct comparison, where sample results are directly compared to cleanup values. However, in this case of area wide sampling, the VSP software utilizes a statistical approach allowing for the 3 part MTCA rule." Should be added to this section, as there must be focused sampling around the location of 231-Z-DR-11.	Add sentence to this section. While this comment was closed out in a previous RCR, it has been retained due to the need for focused sampling around 231-Z-DR-11.				
47	Pg. 25 Section 2.5	The statement "An unexpected event would be an event outside the scope of the SAP or a condition that inhibits implementation of the sampling as written" needs to be edited to be consistent with the 7 CAFO Closure Plans.	To be consistent with the 7 CAFO Closure Plans, the last part of the statement should read "…or a condition that inhibits implementation of the SAP as written."	WAC 173-303-610(3)(a)			

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VSP Comments:							
48	Pg. Addendum H-AttB.i Attachment B	Supporting documentation of visual inspections to determine if contamination is present is superficial. Additional information needs to be evaluated to determine if additional focused samples are needed at OSA-A. Staining of surface gravel is not enough to determine the need for focused samples, a full evaluation of the site is needed to include waste placement, time waste was at each location, documented incidences of waste cover damages/replacement, staining subsurface gravel, and an evaluation of constituents that do not leave stains.	Include in the SAP the evaluation to determine the need for additional focused samples that includes further investigation, in addition to visual inspection.				
49	Attachment C Primary Sampling Objective	The Primary Sampling Objective states, *"VSP calculates the number of samples required to reject the null hypothesis…"*	Describe how VSP takes into consideration incremental/composite sampling when determining if the null hypothesis is rejected or accepted. VSP and the 3 Part test are specific to grab sampling, not composite sampling.				

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50	Attachment C Sensitivity Analysis	The Selected Sampling Approach section, paragraph 3, states, "Knowledge of the spatial structure is useful for geostatistical analysis. However, it may not ensure that all portions of the site are equally represented" It is clear that waste storage at OSA-A was segregated as indicated by known roadways at the unit and placement of the waste stored. If the unit is not equally represented then the probability of missing waste contamination increases.	All sites that stored waste must be adequately sampled to ensure clean closure was met. Describe how areas within OSA-A used to store waste are represented more so than areas that did not store waste. Due to the higher probability of waste contamination in stored waste areas, more sampling is necessary in those areas.				
51	Attachment C Sensitivity Analysis Number of Samples Table	The Sensitivity Analysis section states, *"The sensitivity of the calculation of number of samples was explored by varying the standard deviation, lower bound of gray region (% of action level), beta (%), probability of mistakenly concluding that μ > action level and alpha (%), probability of mistakenly concluding that μ < action level."* When comparing the number of samples calculated in this table to the number of samples calculated in the SAP (closure plan Table 6) there is a difference that needs to be described. MARRSIMS calculated 16 samples then an overage was added to bring the sampling amount to 20. Applying the parameters in the SAP to this table the amount of samples should be 32. To arrive at 16 samples the alpha would be 15 and the beta 25 to arrive at 15 samples.	Describe how VSP determined 20 samples would be sufficient to determine clean closure given the information in the sensitivity analysis table.				

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52	Pg. Addendum H-AttC.i Attachment C	In the VSP summary is a graph showing random sampling locations. This does not match with Figure 4 in the Closure Plan. Figure 7 in the Closure Plan indicates this random sampling proposal does not sample the appropriate locations within the unit (sample locations are not located where waste was stored).	Explain the advantage of using a random sampling plan instead of a random starting point with a systematic grid.				
53	Pg. Addendum H-AttC.i Attachment C	Only 1 sampling grid is shown in the VSP summary. The SAP describes incremental sampling which is not shown in the VSP summary.	Include in the VSP summary all planned sampling for OSA-A.				
54	Attachment C Sensitivity Analysis notes	The last note of Attachment C states, *"The report contents may have been modified or reformatted by end-user of software."*	There is a unit specific permit condition where Ecology expects to see unaltered VSP reports. Describe any contents that have been modified, reformatted, or removed within the VSP report. If alterations are made, they have to be discussed with Ecology and well documented.				

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#	Page/Section/line number	Comment or Question	Modification Needed	Basis/Justification	DOE/CPCco Response	Ecology Response	Disposition
Closure Plan Comments:							
1.	Pg. H.1 Section H1	The location of OSA-B is not included in the introduction of the Closure Plan. The location is only mentioned in Section H2.2.2.1 Security Provisions.	Please include that OSA-B is located in the 200 West Area in the introduction of the Closure Plan.				
2.	Pg. H-2, Figure H-1	Container locations are not shown on the overhead photo of OSA-B.	Container locations should be shown somewhere, since they are not provided in the Part A. Management of the individual containers is an important element of closure. A diagram displaying zones reflecting the types of waste allowed for storage needs to be included.	WAC 173-303-610(3)(a)			
3.	Pg. H.4-H.6 Table H-1	Sample collection personnel need to be included in the training matrix, since this plan does not have a separate personnel training addendum.	Include these acronyms in the list below the table. Add sampler to the training matrix. All workers on a site undergoing closure must be discussed in the Closure Plan Training section.	WAC 173-303-330			
4.	Pg. H.7 Section H2.2.1	The second paragraph in this section states that incompatible wastes will be separated or protected from other incompatible materials. How are the wastes separated/protected from other materials?	Include more details on how the wastes are separated/protected from incompatible materials.	WAC 173-303-200			

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5.	Pg. H.7-H.8 Section H2.2-H.2.2.1 Table H-2	The Section does not address how the large containers of suspect integrity, with unknown contents, and stored relatively unprotected outdoors will be managed to ensure they "do not pose a risk to human health and the environment." A request for additional time to remove wastes from a closing DWMU must also demonstrate the owner/operator "has taken and will continue to take all steps to prevent threats to human health and the environment, including compliance with all applicable permit requirements" and that the criteria of WAC 173-303-610(4)(a)(i) or (ii) have been met. Additional information is needed in the closure plan.	Extended closure activities should document specific actions to ensure containers with poor integrity are prioritized for removal; and that enhanced inspection, corrective actions, and maintenance procedures (replacement of tarps, etc.) are in place. The process to perform corrective actions should be provided, especially in response to inspection requirements in the Agreed Order. Discuss actions if a leak is found. The Inspection Plan Major Theme Agreement 4.4.2017 Resolution: DOE provided Ecology with draft template language to be included in each unit-specific inspection plan on 3.28.17 and 4.4.17. The draft includes a schedule for remediating problems identified during inspections immediately, within 24-hours, and on a schedule for problems which cannot be resolved quickly. The draft language also states that on a unit-specific basis, each unit Addendum I will include a description of the remedy list of problems and schedule for remedy will tie back to the inspection log. The Major Themes Agreement specifies unit specific remedies to problems will be addressed. As there is no Addendum I associated with these closure plans, this information will need to be included in this closure plan. The remedy section language developed by Ecology also needs to be included in the closure plan. The inspections do not match the Hanford Federal Facility Agreement and Consent Order. A description of the inspection and corrective action for the tarps to ensure they are replaced in a timely manner also needs to be included in the closure plan. Have the containers been appropriately inspected, and the waste designated so it can be confirmed that they are stored correctly? Is secondary containment necessary for any of these containers?	WAC 173-303-610(4)(a)			

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6.	Pg. H.11 Section H4	OSA-B currently stores mixed waste. An extended closure period is needed to ship these containers to another receiving treatment, storage, and disposal (TSD) facility for waste processing.	Perma-Fix needs to be identified as the only facility that can accept TRUM waste for treatment/repackaging. An estimate needs to be included of the number of large containers that can be accepted per year. It also needs to be discussed that remaining containers that cannot be accepted at Perma-Fix will be moved to indoor, compliant storage at CWC, and all containers will be removed from OSA-B by 9/30/2026.	Incomplete			
7.	Pg. H.11 Section H4	The "extended period will be needed" to remove wastes from a closing DWMU must demonstrate the owner/operator "has taken and will continue to take all steps to prevent threats to human health and the environment, including compliance with all applicable permit requirements." Prioritizing containers with poor integrity needs to be added to the list of closure activities.	Extended closure activities should document specific actions to ensure DOE will continue to take all steps to prevent threats to human health and the environment, including, but not limited to, prioritizing containers with poor integrity for removal.	WAC 173-303-610(4)(a)			

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8.	Pg. H.11 Section H4	An unspecified, "extended period" cannot satisfy the requirement for the schedule. There is no documentation of an enforceable schedule to complete these activities, or a basis for the (unspecified) extended time required for removal of waste inventory, so we cannot evaluate whether it is justified. Additional comments are provided later.	The closure schedule must be specific for the various closure activities, and allow for tracking of progress. The closure schedule basis should consider availability of storage and treatment capacity in existing on-site and off-site commercial DWMU facilities, and new units that may be permitted on-site. For OSA-B, provide a path forward that spells out what needs to be done to get the waste containers removed from the storage area (e.g. Perma-Fix). For containers with no current path forward: 1. Do you need to construct a facility that can deal with the levels of TRUM contained in the waste packages? 2. Does the waste require any further treatment to be disposed of? 3. Is the treatment available? This is all part of the discussion that must take place for closure of this DWMU to occur. That process must be discussed/documented in this closure plan. This would include, but is not limited to: waste inventory records, container location maps or aerial photos, inspection records, any sampling data from materials with packages, history of spills detected and cleanup operations associated with them, etc. The Closure Activities Schedule needs to be discussed in further detail, and the records review for waste stored in this location needs to be included. Waste inventory removal also needs to be added to the M-091 Schedule. Waste inventory removal must be completed by 2026, and remaining closure activities must begin right after this is complete.	WAC 173-303-610(4)(a) WAC 173-303-610(3)(a)(vii),			

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9.	Pg. H.11 Section H4 Bullet #7	The Closure Plan states, "If contamination is detected investigate further and determine if remediation is necessary." Remediation must be conducted if contamination is found above closure performance standards, investigation does not remove contamination.	Include language in the Closure Plan confirming that remediation will be performed if contamination is found above closure performance standards.				
10.	Pg. H.12 Section H4.1 Table H-3	The Closure Plan states, "If necessary, remove contaminated environmental media…" If contaminated media is found above closure performance standards, it must be removed.	Include language in the Closure Plan confirming that remediation of contaminated environmental media must be conducted if contamination is found above closure performance standards.				
11.	Pg. H.13 Section H4.2	Details on how the waste inventory is removed from OSA-B, and transported, treated, stored, or disposed are missing. Details on the on the type of off-site dangerous waste management units to be used are missing.	WAC 173-303-610(3)(a)(iv) requires, "A detailed description of the methods to be used during partial closures and final closure, including, but not limited to methods for removing, transporting, treating, storing, or disposing of all dangerous wastes, and identification of the type(s) of the off-site dangerous waste management units to be used, if applicable." The following information needs to be provided: - A description of how waste containers are removed from OSA-B including: • Types of waste being moved and transport equipment used to remove waste containers; • Where and how containers are prepared for transport, including verification that containers are fit for transport; - A description of how the waste containers will be transported to Perma-Fix Northwest for repackaging, then returned to the Hanford Site for temporary storage at the Central Waste Complex if Transuranic Mixed Waste, and eventual shipment to the Waste Isolation Pilot Plant for permanent disposal; or, if Mixed Low-Level Waste, is treated and disposed on-site or off-site at an approved land disposal unit.	Incomplete			

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12.	Pg. H.13 Section H4.2	TPA M-091-00 milestone does not include anything that “governs” removal of waste from OSA-B. The phrase “is governed by” does not accurately reflect the relationship between RCRA closure and the TPA milestones.	Modify language in section H4.2 as follows: “Removal of waste from OSA-B will be completed by September 30, 2026, in accordance with Hanford Federal Facility Agreement and Consent Order (HFFACO), Tri-Party Agreement (TPA) Milestone M-091-59.” Delete the language regarding M-091-48 (due September 30, 2050) which has to do with completion of certification and offsite shipment of TRUM waste. The closure schedule itself for waste inventory removal will need to include the annual milestones in addition to the final 2026 milestone.	WAC 173-303-610(3)(a)			
13.	Pg. H.13 Section H4.2	This section mentions commercial facilities available to process containers with low grams of plutonium of CH-TRUM waste and low-dose-rate RH-TRUM waste. However, there is no further information.	Discuss the repackaging capability at Perma-Fix, limitations, through-put, etc., and how this relates to the schedule for OSA-B. An estimate of the number of large containers Perma-Fix can accept within a year needs to be included in the closure plan. Language stating that remaining containers will be moved to inside storage at CWC also needs to be provided.	WAC 173-303-610(3)(a)			
14.	Pg. H.13 Section H4.3	Use of waste management records has some flaws. Most containers in OSA-B, if not all, are associated with the Waste Retrieval Project and have been designated based on “Acceptable Knowledge (AK).” Waste management records may identify constituents of concern included in the closure plan SAP, but should not be used as the sole basis for excluding any particular constituent.	Discuss more recent documentation and certainty related to AK as well as limitations using AK. Does the repackaging done at Perma-Fix Northwest provide additional information that may be (or is) used to update the waste information? Describe the process of taking information from Perma-Fix and reviewing the waste, and add it to the list of COC’s. At a minimum, the entire SWOC Closure Performance Standard list will apply if the contents are not well documented.	WAC 173-303-610(3)(a)			

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15.	Pg. H.14 Section H4.4	Details on decontamination of equipment used to manage waste, contaminated soil, and non-disposable sampling equipment are missing.	There needs to be more detail in the decontamination section. Even though it is expected that there will be no remaining items that require decontamination after removal of waste containers, decontamination methods should still be included in the case that contamination does occur during waste removal and soil sampling. WAC 173-303-610(3)(a)(v) requires, "A detailed description of the steps needed to remove or decontaminate all dangerous waste residues and contaminated containment system components, equipment, structures, and soils during partial and final closure, including, but not limited to, procedures for cleaning equipment and removing contaminated soils, methods for sampling and testing surrounding soils, and criteria for determining the extent of the decontamination required to satisfy the closure performance standard." Please provide the following information: - A description of decontamination procedures for equipment used to remove waste inventory or contaminated soil, and for non-disposable sampling equipment.	Incomplete			
16.	Pg. H.14 Section H4.4	The Closure Plan states, *"Contaminated soil will be removed…"* this statement as written is correct; however, it creates contradiction with the rest of the Closure Plan that states *"…if necessary…"* contaminated soil will be removed. The "if necessary" language is subjective. The entire Closure Plan needs to consistently state that contaminated soil will be removed.	Review and revise closure plan, DQO, and SAP to remove the subjective "if necessary" language, and consistently say all contaminated soil above closure performance standards will be removed.				
17.	Pg. H.14 Section H4.5	"Soil will be collected after removing the overlying gravel at focused and grid sample locations."	Include more detail on how the soil will be collected and how gravel will be removed prior to sampling.				

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18.	Pg. H.14 Section H4.5	The Closure Plan states, *"…if necessary, focused samples will be collected from a location most likely to be contaminated within the possibly affected areas."* Sufficient data from OSA-B is currently available to determine focused sample locations. Ecology Pub. 94-111 states, *"Focused sampling should be conducted in addition to grid sampling where there is evidence of leaks or spills or* ***potential for a dangerous waste constituent to migrate****."* Focused sampling should be conducted based on container material and condition, location stored, length of time stored without a protective cover, etc.	Include in the Closure Plan the location of planned focused samples based on knowledge of the site, waste management history (including container material/condition, if containers were ever stored without protective covers), amount of waste stored, and locations of waste storage.				
19.	Pg. H.15 Section H4.6	The Closure Plan states, *"If contaminated environmental media (soil) is identified as a result of closure verification sampling (i.e., samples indicate contamination above closure performance standards), the nature and extent of contamination will be further investigated. Following further investigation, if it is determined that remediation is necessary…"* Soil found above closure performance standards must be removed, as written the Closure Plan reads as this may be optional, it is unclear how *"further investigation"* would determine that remediation is not needed.	Revise Closure Plan to make clear that remediation of contaminated soil above closure performance standards must be performed to verify clean closure.				
20.	Pg. H.15 Section H4.6	It is unclear what "an approved disposal facility" is.	To be consistent with the 7 closure plans, edit language to read "…appropriate land disposal unit, possibly with central accumulation as an intermediary step…"	Clarification of requirements.			
21.	Pg. H.15 Section H4.6	This section explains that if remediation of contaminated soil is necessary, contaminated soil will be removed using equipment capable of removing the quantity of material required to complete removal at the area of contamination. What equipment would be used?	Include the types of equipment that would be used to remove the contaminated material. For example, you could say: "Contaminated soil will be removed using larger equipment (e.g. excavators, backhoes, bulldozers, etc.) for large areas and smaller equipment (e.g. mini-excavators, skid-steer loaders, shovels, etc.) for smaller areas." The point is to give a general description of how you will perform the soil removal and with what types of equipment.	WAC 173-303-610(3)(a)(v)			

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22.	Pg. H.15 Section H4.7	"There are no newly generated waste streams anticipated for the OSA-B. However, in the unlikely event that waste is generated, newly generated waste will be managed in accordance with all applicable requirements of WAC 173-303-170 through WAC 173-303-230. Once waste characterization results are received, all waste will be designated. The waste will be managed as a newly generated waste stream and either disposed of or decontaminated in accordance with WAC 173-303-610(5). Dangerous and mixed waste will be treated, if necessary, to meet land disposal restrictions in WAC 173-303-140 (which incorporates by reference 40 CFR 268), then ultimately disposed of in an appropriate land disposal unit. Management and disposal of waste generated during closure will be documented and included as part of the clean closure certification documentation (Add. H, Attachment A, Section 3.3)."	Include location of where newly generated waste would be disposed of.	WAC 173-303-170 – WAC 173-303-230, -610(5), -140			
23.	Pg. H.15 Section H4.7	The Closure Plan states, *"There are no waste streams expected to be generated during closure activities."* During closure the use of sampling materials and equipment, and PPE would be expected to generate new waste streams.	Revise Closure Plan language to include waste streams expected to be created during closure activities.				
24.	Pg. H.15 Section H4.8 Bullet #2	The Closure Plan states, *"No evidence of unusual conditions exist at the closing DWMU site."* Stating *"unusual conditions"* is vague and subjective.	In the Closure Plan describe or provide examples of unusual conditions that are looked for as part of the inspection process.				
25.	Pg. H.16 Section H5	The Closure Plan states, *"Unless contamination of the soil is identified during sampling and analysis, removal of the gravel or restoration to its pre-operational appearance are not necessary."* The DQO states, *"Focused sample locations are identified through visual inspection…"* The determination of additional focused samples is dependent on the visual inspection after waste has been removed from the unit; however, only waste contamination that will leave a stain on gravel will determine the need for additional focused samples, waste contamination that has passed through the gravel to the soil below will be missed whether a stain has been left on the soil or not.	Describe how visual inspection will be performed to determine the need for focused samples if the gravel will not be removed from the unit. Describe how non-stained contaminated environmental media will be evaluated to determine the need for additional focused sampling.				
DQO Comments:							

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26.	Pg. 2 Table 1	The table identifies two waste package types – large container and various – with the volume, waste type, dates, and waste codes. The plan does not provide any further information on these waste packages. Ecology is interested in the "various" containers of RCRA-regulated waste. Does the "RCRA-regulated" waste type contain any waste that will be treated and shipped under the M-91 milestone?	Provide some description of the waste package types, especially the "various" waste packages. Further description would include, but not be limited to, size of package, material(s) of construction, condition of package, etc. This would also include the protective covers that are used to ensure precipitation does not get into waste packages. This plan needs to include a description of the waste that is treated and shipped under M-91 and the waste that is not under M-91.				
27. |	Pg. 3 Table 3, 1B, and 2B	In Table 3 the alternate outcome for sample results found above closure performance standards is "further investigation", in both scenarios remediation must be considered as a viable outcome when contaminated soil is found. Investigation of contamination does not satisfy closure.	Revise the alternative outcomes column in Table 3 of the DQO to state remediation of contaminated soils will be performed.				
28.	Pg. 4 Section 1.3	The DQO states, *"A preliminary records review and visual inspection did not identify any areas area of potential contamination in OSA-B."* Records review and visual inspection may not provide a complete evaluation of the unit. There are constituents that may not leave stains; therefore, further review of waste placement, time at each locations, container or container cover issues, how long waste was stored without covers, container materials and condition, and waste constituents is needed. This would allow the permittee to determine focused sample placement. Table 4 states, *"Records review is needed to identify the stored waste type, location, and releases."*	Include in the DQO the location of additional focused samples and describe the evaluation used to determine these additional focused samples.				
29.	Pg. 4 Section 1.5	The DQO states, *"There are no temporal boundaries, as sampling will only occur once."* Stating that sampling will only occur once does not allow for re-sampling.	Revise the language in the DQO to expand the temporal boundary to include re-sampling as necessary.				

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30.	Pg. 5 Section 1.5.2	The DQO states, *"If applicable, for the focused samples, the decision unit is the sampling area determined based on container size and size of the potentially affected area."* In regards to focused sampling, using a decision unit based on container size (18 x 8 ft.) needs to be described. How will one focused sample be taken from such a large area? What criteria are used to determine the focused sample location?	The language, *"If applicable"* is not needed, and should be removed. Describe in the DQO how a focused sample will be taken within an 18 x 8 ft. area, i.e. describe the determination process for which part of the designated area will be sampled.				
31.	Pg. 5 Section 1.7.7.1	The DQO states, *"If results are above closure performance standards, then DOE will further investigate for those analytes that exceed acceptable levels."* Results above closure performance levels must be remediated (removed), it is not clear at all if this is included in the *"further investigation"*?	Include in the DQO the process for remediating waste above closure performance standards and include the description of what "further investigation" means.				
32.	Pg. 5 Section 1.7.1.2	The DQO states, *"If results are above closure performance standards, then DOE will further investigate those analytes that exceed acceptable levels."*	Include in the DQO the process for remediating contaminated soil above closure performance standards.				
33.	Pg. 6 Table 6	The DQO states, *"This criterion is part of the three-part rule. A range of 90% to 99% of the UCL of the closure performance standard can be used depending on the model and accepted risk."* 95% of the UCL was selected, however based on EPA guidance and Ecology's authority to ensure proper closure per WAC 173-303-610, and if complete information is known about the waste and waste management history, this value is subject to change. Given this is an unauthorized unit subject to a Consent Order and Agreed Order, storing waste in containers of questionable integrity, and with waste contents that are not 100% known, the UCL should be higher.	Describe in the DQO the decision and rationale for using 95% of the UCL. The rationale should take into consideration that this is an unauthorized unit subject to a Consent Order and Agreed Order, length of time containers were stored without protective covers, container materials and condition, history of spills or releases, and the fact that container inventory is not 100% known until opened for treatment and repackaging. Increase the percentage of the UCL to 98%.				
34.	Pg. 6 Table 6	The DQO states, *"The soil is presumed to be contaminated. If soil sampling results are below CPSs, then the null hypothesis is rejected, and the site is clean closed. If soil sampling results are above CPSs, then the null hypothesis is accepted, which would be an unexpected event."* The site is considered contaminated until it is proven that it is not.	Delete the reference to an unexpected event. Revise to state something like: "*If soil sampling results are above CPSs, then the null hypothesis is accepted, and further remediation and sampling will be necessary."*				

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35.	Pg. 6 Section 1.7.2	The DQO states, *"Further investigation will be initiated if either type of sample does not support clean closure. Actions will be taken based on the investigation to remedy soil results that fall outside of accepted clean closure criteria."* Remediation must be initiated based on sample results being above closure performance standards; investigation can help determine the extent of remediation.	Clarify in the DQO that contaminated soil above closure performance standards will be remediated to remove contaminated soil. Describe the investigative process to determine the nature and extent of contamination, and extent to which soil remediation is needed.				
36.	Pg. 7 Section 1.7.3.1	The DQO states, "Thirty increments and the random selection approach were based on recommendation in the Interstate Technology & Regulatory Council ISM-1 technical guidance (ITRC, 2012, Incremental Sampling Methodology)." ISM guidance states that ISM is used for site characterization and risk assessments. Guidance does not state that ISM is valid for clean closure.	Describe the validity of using ISM for clean closure and provide regulatory examples of its use for clean closure. ISM is not acceptable for this type of closure, for the following reasons: (1) There is more than one constituent of concern, (2) ISM is usually used to characterize a site, (3) Use of this method is essentially taking "composite" samples, which is not acceptable for determining clean closure or for soil sampling.				
37.	Missing from DQO	Step 4: Specify Boundaries. The rationale for establishing the boundaries was not provided. Based on the sampling design, DOE is assuming the entire site it homogenous. Characterization to determine homogeneity has not been performed to Ecology's knowledge. Based on historical photos of waste storage locations, roadways, load/unload areas, NDA/NDE areas, don/doff areas, it is clear the site is not homogeneous and should be partitioned.	Divide the population into areas that have relatively homogeneous site use and composition.				

38.	Missing from DQO	Attachment A does not include the evaluation of site homogeneity verses site heterogeneity; this evaluation is necessary to develop an efficient sampling plan.	The purpose of this step is to present alternative data collection designs that meet the requirements previously specified. • Develop the general sampling and analysis design alternatives • Document the operational details and theoretical assumptions of the selected design. In Step 7, the permittee would discuss and provide information on the areal characteristics of the unit vs hot spot sampling vs incremental sampling and discuss the rational for using one method over the other. An important point you should keep in mind is the necessity of reducing the natural variability of the population as much as possible. Dividing the population into areas that are as different as possible, yet are as homogeneous as possible within each area, is one way to reduce total variability associated with parameter estimates or other results of your study. (The planning team may have made an initial attempt at areal characterization in Step 4 of the DQO process). The areas may be physically based (areas proximal to an incinerator, septic tanks, receptor wells, underground storage tanks) or based on other factors (potential exposure, activity patterns, residences, ecological habitats, agricultural sectors, historical or future use). The advantages of areal characterization are: • Reducing the complexity of the problem by dividing it into manageable segments • Reducing the variability within strata • Improving the efficiency of sampling Describe as part of the DQO process how the determination was made to perform incremental sampling. ISM is not acceptable for this type of closure, for the following reasons: (1) There is more than one constituent of concern, (2) ISM is usually used to characterize a site, (3) Use of this method is essentially taking "composite" samples, which is not acceptable for determining clean closure or for soil sampling. The current incremental sampling appears to be based on the site being homogenous. Based on the site history,				

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			Ecology believes the site is heterogeneous and therefore grab and focused sampling would be more appropriate to determine clean closure. Divide the site into areas based on homogenous areas within the site.				
SAP Comments:							
39.	Pg. 7 Section 2	The SAP states, "…EPA/240/R-02/005, Guidance on Choosing a Sampling Design for Environmental Data Collection for Use in Developing a Quality Assurance Project Plan, and Ecology Publication #94-111, Guidance for Clean Closure of Dangerous Waste Units and Facilities…" Ecology Publication #94-111 states, "Ecology expects that, generally, sampling to determine or confirm clean closure will be based on grab rather than composite samples." EPA guidance EPA/240/R-02/005, Section 10 states, "There are several fundamental ideas associated with composite sampling: *Compositing results in a physical averaging of the samples making up the composite so that:* • *Variability among similarly formed composite samples is less than the variability of the individual samples.* • *Composite sampling is naturally compatible with a study goal of estimating a population mean, while other goals may not be compatible with composite sampling, since some information is lost.* *Since composite sampling and retesting is aimed at classifying each unit, as opposed to making a statistical inference about the population represented by the sample units"*	Ecology guidance expects clean closure sampling to be based on grab samples and EPA guidance expects composite sampling to show a loss of variability and a loss of sample information, explain the decision to sample against regulatory guidance. Revise the sampling plan to include additional focused samples based on the potential for waste to migrate to the soil below. Include in the DQO a full evaluation of the placement of waste, the duration the waste was at each location, the effectiveness of the container covers, the type of waste stored, and the history of the site. Use the site evaluation to determine a new statistical grab sampling strategy.				

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40.	Pg. 9 Section 2.2.1.2	This section states: The Project Manager is also responsible for ensuring that project personnel are working to the approved closure plan and providing updates to field personnel." This sentence is misleading; it gives the impression that the SAP could be easily changed and the Project Manager will ensure the current version is in use. The 'current version' of the SAP, is the SAP that is incorporated into the Permit as part of the approved Closure Plan. Changes to the SAP require a permit modification.	For clarity and consistency with the 7 closure plans, edit text to read "…to the approved OSA-B closure plan in the permit and for providing updates to field personnel."	WAC 173-303-610			
41.	Pg. 11 Section 2.2.3	The last paragraph of this sections states: "Records required by the Tri-Party Agreement (Ecology et al, 1989, Hanford Federal Facility Agreement and Consent Order) will be managed in accordance with the requirements therein". Records related to this closure plan must be retained in the facility operating record in accordance with Permit Condition II.I.	Please replace the sentence with the following: "Records generated during closure will be maintained in the operating record in accordance with Permit Condition II.I."	Consistency in language with other draft closure plans issued for public comment (e.g. 277-T Building).			
42.	Pg. 11 Section 2.3.1	The SAP states, "This OSA-B SAP used Section 7.0 of Ecology Publication #94-111 to determine the type of sampling design for demonstrating clean closure." Ecology Publication 94-111, Section 9.4, states "Ecology will typically make decisions regarding clean closure by direct comparison of sampling data to the site specific clean closure levels."	Section 7 of Ecology Pub. #94-111 does not allow the use of incremental sampling for clean closure.				

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43.	Pg. 12 Section 2.3.1.2	The SAP states, "*Grid sampling is used to search for hot spots.*" Section 1.7.3 *"Incremental samples are sub-samples that will be collected, homogenized, and distributed to the sampling containers."* EPA/600/SR-92/128 states, "*One problem with compositing samples is the loss of individual sample information and concentration sensitivity due to the dilution of samples' (i.e., a "hot spot" may be unidentifiable due to the inclusion of one increment from the "hot spot" into the composite sample with multiple increments from the "clean background soil). Homogenization is not statistical concept; however, it is used to control the variance within a sample.* " Based on EPA guidance, using composite sampling to search for hot spots is problematic at best, and at worst an invalid approach.	Describe how incremental samples will accurately detect hot spots, or propose another sampling method.				
44.	Pg. 14 Section 2.3.2	The SAP states, *"Focused sampling will be performed for any waste-related staining identified during the final visual inspection performed after all waste containers are removed."* Focused samples can be determined both at this point and after waste is removed. Focused sampling should~~,~~ consider the amount of waste stored at each location and the duration the waste was stored at each location, container materials and condition, waste cover repair and replacement due to damage, and whether the containers were ever stored without protective covers.	In the SAP include additional focused samples and describe the process for determining the location for each additional focused sample				
45.	Pg. 14 Section 2.3.2	In reference to the 30 incremental samples, the SAP states, *"Statistical analysis of grid sample data is valid if a random starting location is used and no bias is introduced."* Statistical analysis is not being run on the 30 incremental samples, statistical analysis is being performed on the 20 composite samples.	Revise SAP to clarify which statistical analysis is being applied to each sampling event.				

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46.	Pg. 14 Section 2.3.2	The SAP states, *"The grid pattern was randomly selected, and each grid node will be divided into 30 equal-sized subareas."* The use of a random grid has a tendency to miss locations where waste has been stored on the unit therefore creating a biased by sample least likely area for contamination, see Figure 4. Consider using a different grid pattern that will cover areas where waste has actually been stored.	Select a sampling grid that is more representative of where waste was stored at OSA-B.				
47.	Pg. 14 Section 2.3.2	In reference to the 30 incremental samples, the SAP states, *"Statistical analysis of grid sample data is valid if a random starting location is used and no bias is introduced."* Statistical analysis is not being run on the 30 incremental samples, statistical analysis is being performed on the 20 composite samples. The previous comment (#37) describes the potential bias in the 20 composite locations; therefore, creating a bias with the 30 incremental samples.	Revise SAP to clarify which statistical analysis is being applied to each sampling event.				
48.	Pg. 15 Figure 4	Figure 4 depicts random sampling locations this method does not match with the Figure 2 which shows a random starting point and systematic grid pattern with evenly distributed sampling locations. There are aerial photographs of OSA-B over several years' time. These photos need to be used to determine how to partition the area into sampling locations, selection of the grid size to be used, and finally the sample locations within the grid. Knowing the locations of waste containers stored in the area can also help determine where focused samples are taken.	For clarity of the SAP remove Figure 2 or replace Figure 2 with a figure similar to Figure 4. Also see previous comment regarding selecting a sampling grid that is more representative of where the waste was stored.				
49.	Pg. 18 Section 2.3.4	The SAP states, *"If sampling and analysis at the OSA-B indicate contamination above closure performance standards, then further investigation will be required. Following further investigation, if it is determined that remediation is necessary and is completed…"* As stated the language in the SAP is written to infer that remediation of contaminated soil is optional (*…**if** it is determined that remediation is necessary…*), this language is non-enforceable and not acceptable in the permit.	Revise SAP to state, remediation of confirmed contaminated soil above closure performance standards **must** be performed to remove contaminated soil.				

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50.	Pg. 23 Section 2.4.1 Bullet #5	The SAP states, *"Data are reasonable based on analytical methodologies."* Use of the word "reasonable" is subjective and should not be used in the permit. Modification to methods need to be documented in the SAP.	Remove subjective language and clarify that all data must be based on analytical methodologies and/or approved modifications to methods.				
51.	Pg. 24 Section 2.4.3	This paragraph does not adequately explain how the permittees will evaluate a data set with results listed as "non-detectable (ND)". Simply not entering the ND results into VSP will not provide valid, reliable results. The current version of VSP has EPA's ProUCL data evaluation built into it. However, the current version of VSP uses an earlier version of ProUCL and does not do a good statistical evaluation when the bulk of results are ND. For that reason, Ecology has asked that data evaluation also include input of data into ProUCL Version 5.1 or later, which is able to adequately evaluate data sets with many ND values.	Describe "additional statistical tools" that are currently planned to be used at OSA-B. This does not remove the ability to create new statistical tools if needed. As an example refer to "FS-1 Outdoor Container Storage Area Full Visual Sample Plan (VSP) Report to Support Clean Closure" CHPRC 1603455 Rev. 0 to see the use of additional statistical methods when dealing with ND's.				
52.	Pg. 24 Section 2.5	The statement "An unexpected event would be an event outside the scope of the SAP or a condition that inhibits implementation of the sampling as written" needs to be edited to be consistent with the 7 CAFO closure Plans.	To be consistent with the 7 CAFO Closure Plans, the last part of the statement should read "…or a condition that inhibits implementation of the SAP as written."	WAC 173-303-610(3)(a)			
Visual Inspection Comments:							

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53.	Attachment B Inspection	The August 14, 2013 inspection states, *"The inspection was to identify and document by photographing any waste related staining of the storage area surface (i.e., gravel and soil), and to denote any remaining waste related items."* The Section 2.3.3 of the SAP states, *"…loose gravel will be moved aside to expose the surface soil and compacted gravel. Over time, precipitation would have caused any potential contamination from waste storage to migrate down from the loose surface gravel into the surface soil and compacted gravel below."* It is unclear how an inspection was conducted of the soil below the gravel to identify stains without removing the surface gravel. Staining of surface gravel is not enough to determine the need for focused samples, a full evaluation of the site is needed to include waste placement, time waste was at each location, documented incidences of waste cover damages/replacement, staining subsurface gravel, and an evaluation of constituents that do not leave stains. Consideration must be taken for constituents that do not leave stains.	Describe in the SAP the details of the visual inspections that would lead to additional focused sampling without the removal of surface gravel. Describe the process for determining the need for additional focused samples related to constituents that do not leave stains.				
VSP Comments:							
54.	Pg. Addendum H-AttB.i Attachment B	Supporting documentation of visual inspections to determine if contamination is present is superficial. Additional information needs to be evaluated to determine if additional focused samples are needed at OSA-B. Staining of surface gravel is not enough to determine the need for focused samples, a full evaluation of the site is needed to include waste placement, time waste was at each location, documented incidences of waste cover damages/replacement, staining subsurface gravel, and an evaluation of constituents that do not leave stains.	Include in the SAP the evaluation to determine the need for additional focused samples that includes further investigation, in addition to visual inspection.				
55.	Attachment C Primary Sampling Objective	The Primary Sampling Objective states, *"VSP calculates the number of samples required to reject the null hypothesis…"*	Describe how VSP takes into consideration incremental/composite sampling when determining if the null hypothesis is rejected or accepted. VSP and the 3 Part test are specific to grab sampling, not composite sampling.				

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56.	Attachment C Sensitivity Analysis	The Selected Sampling Approach section, paragraph 3, states, *"Knowledge of the spatial structure is useful for geostatistical analysis. However, it may not ensure that all portions of the site are equally represented"* It is clear that waste storage at OSA-B was segregated as indicated by known roadways at the unit and placement of the waste stored. If the unit is not equally represented then the probability of missing waste contamination increases.	All sites that stored waste must be adequately sampled to ensure clean closure was met. Describe how areas within OSA-B used to store waste are represented more so than areas that did not store waste. Due to the higher probability of waste contamination in stored waste areas, more sampling is necessary in those areas.				
57.	Attachment C Sensitivity Analysis Number of Samples Table	The Sensitivity Analysis section states, *"The sensitivity of the calculation of number of samples was explored by varying the standard deviation, lower bound of gray region (% of action level), beta (%), probability of mistakenly concluding that μ > action level and alpha (%), probability of mistakenly concluding that μ < action level."* When comparing the number of samples calculated in this table to the number of samples calculated in the SAP (closure plan Table 6) there is a difference that needs to be described. MARRSIMS calculated 16 samples then an overage was added to bring the sampling amount to 20. Applying the parameters in the SAP to this table the amount of samples should be 32. To arrive at 16 samples the alpha would be 15 and the beta 25 to arrive at 15 samples.	Describe how VSP determined 20 samples would be sufficient to determine clean closure given the information in the sensitivity analysis table.				
58.	Pg. Addendum H-AttC.i Attachment C	In the VSP summary is a graph showing random sampling locations. This does not match with Figure 2 in the Closure Plan. Figure 4 in the Closure Plan indicates this random sampling proposal does not sample the appropriate locations within the unit (sample locations are not located where waste was stored).	Explain the advantage of using a random sampling plan instead of a random starting point with a systematic grid.				
59.	Pg. Addendum H-AttC.i Attachment C	Only 1 sampling grid is shown in the VSP summary. The SAP describes incremental sampling which is not shown in the VSP summary.	Include in the VSP summary all planned sampling for OSA-B.				
60.	Attachment C Sensitivity Analysis notes	The last note of Attachment C states, *"The report contents may have been modified or reformatted by end-user of software."*	There is a unit specific permit condition where Ecology expects to see unaltered VSP reports. Describe any contents that have been modified, reformatted, or removed within the VSP report. If alterations are made, they have to be discussed with Ecology and well documented.				