OFFICE OF RIVER PROTECTION
P.O. Box 450, MSIN H6-60
Richland, Washington 99352

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16-TF-0117

Ms. Alexandra K. Smith, Program Manager
Nuclear Waste Program
Washington State
Department of Ecology
3100 Port of Benton Blvd.
Richland, Washington 99354

Ms. Smith:

U.S. DEPARTMENT OF ENERGY, OFFICE OF RIVER PROTECTION RESPONSE TO WASHINGTON STATE DEPARTMENT OF ECOLOGY COMMENTS ON RPP-RPT-58441, *2016 DOUBLE-SHELL TANK SYSTEM INTEGRITY ASSESSMENT*, REV. 0

References:
1. RPP-RPT-58441, *2016 Double-Shell Tank System Integrity Assessment Report (DSTAR)*, Rev. 0, Washington River Protection Solutions LLC, 2016.
2. Ecology letter from J. Lyon to K.W. Smith, ORP, and M.A. Lindholm, WPRS, "Department of Ecology's (Ecology) Comments on the *2016 Double-Shell Tank System Integrity Assessment Report (DSTAR)*, RPP-RPT-58441, Rev. 0, dated March 2, 2016," 16-NWP-109, dated June 20, 2016.

This letter transmits the responses to the Washington State Department of Ecology (Ecology) comments made on RPP-RPT-58441, *2016 Double-Shell Tank System Integrity Assessment Report (DSTAR)*, Rev. 0 (Reference 1). The U.S. Department of Energy, Office of River Protection (ORP) received Ecology's letter of June 20, 2016 (Reference 2) and worked with the Washington River Protection Solutions LLC (WRPS) and the Independent Qualified Registered Professional Engineer (IQRPE) to prepare this response. ORP agrees with the statement in Reference 2 that the DSTAR describes the requirements found in 40 CFR 265.191 and WAC 173-303-640(2).

ORP and WRPS disagree with Ecology's statement that the DSTAR doesn't meet the requirements for an integrity assessment. In Reference 2, Ecology provided examples of deficiencies in a bulleted form. Responses to those bullet items follow:

- Numerous double-shell tank (DST) system components are incorrectly excluded from the scope of the 2016 DSTAR. The DSTAR relies extensively on the concepts of "deferred use" and "emergency use only" as the rationale for excluding non-compliant tank system components. There is no regulatory basis for this, and Ecology will no longer recognize those terms. Non-compliant systems must be upgraded to current standards or subject to closure requirements.

DOE/RL-90-39, *Hanford Facility Dangerous Waste Permit Application, Double-Shell Tank System*, Rev. 1, recognizes the terms "deferred use" and "emergency use." The need to upgrade or close systems is beyond the scope of the integrity assessment. This important topic should discussed separately from the integrity assessment.

The IQRPE has identified the portions of the DST system that are fit for use without additional assessment per 40 CFR 265.191 and WAC 173-303-640 (2). The assessment doesn't evaluate the DST system against other portions of WAC 173-303. (See the disposition of section 8 in the attachment for greater detail)

- Components which are ancillary equipment are also not included in the integrity assessment. The regulatory definitions of tank systems and ancillary equipment should be reviewed.

  The IQRPE has demonstrated knowledge of the definitions for tank systems and ancillary equipment and has identified the transfer lines and pits (ancillary equipment) that are fit-for-use. (See the disposition of section 4 in the attachment for greater detail)

- The previous integrity assessment was predicated on the basis that treatment of tank waste would be complete by 2028. The current DSTAR maintains that perception, while the mission has changed. The integrity assessment needs to acknowledge that the DST system must now operate to 2050 or beyond.

  The IQRPE made limited mention of 2028 date in the 2006 integrity assessment. At no point, did the IQRPE base his certification on that date. The IQRPE in the 2016 assessment found no reason to place an end-date on the use of the DST system. The 2016 IQRPE only required that next integrity assessment be conducted in 2026. (See the disposition of section 1 in the attachment for greater detail)

- No schedule is provided for conducting integrity assessments over the life of the tank system.

  The owner or operator has the responsibility for development of a schedule for conducting integrity assessments and not the IQRPE, per WAC 173-303-640 (2) (e):

  > (e) The owner or operator must develop a schedule for conducting integrity assessments over the life of the tank to ensure that the tank retains its structural integrity and will not collapse, rupture, or fail. The schedule must be based on the results of past integrity assessments, age of the tank system, materials of construction, characteristics of the waste, and any other relevant factors.

  As such, WRPS has developed an integrity assessment schedule of the DST system for the River Protection Project (RPP). WRPS maintains this schedule in the life-cycle estimate for the RPP. The current schedule has an integrity assessment occurring on a ten-year cycle and based on the first two integrity assessments ORP finds no reason to increase the frequency of integrity assessments. (See the disposition of section 3 in the attachment for greater detail)

- Ecology is concerned the DSTs AP-102 and AW-103 may be unfit-for-use. Tank AP-102 lacks a creditable secondary containment according to the documentation provided, while AW-103 has no compliant means of accessing the tank. ORP needs to demonstrate these tanks are fit for use.

  Both AP-102 and AW-103 are fit-for-use. The documentation provided for AP-102 shows that more than one eighth of an inch of the secondary liner remains at the thinnest measured liner location. The monitoring of the location will be increased and WRPS has every confidence that repair of this location can occur should the need arise. The lines going to AW-103 are compliant. They merely require a pneumatic pressure test prior to use to be certified as fit-for-use. ORP considers that the safety and resource limitations associated with pneumatic testing warrants performing these tests only when needed. (See the disposition of sections 9, 13, 14, and 32 in the attachment for greater detail)

- The 2016 DSTAR identifies several issues with the DST infrastructure. While much importance is being given to upgrades to provide feed to early startup of the low-activity waste vitrification system, little appears to be done to ensure the continued availability of the DST system. An example is the questionable status of the single line available for returning slurry from the 242-A Evaporator to the DSTs, which has the potential of impacting the entire mission.

  The 2016 DSTAR neither identifies infrastructure issues nor addresses the upgrades necessary for early startup of low-activity waste vitrification. Also it doesn't address availability of the DST system. It merely identifies elements of the DST system that are fit-for-use without further assessment. In addition, the specific example cited of line SL-167 from the 242-A Evaporator seems to ignore the availability SL-168 for the same purpose and the extensive inspection of SL-167 that was conducted to address concerns with its longevity. (See the disposition of section 10 in the attachment for greater detail)

The specific comments provided as an attachment to your letter have been addressed in the attached response record.

If you have any questions, please contact Ben J. Harp, Assistant Manager for Tank Farms, Office of River Protection, at (509) 376-1462, or Zack Smith, Deputy Project Manager, Washington River Protection Solutions LLC, at (509) 376-6304.

Mark A. Lindholm, President and Project Manager
Washington River Protection Solutions LLC

Kevin W. Smith, Manager
Office of River Protection

Attachment

Distribution: Page 4

cc w/attach:
R. Skeen, CTUIR
S. Dahl, Ecology
E. Holbrook, Ecology
S. Lowe, Ecology
J. Lyon, Ecology
J. Price, Ecology
R. Skinnarland, Ecology
C. Whalen, Ecology
K. Wold, Ecology
D. Bartus, EPA
D. Faulk, EPA
S. Hudson, HAB
G. Bohnee, NPT
D. Dunning, ODOE
K. Niles, ODOE
D. Baide, WRPS
K. Boomer, WRPS
N. Davis, WRPS
A. Feero, WRPS
J. Gunter, WRPS
J. Joyner, WRPS
R. Jim, YN
Administrative Record
Environmental Portal, LMSI
WRPS Correspondence Control

Attachment

16-TF-0117

Response Record

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No.	Section/Page	2016 DSTAR Statement	Comment	Disposition
1	2.1 / p 7	This is not a review of future program plans or an estimate of remaining useful life (ERUL).	A schedule for conducting integrity assessments over the life of the DST System was not included in the 2016 DSTAR. A schedule is required and must be based on the results of past integrity assessments, age of the tank system, materials of construction, characteristics of the waste, and other relevant factors.	Based on the condition of the DST system and the waste management practices employed by USDOE and WRPS, the IQRPE recommended that the next integrity assessment occur in 2026 (2016 DSTAR Recommendation R16-1). The timing of post-2026 assessments will be determined during each previous integrity assessment. Though the current planning baseline assumes a ten-year cycle for DST integrity assessments, the frequency will be adjusted as necessary by the owner-operator.
	3.3.3 / p 15	2016 DSTAR R16-1: The next DSTAR should be in 2026 (a 10-year interval from this 2016 DSTAR). At that time, tank AY-101 will be 6 years from its currently analyzed life expectancy of 60 years. As systems age, it is appropriate that assessments, inspections, and observations become more frequent or at least no less frequent.		
	3.3.3 / p 16	2016 DSTAR R16-9: The life expectancy of the DST's should be reassessed by 2025. The life expectancy developed in the existing thermal and seismic study (RPP-RPT-28968, Hanford Double-Shell Tank Thermal and Seismic Project – Summary of Combined Thermal and Operating Loads with Seismic Analysis) was 60 years. In 2025, tank AY-101 will be 53 years old, which is 7 years from its current life expectancy. By completing the assessment by 2025, the information would be available for the 2026 DSTAR.	The previous 2006 DSTAR included an assessment of potential failure modes, and estimates of the remaining useful life of the DSTs and pipelines. But this was predicated on completing the Hanford cleanup mission by 2028, and clearly no longer applies.	Though the 2006 DSTAR has limited discussion of the 2028 date, the IQRPE did address design life in Section 4.7, *Age of the Tanks*. "Tanks from the above-mentioned tank farms will have exceeded their design life by 2028, but that is not to say that they will be unfit for use at that time. No basis for these design lives could be verified, nor is it known what the original designers considered to be minimum wall thickness, nor is it known what corrosion allowance they used in all cases. We note that during this present IQRPE assessment, the PNNL finite element model was used to calculate the bounding minimum design wall thickness (see Section 4.10.2.4)." The 2016 DSTAR is based on the current condition of the DST System. The IQRPE has recommended a period(s) for when the next review(s) or inspections should occur, based upon current condition information, design life, and the assumption that operations will remain within current specifications and limitations. As such, the owner-operator's schedule for future use was not a discriminating factor. Thus, the 2028 date did not factor into the 2016 DSTAR.
	5.1.1 / p 48	ERUL results indicated that all DST System pipelines will reach the 2028 milestone with enough remaining wall thickness to support internal pressure.		
	5.6 / p 67	2006 DSTAR R47: A formal ERUL calculation should be performed to assess the structural impact of corrosion/erosion on the DST System pipelines.		
	Table H-1 / p H-11	2006 DSTAR R-19: The DSTs will be re-evaluated for structural integrity before the end of their service life in 2028.	The 2016 DSTAR continues the same incorrect theme (e.g., Section 5.1.1 credits earlier ERUL calculations and states "…all DST System pipelines will reach the 2028 milestone with enough remaining wall thickness to support internal pressure.")	This statement is incorrect. Section 5.1.1 from the 2016 DSTAR doesn't address this topic. It merely cites recommendations from the 2006 DSTAR. Though it may be confusing, the Subject Matter Experts wanted the 2006 recommendations listed to guide their review. The IQRPE has recommended that the next integrity assessment occur in ten years based on evaluation of the DST system condition. The timing of later assessments will be determined by the condition of the DST system determined during each previous integrity assessment.
	Table H-1 /p H-29	2006 DSTAR R-47: A formal Estimated Remaining Useful Life (ERUL) calculation should be performed to assess the structural impact of corrosion/erosion on the DST system pipelines...ERUL calculations seem to indicate that relatively few, if any, waste transfer lines would fail during the 2028 mission.		

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			A formal assessment of the ERUL was recommended in 2006 by the IQRPE, the WRPS disposition shows this as "Completed," when in fact it was not.	The IQRPE assessment of pipeline ERUL was that it did not show any meaningful data and did not need to be further completed. The pipeline system is operated at relatively low pressures, velocities and there is very little corrosion/erosion.* For tanks, RPP-RPT-28968, *Hanford Double-Shell Tank Thermal and Seismic Project – Summary of Combined Thermal and Operating Loads with Seismic Analysis* presents finite element analysis to determine tank life. UT examinations since have shown that there are insufficient data for an ERUL study for the tanks. *Pipeline ERUL has been estimated in RPP-RPT-52791, Rev. 0, *Tank Farm Waste Transfer System Fitness-for-Service Erosion and Corrosion Basis*. The report was not available in time to be included in the 2016 DSTAR assessment.
			Now treatment of tank wastes will not even begin until 2022 and HLW-Vit initial operation has been delayed to 2036. All the DSTs have exceeded their design lives, and many have documented instances of pitting and wall thinning.	Future treatment of waste is not part of 2016 integrity assessment; however, the DST system may be used for any compatible wastes per HNF-SD-WM-OCD-015, *Tank Farms Waste Compatibility Transfer Program.* The tanks have not exceeded their design life per RPP-RPT-28968, *Hanford Double-Shell Tank Thermal and Seismic Project – Summary of Combined Thermal and Operating Loads with Seismic Analysis.*
			There is a lack of DST storage space, and some DSTs are being re-purposed for WTP feed characterization, staging, and waste returns. Their role has changed significantly from what was previously assessed.	The operation of the DSTs has not changed. The DSTs have experienced evolving mission roles since first use. Per the 2016 DSTAR, the tanks can be "repurposed" for storing any compatible wastes (per HNF-SD-WM-OCD-015, *Tank Farms Waste Compatibility Transfer Program*) and filled or emptied to their design fill limits. . Lack of DST storage space and similar programmatic considerations are not a basis for determining the tank integrity assessment interval, nor is the "re-purposing" of DSTs provided the waste stored in them conforms to the DST system operating specifications.

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			Earlier estimates of the remaining useful life are now a concern (e.g., AY-101 is 2032).	The analysis of AY-101 in RPP-13361, *Tank 241-AY-101 Fitness for Service*, didn't contain a useful life limitation. The independent review of the Fitness for Service evaluation by PNNL, reported in PNNL-14176, *Independent Review of Tank 241-AY-101 Fitness for Service*, also concluded that the tank could return to service without restriction. In addition, the 2006 DSTAR had no such restriction. The RPP-RPT-28968, *Hanford Double-Shell Tank Thermal and Seismic Project – Summary of Combined Thermal and Operating Loads with Seismic Analysis* report listed tank AY-101 tank as having a 60 year life. The IQRPE believes that the analysis was based on some relatively conservative assumptions. Recent UT data show current tank wall loss is less than assumed in that document, indicating that the life of the tank will exceed the current anticipated design life. For that reason, 2016 DSTAR recommendation R16-9 is to revisit that life expectancy study in 2025. There is no reason to accelerate or change the schedule of the next DSTAR or recommendation R16-9.
2	9.3.3 / p 108 9.6.2 / p113 9.6.3 / p 114 Table B-2 / p B-4	…future waste additions would be typical of the types of waste currently stored in the tanks. This includes the vast majority of waste to be received, which is retrieved waste from the SSTs. Future waste additions will likely be of similar properties and present no concerns assuming continued management per HNF-SD-WM-OCD-015. For waste characterization, the next overall DSTAR integrity assessment should follow the current 10-year schedule. The characteristics of the tank waste, as currently managed, are not a driver of the schedule for conducting the next integrity assessment.	The integrity assessment is required to address current wastes and wastes that will be handled.	The WAC 173-303-806, "Final Facility Permits," section (4(a)(iii) requires that a waste analysis plan be submitted with Part B of the permit application. RPP-29002, Rev. 1, *Double Shell Tank Waste Analysis Plan*, documents the waste analysis activities associated with the DST System to comply with WAC 173-303-300, "*General Waste Analysis*" subsections (1), (2), (4), and (5) and WAC 173-303-806 subsection (4)(a)(ii) for the DST System Treatment, Storage and Disposal (TSD) unit. The formal, continuous process that ensures current, as well as future, wastes received by the DST System comply with corrosion limits and safety limits is described in HNF-SD-WM-OCD-015, *Tank Farms Waste Compatibility Transfer Program*. The IQRPE review of the program is found in Chapter 10, *Waste Compatibility with Double-Shell Tank System Materials of Construction*. This review mirrors the analysis conducted during the 2006 DSTAR.
			The 2016 DSTAR does not address known issues associated with future waste additions to the DSTs. Little mention is made of waste returning to the DSTs from LAWPS, LAW-Vit, and EMF starting in 2022. Design and construction of the new facilities is underway. The chemistry of these future waste streams will require adjustment to the corrosion control specifications for the DSTs and 242-A Evaporator.	Both current, as well as future, wastes received by the DST System must comply with corrosion limits and safety limits in HNF-SD-WM-OCD-015. The 2016 DSTAR discusses waste compatibility in Section 10.3, *Corrosion Control*.
			Solids settling and erosion has presented design issues for WTP systems, but has yet to be considered for how it may impact the DSTs.	Engineering Standard TFC-ENG-STD-26, *Waste Transfer, Dilution, and Flushing Requirements*, ensures that risks of transfer line plugging, required flush flow rates and corrosion are considered and addressed at the earliest stage of process design and that the resulting process and equipment designs are developed that mitigate those risks.

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			Deferring the assessment of waste compatibility to the next DSTAR means not until 2026, after the startup of WTP which is too late. A recommendation to assess the compatibility of these new waste streams in the next 3 years is needed. It is not enough to simply assume existing processes will make things okay. [40 CFR 265.191(b)(2)] [WAC 173-303-640(2)(c)(ii)]	Every waste receipt into the DST System is subject to the RPP-29002, *Waste Analysis Plan*, and the corrosion and safety limits in HNF-SD-WM-OCD-015, regardless of mission timing.
3	Table 7-1 / p 89 Table H-1 / p H-38 3.3.2 / p.16 3.3.2 / p 17 7.6.3 / p 93	AW-01A 9/2013 to 9/2015 AW-06A 12/2013 to 12/2015 AW-04A 8/2013 to 8/2015 AW-03A 5/2013 to 5/2015 AN-05A 8/2013 to 8/2015 AN-02A 8/2013 to 8/2015 AN-03A 8/2013 to 8/2015 AN-07A 8/2013 to 8/2015 2006 DSTAR R61: Pits must be cleaned and have their coatings re-inspected by a qualified NACE coating inspector at the following periodicities… 2016 DSTAR R16-5: Inspection cycles of the pit coatings and lining materials should be completed every... 2016 DSTAR R16-7: In instances where the recommended inspection cycles have not been met for pits that are not being used, the pit coatings should be inspected prior to use.	Many of the pits listed in Table 7-1 are beyond the due date to be inspected. Yet these same pits are listed in Table D-1 as being **Fit For Use**. The 2006 DSTAR included a recommended inspection frequency for each of the pits. The 2016 DSTAR reiterates the recommendation, but then goes on to say it is okay to just inspect the pits prior to use for those that are late rather than prioritizing them. That defeats the purpose of any schedule (a regulatory requirement), ignores the recommendation of the previous IQRPE, and provides no basis for stating these pits are Fit For Use. [WAC 173-303-640(2)(e)]	WAC 173-303-640(2) (e) states that the owner/operator must develop a schedule for integrity assessments, not a schedule for doing pit coating inspections. Therefore, the last statement is invalid, as the pit inspections are not regulatory requirements. Most coatings perform extremely well for long periods of time especially when undisturbed. Pits that are current with their inspection schedule, and pits that have exceeded their inspection schedule but will be inspected prior to next use are fit-for-use. Table D-1 is correct.
4	2.1 / p 7 2.3 / p 9	The DST System includes 27 DSTs, 77 pipelines, 38 pits, and other ancillary systems. The following tanks and ancillary equipment are excluded from this 2016 DSTAR: □ (Numerous items listed)	The regulations specify the types of tank system components which must be evaluated in the integrity assessment. Many types of components were incorrectly excluded. The tanks, secondary containment, and ancillary equipment all must be evaluated. See the regulatory citations below.	Ancillary equipment was included in the 2016 DSTAR, described in Section 2.0. The DST system consists of non-enterable tanks, pipelines, and ancillary equipment for transferring and storing mixed waste. Pit and pipeline encasement leak detectors are the principal means of monitoring the DST System, including the ancillary equipment. The leak detection system is described in Section 8.0 of the 2016 DSTAR.
			There is no logic to include items like the RCSTS line SNL-3150 but not mention the associated 6241-A Diversion Box or the 6241-V Vent Station, both of which were included in the previous 2006 DSTAR and determined to be FFU.	The pipelines and pits cited are intended for future use. Before use they will be inspected, repaired if necessary, and tested in accordance with applicable regulations in place at the time. Line SNL-3150, the 6241-A Diversion Box and the 6241-V Vent Station are FFU but will require successful completion of an encasement pressure test and pit inspection before the next use. SNL-3150 was FFU on August 30, 2015, which was the cut-off date for documentation for the 2016 DSTAR. The 6241-A diversion box and the 6241-V vent station have been added to the 2016 DSTAR report in Sections 4, 7 and Appendix D.
			Other components such as the lines SN-637, SN-700, and SN-701 for delivering feed to WTP,	The pipelines cited are intended for future use and were therefore excluded from the 2016 DSTAR.

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			or the radioactive/dangerous liquid effluent lines from WTP to LERF/ETF and that tie into the 242-A Evaporator PC-5000 line were also omitted.	The 2016 DSTAR and future DST system integrity assessment scope is limited to the DST system waste transfer system pipelines that are currently fit-for-use. The process condensate line PC-5000 is part of the 242-A system and was not assessed as part of the DST system, nor are the future effluent lines between WTP, the future Effluent Management Facility and LERF/ETF. The last assessment of the PC-5000 system occurred FY 2008, RPP-RPT-33307, *IQRPE Integrity Assessment Report for the 242-A Transfer Pipeline*, Revision 0. The next integrity assessment of this system is planned for FY 2018.
			Applicable Regulations 40 CFR 265.191 Assessment of existing tank system's integrity. (a) For each existing **tank system** that does not have secondary containment meeting the requirements of § 265.193, the owner or operator must determine that the tank system is not leaking or is unfit for use.	The 2016 DSTAR evaluated the in-service portion of the DST system and determined that it was fit-for-use. This evaluation included the secondary containment. Since the tanks are existing and have secondary containment, they meet 40 CFR 265.191. 40 CFR 265.193 is not applicable to this integrity assessment.
			40 CFR 260.10 Definitions. **Tank system** means a hazardous waste storage or treatment tank and its associated **ancillary equipment** and **containment system**. **Ancillary equipment** means any device including, but not limited to, such devices as piping, fittings, flanges, valves, and pumps, that is used to distribute, meter, or control the flow of hazardous waste from its point of generation to a storage or treatment tank(s), between hazardous waste storage and treatment tanks to a point of disposal onsite, or to a point of shipment for disposal off-site. [40 CFR 260.10, 40 CFR 265.191] [WAC 173-303-640(2)(a), WAC 173-303-040]	Ancillary equipment was included in the 2016 DSTAR, described in Section 2.0.
5	2.3 / p 9	The following tanks and ancillary equipment are excluded from this 2016 DSTAR: • (Numerous items listed)	The 6241-A Diversion Box and the 6241-V Vent Station support operation of the Replacement Cross-Site Transfer System (RCSTS). Planning for operation of the DFLAW and LAW-Vit systems requires extensive use of the RCSTS for transferring waste from 200W to 200E starting in 2025. The entire RCSTS system must be evaluated in the 2016 DSTAR. Deferring to the next DSTAR in 2026 is not acceptable.	Line SNL-3150 exceeded its ten-year test interval March 21, 2016, after completion of the 2016 DSTAR cutoff, August 30, 2015. It will require a pneumatic pressure test; and the 6241-A diversion box and the 6241-V vent station will require inspections before next use. The condition of line SLL-3160 and refurbishment needed before use are discussed in RPP-RPT-47572, *Cross-Site Slurry Line Evaluation Report*. The timing of the pressure tests and pit inspections necessary for next use of the SNL-3150 or SLL-3160 lines will be determined by future need. It is unlikely they will coincide with the 2026 DSTAR.
6	2.3 / p 9	The following tanks and ancillary equipment are excluded from this 2016 DSTAR:	The AZ-301 Condensate Collection Tank is a RCRA-compliant installation that manages dangerous waste and replaced 241-AZ-702, which itself was FFU in the 2006 DSTAR. The 2006 DSTAR included a	Designation of the tank AZ-301 condensate and the collection system is currently being discussed between Ecology and USDOE. The USDOE and WRPS re-iterated

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	Table H-1 / p H-18	• Air handling systems used to ventilate the DSTs and ancillary structures, such as tank AZ-301. 2006 DSTAR Recommendation R29: Attachment 2 of Volume 4 contains a letter report from a NACE certified Cathodic Protection Specialist who evaluated the need for cathodic protection and corrosion protection measures on the secondary liner of catch tank AZ-301…It is therefore recommended to invoke a visual inspection program for the internal side of the secondary liner. Visual inspections on the internal side of the secondary liner should be performed every ten years from the time the tank was installed. The first inspection will be due to be performed in 2015. (WRPS Disposition) The visual inspection will occur in FY 2014. The action to complete the inspection will be incorporated in the next revision of RPP-7574, *Double-Shell Tank Integrity Program Plan.*	recommendation by a corrosion specialist for regular inspections of AZ-301. The WRPS disposition committed to this and the action was incorporated in the *DST Integrity Program Plan.* Many of the waste compatibility assessments reviewed for the 2016 DSTAR listed in Table U-1 are specifically for AZ-301 condensate transfers. Yet AZ-301 is specifically excluded from the scope of the 2016 DSTAR without explanation. The drain lines (DR-AY1, DR-AZ2) associated with AZ-301 also were previously determined to be FFU but are similarly excluded from the 2016 DSTAR. Tank AZ-301 and its associated ancillary equipment need to be included in the 2016 DSTAR.	their position on this topic following a meeting on June 14, 2016 (Letter 16-TF-0071, *Waste Designation for 241-AZ-301 Condensate*). "The Office of River Protection and Washington River Protection Solutions LLC maintain the position that 241 -AZ-301 condensate is not dangerous waste based upon RPP-RPT-58778, *AZ-301 Condensate Waste Designation and Loading Station* and sample analysis results which confirm that the condensate does not exhibit any characteristics which would require the condensate to be designated as "dangerous waste." From the June 14, 2016 meeting, we anticipate follow-on discussions regarding this matter."
7	2.3 / p 9	2016 DSTAR Exclusions: • Tank AY-102 is leaking from the primary containment and, as such, the tank is designated as not fit for use. • Pits at tank AY-102.	Only the AY-102 tank itself is unfit for use. It is not correct to exclude the pits or other ancillary equipment. Many components were upgraded to support waste retrieval from AY-102, and IQRPE assessments were performed of the upgrades. Some components support other uses. For example, routine waste transfers and line flushes to/from the adjacent DST AY-101 pass through the AY-02A central pump pit; several such transfers are forecasted (WRPS-59691-S, *241-AY-02A Design Specifics AY-102 Draining Jumper*). A line to AY-102 is also used to drain the jumper in the AY-02A pit after these transfers; draining this jumper is required by the *Tank Farms Documented Safety Analysis*, RPP-13033. The 2016 DSTAR needs to include the pits and other ancillary equipment at AY-102. References should be provided to any IQRPE assessments of the upgraded components along with the results, recognizing that some (but not all) of these occurred after the cutoff date for the 2016 DSTAR. [40 CFR 265.191(a)] [WAC 173-303-640(2)(a)]	The integrity assessments of the pits, jumpers and pipelines that form the tank AY-102 waste retrieval system were performed out of phase with the 2016 DSTAR and were therefore excluded. Any of these components that remain active will be acknowledged in the 2026 DSTAR.
8	5.4.2 / p 58	Although deferred use lines are not part of the scope of this report, this section is included to demonstrate that a process is in place to activate a deferred use line if the need arises. Once the deferred use line is activated, it would be added to drawing H-14-107346, *Waste Transfer Piping Diagram* (sheets 1 to 8), which is often referred to as the 'fit for use line list / interface diagram' or 'routing board'.	The terms **Deferred Use** and **Emergency Use Only** for non-compliant tank systems and ancillary equipment have no regulatory basis. Ecology no longer recognizes those terms. Citing those categories as the basis for not including some types of tank system components in the periodic integrity assessments is not acceptable. USDOE must operate and maintain the DST System to minimize the possibility of any unplanned release of hazardous waste which could threaten human health or the environment. Monitoring must be conducted for deterioration of tank system components. The purpose of the integrity assessment is to	The terms "**Deferred Use**" and "**Emergency Use Only**" are still applicable. The DOE/RL-90-39, Rev. 1, *Hanford Facility Dangerous Waste Permit Application, Double-Shell Tank System*, includes the following description of "Deferred Use" and "Emergency Use Only" equipment: "... Because of changing mission needs, not all of the DST Systems were upgraded and certified under major Tri-Party Agreement Milestones M-43 and M-48. Through a series of agreements between Ecology and ORP, the following

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		Deferred use lines are RCRA-compliant lines that have not been pressure-tested after construction was completed. These lines have not been certified by an IQRPE and do not have a fit for use designation. In order for these lines to be placed into service, the following process is used: • A pneumatic pressure test is performed and witnessed by an IQRPE or Qualified Inspectors. • An IQRPE report for the testing is produced and, if the line passes the pressure test, an integrity assessment is completed and a fit for use letter is produced by the IQRPE. • The routing board (H-14-107346) is updated to include the line 'Fit for Use.'	determine that the tank system is not leaking and is fit for use. Whether a component is fully compliant with RCRA does not exempt it from the periodic integrity assessment. Allowing a portion of the tank system to possibly deteriorate without (for example) ensuring that adequate corrosion protection is being maintained cannot be allowed. It is not sufficient to say that an IQRPE will later assess a component when a need for its use arises. There is no assurance the component will perform as needed, and the approach skirts the purpose of periodic integrity assessments. Based on comments received during the Draft Rev 9 comment period, the terms **Deferred Use** and **Emergency Use Only** for non-compliant tank systems and ancillary equipment have no regulatory basis. Ecology no longer recognizes those terms. [40 CFR 265.15] [40 CFR 265.31] [40 CFR 265.191]	categories of operating DST System components (ancillary equipment) are addressed in this permit application. **"2.1.1.1 Deferred Use Equipment** "By definition, deferred use equipment (DUE) does not yet have a specifically defined mission or the need date for using this equipment has been established well out into the future. This typically is true of components that are not required for tank farm operations but are anticipated to be needed for the retrieval of individual DSTs. Immediate upgrading of these components is not deemed to be cost effective because the associated method of retrieval has not been defined yet. Prior to use (other than for emergency use), DUE must be upgraded to meet all applicable RCRA standards, including a design assessment and construction inspection certified by an independent qualified registered professional engineer. ... See Appendix 4F for DOE/Ecology agreement on DUE management. **"2.1.1.2 Emergency Use Only Equipment** "These components are used only in the case of an accident or emergency. The physical configuration of some of the components presently may not fully comply with the requirements or interpretation of WAC 173-303. ... See Appendix 4F for DOE/Ecology agreement on management of emergency use only equipment." Appendix 4F, *Letters and Approvals Regarding the Double-Shell Tank Transfer System*, includes the following correspondence in which Ecology recognizes the two categories: • Ecology Letter, *Re: Letter 02-OMD-046 to M. Wilson from J. Rasmussen, "Response to the State of Washington Department of Ecology (Ecology) Letter Regarding the Exercising of Enforcement Discretion against Secondary Containment for Transfer Lines SN-277 through SN-280 and LIQW-702*, dated January 14, 2003. "Assumption 2: Ecology agrees with the proposed condition for the use of the emergency pumpout lines as they are part of secondary containment "Assumption 3: Ecology agrees with the proposed management of the deferred-use components as described in the referenced letter." [refers to USDOE letter 02-OMD-046, dated July 24, 2002] Examples of other correspondence that demonstrates acceptance and use of the two categories, but that is not included in DOE/RL-90-39 are: • Ecology Letter, *Re: Response to the Request for Amendment of the Double-Shell Tank (DST) Deferred Use Components*, dated April 29, 2005 [refers to USDOE

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				letters 02-OMD-046, dated July 24, 2002, and 05-TPD-045, dated April 15, 2005] • USDOE Letter 06-TPD-042, *Completion of Hanford Federal Facility Agreement and Consent Order (HFFACO) Milestone M-48-07 Requirements for Isolation, Stabilization, and Monitoring of Double-Shell Tank System Components*, dated June 27, 2006. "The enclosure provides an update to the original "Table of Disposition of Double-Shell Tank System Components Not in Use Beyond June 30, 2005". This update reflects: ... ○ "Ecology agreements for options for physical containment, emergency pump out lines, management of deferred use components, and drain lines contained in Reference 5. ..." [Ecology January 14, 2003 letter cited above] In addition to the category descriptions in DOE/RL-90-39, Rev. 1, the deferred use and emergency use categories are discussed in WA7890008967 *Hanford Facility Dangerous Waste Permit*, Rev. 9 [DRAFT], Part III – Operating Units, Double-Shell Tank System & 204-AR Waste Unloading Station Operating Unit Group 12 (OUG-12): **"C.2.9 DST System Drawings** " ... Drawings listed in Table C.1 may show equipment that is currently not in use including but not limited to deferred and emergency use equipment. ... **"H.7. Interim Closure for Disposition of Unfit-for-Use/No Longer Required Components** "DST System components are shown on H-14-107346, sheets 1 through 7, DST Waste Transfer Piping Diagram, including those components identified as compliant with WAC 173-303-640, those that are not in compliance with WAC 173-303-640, those that are identified as subject to variances, and those that are identified as "deferred use. ... " **"H.7.2 Interim Closure for Category 3 Components** "Category 3 components may be designated as "deferred use" if there is a good potential that they will be needed for future closure activities. ..."
9	Table D-1	(None of the lines to/froare FFU.)	None of the waste transfer lines to/from AW-103 are Fit For Use. The regulations require that a tank system which is unfit for use must be	The 2016 DSTAR concluded that tank AW-103 was fit-for-use. There is no requirement to have fit-for-use pipelines connecting to the tank for the tank to be

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			removed from service immediately, further addition of wastes must be prevented, and waste in the tank system must be removed. [40 CFR 265.196]	adequate to store waste. In the event of a leak from the primary tank, the owner/operator would be required to remove waste.
10	Table D-1 / p D-8	(Line SL-168 is not FFU.)	The slurry line SL-168 from the 242-A Evaporator to the AW-A Valve Pit is **not Fit For Use** per Table D-1. However, this line is permitted in the 242-A Evaporator portion of the Hanford DW Permit, Rev 8C (see Section 4.1.7.3.2). This line is actually the responsibility of the DST System, not the 242-A Evaporator. (See the DST boundary definition in Section 2.1.1 of the certified Part B Permit Application for the DST System, and response USDOE response 00-OSD-174 to the *Administrative Orders No. 00NWPKW-1250 and No. 00NWPKW-1251*). Status of the line needs to be clarified. A permit modification is also needed to correct the 242-A Evaporator portion of the DW permit.	Lines SL-167 and SL-168 are part of the of the DST system, not the 242-A Evaporator system (refer to *Hanford Dangerous Waste Permit*, Rev 8C, Part III, Section 4.1.7.3, *Transfer Line Containment,* Lines 45-46). Line SL-168 is RCRA-compliant but requires completion of a successful encasement pneumatic pressure test prior to use; line SL-167 is fit-for-use.
11	3.3.3 / p 17 5.7.3 / p 69 5.1.1 / p 48 Table 5-1 / p 50 5.2.1.6 / p 51	2016 DSTAR R16-19: Pressure testing of the encasements of the DST WTS piping should continue on a 10- year schedule, except pipeline SL-167 should be on a 5 year schedule. There is an identified low spot in transfer line SL-167 at cleanout box AW-COB-6. This line has shown signs of corrosion product on the exterior of the 2 in. primary pipe due to standing uninhibited water. Although line SL-167 has been declared fit for use (7G110-05-003), there is still a potential for continued corrosion. Low point identified on transfer line SL-167. Line SL-167 subjected to pressure transients during in-service leak test. Improper Fit-Up on Jumper AWVPB-WT-J-(R1-R3-C): During jumper removal attempts to support the transfer line SL-167 hydrostatic pressure test, it was noted that jumper AWVPB-WT-J-(R1-R3-C) required significant effort to remove. A laser scan of the jumper was performed. It was determined that the nozzle as-built dimensions and the current dimensions of the jumper did not match and created fit-up issues. The jumper was evaluated for potential stresses it would be subjected to while installed and it was determined that the jumper would exceed code allowable	Numerous references are made throughout the 2016 DSTAR of the **issues** associated with the line **SL-167**. This is the **primary line for returning slurry from the 242-A Evaporator to the DSTs** via the AW-B Valve Pit. The **backup is SL-168**; see the previous comment that **SL-168 is unfit-for- use**. Given that operation of the 242-A Evaporator is wholly dependent on a single pipeline of suspect integrity, simply pressure testing that line every 5 years is not enough. Continued availability of the 242-A Evaporator is essential for managing the tank wastes and completing the cleanup mission. A more proactive approach needs to be identified. The line SL-167 should be pressure each time prior to use. Priority needs to be given to replacing both the primary slurry line SL-167 and the backup line SL-168.	Although line SL-167 has a low point, the waste is compatible and pressure testing is adequate at a five year interval per 2016 DSTAR recommendation R16-19. In the event SL-167 is determined to be leaking, spare line SL-168 would be tested and placed in service. Line SL-168 is RCRA-compliant but requires completion of a successful encasement pneumatic pressure test prior to use.

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		stress by a significant margin and therefore required replacement.		
	5.2.3.1 / p 53	Standing Liquid Transfer Line SL-167 Encasement …Multiple tests and visual inspections, including video inspections, were performed and confirmed that the water was removed and the environment in the encasement had significantly improved. The primary line was hydrostatically tested to 1.5 times the design pressure. The encasement was also pneumatically tested. The testing confirmed the integrity of line SL-167. Transfer line SL-167 in the AW Tank Farm was subsequently replaced on the active line list and declared fit for service.		
	5.6 / p 66	2006 DSTAR Item R43: This document in conjunction … finds that the following actions are necessary to reduce the possibility of continued corrosion in AW tank farm slurry line SL-167… • 2016 DSTAR Assessment: The response to this recommendation indicates there is no simple way of introducing inhibited water to the system. At the completion of each campaign, the 242-A Evaporator vessel is deep flushed to remove residual supernate. A portion of the deep flush is drained through line SL-167. Further, if raw water is used in the line instead of residual supernate, the line must be used for a waste transfer or flushed with inhibited water or a portion of the deep flush from the 242-A Evaporator within 12 months after the line's last usage as described in TFC-ENG-STD-26.		
	11.5.2 / p 161	Line SL-167 This primary line is 2 in. Schedule 40 carbon steel encased in a 4 in. Schedule 40 carbon steel line. Residual water was found in the annulus in 2005 after tests performed earlier in 2005. In 2012 the annulus was dried, examined visually and with UT, and tested for Fitness-for-Service (RPP-RPT-55204). Corrosion was determined to be minimal and the line fit for use. The line has been moved to a 5-year test schedule rather than the standard 10-year period.		
12	G.2 / p G-5	Several instances of duplicate pipe numbers exist within the DST WTS. As an example, there is a line numbered SL-167 in the AN Tank Farm and another line numbered SL-167 in the AW Tank Farm. These are completely separate	A plan for determining the extent of the line discrepancies and making corrections needs to be developed. The Observations noted by the IQRPE in Section G.2 have no follow-on Recommendation. They were also not addressed by WRPS in the follow-on report 2016 Double-Shell Tank	When the entire Equipment Identification Number (EIN) for the line is used, each line has a unique identifier (*e.g.*, SN-268 in the AN Tank Farm is ANVPA-WT-WTL-SN-268 and SN-268 in the AW Tank Farm is AWVPB-WT-WTL-SN-268). The 2016

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		lines and are in no way related to each other. The line in the AN Tank Farm is listed as not approved for use while the AW Tank Farm line is fit for service. The line numbers are unique if the entire line number is used. However, it is the practice to use shortened line numbers. To avoid confusion when using shortened line numbers, a reference to the tank farm where the line is located should be used along with the line number.	Integrity Assessment Recommendation Dispositions, RPP-RPT-59218. Of particular concern, the discrepancies carry over to (as quoted from the 2016 DSTAR) "the H-14-107346, Waste Transfer Piping Diagram (sheets 1 to 8), which is often referred to as the 'fit for use line list/interface diagram' or 'routing board'." The particular example cited by the IQRPE appears on drawings H-14-107346, Sheets 3 and 6. Errors in the routing board may cause misrouting of waste transfers and use of unpermitted lines.	DSTAR does not make a recommendation to change the 241-AN and 241-AW tank farms line numbers, nor is there a regulatory requirement to do so.
13	11.4 / p 158	In 2015 the tank AP-102 floor was inspected and several areas of thinning were noted, the most serious being measured as 0.156 in. or about a **70% loss** from the nominal 0.500 in. thickness. No areas of reportable thinning were discovered above the thinned floor regions on the secondary liner sidewall. No through-wall penetration of the secondary liner was discovered. Based on a review of construction drawings, these areas of thinning are noted to be located approximately above the concrete foundation drain slot locations. Continued visual examination is planned with a UT rescan in 5 years.	Based on the information provided in the report, tank AP-102 is unfit for use as it has no creditable secondary containment. AP-102 is no longer capable of storing waste without posing a threat of release of dangerous waste to the environment; see the definition of "unfit-for-use tank system" in WAC 173-303-040. USDOE needs to provide a more detailed explanation on how this tank still meets requirements for secondary containment, or move forward to prevent any further waste additions to AP-102.	While localized thinning has occurred in a small area of the liner of tank AP-102, the tank is still fit for use as it is structurally sound and no liner breaches have been identified at the time of the 2016 DSTAR. There is no evidence that this secondary containment is not adequate to contain waste if the primary tank were to leak. It is also important to understand why the secondary liner plate is so thick. The thickness of this plate was for initial construction loads from the wet concrete. The thickness necessary to resist leakage is very small. Although there is a 70% reduction in original thickness, the remaining thickness is more than adequate to maintain leak integrity. Due the limited scan area, a recommendation to perform a followup UT scan of the tank AP-102 annulus floor in five years has been added to the 2016 DSTAR together with additional discussion on the original basis for the liner thickness (Sections 4, 11, and Section 3.3.3 R16-5.)
	11.7 / p 165	None of the tank farms have significant concerns: Tank AP-102 may have external corrosion on the secondary tank. **At this time there is no significant concern and could be patched if it does.**		
	11.7 / p 165	The discovery of 70% through-floor corrosion in the tank AP-102 secondary has many aspects...The best approach is to check this site again in 5 to 10 years and see if the corrosion is continuing; alternatively, a core sample could be taken to see if corrosion has actually occurred.	The minimum thickness of the secondary tank bottom was actually measured to be 0.149 inches as reported in RPP-RPT-58276, *Ultrasonic Inspection Results for Double-Shell Tank 241-AP-102 – FY 2015*. The measurement error may cause the thickness measurement to be under/over estimated by +/- 0.014 inch. This represents greater than 70% reduction in the thickness of the secondary tank bottom. The cause is external corrosion on the underside of the secondary tank bottom. Only two small areas of the secondary tank bottom were inspected, altogether representing less than 20% of the visible portion of the annulus. The remaining portion of the secondary tank bottom resides under the primary tank and is inaccessible. The secondary tank bottom was not inspected in a previous examination, so there are no earlier results for comparison. The 2016 DSTAR demonstrates a lack of understanding of the seriousness of this condition.	The liner thickness necessary to resist leakage is very small. While there is a 70% reduction in original thickness, the remaining thickness is more than adequate to maintain leak integrity. Additional discussion of the original basis for the liner thickness and a recommendation to repeat the UT scan of the annulus floor in five years have been added to the 2016 DSTAR, as noted above. .
	11.7.4 / p 167	In regards to the DST corrosion assessment, the DST System is fit for use as listed in Appendix D.		
	4.3.1.1 / p 36	A complete list of tanks inspected using UT is in Table 1 of RPP-RPT-58301, *Double-Shell Tank Ultrasonic Testing Summary*. That report also contains comprehensive summaries of all UT inspections.		

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		[Excerpt from RPP-RPT-58301, Section 4.1.6: As a result of these discoveries, WRPS Engineering and members of the HIAP recommended that an enhanced visual inspection of the annulus space be performed for **Tank AP-102, and that the annulus floor be rescanned in five years to trend the condition**. Planned annulus floor UT will also be continued for other DSTs, with the criteria that a minimum of 16 ft of annulus floor space be scanned to inspect a region covering three concrete foundation drain slot locations. Continued scanning of the secondary liner bottom on the annulus floor is being incorporated into work planning for UT activities for upcoming tanks.]	No Findings, Observations, or Recommendations specific to AP-102 are noted in Sections 3.3.3, 11.7.1, 11.7.2, or 11.7.3. Checking only the same site in AP-102 in 5-10 years ignores the possibility that more extensive corrosion may exist elsewhere and is yet to be detected. "Checking in 5-10 years" is not the same thing as rescan the area in 5 years. Further, stating that defects in the secondary tank can be repaired is inconsistent with the physical reality of the situation. There is nothing to show that the secondary tank is leak tight and thus AP-102 cannot be fit for use. [40 CFR 265.191] [WAC 173-303-640(2)(a)] [WAC 173-303-040]	
14	3.3.3 / p 15	2016 DSTAR R16-5: UT measurements of the primary DST and the secondary liner lower knuckle should be conducted at least every 8 to 10 years.	The secondary tanks are constructed of thinner material and were not stress relieved like the primary tanks. The HIAP identified in 2014 the concern with corrosion on the underside of the secondary tank bottoms in areas of the drain slots. There are no recommendations whatsoever in the 2016 DSTAR that mention the annulus floors or the secondary tank bottoms. The 2016 DSTAR recommendations need to address further UT examination of the secondary tank bottoms.	The 2016 DSTAR concluded that the DSTs, excluding tank AY-102, were fit-for-use (RPP-RPT-58441, *Executive Summary*). The implications of the tank AP-102 thinned annulus floor area are discussed in Section 11.7. The UT examination of the DST annulus floors has been added to 2016 DSTAR report as new recommendation R16-5.1. Baseline thickness measurements of an accessible area of the annulus floors are planned as part of future DST primary tank sidewall ultrasonic inspections.
15	8.2.1.6 / p 100	The AP Tank Farm contains eight DSTs. The eight DSTs each have a level detector and three annulus leak detectors. All of these are Enrafs. The CAMs that monitor the individual annulus exhaust ventilation ducts for radiation normally are not in operation. They can be made temporarily operational for special activities such as when a tank is qualified at a higher level than the previous maximum capacity. The AP Tank Farm level and leak detection instruments are numbered as shown in Table 8-6.	The SY Settlement Agreement states that "All DSTs equipped with operating annulus CAMs will be monitored daily for airborne releases into the annulus that could give an indication of a leak from the primary tank structure into the annulus." Not operating the CAMs violates the SY Settlement Agreement. The CAMs are also not listed in the 2016 DSTAR Table 8-6, "AP Tank Farm Level and Leak Detection Instruments." [SY Settlement Agreement, PCHB Nos. 98-249, 98-250, *Settlement Agreement and Stipulated Order of Dismissal*, Part II, Section I]	The 2016 DSTAR correctly cites the 'SY Settlement Agreement'. According to Section G, LEAK DETECTION SYSTEM, the DST leak detection system is comprised of three annulus leak detectors and a primary tank surface level monitor. Section I identifies CAMs as a supplement to the Leak Detection System, and states that DSTs equipped with operating CAMs will be monitored daily.

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16	3.3.3 / p 15 10.3 / p 130 11.3.1 / p 147	2016 DSTAR R16-8: Visual inspections of the DST annuli should be conducted at least every 8 to 10 years preceding UT and can help direct where UT measurements are taken. 3. Each DST annulus shall be video inspected on a 5-year frequency not to exceed 7 years (calendar years). 'Normal' visual inspections that examine about 50% of the annulus area on a 5- to 7-year interval have been replaced by 'enhanced' inspections that cover over 95% of the annulus area at a 3-year interval.	The plan for conducting visual inspections has changed significantly since AY-102 leaked. The schedule for limited visual inspections previously was every 5-7 years. Now an 'enhanced' visual inspection is performed every 3 years. The current visual inspection plan is described correctly in Section 11.3.1 but not elsewhere. The description should be adjusted as needed.	The 2016 DSTAR recommendation R16-8 states visual inspections shall be performed every eight to ten years. The 2016 DSTAR has been modified to acknowledge that WRPS is conducting enhanced visual inspections every three years, exceeding the recommended frequency.
	Table H-1 / p H-10	2006 DSTAR R16 (WRPS Disposition): The methodology of comparing current inspections with results from past inspections is described in RPP-PLAN-46847, Rev. 0, *Visual Inspection Plan for Single-Shell Tanks and Double-Shell Tanks*. Section 3.2, "Double-Shell Tank Visual Inspections," states that the present approach for conducting visual examinations of DSTs is to perform a video examination of each tank's interior and annulus regions in conjunction with the tank's ultrasonic examination inspection, or approximately every 5 years (not to exceed 7 years between inspections), whichever occurs first.	RPP-PLAN-46847 was updated in April 2015 to Rev 2. While the document now discusses the leak from AY-102, it also describes the "old" plan for conducting visual inspections of the DSTs. RPP-PLAN-46847 needs to be updated too.	According to a USDOE letter 13-TPD-0017, *Contract No. DE-AC27-08RV14800 – Doulbe-Shell Tank (DST) Annulus Video Inspections*, dated June 11, 2013, enhanced visual inspections of the primary tank exterior surface and annulus floor were to begin with the scheduled inspections in the 241-AP tank farm: "From this point forward starting with the scheduled inspections in the 241 -AP Tank Farm, the entire annulus floor and primary tank wall to the greatest extent practical of each DST shall be visually inspected. Please adjust the methodology of visually inspecting the annulus spaces until this is accomplished in all the DSTs." The information will be incorporated in RPP-PLAN-46847 during the next scheduled revision. The three year frequency for enhanced inspections is exceeds the eight to ten year interval recommended in the 2016 DSTAR as Recommendation R16-8.
17	2.3 / p 9 8.0 / p 94	The following tanks and ancillary equipment are excluded from this 2016 DSTAR: • Electrical and instrumentation circuitry, except for: — **The leak detection devices for the tanks are included**; leak detection pits for the secondary liner are excluded.	Section 8 of the 2016 DSTAR provides a physical description of the leak detection system for the tanks (only). What is provided is simply a system description. The Observation finally notes the databases used to track the repair history and performance issues of the instruments. What is not evident is that any of the available performance information for the tank leak detection system was reviewed by the IQRPE. There are known issues with the ENRAFs being out of service for extended periods of time and not being reported.	According to the 2016 DSTAR, the assessment reviewed the leak detection system and described it in Section 8.3, *System Design*; Section 8.4, *Testing and Calibration Operating Procedures*. Section 8.6.2, *Observations*, identifies: the operating logs that include out-of-limit readings and instrument malfunctions; repair history and performance issue tracking; and compliance with regulatory requirements.

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		LEAK DETECTION SYSTEMS The purpose of this assessment is to determine that DSTs are not leaking and are fit for use. Additionally, this assessment is to determine that the leak detection system is in place, maintained, and operated adequately to ensure the ability to detect a leak. The leak detection systems are used to determine if the primary shell is leaking or if the tank liquid level changes rapidly. This section addresses the primary tank liquid level and the tank annulus between the primary and secondary shells for leak detection. This section is to evaluate the tank leak detection systems fit for purpose, inspections, maintenance and compliance with regulations.	Many of the CAMs were either removed or are inoperable, even though they are required by the SY Settlement Agreement.	Section I of the 'SY Settlement Agreement' identifies CAMs as a supplement to the Leak Detection System, and states that for DSTs equipped with operating CAMs, the CAMs will be monitored daily.
			Leak detection for the waste transfer systems was not addressed in the 2016 DSTAR.	Section 8 addresses leak detection.
	8.6.2 / p 102	Observations Each DST has a level detector and three annulus leak detectors meeting the requirements of WAC-173-303-610(2)(a). The logs show any issue with a level/leak detector and any out-of-limit reading, as well as an instrument malfunction. The repair history of any individual instrument is maintained in the CHAMPS and Enterprise Asset Manager (EAM) database. Performance issues of the leak detection system are addressed in the Corrective Action database, and compliance with regulatory requirements are identified in the Environmental Notification database.		
			Leak detection systems are installed in the encasement of waste transfer lines or in waste transfer-associated structures (e.g., pump pits, valve pits, diversion boxes, Diversion Box 6241-A, Vent Station 6241-V, siphon standpipe stations, 241-SY101-PPP prefabricated pump pit, aboveground manifold boxes) into which the encasements drain. The RCSTS includes leak detection along the length of the route. These structures are all ancillary equipment and many of them were evaluated and determined to be Fit For Use (Table D-1), but their leak detection systems were not evaluated.	The WAC 173-303-640(2)(c)(v)requires that the integrity assessment of an existing tank system includes the following: "(v) Results of a leak test, internal inspection, or other tank system integrity examination such that: (A) For non-enterable underground tanks, the assessment must include a leak test that is capable of taking into account the effects of temperature variations, tank end deflection, vapor pockets, and high water table effects; and (B) ... for ancillary equipment, this assessment must include either a leak test, as described above, or other integrity examination, that is certified by an independent, qualified, registered professional engineer, ... addresses cracks, leaks, corrosion, and erosion." The pipeline encasement pneumatic pressure tests and the pit NACE coating inspections meet the requirements of (A) and (B). The 2016 DSTAR incorporated Section 8 summarizing the DST leak detection system because the IQRPE judged that familiarity with the system was beneficial to a comprehensive understanding of the DST system.
	3.3.3 / p 18	2016 DSTAR R16-24: A common leak detection instrument database or a program that extracts data from the multiple databases should be developed to identify issues relating to a particular instrument or location that has repeating issues. (For additional information, see Section 8.)		
18	2.3 / p 9	The following tanks and ancillary equipment are excluded from this 2016 DSTAR: • Electrical and instrumentation circuitry, except for:	The purpose of the leak detection pits is to detect failure of the secondary containment. While Ecology does not recognize tertiary leak detection under the regulations, they are ancillary equipment, designed to contain waste, and required to be included in the 2016 DSTAR.	Leak detection pits for the secondary liner are tertiary containment not required by the WAC 173-303-640(2), and therefore are not subject to an integrity assessment. They are therefore not included in the 2016 DST integrity assessment; nor were they included in the 2006 DST integrity assessment.

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	Table H-1 / p H-7 4.5 / p 40	• The leak detection devices for the tanks are included; **leak detection pits for the secondary liner are excluded**. 2006 DSTAR R12: The short design life for the secondary tanks, coupled with the current age of the tanks suggests it is vitally important to ensure operability of the tertiary leak detection pits. The TFC needs to maintain tertiary leak detection capability throughout the life of the tanks. (WRPS Disposition) The tertiary leak detection pits are no longer listed as a Leak Detection Monitoring and Mitigation (LDMM) feature because **they are not recognized by the Washington State Department of Ecology as necessary features.** DISCUSSION OF RESOLUTIONS OF THE 2006 DSTAR RECOMMENDATIONS (The WRPS disposition to Recommendation R12 was not reviewed by the IQRPE.)		The DOE/RL-90-39, Rev. 1, *Hanford Facility Dangerous Waste Permit Application, Double-Shell Tank System*, describes development of the post-2005 Double-Shell Tank System boundary in the following section: **"2.1.1 Treatment, Storage, and Disposal Unit Boundary Description [B-1a]** "The DST Treatment, Storage, and Disposal (TSD) Unit boundary was established in response to Ecology's Administrative Orders 00NWPLW-1250 and 00NWPKW-1251. The main purpose of the Administrative Orders was to define integrity assessment requirements for the DST System. Item IA of the order required identification of all components comprising the DST System. The following definition was taken from the DOE, Office of River Protection (ORP), letter 00-OSD-174, *Resubmittal of Administrative Orders NO. 00NWPKW-1250 and NO. 00NWPKW-1251 Action 1A* (Clark 2000). This letter is ORP's response to Action 1.A ("Define the DST RCRA TSD Unit Boundary") of Administrative Orders 00NWPKW-1250 and 00NWPKW-1251 and was used to generate the list response to Item 1A. "In October 2001 the Administrative Order was transitioned to the *Hanford Federal Facility Agreement and Consent Order* (Ecology et. al 1989) (Tri-Party Agreement) Milestone M-45-00: "Complete tank integrity assessment activities as set forth in interim milestones established under this major milestone." Interim Milestones M-48-01 and M-48-07 incorporated the requirements stated in Items 1A and 5, respectively. The Items 1A and 5 lists subsequently were revised and converted into engineering sketches. This activity was done as part of the Project E-525 scoping process. ..." "The H-14 drawings (Appendix 4B) and the component listing in Appendix 4C, define the DST TSD Waste Transfer Unit Boundary for Operations. Appendix 4E (Item 5 list) provides a listing of the DST System components that will be closed under the single-shell tank (SST) closure plan. Those DST Systetm components not closed as part of the SST closure plant will be closed under the DST closure plan ..." Appendix 4C, *Double-Shell Tank Waste Transfer System Component List* of post-2005 components does not include the 22 tertiary containment DST leak detection pits.

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			See the regulatory citation from 40 CFR 265.193(c) (3) below. [Regarding the latter portion of the citation…The ENRAFs in the annulus have been shown to be unable to detect a leak within 24 hours. Other technology is available which can detect a leak (i.e., CAMs in the annulus ventilation) but is not being employed.]	The scope of 2016 Double-Shell Tank Integrity Assessment is described in WAC 173-303-640(2), *Assessment of existing tank system's integrity.* 40 CFR 265.193, *Containment and detection of releases*, is not applicable to this integrity assessment.
			The 2006 IQRPE recommendation noted the LDPs are vital for monitoring the leak integrity of the secondary tank, which is clearly included in the scope of the integrity assessment. The regulations further state the "operator must determine that the tank system is not leaking..." However, the 2006 IQRPE recommendation was essentially ignored. The WRPS disposition talks about how the LDPs operate and provides reasons for maintaining their capability, but says nothing about how (or if) the LDPs are being maintained. The 2016 DSTAR then excluded the LDPs altogether from the scope; the 2016 IQRPE avoided discussion of all this in Section 4.5 where the disposition of the previous IQRPE's recommendations is reviewed.	The leak detection pits are not part of the DST permitted system because they are a tertiary element. The integrity assessment of tertiary containment is not required by WAC 173-303-640(2).
			Please also provide the basis for the statement that the LDPs are not recognized by Ecology as being necessary.	As described above the DOE/RL-90-39, Rev. 1, *Hanford Facility Dangerous Waste Permit Application, Double-Shell Tank System*, Rev. 1, Appendix 4C, *Double-Shell Tank Waste Transfer System Component List* of post-2005 components does not include the 22 tertiary containment DST leak detection pits.
			40 CFR 265.193 **Containment and detection of releases**. (c) To meet the requirements of paragraph (b) of this section, secondary containment systems must be at a minimum: (3) Provided with a leak detection system that is designed and operated so that it will **detect the failure of either the primary and secondary containment structure** or any release of hazardous waste or accumulated liquid in the secondary containment system within 24 hours, or at the earliest practicable time if the existing detection technology or site conditions will not allow detection of a release within 24 hours; [40 CFR 265.191] [WAC 173-303-640(2)(a)]	The 2016 DSTAR determined that the tanks are not leaking, nor unfit for use. Since these are existing tanks with secondary containment, 40 CFR 265.191 is a requirement. 40 CFR 265.193 is not applicable to the integrity assessment.

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19	5.6 / p 67	2006 DSTAR Item R45: A formal integrity assessment should be performed on all DST System waste transfer, drain, and process waste lines eight years after the issuance of this integrity assessment. • 2016 DSTAR Assessment: This recommendation is inconsistent with other portions of the DSTAR. Pneumatic pressure testing of the 75 active transfer pipeline encasement has been implemented on a 10-year interval. This disposition satisfies the recommendations outlined in Item R45.	Both the IQRPEs in 2006 and 2016 recommended that leak testing of the waste transfer lines be conducted every 10 years. The facility agreed on paper to implement the recommendation. However, performance of leak testing in the field has not been adequate. Results of transfer line encasement pressure testing are provided in the 2016 DSTAR in Table 5-4. Spot checking the results for **just the AN tank farm**, six transfer lines (SL-161, SL-168, SN-261, SN-266, SN-268, SN-636) which are identified in Table D-1 as being Fit For Use were not pressure tested in the last 10 years. Altogether, Table 5-4 provides results for only 31 lines, of which 29 lines passed. Several places in the 2016 DSTAR is the statement "The scope of the DST System includes 27 DSTs and ancillary systems including 77 pipelines, 38 pits, and other ancillary systems." Given that several of these "77 pipelines" are drain lines, many transfer lines are still unaccounted for in terms of having been pressure tested. Yet all "77 pipelines" are designated as Fit For Use in Table D-1. The IQRPE did not note in the 2016 DSTAR the discrepancy between the recommended level of testing and what was actually performed. No mention is made of whether all the transfer lines were tested, some but not all, what should be done about those overdue for testing, etc.	The 2016 DSTAR has been updated such that Table 5-4 shows all the fit-for-use pipelines and is coordinated with Appendix D. The 2016 DSTAR recommendation R16-19 has been updated to state that pipelines shall have a pressure test every 10 years or prior to next use, whichever is greater. The agreement to postpone pressure testing of deferred use lines until the lines are required for use was proposed by USDOE and accepted by Ecology. Refer to USDOE Letter 06-TPD-042, *Completion of Hanford Federal Facility Agreement and Consent Order (HFFACO) Milestone M-48-07 Requirements for Isolation, Stabilization, and Monitoring of Double-Shell Tank System Components*, dated June 27, 2006, described earlier.
	Table H-1 / p H-28	2006 DSTAR R45 (WRPS disposition): …the IQRPE recommended interval of 10 years has been adopted for pneumatic pressure testing of the 75 active transfer pipeline encasements.		
	3.3.3 / p 17 5.7.3 / p 69	2016 DSTAR R16-19: Pressure testing of the encasements of the DST WTS piping should continue on a 10- year schedule, except pipeline SL-167 should be on a 5 year schedule.		
	5.4.1 / p 58	Operating Specifications Operating specifications cover WTS integrity testing and verification requirements including pressure testing of transfer lines, automated leak detection, and life cycle management controls for HIHTLs. OSD-T-151-00010, *Operation Specifications for Pressure Testing and Leak Detection for Tank Farm Transfer Systems & for Control and Use of Temporary Transfer Lines,* requires transfer lines be pressure tested to 150% of maximum operating pressure for 1 hour. The lines must show less than a 5% pressure drop during the test to meet the acceptance criteria. Construction specifications for RCRA-compliant lines require pressure testing in accordance with ANSI/ASME B31 series piping codes following installation and prior to service. **Periodic testing of these lines may be performed based on engineering judgment of factors such as date of the last transfer and age of the line, but additional pressure testing requirements are not specified by OSD- T-151-00010.**	The IQRPEs recommendation for pressure testing the transfer lines every 10 years was never adopted in the facility operating specification. The testing frequency is left open. The facility has since attempted to move even further away from the recommended testing frequency. The draft *2016 Double-Shell Tank Integrity Assessment Recommendation Dispositions*, RPP-RPT-59218, attempts to qualify the IQRPE recommendation by stating checks will be performed "…every 10 years **or prior to use**." The regulations clearly state the schedule for integrity assessment must be based on the results of past integrity assessments. [WAC 173-303-640(2)(e)]	Ecology concurred with the management practice of testing waste transfer lines before next use when they have exceeded their pressure test interval in an April 13, 2004 letter (*Re: Request for a Variance from Secondary Containment Standards for Ten double-Shell Tank (DST) System Dangerous Waste Transfer lines, 03-ED-127, dated September 4, 2003*). From the Ecology Letter, dated April 13, 2004: "The Washington State Department of Ecology (Ecology) has reviewed the United States Department of Energy's request for a variance to operate ten (10) waste transfer lines ... These ... lines have inadequate secondary containment that does not meet Washington Administrative Code (WAC) 173-303-640(4)(f). "Ecology agrees that the lines may be operated without upgrading under the following conditions: • "The lines must be hydraulically tested annually, or prior to use if the lines are used less often than once a year. ..." In 2005 ORP identified 22 deferred use waste transfer lines that would require an encasement pneumatic test before use (Letter 05-TED-093, *List of 200 East Area Double-Shell Tank (DST) System Transfer Encasement Lines Not Pressure Tested For Inclusion In The DST Integrity Assessment Report, Hanford Federal Facility Agreement and Consent Order Milestone M048-14*, dated December 21, 2005):

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				From the ORP Letter 05-TED-093, dated December 21, 2005: " ... ORP proposes the following: • "Identify the attached transfer lines in a deferred list as DST ancillary transfer lines not Independent Qualified Registered Professional Engineer (IQRPE) certified for use, but placed in a standby mode. The intent is to pressure test the transfer lines sometime in 2010 prior to scheduled project mission needs starting in 2011. • "Upon completion of pressure testing of the transfer line encasements, submit to Ecology the list of these tested DST transfer lines and request incorporation into the RCRA operating permit."
20	Table H-1 / p H-28	2006 DSTAR R45 (WRPS disposition): Drain lines cannot be assessed by traditional means of pneumatic pressure testing because they are open at each end (i.e., at the pump pits and where they drain waste back into the tanks). There is no need to pressure test drain lines because they are never pressurized during operations. Therefore, **integrity assessments of the drain lines are not performed**.	While drain lines cannot be pressure tested, there are other means of inspecting these lines which satisfy the regulatory requirements. The lines may not drain completely and have corroded through completely. Instances are reported in the 2016 DSTAR of waste transfer lines not draining due to the field configuration. Without any leak detection system whatsoever for the drain lines, leaks could occur and be undetected. Several drain lines are shown as Fit For Use in Table D-1 without having been leak tested and no plans for doing so. The drain lines are **ancillary equipment** and a plan is needed to verify their integrity. The 2016 DSTAR in Section 5.1.2 talks about alternatives to pressure testing that were previously researched and evaluated. [40 CFR 260.10, 40 CFR 265.191] [WAC 173-303-640(2)(a), WAC 173-303-040]	The USDOE proposed management of the drains as an extension of secondary containment in letter 02-OMD-046, and Ecology concurred in a letter dated January 14, 2003, (Letter, *Re: Letter 02-OMD-046 to M. Wilson from J. Rasmussen, "Response to the State of Washington Department of Ecology (Ecology) Letter Regarding the Exercising of Enforcement Discretion against Secondary Containment for Transfer Lines SN-277 through SN-280 and LIQW-702", dated July 24, 2002*). In Letter 02-OMD-046, drains were proposed as compliant for use in their existing configurations because they are: • not pressurized under normal operation • not configured to allow the accumulation of waste • not used to transfer waste during normal operation. Drains have a variety of sizes, configurations, and termination locations making inspection impractical except in the case of transfer line valved encasement drain pneumatic pressure testing. The drain referred to as not draining is the 241-AW-04A pit floor drain. The pit is designated as not fit for use until the drain is unplugged. The 2016 DSTAR has been updated to discuss the fit-for-use criteria for drain lines. Drain lines are considered part of secondary containment so, pressure testing is not required.
21	5.5 / p 59	HIHTLs are considered part of the SST WTS and are not considered in this report.	Use of HIHTLs is not restricted to SSTs. HIHTLs were used in the SY tank farm,	The HIHTL used in 241-SY farm were used to transfer waste from SSTs into the DSTs. These systems haven't been used since 2004 when the interim stabilization of SSTs was completed.
			and are currently being used for removing waste from the leaking AY-102. See the DST Waste Transfer Piping Diagram H-14-107346 Sheet 5.	The AY-102 retrieval system was covered by a separate IQRPE assessment not completed in time to be incorporated in the 2016 DSTAR.

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22	2.1 / p 7 6.1.3 / p 72	The DST System includes 27 DSTs, 77 pipelines, 38 pits, and other ancillary systems. There are a total of 246 post-2005 pipelines evaluated, as defined by the 2006 DSTAR Volume 2 and Attachment 3 of RPP-20960.	The distinction between the 246 pipelines evaluated for cathodic protection, and the 77 pipelines said to be in the scope of the 2016 DSTAR, is unclear. Further explanation is needed.	Attachment 3 of RPP-20960, Rev. 1, *Double-Shell Tank Waste Transfer System and Isolation Project Plan*, identified DST Transfer System Deferred Use components that had been ... " stabilized, monitored, and isolated to the requirements listed in TPA-M-48-07." The 2006 DSTAR included these pipelines even though they were designated as deferred use and/or future use pipelines. Only pipelines classified as fit-for-use are evaluated in the 2016 DSTAR. The 2016 DSTAR relied upon the cathodic protection data submitted in several consecutive annual reports to make the assessment of the system as a whole (Section 6). Section 6 included both regulated and non-regulated piping, approximately the 246 pipelines. Of all the pipelines discussed, only 77 pipelines were fit-for-use as stated in the 2016 DSTAR. As a point of clarification, the 2006 DSTAR described fit-for-use lines and pits requiring encasement pneumatic pressure testing or coating/liner inspection before next used were described as "NAU" – not authorized for use.
23	10.2.2.2 / p 123	The outside surface of the secondary containment is in contact with the concrete encasement. The alkaline environment of concrete (pH of 12 to 13) provides steel with corrosion protection through the formation of a thin oxide layer on the steel that prevents metal atoms from dissolving.	This section looks at degradation of the various DST system components due to corrosion. The section on corrosion of the outside surface of the secondary containment needs to be revised to address corrosion of the outside surface of the secondary containment adjacent to the drain slots. This should include discussion of the corrosion mechanism, available monitoring methods, inspection results, and recommendations.	Section 10.2.2. discusses the annulus space and the secondary liner. Although the outside surface of the secondary liner above the drain slots is not specifically addressed, the potential for corrosion on the liner outside at the drain slots has been recognized. Corrosion of the DST secondary liners is being evaluated with corrosion testing and during UT inspections.* *The activities are described in RPP-PLAN-60778, Rev. 0, *Double-Shell Tank Tertiary Leak Detection System Investigation and Mitigation Plan*. The plan was issued during July, 2016, after the 2016 DSTAR was completed.
24	10.3.2 / p 132	The results of the evaluation showed five tanks that were of potential concern at the time or within the next 5 years, not including tank AY-102. (The concerns with AN-101, AN-106, AN-107, AY-101, and AZ-102 are then described.)	Several DSTs are identified in the 2016 DSTAR in which the tank chemistry is out of spec and a source of corrosion. The corrosion control program described in Section 10.3 outlines the approach to detecting and controlling tank chemistry issues like this. Corrective actions are also planned. The 2016 DSTAR needs to include a recommendation for tracking the resolution of the issues associated with these particular tanks.	There are no tanks that are out of specification as shown in the 2016 DSTAR, Table 9-1: *Summary of Tank Conditions Important to Corrosion*. The Section 10.3 cites tanks that may go out specification, but corrosion mitigation activities ensure that the tanks are brought back into specification.
25	10.4 / p 138	2006 DSTAR Item R11: Emergency pumping procedures currently estimate that the pumping of a secondary tank will begin on the tenth day from discovery of the leak. According to stated functional requirements for the secondary tanks, pumping needs to be completed on the seventh day. It was further recommended that the Tank Farm Contractor perform one of three actions. • 2016 DSTAR Assessment: As detailed in Section 10.2.2.2, the secondary liner can contain the waste for a reasonable period of time, well in excess of that	As was demonstrated in response to the leaking AY-102, **emergency pumping plans are inadequate** and need to be revised. Further, the secondary tank cannot realistically be emptied due to physical limitations of the equipment and the nature of the leaked waste. Corrosion of the secondary tank from the leaked waste will continue and needs further evaluation. The 2016 DSTAR needs to identify this as a significant uncertainty, and include a recommendation for developing a path forward.	40 CFR 265.191 does not identify removal of waste from secondary containment as an element of integrity assessments.

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		necessary to empty the annulus in the event of an emergency.		
26	11.3.1 / p 147	(Visual inspection results for AY, AZ, SY, AW, AN, and AP Tank Farms)	Results of the visual inspections are described in this section. However, the results lack detail, some individual DSTs are not mentioned, it is not always clear which tanks had limited versus enhanced visual inspections, or what the plan is for inspecting the remaining tanks if only a portion of the tanks in a farm were inspected in the time period. For example, two AN tanks received enhanced visual inspections in 2014, but no mention is made of the remaining tanks. The 2016 DSTAR needs to better address visual inspections in general. Something similar to what was done for pit inspections in Section 7.4 of the 2016 DSTAR would be expected.	Visual inspections are addressed in the 2016 DSTAR, Section 11.3, *Double-Shell Tank Primary Containment*, stating that tanks are inspected on the "enhanced" schedule every 3 years. The section summarizes highlights from the DST and DST farm inspection reports that the IQRPE reviewed during the integrity assessment. The individual reports are referenced so a reader can locate them to find inspection details. The 2016 DSTAR recommendation R16-8 states visual inspections shall be performed every eight to ten years. The 2016 DSTAR, Section 4, has been modified to acknowledge that WRPS is conducting DST enhanced visual inspections every three years.
27	Executive Summary	Integrity assessments are required to determine that the existing Hanford Double-Shell Tank (DST) System is sound and fit for use.	Integrity assessments are to determine if the tank(s) are capable of performing their design function, which is the containment of hazardous materials. Specifically, the regulations state that "…the owner or operator must determine that the tank system is not leaking…" This report does not address the system's ability to contain hazardous materials. DSTAR 2006 addressed both structural and leak integrity. [40 CFR 265.191]	The ability of the tanks to contain hazardous material is addressed from a structural perspective in Section 4, *Double-Shell Tank Structural Adequacy*. The ability of the tanks to contain hazardous material from a material compatibility perspective is addressed in Section 9, *Waste Characterization for Double-Shell Tank System*; Section 10, *Waste Compatibility with Double-Shell Tank System Materials of Construction*; and Section 11, *Corrosion Assessment and Status*.
28	Executive Summary	The purpose of this integrity assessment report is to determine if the DST System is fit for use such that the tanks and ancillary systems are not leaking, are adequately designed, and are structurally adequate and compatible with the waste to ensure that the tank or ancillary system will not collapse, rupture, or fail and to certify the DST System as fit for use.	See the previous comment on the need to demonstrate the tank system is not leaking. The 2016 DSTAR does not address the requirements from 40CFR 265, Subpart J on containment. [40 CFR 265.191]	The discussion on containment is contained in the chapters that address the tanks and ancillary equipment. See Sections 4, *Double-Shell Tank Structural Adequacy*; 5, *Double-Shell Tank Waste Transfer System Integrity*; 7, *Pit Secondary Liners/Coatings for Double-Shell Tank System*; and 11, *Corrosion Assessment and Status*, for discussions specifically related to demonstrating that the tank system is not leaking. See Figure 3-1 for a diagram of how the fit-for-use designation was decided.
29	2.3 / p 9	Air handling systems used to ventilate the DSTs and ancillary structures, such as tank AZ-301.	Please explain what standard was applied to ancillary structures to determine an assessment was not required.	Designation of condensate from the air handling equipment is currently being discussed between Ecology and USDOE. The condensate is produced by 702-AZ and is collected in AZ-301.

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30	4.2.6 / p 30-31	**Secondary Tank Walls** The secondary tank walls provide secondary DST containment. These tank walls also provide the interior form for the concrete shell surrounding the tank. In the completed state, the bottom knuckle is the only portion of the secondary tank wall that is not supported by concrete. Therefore, the only area that needs to be considered for the structural adequacy of the DSTs after the concrete has cured is the bottom knuckle. … For AP Tank Farm tanks with 460 in. of waste, the maximum specific gravity of the waste in the secondary containment tank is 1.83 (2006 DSTAR Volume 1). Apparent thinning of the secondary containment floor reported in RPP-RPT-58276, *Ultrasonic Inspection Results for Double-Shell Tank 241-AP-102 – FY 2015,* does not pose a structural adequacy concern because these areas are supported by the concrete foundation.	This does not address the requirement of § 265.193(b) Secondary containment systems must be: (1) Designed, installed, and operated to prevent any migration of wastes or accumulated liquid out of the system to the soil, ground water, or surface water at any time during the use of the tank system; and	40 CFR 265.193 is not applicable to the integrity assessment. 40 CFR 265.191 specifies the content of the integrity assessment. However the 2016 DSTAR did the integrity of the secondary containment system, including chemical compatibility and corrosion resistance, and the results of visual and ultrasonic inspections, and determined that the DSTs were fit-for-use.
	11.4 / p 158	In 2015 the tank AP-102 floor was inspected and several areas of thinning were noted, the most serious being measured as 0.156 in. or about a 70% loss from the nominal 0.500 in. thickness. No areas of reportable thinning were discovered above the thinned floor regions on the secondary liner sidewall. No through-wall penetration of the secondary liner was discovered. Based on a review of construction drawings, these areas of thinning are noted to be located approximately above the concrete foundation drain slot locations. Continued visual examination is planned with a UT rescan in 5 years.	(2) Capable of detecting and **collecting releases and accumulated liquids until the collected material is removed**. This section requires the secondary containment be able to contain liquids. Structural integrity is evaluated but containment capability has not been addressed. The definition of a "tank" at WAC 173-303-040 includes "…a device…to contain an accumulation of dangerous waste."	40 CFR 265.193 is not applicable to the integrity assessment. 40 CFR 265.191 specifies the content of the integrity assessment.
31	11.7 / p 165	The definition of thinning is a structural concern.	That does not address the potential impact on the ability of a tank to perform its function of containment as required by 40 CFR § 265, Subpart J.	As has been noted by the Tank Structural Integrity Panel in BNL-52527 and others, the author was discussing the difference of the threat between general corrosion and pitting corrosion to containment of the waste. Thinning is a structural integrity concern to containment of the waste and not a leak concern because the tank would fail prior to leaking. The 2016 DSTAR has been updated to delete the statement that thinning is a structural concern, see Section 11, *Corrosion Assessment and Status.*
32	11.7 / p 165	The discovery of 70% through-floor corrosion in the tank AP-102 secondary has many aspects. Inasmuch as the drain pits have not been reported as being flooded, it is difficult to determine the source of water to effect corrosion. Hanford is an arid site with a water table	The report doesn't address if the 70% corrosion affects its ability to contain waste that could leak into the annulus. In other words, there is no conclusion as to whether the secondary containment can perform as design and the tank is therefore fit for use.	Based on short duration waste simulant studies, an estimated secondary liner external surface pitting growth rate of 5 mils/yr to 10 mils/yr has been determined (RPP-RPT-57774, Rev. 1). Applying the rates to the small, thinned area of the tank AP-102 0.5-in. thick secondary liner suggests a worst-case minimum remaining lifetime of 15 years (10 mils/yr) to 30 years (5 mils/yr) assuming a pitting constant growth rate .

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		roughly 200 ft. below ground level or about 150 ft. below the bottom of the tank. Carbon steel could corrode to the extent noted in 28 years in Hanford Site soil; unfortunately, the steel was not in contact with soil so the mechanism is uncertain. It is possible, though not likely, for conditions present during construction to have affected the corrosion during and shortly after construction. The best approach is to check this site again in 5 to 10 years and see if the corrosion is continuing; alternatively, a core sample could be taken to see if corrosion has actually occurred.	Using the corrosion rate evaluated in RPP-RPT-57774, Rev 1 for external corrosion of the secondary liner, the leak integrity of the liner floor may be gone within 15 yrs. Please provide a justification for UT inspection on only a 10 yr schedule and not mandating a 5 yr or less schedule. +	However, pit growth has been widely demonstrated to proceed at a fractional time constant rate, *i.e.*, the pitting rate slows over time (National Bureau of Standards Circular 579, Underground Corrosion, 1957). Planned reinspection of the thinned area in five years is conservative whether improbable linear growth or empirically-derived fractional time constant growth is assumed. It is also important to understand why the secondary liner plate is so thick. The thickness of this plate was for initial construction loads from the wet concrete. The thickness necessary to resist leakage is very small. Although there is a 70% reduction in original thickness, the remaining thickness is more than adequate to maintain leak integrity. The 2016 DSTAR determined that the tank is fit-for-use since it is structurally sound and no secondary containment breaches have been identified. There is no evidence that this secondary containment is not adequate to contain waste if the primary tank were to leak. Due the limited scan area, the an additional recommendation has been added to the 2016 DSTAR stating that a UT scan of the tank AP-102 annulus floor be repeated five years, and the discussion expanded on the original basis for the secondary liner thickness.
33	5.2.2.2 / p 52	Transfer Lines SN-264 and SN-274 Full of Liquid During jumper installation efforts in valve pit AW-B, liquid was discovered in a jumper connected to transfer line SN-264. After a review of the system and associated waste transfer history, it was determined the existing system could not be drained based on field configuration. Both of these lines were dedicated to supporting waste transfers from the 204-AR Facility. The last transfer of waste to the DST System was in 2005. Both lines run from a high point at AW-B to pump pit AW-04A (low point of the lines). There is no near term use for these lines. However, both lines were deferred use components and are not certified to contain liquid. Engineering recommended that the flexible metal jumper connected to nozzles A and L in pit AW-04A be removed and disposed of so the lines can be adequately drained.	This section discusses abnormal issues associated with the waste transfer system since the 2006 DSTAR. An issue was identified for the lines SN-264 and SN-274 in that the lines do not drain and were found to be full of liquid. These lines were used to support waste transfers from the 204-AR Waste Unloading Station to the AW-04A Pump Pit. The previous 2006 DSTAR indicated SN-264 and SN-274 were not available for use. The current 2016 DSTAR shows the lines as FFU in Table D-1, but doesn't say whether the draining issue was resolved or how. If the issue still exists, there needs to be a follow-on recommendation for regular inspection and actions to prevent further degradation (such as maintaining corrosion protection and flushing with inhibited water after each use).	The 2006 DSTAR indicated that lines SN-264 and SN-274 were "not authorized for use". At the time the lines were classified as "deferred use" lines according to letter 05-TED-093, as described early in the response to Comment 8. Lines SN-264 and SN-274 successfully passed encasement pneumatic pressure tests on May 28, 2014 and May 29, 2014, respectively. Therefore both the 2006 DSTAR and the 2016 DSTAR are correct. Flush water remaining in the lines will be drained once the AW-04A central pump pit floor drain is unplugged.
			The AW-04A Pump Pit itself is non-compliant and is also deficient on its coating inspection (see earlier comment).	See previous comment.
			No mention is made of the TK-1 Catch Tank in the 204-AR Waste Unloading Station or the transfer line LIQW-702. The tank presently contains 800+ gallons of wastewater containing dangerous waste. This tank was identified in the 2006 DSTAR as having no future use. In 10+ years no progress has been made in deciding its path forward, and in the meantime has not received any integrity assessment whatsoever.	Ecology and USDOE are reviewing the status of the 204-AR Facility (Letter 16-ECD-0027, *U.S. Department of Energy, Office of River Protection and Washington River Protection Solutions LLC Submit Proposed Resolution of Washington State Department of Ecology Inspection Finding from Letter 16-NWP-019*). It is not in service and was therefore excluded from the 2016 DSTAR assessment.

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				Ecology agreed to classify line LIQW-702 as a "deferred use" line according to an April 29, 2005 letter (Letter, *Re: Response to the Request for Amendment of the Double-Shell Tank (DST) Deferred Use Components*).