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DNFSB	Defense Nuclear Facilities Safety Board
DOE-RL	U.S. Department of Energy, Richland Operations Office
DOE-ORP	U.S. Department of Energy, Office of River Protection
DQO	Data Quality Objective
DSC	differential scanning calorimetry
DST	double-shell tank
LMHC	Lockheed Martin Hanford Corporation
SST	single-shell tank
TCP	Tank Characterization Plan
TCR	Tank Characterization Report
TGA	thermogravimetric analysis
TOC	total organic carbon
TWRS	Tank Waste Remediation System

1.0 INTRODUCTION

This document presents the evaluation of the adequacy of the sampling and analysis of Hanford tank wastes for safety screening. A comparison was made of the data collected through sampling and analysis to the data required by the Safety Screening Data Quality Objective (DQO) (Dukelow et al. 1995). The evaluation was for the purpose of determining whether the sampling met the Defense Nuclear Facilities Safety Board (DNFSB) Recommendation 93-5 Implementation Plan milestone 5.6.3.1j. Milestone 5.6.3.1j states, "Core sample all tanks by 2002" (DOE-RL 1996). The milestone is considered completed for a specific tank if sufficient sample material was taken and analyzed to meet the Safety Screening DQO.

A description of the scope is presented in Section 2.0. The definition of Safety Screening DQO needs is presented in Section 3.0. The logic used to determine if the sampling and analysis was sufficient is presented in Section 4.0. In Section 5.0, the tanks that satisfy the Safety Screening DQO are presented. In total, 138 tanks were identified as having been sampled since 1989, and 132 of those tanks met the established criteria. Six tanks did not meet the established criteria. Section 6.0 lists the 45 tanks that either did not meet the criteria or were not sampled since 1989.

2.0 SCOPE

This evaluation of tank sampling and analysis data determined if a tank had been sufficiently sampled to meet the requirements of the latest Safety Screening DQO (Dukelow et al. 1995). For a tank to be declared "sampled" per the DNFSB Recommendation 93-5 Implementation Milestone 5.6.3.1j, the Safety Screening DQO must be met. All tanks will likely be sampled in the future to support additional retrieval and disposal needs. The requirements of the milestone were focused on safe interim storage and resolution of safety concerns.

The tanks that were evaluated had been sampled since 1989. This date was selected because the analyses performed on tank wastes beginning in 1989 had full documentation of the materials removed and detailed quality assurance records available. Analyses prior to 1989 tended to be performed on composite material or process samples, and the record documentation of the work was often not available. The evaluation time-frame concluded October 1998. At the time of this evaluation, no tank sampled after that date had issued analytical reports.

A minimum set of analyses had not been established to assure appropriate safety categorization for the tanks until the first DQO for safety screening was issued in February 1994 (Babad 1994). The DQO has been updated twice since then. Because of the changes in the DQO and the overall characterization program since 1989, it was necessary to establish a consistent set of criteria to evaluate the older analytical reports to determine if sufficient information had been obtained. The analysis list in the early days (pre-1994) of the Characterization Program was extensive because the perceived requirements were based on regulatory permitting. As the characterization program evolved and formal criteria were established, DQOs were established for each safety topic. The Safety Screening DQO, which established basic screening values for safety-related analyses, was prepared in 1994. The purpose of this DQO was to ensure that the minimum data necessary for safe storage of the waste and tank farm operation were collected from each sampled tank. It was later revised in early 1995 and again in late 1995. The Safety Screening DQO specified measurements to determine the energetic behavior of the waste and the relative concentration of organic complexants and solvents, criticality-related material, and flammable gases. A minimum set of information was used to confirm tank waste was categorized correctly relative to the safety issues that existed at the time DNFSB Recommendation 93-5 was issued.

Only the condensed phase (liquid and solid) waste samples were within the scope of the evaluation. Flammable gas and toxic vapor sampling in the dome space of a tank were outside the scope of this evaluation. The evaluation presented in this document compares the data collected with the data necessary to meet the requirements of the latest revision of the Safety Screening DQO, which is Revision 2 (Dukelow et al. 1995). The following sections define how the sampling and analysis results were determined to be adequate considering variations in both method (e.g., core versus grab sample) and sample recovery. The adequacy of the analysis to meet the requirements of the milestone was also reviewed.

3.0 SAFETY SCREENING DQO NEEDS

No fixed or minimum number of samples or analyses are specified in DNFSB Recommendation 93-5 (Conway 1993) or in milestone 5.6.3.1j (DOE-RL 1996). The initial version of the Safety Screening DQO (Babad 1994) required two vertical profiles of the liquid and solid regions from a tank, and a minimal number of analyses performed. This was modified in later revisions to state that "an optimum number of profiles will be determined . . ." (Dukelow et al. 1995).

One task of this evaluation was to determine if there was adequate waste sample recovery to satisfactorily perform the Safety Screening DQO analysis. In addition, when the analyses performed differed from what is specifically identified in the DQO, reviewers determined if other analyses that had been performed provided equivalent information. The following two sections expand on the criteria used for this evaluation.

3.1 DEFINITION OF ACCEPTABLE SAMPLING

The Safety Screening DQO states: "Tank sampling can be done by core drilling, by auger sampling (for shallow tanks) and/or by other appropriate sampling techniques" (Dukelow et al. 1995). An acceptable sampling event for this evaluation was one that provided a similar degree of physical coverage of the waste as a "core sample." The appropriate sampling method for the waste in each tank was determined on a case-by-case basis and was documented in the Tank Characterization Plan (TCP) or tank sampling and analysis plan (TSAP) for the tank in question. If the waste in the tank was shallow in comparison to a 19-inch segment length, an auger sample could be substituted for a core sample. Liquid grab samples could be substituted in tanks that were primarily liquid (e.g., low specific gravity wastes in a double-shell tank [DST]). Grab samples were taken at several depths to provide appropriate tank coverage, or the tank could be mixed such that a smaller sample provided a representation of the overall tank contents.

If sample recovery was poor (e.g., if an empty sampler or less than 150-gram sample recovered), further review was necessary. The review was performed by a group of staff at the time the sampling and analytical work was summarized into the Tank Characterization Report (TCRs). The review group looked at the tank sampling event to ensure that the samples obtained were representative of the tank contents, waste volume, and waste phases present. Included in the group of reviewers were sampling, laboratory, process engineering, and safety analysis staff. The review group considered the following:

- If there were low or no recovery in one segment of one core, was there recovery of the same layer of waste from a second core in the tank?

- Was there good recovery of sample material (e.g., all samplers contained 150 grams of material or more) on either side of the sample gap? Did the material appear physically (color, texture) and chemically similar on either side?

- Within the segment, was there sufficient material (approximately 25 grams) to complete safety screening analysis? A very small portion of the waste in a segment is used for most analyses.

- Was the data obtained by analysis of the waste consistent with what was expected from historical records?

3.2 DEFINITION OF ACCEPTABLE ANALYTICAL EVALUATION FOR SAFETY SCREENING

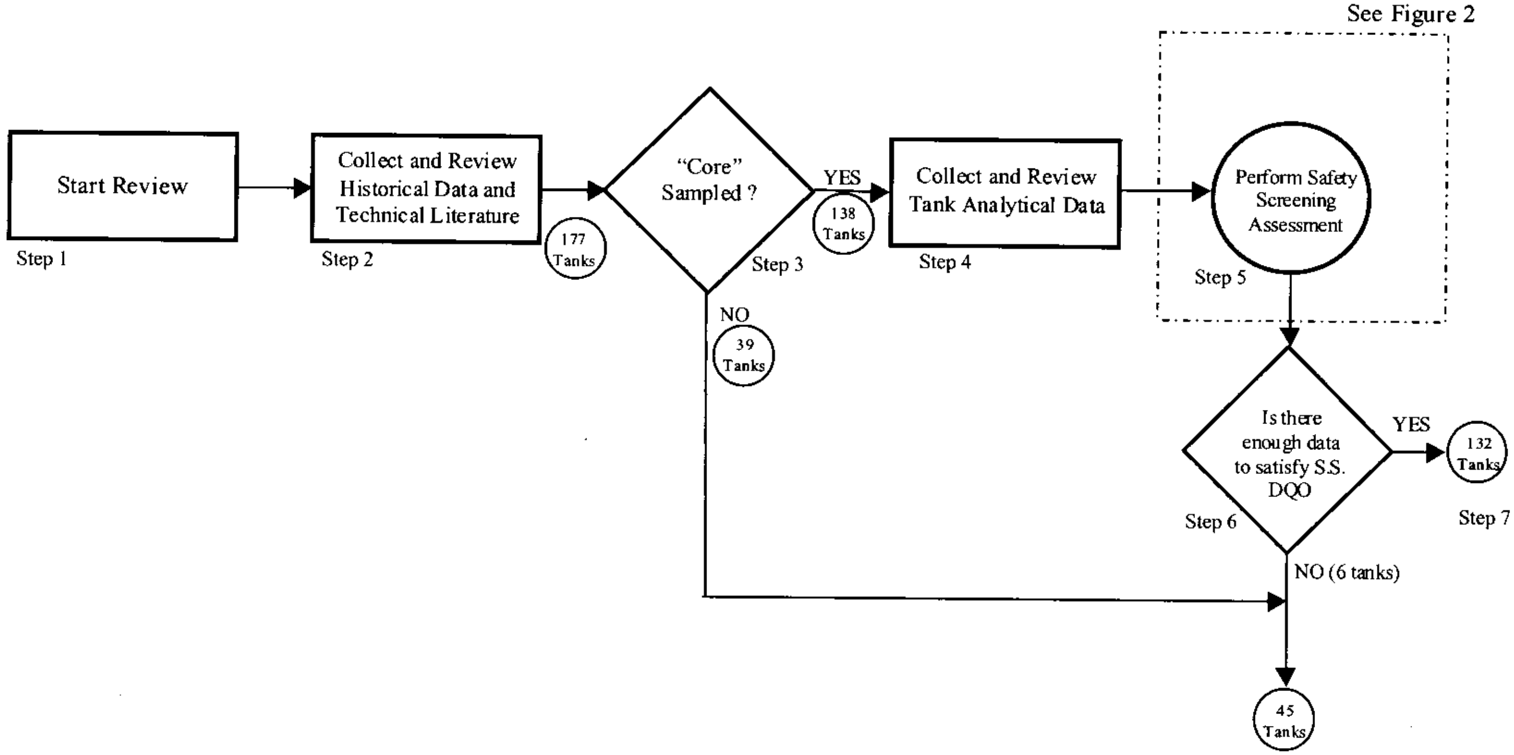
Chemical reactivity (as measured by Differential Scanning Calorimetry [DSC]), total alpha (for criticality concerns), and water (generally the largest diluent present) are the Safety Screening DQO requirements for solids evaluation. The Safety Screening DQO also required vapor samples of the headspace, but vapor samples are not part of the milestone 5.6.3.1j dealing with core sampling and are not addressed in this document.

Because twenty-three of the tanks were sampled and analyzed prior to the issuance of the latest Safety Screening DQO, not all tanks sampled were analyzed using the techniques identified in the Safety Screening DQO. In addition, there were cases where concerns about excessive radiation exposure resulted in modifications to the analytical techniques specified. There are acceptable substitutes for the specific analyses listed in the Safety Screening DQO. Assays for total organic carbon (TOC) provide an estimate of the energy content of a particular waste, satisfying concerns about its energetic potential. (The ferrocyanide safety issue was closed several years ago and a measurement of energetics was no longer necessary for that issue; TOC is more specific for the organic complexant issues than energetics.) Testing for plutonium-239/240 is specific for criticality and can be substituted for total alpha because the conventional assumption is that all alpha activity is from plutonium-239/240. Gravimetric water measurements can be used to quantify water content in the waste instead of the more frequently used thermogravimetric analysis (TGA).

4.0 LOGIC USED TO SATISFY MILESTONE 5.6.3.1j

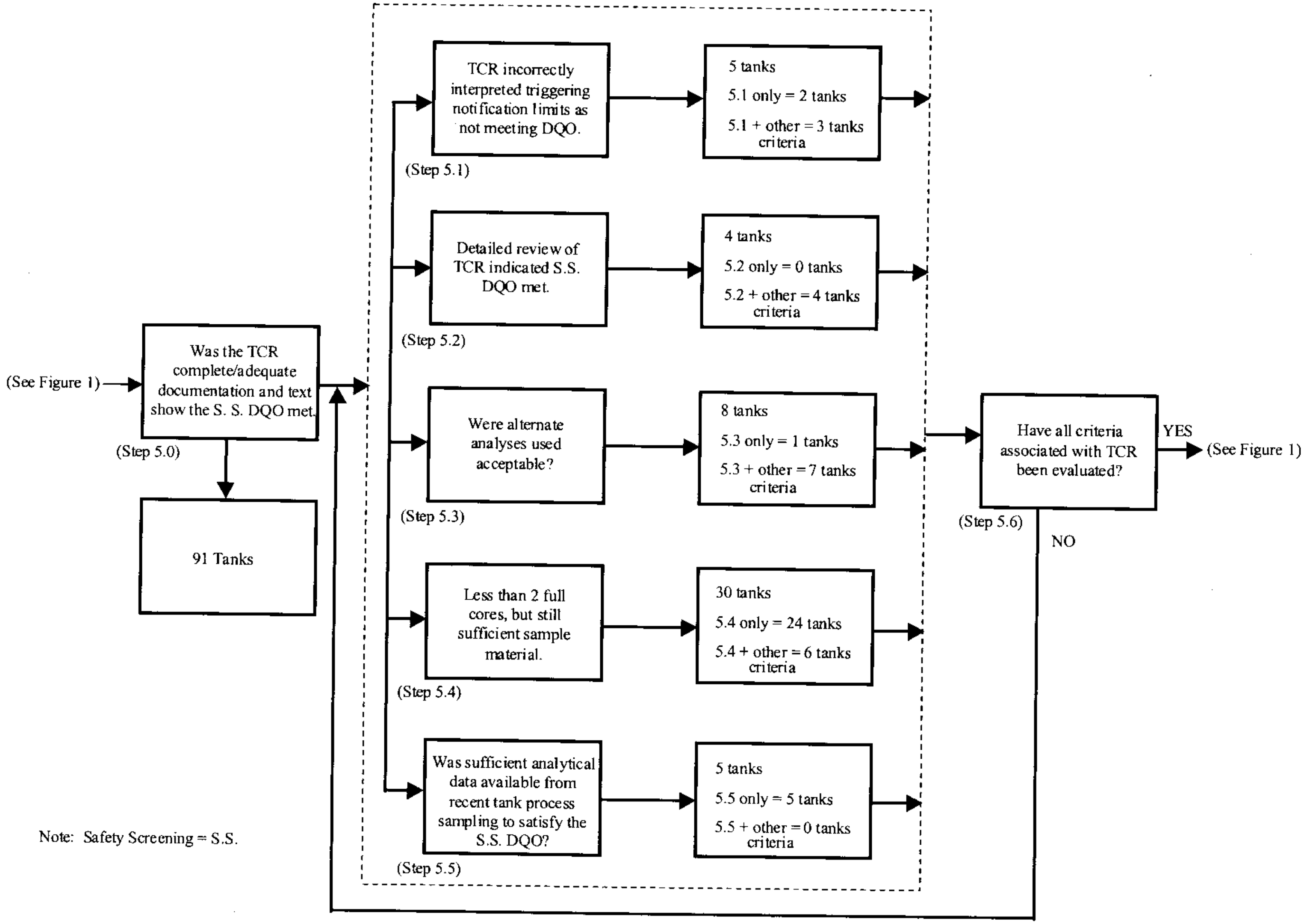
Figure 1 presents the logic for assessing tank data for safety screening. Each of the steps is described in more detail in this section. Step 5 of the logic is broken down into smaller steps that are shown in Figure 2.

Figure 1. Logic for Assessing Tank Data for Safety Screening



Note: Number beside box ties to step description in Section 4.0.

Figure 2. Detailed Safety Screening Assessment Steps



Step 1: This is the start of the review process. All 177 tanks are included in the evaluation. The manager of Process Engineering Technical Basis and Planning developed a working table with each of the 177 tanks listed and the corresponding Tank Coordinator. The working table was provided to each of the tank coordinators to fill in information for his/her assigned tanks. The information to include in the table were:

- The Tank Characterization Report (TCR) number.
- If the TCR addressed safety screening, whether the original author indicated it had or had not been met.
- The Tank Coordinators' present opinion, based on Revision 2 of the Safety Screening DQO, whether the tank met the requirements for Safety Screening. In most cases, the current Tank Coordinator was not the author of the TCR.
- The pertinent pages of the TCR used for documentation of the second and third bullets.

Tank Coordinators are technical staff within the Process Engineering organization who are responsible for understanding the process history and laboratory data for the tanks they are assigned. The Tank Coordinators were briefed on Revision 2 of the Safety Screening DQO and directed to fill in the portions of the working table for their tanks, being conservative in their assessment of the data. Specifically, if there was a question regarding the sample recovery or the analyses performed, they were directed to note that in the comments.

Step 2: The Tank Coordinators reviewed the TCR of the tank in question and any related information deemed necessary to complete the working table. The TCR is a detailed document that contains information about the tank and its contents, the process history, the sampling events, and the analytical results from the sampling. Additional process information, including documentation about the chemical separation processes that generated Hanford waste, waste transfers, and layering of wastes in a tank, (Brevick et al. 1997a, b, c, and d and Agnew et al. 1997a and b) was also available.

Step 3: Concurrent with the review by the Tank Coordinators, the Manager, Technical Basis and Planning obtained the list of tanks that had solid or liquid samples taken since 1989 and for which a TCR was prepared. This list was obtained from the Characterization Program Office of Lockheed Martin Hanford Corporation (LMHC), which maintains detailed sampling records. At this step, 39 tanks were identified that have no recent (post-1989) sampling events, and, therefore, do not have any Safety Screening DQO information. These were identified on the working table and no further review for these 39 tanks was made as part of this evaluation. These tanks are listed in Section 6.0. This left 138 tanks to be evaluated.

Step 4: The Tank Coordinators initially evaluated the safety screening data for each tank that had been sampled and for which TCRs had been prepared. Most (91) of the remaining tanks met the sampling and analysis requirements of the Safety Screening DQO, and the TCR contained statements to that effect. Some early TCR authors had interpreted the Safety Screening DQO in a manner inconsistent with the current understanding. The Tank Coordinators identified 47 tanks as either not meeting the requirements, partially meeting the requirements, or not specific about meeting the requirements. Some of the changes leading to the observed inconsistencies in interpretation were:

- Early characterization documentation (1989 through 1994) had no DQO to provide guidance regarding the data requirements. It is often difficult to compare previously gathered characterization data against the current DQO requirements.

- The Safety Screening DQO was prepared in 1994 and underwent two revisions between 1994 and 1995. The changes to the DQO often affected the original author's interpretation with regard to whether a tank was satisfactorily safety screened. Furthermore, verbal guidance provided by the safety and characterization program management varied during the early evaluations.

- The amount of data, both historical and analytical, available about the tanks at the time of sampling directly affected the interpretive abilities of the staff, particularly related to the amount and number of samples needed. The initial Safety Screening DQO explicitly stated that two full depth cores were needed, even though there was insufficient data to support this criterion being applied to all tanks. Many of the authors of the TCRs conservatively used 2 cores as the minimum required number when they made their initial assessment.

- Some TCR authors misinterpreted analytical values that exceeded the Safety Screening threshold values as an indication that the DQO was not met. This interpretation was not correct because screening criteria were explicitly established to identify tanks with elevated values. The Safety Screening DQO had additional steps (analyses) to perform if certain values were exceeded to determine safety categorization or to develop a course of action if necessary. For example, if total alpha exceeded a certain threshold, then additional calculations of poisons and Pu/U were made. High values did not negate the fact that the DQO sampling and analysis criteria were met.

- The format and content of the TCRs has changed between 1993 and 1999, and between 1989 to 1993, data was presented in thick (greater than 1,000 pages) data packages. Differences in the various versions of the Safety Screening DQO and the TCR format and content affected the clarity of statements made as to whether the samples and analytical data were adequate to meet the Safety Screening DQO requirements. In some cases, the TCR did not fully discuss the results of sampling and analysis in the context of safety screening, even though the sampling and analyses were satisfactory and the requirements of the DQO was met. This required the Tank Coordinator to evaluate other data sources, such as the laboratory and field sampling reports.

Step 5: To provide a consistent interpretation for the tanks that did not pass the initial screening by the Tank Coordinators, a panel of four senior staff was convened. The panel was selected by the Process Engineering manager to represent a broad safety and process engineering background. All but one had been involved in varying aspects of the tank safety issue evaluation and closure process. One has extensive experience in the nuclear safety and licensing arena and had extensive knowledge of the accident evaluations in the TWRS Basis for Interim Operations

(Noorani 1999). One had extensive experience evaluating tank historical data and two had extensive process engineering experience. Cumulatively, they represented over 85 years experience evaluating tank wastes. The authors of this document comprised the panel. Appendix A contains a brief description of each panel member's qualifications.

The panel developed evaluation logic and tested the logic on a variety of tanks. They met with LMHC management several times during this period to confirm that they had established appropriate evaluation steps and interpretations. The evaluation logic is shown in Figure 2 and is broken into the specific sub-steps in the evaluation. Tanks that had not passed in Step 4 were screened according to the process, moving in order from the initial criterion, to the next, and so on. Each criterion is independent of the others. If a tank satisfies the sampling and data requirements of the Safety Screening DQO at any point in the process, it was categorized as "meets the requirements of safety screening." Thus, that tank was considered satisfactory for meeting the requirements of milestone 5.6.3.1j. Tanks that did not meet any of the criteria for "passing" the safety screening are categorized as "does not meet the requirements of safety screening."

If the TCR clearly stated that the safety screening had been met and the Tank Coordinator agreed with that statement, the panel initially deferred evaluation. Each TCR had previously undergone thorough, extensive review and approval by multiple organizations, including the Tank Safety organization and the U.S. Department of Energy, Richland Operations Office (DOE-RL) prior to issuance. Because of the turnover in staff and reassignment to other tasks, the current Tank Coordinator is rarely the same individual as the TCR author, so the Tank Coordinator provided an independent review of the TCR results. At the end of the evaluation, the panel performed a review of the 91 tanks that passed the initial screening to confirm the Tank Coordinators' assessments.

The panel evaluated the 138 tanks identified in the working table as having been sampled since 1989. The panel first focused on evaluating the 47 tanks that Tank Coordinators stated did not meet the Safety Screening DQO requirements. Criteria were derived to assist in the evaluation of tanks that did not clearly meet the Safety Screening DQO requirements. Review of the initial screening by the Tank Coordinators identified several common areas where additional evaluation of the results was necessary. These common areas are discussed below. Tanks could fall in more than one area. In addition, there are five tanks that did not fall into these common areas but were still judged to be acceptable. These tanks are identified in Section 5.0.

Step 5-1: The Safety Screening DQO set notification limits for various analyses. These limits were used to alert the safety programs of situations that may need further study. Any analysis results that exceeded the preset notification limits triggered notification of the tank coordinator, the shift manager, the on-call engineer, the manager of the appropriate safety program, and other interested individuals. A review of the result was initiated to determine whether they indicated additional analysis was needed. Analytical values that exceeded the notification limits triggered additional analysis of the samples.

In five cases, tanks with analytical results that exceeded a Safety Screening DQO notification limits were interpreted as "failed the safety screening." The senior panel determined that tanks that "failed the safety screening" only because the notification limit was exceeded, did indeed "meet the requirements of the safety screening." One of the purposes of safety screening was to identify unknown situations and discover potential problems that may require further action. An analytical result that exceeded the notification limit served that purpose of safety screening and should not be interpreted as causing the safety screening to "fail."

Step 5-2: Several different formats for the TCRs have been used through the years, with varying content. In the recent TCRs there is a statement regarding whether each of the applicable DQOs, including the Safety Screening DQO, were met and whether the TWRS Program that owned the DQO had accepted the data as meeting their requirements. If the TCR stated that the Safety Screening DQO was satisfied, and that the TWRS Tank Safety Program had accepted the data, no further evaluation was performed and that statement was accepted, because the customer had found the data adequate.

In TCRs where the author did not state that the Safety Screening DQO was satisfied or that stated that it was not satisfied, further review by the panel was performed. Because the format and content of TCRs between 1993 to 1999, determining whether the safety screening data requirements were actually met was occasionally not apparent until the TCR was thoroughly reviewed. This more detailed review usually concluded that the tank sampling/analytical event had met the DQO requirements. Four tanks fell into this category.

Step 5-3: Three analyses were specified for the Safety Screening DQO. These are DSC for energetics, TGA for water, and total alpha for criticality concerns. Notification limits were established for each of these analyses. Sample results that exceeded the established limit for energetics or total alpha triggered additional, more specific analyses. For DSC values greater than the limit, TOC analysis was required. A plutonium analysis was required if total alpha was high. The DSC and total alpha analyses were used for initial screening instead of TOC and plutonium analyses because they were less expensive to perform than the specific assay.

Because of changing data requirements, there are cases where a tank may not have had DSC results, but did have TOC analysis. Other tanks may have had plutonium analysis, without a total alpha analysis. The panel determined that if all other aspects of the sampling and analysis were considered satisfactory, the requirements of the Safety Screening DQO were met if TOC was measured instead of DSC. Likewise, the plutonium measurement is an acceptable substitute for total alpha. Eight tanks were in this category.

Step 5-4: The Safety Screening DQO indicates that the "optimal" number of cores should be defined in the sampling plan. Two widely spaced vertical cores would be considered as near optimal sampling according to the DQO. This optimal case was often accepted as the default case for meeting the DQO requirements in the sampling plan. The initial determination of not meeting the DQO often centered on incomplete recovery of cores or insufficient riser access to allow core samples to be widely spaced.

The panel evaluation focused on what constituted **adequate** coverage of tank waste sampling, rather than **optimal**. This area resulted in detailed discussions on each tank that this occurred. The panel evaluated the detailed field operations sampling record and the extrusion results presented in the TCR. If there were two cores and one had poor recovery in a segment, the panel determined if that layer of the tank waste was adequately sampled in the other core within the tank. The panel also looked to see if there was good recovery of the material from the segments on either side of the one with poor recovery. If the segments on either side had good recovery and had the same material (e.g., same physical appearance and similar analytical constituents), then the samples provide enough material coverage. The amount of recovery was evaluated. A full 19-inch segment has between 230 to 350 grams of material depending on the density of the waste. Recovery of at least 150 grams in each segment was considered adequate information on the layer. When the analyses are performed, small amounts from several locations of the segment are used, instead of using the whole segment. The minimum amount of sample necessary to complete safety screening is approximately 25 grams per segment with no sample archive. If a sample is a single waste layer (different waste layers are usually visible by some color or texture changes), then using sample material from only a 150-gram sample does not add significantly to the error band.

Regarding the wide horizontal spacing of cores in a tank, the experience gained from evaluating over 130 tanks that have been analyzed has shown that vertical variability is more significant because wastes tend to be deposited in tanks in layers. Thus, a single core with sample material from each segment was considered satisfactory for meeting the sample requirements in the Safety Screening DQO in this evaluation as long as there was not evidence from the photographs or process records of a complex layering or fill/drain events. Thirty tanks were in this category.

Step 5-5: There were five tanks that did not fit one of the above criteria, but were judged to meet the requirements of the safety screening. These tanks were discussed individually by the panel, and a consensus was reached with concurrence from management. These tanks are discussed in the comment section of the table to provide the rationale for the determination. Several of these tanks were active DSTs that are used to support the evaporation mission. Extensive sampling data exists from the grab samples prior to each transfer as evaporation missions are staged.

Step 5-6. There were several tanks that had more than one criterion associated with its evaluation. Table 5-1 records all of the criteria that apply to each tank evaluation.

Step 6: Using the criteria outlined in Steps 5-1 to 5-5, a panel member reviewed a tank and reached a conclusion regarding whether the Safety Screening DQO was met. Each of the other panel members also reviewed the collected data and had the opportunity to arrive at an independent conclusion. The evaluation resulted in a "Yes" or "No" answer to the question, "Has sufficient waste been sampled and analyzed to meet the Safety Screening DQO and ensure that the tank is within the authorization basis assumption for waste types?" The panel then discussed each tank, and a consensus was reached. The consensus was recorded in Table 5-1 in Section 5.0.

5.0 RESULTS OF THE SCREENING ACTIVITIES

The results of the screening activities are shown in Table 5.1.

Table 5-1. Results of the Safety Screening Review (9 sheets)

Tank 241-	Tank Type	TCR No. or Reference Data	Step No.	Comments
A-101	SST	HNF-SD-WM-ER-673 2-7, 4-1, 4-2	4	The sampling and analysis performed in this tank were consistent with the requirements of the Safety Screening DQO.
A-102	SST	WHC-SD-WM-ER-597 ES-6, 6-1	4	The sampling and analysis performed in this tank were consistent with the requirements of the Safety Screening DQO. This tank was sampled using auger samples.
AN-101	DST	WHC-SD-WM-ER-578 5-6 – 5-10, 6-1	5.4	Sampling using liquid grab samples was less than optimal. The sampling and analysis for this tank were reviewed and found to be adequate to satisfy the requirements of the Safety Screening DQO.
AN-102	DST	WHC-SD-WM-ER-545 5-11	4	The sampling and analysis performed in this tank were consistent with the requirements of the Safety Screening DQO.
AN-103	DST	HNF-SD-WM-ER-702 4-1, 4-2	4	The sampling and analysis performed in this tank were consistent with the requirements of the Safety Screening DQO.
AN-104	DST	HNF-SD-WM-ER-690 2-1, 4-2	4	The sampling and analysis performed in this tank were consistent with the requirements of the Safety Screening DQO.
AN-105	DST	HNF-SD-WM-ER-678 4-1, 4-2	4	The sampling and analysis performed in this tank were consistent with the requirements of the Safety Screening DQO.
AN-106	DST	WHC-SD-WM-ER-569 ES-4, 5-6	5.4	Sampling using liquid grabs was less than optimal. The sampling and analysis for this tank were reviewed and found to be adequate to satisfy the requirements of the Safety Screening DQO.
AN-107	DST	WHC-SD-WM-ER-600 6-1	5.1	Some analytical results exceeded preset notification limits. The sampling which used liquid grab samples and analysis for this tank were reviewed and found to be adequate to satisfy the requirements of the Safety Screening DQO. Propagation tests performed.
AP-101	DST	HNF-SD-WM-ER-357 2-1	4	The sampling which used liquid grab samples and analysis performed in this tank were consistent with the requirements of the Safety Screening DQO.
AP-102	DST	HNF-SD-WM-ER-358 2-4, 4-1	5.1 5.2 5.3	Some analytical results exceeded preset notification limits. The TCR format has changed since the TCR was written. Acceptable substitute analyses were performed in lieu of the analysis requirements in the Safety Screening DQO. The sampling which used liquid grab samples and analysis for this tank were reviewed and found to be adequate to satisfy the requirements of the Safety Screening DQO.
AP-103	DST	HNF-SD-WM-ER-359 4-1, 4-2	5.2 5.3	The TCR format has changed since the TCR was written. Acceptable substitute analyses were performed in lieu of the analysis requirements in the Safety Screening DQO. The sampling which used liquid grab samples and analysis for this tank were reviewed and found to be adequate to satisfy the requirements of the Safety Screening DQO.
AP-104	DST	WHC-SD-WM-ER-596 5-8, 5-9	5.4	Sampling which used liquid grab samples was less than optimal. The sampling and analysis for this tank were reviewed and found to be adequate to satisfy the requirements of the Safety Screening DQO.
AP-105	DST	HNF-SD-WM-ER-360 2-1, 4-1	4	The sampling which used liquid grab samples and analysis performed in this tank were consistent with the requirements of the Safety Screening DQO. Acceptable substitute analyses were performed in lieu of the analysis requirements in the Safety Screening DQO.

Table 5-1. Results of the Safety Screening Review (9 sheets)

Tank 241-	Tank Type	TCR No. or Reference Data	Step No.	Comments
AP-106	DST	HNF-SD-WM-ER-361 4-1, 4-2	4	The sampling which used liquid grab samples and analysis performed in this tank were consistent with the requirements of the Safety Screening DQO.
AP-107	DST	HNF-SD-WM-ER-362 2-1 – 2-3	5.1 5.2	Some analytical results exceeded preset notification limits. The TCR format has changed since the TCR was written. The sampling and analysis for this tank were reviewed and found to be adequate to satisfy the requirements of the Safety Screening DQO. Water content was determined by difference.
AP-108	DST	WHC-SD-WM-ER-593 5-8	4	The sampling and analysis performed in this tank were consistent with the requirements of the Safety Screening DQO.
AW-101	DST	HNF-SD-WM-ER-470 4-1	4	The sampling and analysis performed in this tank were consistent with the requirements of the Safety Screening DQO.
AW-102	DST	HNF-SD-WM-ER-363 2-1, 2-6, 4-1	5.5	Evaporator feed tank. The tank was sampled for compatibility using liquid grab samples. The TWRS safety program accepted the sampling and analysis because the compatibility DQO meets or exceeds the safety screening DQO requirements. The sampling and analysis for this tank were reviewed and found to be adequate to satisfy the requirements of the Safety Screening DQO.
AW-103	DST	WHC-SD-WM-ER-455 2-1, 6-1	4	The sampling and analysis performed in this tank were consistent with the requirements of the Safety Screening DQO.
AW-104	DST	WHC-SD-WM-ER-453 2-1	4	The sampling and analysis performed in this tank were consistent with the requirements of the Safety Screening DQO.
AW-105	DST	HNF-SD-WM-ER-364 2-3, 2-4, 4-1, 4-2	4	The sampling and analysis performed in this tank were consistent with the requirements of the Safety Screening DQO.
AW-106	DST	HNF-SD-WM-ER-365 2-1, 4-1	5.5	Evaporator slurry tank. Before transfers out, the supernate is sampled using liquid grab samples for compatibility. The sampling and analysis for this tank were reviewed and found to be adequate to satisfy the requirements of the Safety Screening DQO because the compatibility DQO meets or exceeds the safety screening DQO requirements.
AX-101	SST	HNF-SD-WM-ER-649 4-1 – 4-3	4	The sampling and analysis performed in this tank were consistent with the requirements of the Safety Screening DQO.
AX-102	SST	HNF-SD-WM-ER-472 4-1, 4-2	4	The sampling which used auger samples and analysis performed in this tank were consistent with the requirements of the Safety Screening DQO.
AX-103	SST	HNF-SD-WM-ER-685 2-1	4	The sampling and analysis performed in this tank were consistent with the requirements of the Safety Screening DQO.
AX-104	SST	HNF-SD-WM-ER-675 4-1	5.3	Acceptable substitute analyses were performed in lieu of the analysis requirement in the Safety Screening DQO. The sampling using auger samples and analysis for this tank were reviewed and found to be adequate to satisfy the requirements of the Safety Screening DQO.
AY-101	DST	WHC-SD-WM-ER-605 6-3	5.5	Dilute receiver; evaporator feed tank. The sampling using liquid grab samples and analysis for this tank were reviewed and found to be adequate to satisfy the requirements of the Safety Screening DQO.

Table 5-1. Results of the Safety Screening Review (9 sheets)

Tank 241-	Tank Type	TCR No. or Reference Data	Step No.	Comments
AY-102	DST	WHC-SD-WM-ER-454 5-7, 6-1	5.3 5.4	An acceptable substitute analysis was performed in lieu of the analysis requirement in the Safety Screening DQO. Sampling and/or sample recovery were less than optimal. The sampling using liquid grab samples and analysis for this tank were reviewed and found to be adequate to satisfy the requirements of the Safety Screening DQO.
AZ-101	DST	WHC-SD-WM-ER-410 4-1	5.3 5.4	An acceptable substitute analysis was performed in lieu of the analysis requirement in the Safety Screening DQO. Sampling and/or sample recovery were less than optimal. The sampling and analysis for this tank were reviewed and found to be adequate to satisfy the requirements of the Safety Screening DQO.
AZ-102	DST	WHC-SD-WM-ER-411 5-14	5.5	Aging waste tank. The sampling and analysis for this tank were reviewed and found to be adequate to satisfy the requirements of the Safety Screening DQO.
B-101	SST	WHC-SD-WM-ER-528 5-6	4	The sampling and analysis performed in this tank were consistent with the requirements of the Safety Screening DQO.
B-102	SST	WHC-SD-WM-ER-405 5-4	5.4	Sampling and/or sample recovery were less than optimal. The sampling using auger samples and analysis for this tank were reviewed and found to be adequate to satisfy the requirements of the Safety Screening DQO.
B-103	SST	WHC-SD-WM-ER-488 5-5, 6-1	4	The sampling using auger samples and analysis performed in this tank were consistent with the requirements of the Safety Screening DQO.
B-104	SST	WHC-SD-WM-ER-552 6-1	4	The sampling and analysis performed in this tank were consistent with the requirements of the Safety Screening DQO.
B-106	SST	WHC-SD-WM-ER-601 5-11 – 5-13	4	The sampling and analysis performed in this tank were consistent with the requirements of the Safety Screening DQO.
B-107	SST	HNF-SD-WM-ER-723 4-1	4	The sampling and analysis performed in this tank were consistent with the requirements of the Safety Screening DQO.
B-108	SST	HNF-SD-WM-ER-674 2-1, 4-1	5.4	Unsampled hard pan in bottom two segments. May have hit obstruction. Sample recovery in one layer was less than optimal. Did get some of the bottom layer and it matched historical records for first cycle waste. The sampling and analysis for this tank were reviewed and found to be adequate to satisfy the requirements of the Safety Screening DQO.
B-109	SST	HNF-SD-WM-ER-677 2-1, 4-1	4	The sampling and analysis performed in this tank were consistent with the requirements of the Safety Screening DQO.
B-110	SST	HNF-SD-WM-ER-368 6-4	4	The sampling and analysis performed in this tank were consistent with the requirements of the Safety Screening DQO.
B-111	SST	HNF-SD-WM-ER-549 2-1, 4-1	4	The sampling and analysis performed in this tank were consistent with the requirements of the Safety Screening DQO.
B-112	SST	HNF-SD-WM-ER-549 4-1	4	The sampling using auger samples and analysis performed in this tank were consistent with the requirements of the Safety Screening DQO.

Table 5-1. Results of the Safety Screening Review (9 sheets)

Tank 241-	Tank Type	TCR No. or Reference Data	Step No.	Comments
B-201	SST	HNF-SD-WM-ER-550 2-1	4	The sampling and analysis performed in this tank were consistent with the requirements of the Safety Screening DQO.
B-202	SST	WHC-SD-WM-ER-371 5-4, 6-1	4	The sampling and analysis performed in this tank were consistent with the requirements of the Safety Screening DQO.
B-203	SST	WHC-SD-WM-ER-587 ES-10, 6-2	4	The sampling and analysis performed in this tank were consistent with the requirements of the Safety Screening DQO.
B-204	SST	WHC-SD-WM-ER-581 ES-10, 5-13, 6-1	4	The sampling and analysis performed in this tank were consistent with the requirements of the Safety Screening DQO.
BX-101	SST	WHC-SD-WM-ER-408 5-4, 6-1	5.4	Sampling and/or sample recovery were less than optimal. The sampling using auger samples and analysis for this tank were reviewed and found to be adequate to satisfy the requirements of the Safety Screening DQO.
BX-103	SST	WHC-SD-WM-ER-535 5-7	5.4	Sampling and/or sample recovery were less than optimal. The sampling and analysis for this tank were reviewed and found to be adequate to satisfy the requirements of the Safety Screening DQO.
BX-104	SST	WHC-SD-WM-ER-599 5.5.1 and 6.0	4	The sampling and analysis performed in this tank were consistent with the requirements of the Safety Screening DQO.
BX-105	SST	WHC-SD-WM-ER-406 5.5.1 and 6.0	4	The sampling using auger samples and analysis performed in this tank were consistent with the requirements of the Safety Screening DQO.
BX-106	SST	WHC-SD-WM-ER-570 5-7, 6-1	4	The sampling using auger samples and analysis performed in this tank were consistent with the requirements of the Safety Screening DQO.
BX-107	SST	HNF-SD-WM-ER-539 4-1	5.2 5.4	The TCR format has changed since the TCR was written. Sampling and/or sample recovery were less than optimal. The sampling and analysis for this tank were reviewed and found to be adequate to satisfy the requirements of the Safety Screening DQO.
BX-108	SST	WHC-SD-WM-ER-407 5.5.1, 6.0	4	The sampling using auger samples and analysis performed in this tank were consistent with the requirements of the Safety Screening DQO.
BX-109	SST	WHC-SD-WM-ER-572 5-13	4	The sampling and analysis performed in this tank were consistent with the requirements of the Safety Screening DQO.
BX-110	SST	WHC-SD-WM-ER-566 2-1, 4-1	4	The sampling and analysis performed in this tank were consistent with the requirements of the Safety Screening DQO.
BX-111	SST	HNF-SD-WM-ER-653 4-1, 4-2	4	The sampling and analysis performed in this tank were consistent with the requirements of the Safety Screening DQO.
BX-112	SST	WHC-SD-WM-ER-602 5-10	4	The sampling and analysis performed in this tank were consistent with the requirements of the Safety Screening DQO.
BY-101	SST	HNF-SD-WM-ER-647 HNF-SD-WM-DP-258	4	The sampling and analysis performed in this tank were consistent with the requirements of the Safety Screening DQO.

Table 5-1. Results of the Safety Screening Review (9 sheets)

Tank 241-	Tank Type	TCR No. or Reference Data	Step No.	Comments
BY-102	SST	HNF-SD-WM-ER-630 2-7, 4-1	5.4	Sampling and/or sample recovery were less than optimal. The sampling and analysis for this tank were reviewed and found to be adequate to satisfy the requirements of the Safety Screening DQO.
BY-103	SST	HNF-SD-WM-ER-663 WHC-SD-WM-DP-104 84E480-95-021 WMH-9758360 WMH-9854538	5.4	Sampling and/or sample recovery were less than optimal. Grab and auger samples used. The sampling and analysis for this tank were reviewed and found to be adequate to satisfy the requirements of the Safety Screening DQO.
BY-104	SST	WHC-SD-WM-ER-608 4-9, 5-1, 6-1, 6-2	4	The sampling and analysis performed in this tank were consistent with the requirements of the Safety Screening DQO.
BY-107	SST	HNF-SD-WM-ER-637 2-2 – 2.5	4	The sampling and analysis performed in this tank were consistent with the requirements of the Safety Screening DQO.
BY-108	SST	WHC-SD-WM-ER-533 6-1 – 6-2	4	The sampling and analysis performed in this tank were consistent with the requirements of the Safety Screening DQO.
BY-109	SST	HNF-SD-WM-ER-648 4-1	4	The sampling and analysis performed in this tank were consistent with the requirements of the Safety Screening DQO.
BY-110	SST	WHC-SD-WM-ER-591 6-2	4	The sampling and analysis performed in this tank were consistent with the requirements of the Safety Screening DQO.
BY-111	SST	HNF-SD-WM-ER-687 2-1, 4-1	5.4	Sampling and/or sample recovery were less than optimal. The sampling and analysis for this tank were reviewed and found to be adequate to satisfy the requirements of the Safety Screening DQO.
BY-112	SST	WHC-SD-WM-ER-441 2-1, 4-1	4	The sampling and analysis performed in this tank were consistent with the requirements of the Safety Screening DQO.
C-101	SST	WHC-SD-WM-ER-473 5-6, 6-1	5.4	Sampling and/or sample recovery were less than optimal. The sampling using auger samples and analysis for this tank were reviewed and found to be adequate to satisfy the requirements of the Safety Screening DQO.
C-103	SST	WHC-SD-WM-ER-558 5-11, 6-1	4	The sampling and analysis performed in this tank were consistent with the requirements of the Safety Screening DQO.
C-104	SST	HNF-SD-WM-ER-679 2-2, 2-7, 4-1, 4-2	4	The sampling and analysis performed in this tank were consistent with the requirements of the Safety Screening DQO.
C-105	SST	WHC-SD-WM-ER-489 5-9, 6-1	4	The sampling and analysis performed in this tank were consistent with the requirements of the Safety Screening DQO.
C-106	SST	WHC-SD-WM-ER-615 ES-10, 5-25, 6-1	5.5	Tank C-106 is currently being sluiced. Extensive safety documentation was prepared prior to sluicing. The chemical aspects are summarized in Reynolds (1997). The sluicing operation calls for sampling of the waste in the receiving tank (AY-102). No samples are required.

Table 5-1. Results of the Safety Screening Review (9 sheets)

Tank 241-	Tank Type	TCR No. or Reference Data	Step No.	Comments
C-107	SST	WHC-SD-WM-ER-474 5-11	4	The sampling and analysis performed in this tank were consistent with the requirements of the Safety Screening DQO.
C-108	SST	WHC-SD-WM-ER-503 5-11	5.1	The sampling and analysis for this tank were reviewed and found to be adequate to satisfy the requirements of the Safety Screening DQO. Used auger samples.
C-109	SST	HNF-SD-WM-ER-402 4-1	4	The sampling and analysis performed in this tank were consistent with the requirements of the Safety Screening DQO.
C-110	SST	HNF-SD-WM-ER-367 2-1, 2-2, 4-1	4	The sampling and analysis performed in this tank were consistent with the requirements of the Safety Screening DQO.
C-111	SST	WHC-SD-WM-ER-475 6-2	4	The sampling and analysis performed in this tank were consistent with the requirements of the Safety Screening DQO.
C-112	SST	HNF-SD-WM-ER-541 4-2	4	The sampling and analysis performed in this tank were consistent with the requirements of the Safety Screening DQO.
C-201	SST	HNF-2866 2-1 – 2-4	4	The sampling and analysis performed in this tank were consistent with the requirements of the Safety Screening DQO.
C-202	SST	HNF-2866 2-1 – 2-4	4	The sampling and analysis performed in this tank were consistent with the requirements of the Safety Screening DQO. Used solid grab samples. Performed propagation tests.
C-203	SST	WHC-SD-WM-ER-478 4-6, 5-4, 6-1	4	The sampling and analysis performed in this tank were consistent with the requirements of the Safety Screening DQO Used solid grab samples. Performed propagation tests..
C-204	SST	WHC-SD-WM-ER-479 5-4, 5-5	5.3 5.4	An acceptable substitute analysis was performed in lieu of the analysis requirement in the Safety Screening DQO. Sampling and/or sample recovery were less than optimal. Used solid grab samples. The sampling and analysis for this tank were reviewed and found to be adequate to satisfy the requirements of the Safety Screening DQO. Performed propagation tests.
S-101	SST	WHC-SD-WM-ER-613 6-1	4	The sampling and analysis performed in this tank were consistent with the requirements of the Safety Screening DQO.
S-102	SST	WHC-SD-WM-ER-611 5-11	4	The sampling and analysis performed in this tank were consistent with the requirements of the Safety Screening DQO.
S-104	SST	HNF-SD-WM-ER-370 2-1	4	The sampling and analysis performed in this tank were consistent with the requirements of the Safety Screening DQO.
S-106	SST	HNF-SD-WM-ER-645 4-1 – 4-3	5.4	Sampling and/or sample recovery were less than optimal. The sampling and analysis for this tank were reviewed and found to be adequate to satisfy the requirements of the Safety Screening DQO.
S-107	SST	WHC-SD-WM-ER-589 6-3	4	The sampling and analysis performed in this tank were consistent with the requirements of the Safety Screening DQO.
S-109	SST	HNF-SD-WM-ER-627 4-1, 4-2	5.4	Sampling and/or sample recovery were less than optimal. The sampling and analysis for this tank were reviewed and found to be adequate to satisfy the requirements of the Safety Screening DQO.

Table 5-1. Results of the Safety Screening Review (9 sheets)

Tank 241-	Tank Type	TCR No. or Reference Data	Step No.	Comments
S-110	SST	HNF-SD-WM-ER-642	5.4	Sampling and/or sample recovery were less than optimal. The sampling and analysis for this tank were reviewed and found to be adequate to satisfy the requirements of the Safety Screening DQO.
S-111	SST	WHC-SD-WM-ER-507 2-1	5.4	Sampling and/or sample recovery were less than optimal. The sampling and analysis for this tank were reviewed and found to be adequate to satisfy the requirements of the Safety Screening DQO.
SX-101	SST	HNF-SD-WM-ER-660 2-5, 4-2	5.4	Sampling and/or sample recovery were less than optimal. The sampling and analysis for this tank were reviewed and found to be adequate to satisfy the requirements of the Safety Screening DQO.
SX-102	SST	HNF-SD-WM-ER-661	5.4	Sampling and/or sample recovery were less than optimal. The sampling and analysis for this tank were reviewed and found to be adequate to satisfy the requirements of the Safety Screening DQO.
SX-103	SST	HNF-SD-WM-ER-662 4-6, 4-7	4	The sampling and analysis performed in this tank were consistent with the requirements of the Safety Screening DQO.
SX-105	SST	HNF-SD-WM-ER-644	4	The sampling and analysis performed in this tank were consistent with the requirements of the Safety Screening DQO.
SX-106	SST	HNF-SD-WM-ER-645 4-2	4	The sampling and analysis performed in this tank were consistent with the requirements of the Safety Screening DQO.
SX-108	SST	WHC-SD-WM-ER-582 5-6	5.4	Sampling and/or sample recovery were less than optimal. The sampling and analysis for this tank were reviewed and found to be adequate to satisfy the requirements of the Safety Screening DQO. Used auger samples.
SX-113	SST	WHC-SD-WM-ER-480 5-4 &6-1	4	The sampling and analysis performed in this tank were consistent with the requirements of the Safety Screening DQO. Used auger samples.
SX-115	SST	HNF-SD-WM-ER-684 4.0 & 4-2	4	The sampling and analysis performed in this tank were consistent with the requirements of the Safety Screening DQO. Used auger samples.
SY-101	DST	WHC-SD-WM-ER-409 5.5.1,5-15	4	The sampling and analysis performed in this tank were consistent with the requirements of the Safety Screening DQO.
SY-102	DST	HNF-SD-WM-ER-366 2-6,7 & 4—1,2	4	The sampling and analysis performed in this tank were consistent with the requirements of the Safety Screening DQO.
SY-103	DST	WHC-SD-WM-ER-471 5-11, 6-1	5.4	Sampling and/or sample recovery were less than optimal. The sampling and analysis for this tank were reviewed and found to be adequate to satisfy the requirements of the Safety Screening DQO.
T-102	SST	HNF-SD-WM-ER-700 2.5,2-4,4-1	5.4	Sampling and/or sample recovery were less than optimal. The sampling and analysis for this tank were reviewed and found to be adequate to satisfy the requirements of the Safety Screening DQO.
T-104	SST	HNF-SD-WM-ER-372 2-3, 4-1,2	4	The sampling and analysis performed in this tank were consistent with the requirements of the Safety Screening DQO.
T-105	SST	HNF-SD-WM-ER-369 4-1,2	4	The sampling and analysis performed in this tank were consistent with the requirements of the Safety Screening DQO.
T-106	SST	WHC-SD-WM-ER-544 5-4	4	The sampling and analysis performed in this tank were consistent with the requirements of the Safety Screening DQO.

Table 5-1. Results of the Safety Screening Review (9 sheets)

Tank 241-	Tank Type	TCR No. or Reference Data	Step No.	Comments
T-107	SST	HNF-SD-WM-ER-382 2-5, 4-1,2	4	The sampling and analysis performed in this tank were consistent with the requirements of the Safety Screening DQO.
T-108	SST	WHC-SD-WM-ER-554 6-1	4	Used auger samples The sampling and analysis performed in this tank were consistent with the requirements of the Safety Screening DQO.
T-109	SST	WHC-SD-WM-ER-559 4.0, 4-1	5.4	Sampling and/or sample recovery were less than optimal. The sampling and analysis for this tank were reviewed and found to be adequate to satisfy the requirements of the Safety Screening DQO.
T-110	SST	HNF-SD-WM-ER-686 2-1, 2-3	4	The sampling and analysis performed in this tank were consistent with the requirements of the Safety Screening DQO.
T-111	SST	HNF-SD-WM-ER-540 2-1, 4-2	4	The sampling and analysis performed in this tank were consistent with the requirements of the Safety Screening DQO.
T-112	SST	HNF-SD-WM-ER-699 2-4	4	The sampling and analysis performed in this tank were consistent with the requirements of the Safety Screening DQO.
T-201	SST	HNF-1501 4-1	4	The sampling and analysis performed in this tank were consistent with the requirements of the Safety Screening DQO.
T-202	SST	HNF-1501 4-1	4	The sampling and analysis performed in this tank were consistent with the requirements of the Safety Screening DQO.
T-203	SST	HNF-1501 4-1	4	The sampling and analysis performed in this tank were consistent with the requirements of the Safety Screening DQO.
T-204	SST	HNF-1501 4-1	4	The sampling and analysis performed in this tank were consistent with the requirements of the Safety Screening DQO.
TX-104	SST	HNF-SD-WM-ER-672 4-1, 2-1	4	The sampling and analysis performed in this tank were consistent with the requirements of the Safety Screening DQO.
TX-107	SST	WHC-SD-WM-ER-584 6-1	4	The sampling and analysis performed in this tank were consistent with the requirements of the Safety Screening DQO.
TY-104	SST	WHC-SD-WM-ER-481 5-10	4	The sampling and analysis performed in this tank were consistent with the requirements of the Safety Screening DQO.
TY-106	SST	WHC-SD-WM-ER-482 5-13	4	The sampling and analysis performed in this tank were consistent with the requirements of the Safety Screening DQO.
U-102	SST	HNF-SD-WM-ER-618 2-2, 4-1	5.4	Sampling and/or sample recovery were less than optimal. The sampling and analysis for this tank were reviewed and found to be adequate to satisfy the requirements of the Safety Screening DQO.
U-103	SST	HNF-SD-WM-ER-712 2-6, 4-1 – 4-3	4	The sampling and analysis performed in this tank were consistent with the requirements of the Safety Screening DQO.

Table 5-1. Results of the Safety Screening Review (9 sheets)

Tank 241-	Tank Type	TCR No. or Reference Data	Step No.	Comments
U-105	SST	WHC-SD-WM-ER-617 5-9 – 5-11, 6-1, 6-2	5.1 5.3 5.4	Some analytical results exceeded preset notification limits. An acceptable substitute analysis was performed in lieu of the analysis requirement in the Safety Screening DQO. Sampling and/or sample recovery were less than optimal. The sampling and analysis for this tank were reviewed and found to be adequate to satisfy the requirements of the Safety Screening DQO.
U-106	SST	HNF-SD-WM-ER-636 2-1, 4-1	4	The sampling and analysis performed in this tank were consistent with the requirements of the Safety Screening DQO.
U-107	SST	WHC-SD-WM-ER-614 5-8 – 5-11	5.4	Sampling and/or sample recovery were less than optimal. The sampling and analysis for this tank were reviewed and found to be adequate to satisfy the requirements of the Safety Screening DQO.
U-108	SST	HNF-SD-WM-ER-639 4-1 – 4-3	5.3 5.4	An acceptable substitute analysis was performed in lieu of the analysis requirement in the Safety Screening DQO. Sampling and/or sample recovery were less than optimal. The sampling and analysis for this tank were reviewed and found to be adequate to satisfy the requirements of the Safety Screening DQO.
U-109	SST	WHC-SD-WM-ER-609 5-6	4	The sampling and analysis performed in this tank were consistent with the requirements of the Safety Screening DQO.
U-110	SST	HNF-SD-WM-ER-551 ES-4, 9-1	5.4	Sampling and/or sample recovery were less than optimal. The sampling and analysis for this tank were reviewed and found to be adequate to satisfy the requirements of the Safety Screening DQO.
U-112	SST	HNF-SD-WM-ER-720 4-1	4	The sampling and analysis performed in this tank were consistent with the requirements of the Safety Screening DQO.
U-201	SST	WHC-SD-WM-ER-483 ES-2, 5-5	4	The sampling and analysis performed in this tank were consistent with the requirements of the Safety Screening DQO.
U-202	SST	WHC-SD-WM-ER-484 5-2	4	The sampling and analysis performed in this tank were consistent with the requirements of the Safety Screening DQO.
U-203	SST	WHC-SD-WM-ER-485 ES-3, 4-1	4	The sampling and analysis performed in this tank were consistent with the requirements of the Safety Screening DQO.
U-204	SST	WHC-SD-WM-ER-486 ES-2, 5-13	4	The sampling and analysis performed in this tank were consistent with the requirements of the Safety Screening DQO.

6.0 TANKS OUTSIDE THE SCOPE OF THE EVALUATION

The following Table lists the 39 tanks that have not been sampled since 1989. Six tanks did not pass the safety screening. Tanks 241-BY-105, 241-BY-106, 241-C-102, 241-T-103, 241-U-101, and 241-TX-118 did not pass the safety screening for various reasons and are not discussed in this document

Table 6-1. Tanks That Have Not Been Sampled Since 1989

Tank 241-	Tank 241-	Tank 241-	Tank 241-	Tank 241-
A-103	S-108	SX-114	TX-109	TX-117
A-104	S-112	T-101	TX-110	TY-101
A-105	SX-104	TX-101	TX-111	TY-102
A-106	SX-107	TX-102	TX-112	TY-103
B-105	SX-109	TX-103	TX-113	TY-105
BX-102	SX-110	TX-105	TX-114	U-104
S-103	SX-111	TX-106	TX-115	U-111
S-105	SX-112	TX-108	TX-116	

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APPENDIX A

SENIOR TECHNICAL REVIEW TEAM BIOGRAPHIES

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SENIOR TECHNICAL REVIEW TEAM BIOGRAPHIES

Daniel A. Reynolds

Dan Reynolds has worked at Hanford since 1975 and is recognized throughout the site as one of the top experts on waste tank behavior. Dan has been responsible for developing and enhancing evaporator technologies and is a recognized expert in the DOE complex on waste chemistry. He has authored numerous technical reports on waste chemistry and waste solubility behavior. Dan has been a principal contributor to the resolution of the flammable gas and organic nitrate safety issues, and he assisted in source term development for the authorization basis. Prior to coming to Hanford, Dan worked as a chemist where he was responsible for quality control standards, and as an engineer worked in development group dealing with rocket propellants and explosives. Dan has a Bachelor of Engineering Science and a Masters of Engineering Science from Brigham Young University.

Jeanne A. Lechelt

Jeanne Lechelt has worked at Hanford since 1982. Prior to coming to Tank Farms in 1990, she worked in the field of instrumentation design, upgrades, and modification at N Reactor. Jeanne's work in Tank Farms has focused on tank safety issue resolution, including evaluation of tanks for flammable gas and organic complexants, and mitigation of the periodic gas releases in tank 241-SY-101. She has extensive experience working with the tank sampling analytical data in the Tank Characterization Database. Jeanne has authored numerous documents, including several tank characterization reports, the tank pedigree database, end state analyses for saltwell pumping, and reports on tank temperatures and flammable gas releases. Jeanne is the currently the data administrator for tank 241-C-106 retrieval. Jeanne has a B. S. in Electrical Engineering from Washington State University.

Brett C. Simpson

Brett Simpson has been working in tank characterization at Hanford since 1990. He is one of the principal analysts regarding the sampling and analysis of the Hanford Site Waste Tanks. Brett's work has encompassed all aspects of the history, properties, and composition of Hanford's high-level radioactive waste. Individually, and as part of several different teams, he has contributed to numerous documents relating to the characterization and safety of the Hanford Site waste tanks. He helped develop the tank characterization report concept, and is the principal author of several tank characterization reports. Brett worked on several documents relating to the definition and closure of the Ferrocyanide safety issue, and several data quality objectives. Brett worked extensively with the Los Alamos team that developed the Hanford Defined Waste model. He is currently involved in developing the Hanford Site's Best-Basis Inventory, and in statistical efforts to group tanks using laboratory and historical process data. Brett has a B.S. in Chemical Engineering from the University of North Dakota.

William L. Cowley

Bill Cowley has worked at Hanford since 1974. Prior to joining Safety Analysis in 1990, he worked in operations and engineering at Tank Farms and the 234-5 plant, and in project management. Bill's work in safety analysis has focused on Tank Farm safety issues. He participated in the early studies of the flammable gas safety issue for tank 241-SY-101 that led to the installation of the mixer pump for mitigation of tank 241-SY-101. Bill has also had extensive experience with the preparation and application of the Basis for Interim Operation (BIO). He wrote portions of the BIO dealing with the organic solvent safety issue, and the organic complexant Unreviewed Safety Question (USQ). Bill also led a team that developed the radiological and toxicological source terms for the BIO and is leading a new effort to redefine these source terms for the Final Safety Analysis Report (FSAR). He is currently in the Nuclear Safety and Licensing group, and serves in the dual role of licensing engineer and safety analyst responsible for preparing the documentation that led to the closure of the organic solvent safety issue and the organic nitrate USQ. Bill is a core USQ evaluator for the Tank Waste Remediation System. He has a B. S. in Chemical Engineering from Gonzaga University and has completed several courses in safety analysis sponsored by the American Institute of Chemical Engineers.

Cherri DeFigh-Price, P.E.

Cherri DeFigh-Price has worked at Hanford since 1975. She is Manager, Process Engineering for Lockheed Martin Hanford Company. Cherri has held various project management and engineering management positions at the Hanford Site since 1975, primarily related to the safe operations of high level and transuranic waste storage facilities at the Hanford Nuclear Reservation. Most of these assignments involved having a knowledge of both the tank wastes and the safety basis for TWRS. These include: managing the tank characterization program in 1993-94; Deputy Manager for Waste Tank Safety activities including ferrocyanide, flammable gas, organic complexant, and high heat safety issues; technical manager responsible for issuing all data packages supporting the Hanford Defense Waste Environmental Impact Statement; managing regulatory reporting including Dangerous Waste Report and SARA Title III reports; being on the negotiation team for a major compliance agreement with EPA and state agencies, and managing nuclear safety and environmental compliance at the K-Basins spent fuel storage facility. A 1975 graduate of Washington State University, Cherri has a BS degree in civil/environmental engineering. She is a registered Professional Engineer in the State of Washington in civil engineering.

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