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# PROBABILISTIC CAPACITY OF THE 241-AX UNDERGROUND WASTE STORAGE TANKS TO WITHSTAND SEISMIC EXCITATION

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# 1. INTRODUCTION

A probabilistic risk assessment of the Hanford 241-AX underground waste storage tank is being conducted by PLG, Inc. to evaluate the probability of radioactive release. In this study, systems models, event trees, and fault trees are used to determine the risk. EQE Engineering Consultants is under contract to PLG, Inc. to establish the capacity of the tank structure for earthquake loading. For seismic excitation, the probability of failure is developed as a function of peak free field ground acceleration.

The 241-AX underground storage tanks are used for long term storage of high level radioactive wastes. The tanks have an outside diameter of approximately 79 feet and are about 48 feet high overall. A single-wall tank configuration is used as shown in Figure 1. The tank wall thickness varies from 2 feet at the base to 1.25 feet near the dome. The concrete wall is reinforced with Grade 40 reinforcing steel and the concrete 28 day design compressive strength was 4000 psi. A steel liner was used for the tank base and wall as shown in Figure 1. In this evaluation, at the direction of PLG, the steel liner was assumed to have experienced significant corrosion and was not considered as contributing to the seismic capacity of the tank. This assumption is believed to have a minimal impact on the fragility calculations since the governing failure mode was found to occur in the unlined dome of the tank. A minimum of 6'-10" of overburden is placed above the dome.

Analysis has previously been conducted to establish both the seismic behavior of the tank, as well as investigate the capacity of the tank to withstand internal pressure variations and loading of the ground surface. Reference 1 evaluates the seismic capacity at design basis acceleration including the effects of soil-structure interaction. Maximum utilization of these existing results was made wherever possible in the current evaluation. As such, most of the effort reported here was to obtain estimates of increased tank seismic acceleration than previously evaluated and to assure that all results were consistent and in a form readily usable by the risk analyst including quantification of expected variabilities.

## 2. PROBABILISTIC DESCRIPTION OF SEISMIC CAPACITY

In order to fit into the PRA context, a probabilistic description of the seismic capacity of the tank is required. Also, since the seismic capacity is treated as a random variable, it is possible for more than one failure mode to significantly contribute to the risk. Therefore, several failure modes must be evaluated. This section discusses how the capacities are described in a probabilistic form.

### 2.1 DEVELOPMENT OF FAILURE PROBABILITIES

Seismic fragility of the tank is defined as the conditional frequency of its failure for a given value of the ground motion parameter (for example, peak ground acceleration). Thus, the fragility evaluation is based on the estimation of the median ground acceleration value for which the seismic response of a given component exceeds its capacity, resulting in failure. Because there are many sources of variability in the estimation of the median ground acceleration capacity, the component fragility is described by means of a family of fragility curves. Figure 2 depicts such curves, showing the median (50 percent confidence) curve with its shape governed by randomness variability, ($\beta_R$), and showing the relative position of the curve for other confidence levels greater than or less than 50 percent. The properties of the fragility curves and the general approach to their development are defined in previous works (References 2 and 3). Employing the characteristics of the lognormal distribution as described in these references, the entire family of fragility curves for any mode of failure is defined in terms of a median estimate of the ground acceleration capacity, $\hat{A}$ (Figure 2), times the product of randomness and uncertainty variables, $\epsilon_R$ and $\epsilon_U$, which have unit median values and are lognormally distributed with logarithmic standard deviations of $\beta_R$ and $\beta_U$, respectively.

$$A = \hat{A}\epsilon_R\epsilon_U \tag{2-1}$$

The median ground acceleration capacity, $\hat{A}$, is computed as:

$$\hat{A} = \hat{F} \cdot A_R \tag{2-2}$$

where $\hat{F}$ equals the median overall factor of safety based on response to the reference earthquake, and $A_R$ equals the peak ground acceleration of the reference earthquake.

In this study, the guidelines used to estimate the values of $\beta_R$ and $\beta_U$ for each variable affecting the fragility were based on considering the inherent randomness, $\beta_R$, to be associated primarily with the earthquake characteristics themselves, and the uncertainty, $\beta_U$, to be associated with lack of knowledge of the model and material parameters. Thus, the variability resulting from earthquake response spectra shape and amplification, earthquake duration, numbers and phasing of peak excitation cycles, together with their contributions to structure ductility and response characteristics was attributed to randomness. In general, it is not considered possible to significantly reduce randomness by additional analysis or test based on current state-of-the-art techniques. Uncertainty, on the other hand, is considered to result primarily from analytical modeling assumptions and other knowledge gaps concerning variables such as material strength and damping that could, in many cases, be reduced by additional study or test.

The lognormal distribution can be justified as a reasonable distribution since the statistical variation of many material properties (References 2 and 3) and seismic response variables (Reference 4) may reasonably be represented by this distribution. In addition, the central limit theorem states that a disruption consisting of products and quotients of distributions of several variables tends to be lognormal even if the individual distributions are not lognormal.

## 2.2 VARIABILITY IN MATERIAL PROPERTIES

Based largely on information available in the literature (Reference 5) the following median strength values and variabilities were used for the Grade 40 reinforcing bars:

| | |
|---|---|
| $\hat{\sigma}_y$ = 48.8 ksi | $\beta$ = 0.10 |
| $\hat{\sigma}_u$ = 74.5 ksi | $\beta$ = 0.13 |
| $\hat{\epsilon}$ = 12% | $\beta$ = 0.14 |

Normally the concrete is expected to exhibit strengths above the 4000 psi 28 day design value. In addition, concrete can be expected to increase in strength with

time after the 28 day test. Site specific data on the concrete was not available at the time of this investigation. Conclusions reached in the thermal analysis reported in Reference 1 were used in formulating concrete properties. Thermal effects were reported as degrading over the first 2,000 days of the tank life such that the concrete strength would be 2,450 psi. This was assumed to be a design value and the median concrete strength and logarithmic standard deviation were estimated as:

$$\hat{f}_c' = 3{,}450 \text{ psi} \qquad \beta = 0.22$$

In addition to the variabilities in the yield stress and ultimate stress, variability exists in the post yield stress-strain relationships, the crack spacing in the concrete and corresponding average strain in the reinforcing steel. Since all credible failure modes of the tank involve some degree of inelastic deformation, these sources of variability must also be accounted for.

## 2.3 MODELING VARIABILITY

Uncertainties will exist in the estimated pressure capacities due to differences between the analytical idealization of the structure and the real conditions. There are numerous possible sources of modeling uncertainties. Examples of the sources of modeling uncertainties include: assumptions used to develop the internal force distributions, failure criteria, and the use of empirical formulae. Moreover, since they are dependent on the particular failure mode under consideration, they must be evaluated on a case-by-case basis. Bounding analytical assumptions such as different boundary conditions can often by used to establish an estimate of the modeling variability. However, in many instances, the evaluation of these uncertainties would require very detailed analysis and/or extensive data which may not be available. The tank analysis reported in Reference 1 used conservative design loadings and loading conditions that were not part of the fragility evaluation. These included a greater depth of soil overburden, a 100-ton surface surcharge, internal pressure equivalent to -6 and +60 inches of water, and a lower-bound estimate of lateral earth pressure. The impact of these modelling conditions on the results presented in Reference 1 was estimated using simplified closed form solutions for axisymmetric shells. The results of the simplified evaluation were used to factor the forces and moments computed in the tank wall and dome in Reference 1. Determination of the critical failure mode relied upon the factored

results of Reference 1. Physical and geometric constants used in the simplified analysis to evaluate the impact of modeling conservatisms also provided a means to gauge uncertainty in the modeling of the tank.

## 2.4 SEISMIC FRAGILITY OF THE TANK

The capacity of the outer concrete shell was evaluated to arrive at a fragility associated with a gross leakage from the tank. The existing soil-structure interaction analysis was used as a basis for developing relationships between the seismic input and the tank response. In order to estimate the membrane capacities, reinforcing the median failure criteria including stress expected at failure and its variability must be considered. No credit was taken for the tensile strength of the concrete. A failure condition was assumed to occur when the reinforcing steel reaches the median yield strength of 48.8 ksi.

As previously noted, the seismic fragility is described in terms of a median free field ground acceleration capacity and logarithmic standard deviations associated with randomness and uncertainty. By anchoring the median ground acceleration capacity to a reference motion, the fragility can then be expressed in terms of a series of probabilistic factors of safety and their associated logarithmic standard deviations. These factors of safety are evaluated for the various parameters that affect the strength and response of the structure.

In the evaluation of the fragility of the concrete tanks, the critical failure mode was found to be circumferential tensile failure of the tank dome near the haunch. This failure mode is controlled largely by the horizontal seismic input. Loads from vertical seismic input and hydrodynamic response of the tank contents were found to have no impact on the failure mode and only a small impact on the estimate of the factor of safety.

In estimating the median seismic demand, the results from Reference 1 were adjusted to reflect a median horizontal ground spectral shape consistent with NUREG/CR-0098 (Reference 6) and a median damping ratio of 7% for the reinforced concrete tank. Results from Reference 1 were used directly in estimation of the factor of safety against failure under seismic excitation. The impact of modeling conservatism was treated separately. Since the failure mode occurs in conjunction with ductile flexural response of the tank wall near the haunch, additional capacity beyond the static capacity can be accounted for

through inelastic energy absorption. Table 1 shows the median factors of safety, the corresponding logarithmic standard deviations, and the overall seismic fragility parameters for the failure of the reinforced concrete dome.

Table 1

SEISMIC FRAGILITY FOR THE REINFORCED CONCRETE SHELL

Failure Mode: Hoop Tensile Failure in the Dome

| Factor | $\hat{F}$ | $\beta_R$ | $\beta_U$ |
|---|---|---|---|
| Strength | 1.97 | 0.0 | 0.10 |
| Inelastic Energy Absorption | 1.68 | 0.07 | 0.13 |
| Spectral Shape | 0.97 | 0.25 | 0.0 |
| Damping | 1.12 | 0.0 | 0.11 |
| Modeling | 1.06 | 0.4 | 0.09 |
| Earthquake Component Comb. | 1.0 | 0.0 | 0.0 |
| | 3.81 | 0.26 | 0.22 |

$\hat{A} = 3.81 \times 0.25g = 0.95g$

$HCLPF = 0.95e^{-1.65(0.26 + 0.22)} = 0.43g$

## 3. REFERENCES


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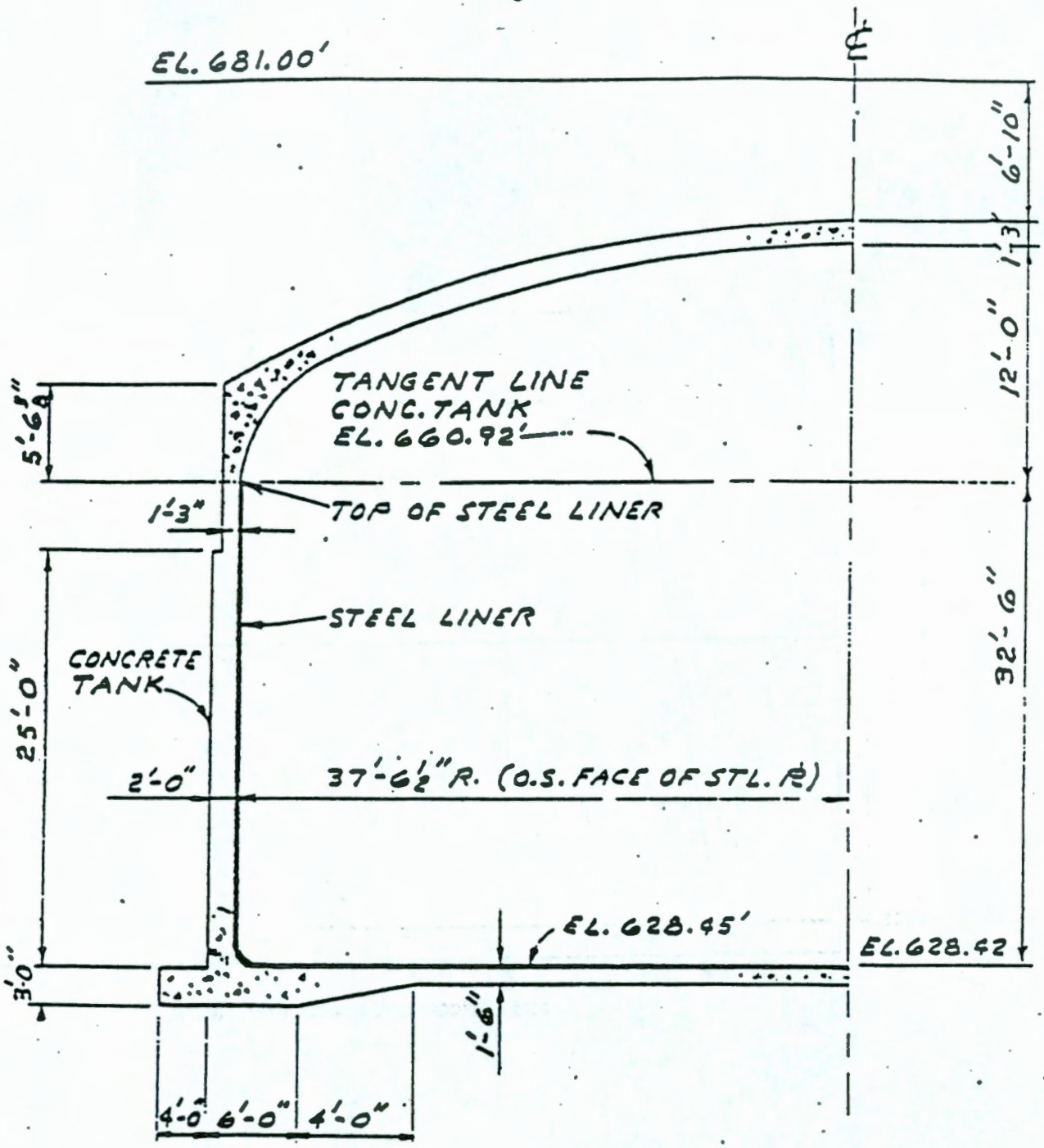


Figure 1: Half Vertical Section Through Tanks 241-AX

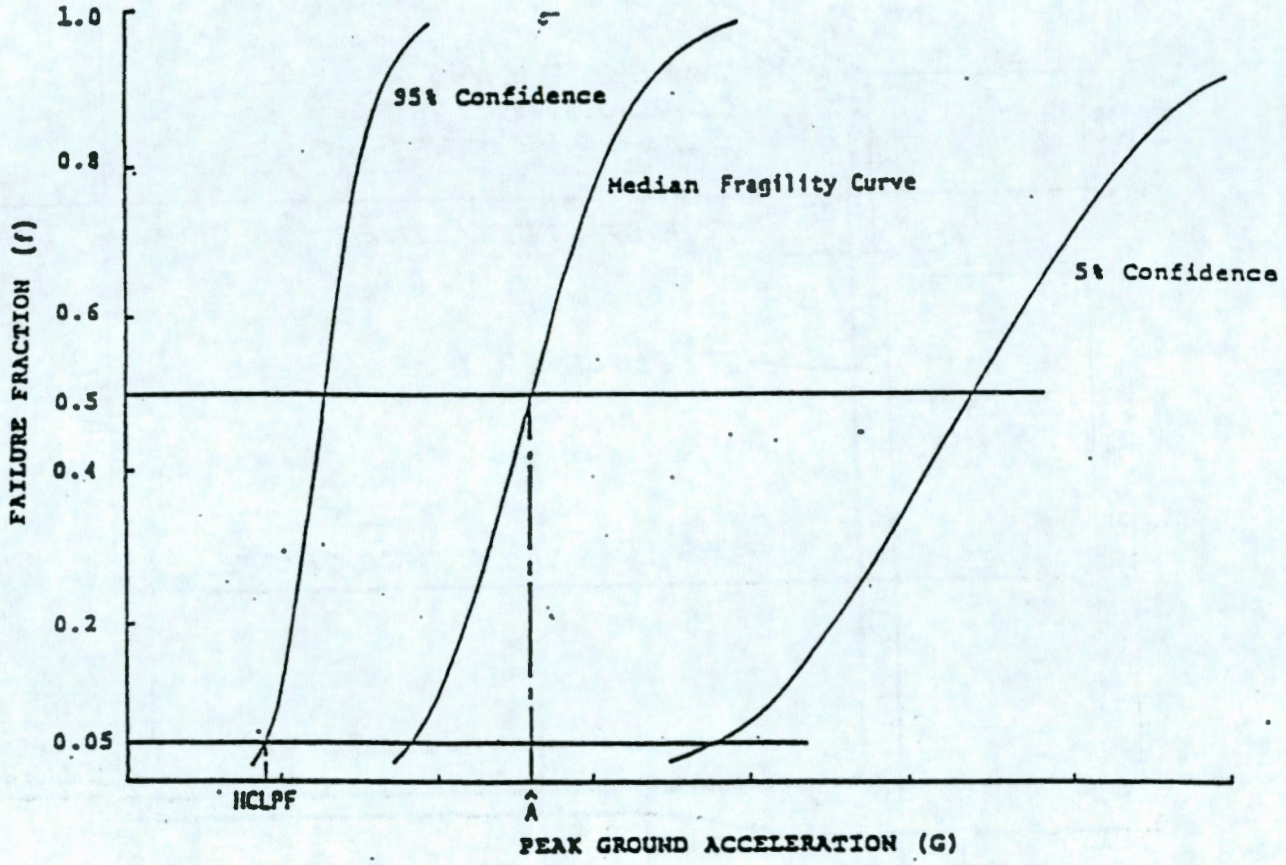


Figure 2: Typical Fragility Curve Representation

# APPENDIX E
# METEOROLOGICAL AND POPULATION DATA

The Hanford 200 Area joint-frequency data for 10 m and 89 m are given in Tables E-1 and E-2, respectively. The 10-m data were used for the ground-level releases, whereas the 89-m data were used for the elevated releases (fire scenarios). The 16 wind directions start at north and go clockwise across the top of the table. The rows are grouped by wind speed starting with 0.89 m/s and continuing through 19.0 m/s. Within each wind speed group, the stability classes start at A and go through G. For example, the first seven lines correspond to a wind speed of 0.89 m/s and, proceeding from the first line through the seventh line, stability classes A through G. Each wind speed and the associated stability classes are represented in Tables E-1 and E-2 by sequential groups of seven lines. Thus, the total number of entries in the tables is 16 x 8 x 7 = 896.

The offsite population data are given in Table E-3. They are based on the 1990 census, updated to 1992. The data in the table were used for the offsite population estimates (16–80 km). The following data, based on the Hanford site telephone directory, were used for the onsite population (< 16 km).

| Area Location | No. of Workers |
|---|---|
| 200 E | 2772 |
| 200 W | 1873 |
| 400/WPPSS | 1808 |
| 100 N/100 KE/ 100 KW | 485 |
| Total | 6938 |

These workers are distributed as shown in Figs. 6-2 to 6-5 in Sec. 6. Workers in other areas are either too few in number or at too great a distance to contribute significantly the onsite population dose. Actually, the workers in 200 E and 200 W contribute over 95% of the totals in most cases.

## TABLE E-1

## HANFORD 10-METER JOINT FREQUENCY DATA

200 AREA (HMS) - 10 M - Pasquill A - G (1983 - 1991 Average)
Created 8/26/92 KR
8 7 1 1 10.0
wind speeds 0.89 2.65 4.7 7.15 9.8 12.7 15.6 19.0

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.36 | 0.20 | 0.23 | 0.26 | 0.40 | 0.24 | 0.17 | 0.10 | 0.10 | 0.06 | 0.06 | 0.06 | 0.10 | 0.10 | 0.14 | 0.22 |
| 0.15 | 0.13 | 0.10 | 0.11 | 0.16 | 0.09 | 0.07 | 0.03 | 0.05 | 0.02 | 0.01 | 0.03 | 0.04 | 0.05 | 0.07 | 0.10 |
| 0.14 | 0.10 | 0.09 | 0.12 | 0.14 | 0.10 | 0.06 | 0.04 | 0.04 | 0.02 | 0.02 | 0.02 | 0.04 | 0.04 | 0.10 | 0.10 |
| 0.87 | 0.58 | 0.59 | 0.59 | 0.77 | 0.50 | 0.43 | 0.32 | 0.27 | 0.19 | 0.21 | 0.17 | 0.40 | 0.44 | 0.54 | 0.55 |
| 0.39 | 0.26 | 0.28 | 0.25 | 0.46 | 0.34 | 0.31 | 0.30 | 0.34 | 0.21 | 0.25 | 0.29 | 0.49 | 0.44 | 0.45 | 0.39 |
| 0.23 | 0.13 | 0.12 | 0.14 | 0.31 | 0.23 | 0.28 | 0.26 | 0.35 | 0.23 | 0.22 | 0.27 | 0.48 | 0.36 | 0.32 | 0.23 |
| 0.10 | 0.04 | 0.08 | 0.08 | 0.13 | 0.13 | 0.13 | 0.14 | 0.17 | 0.09 | 0.10 | 0.09 | 0.22 | 0.14 | 0.14 | 0.09 |
| 0.69 | 0.44 | 0.29 | 0.32 | 0.60 | 0.51 | 0.45 | 0.29 | 0.24 | 0.12 | 0.17 | 0.19 | 0.25 | 0.30 | 0.42 | 0.48 |
| 0.21 | 0.15 | 0.06 | 0.08 | 0.16 | 0.13 | 0.13 | 0.09 | 0.08 | 0.04 | 0.03 | 0.05 | 0.07 | 0.09 | 0.16 | 0.16 |
| 0.19 | 0.12 | 0.06 | 0.09 | 0.13 | 0.13 | 0.19 | 0.10 | 0.06 | 0.02 | 0.03 | 0.05 | 0.08 | 0.10 | 0.19 | 0.15 |
| 0.84 | 0.48 | 0.40 | 0.33 | 0.66 | 0.57 | 0.75 | 0.53 | 0.35 | 0.18 | 0.24 | 0.28 | 0.69 | 1.09 | 1.05 | 0.77 |
| 0.32 | 0.17 | 0.11 | 0.13 | 0.31 | 0.34 | 0.47 | 0.52 | 0.46 | 0.21 | 0.29 | 0.48 | 1.58 | 1.68 | 1.11 | 0.39 |
| 0.13 | 0.05 | 0.05 | 0.05 | 0.16 | 0.21 | 0.39 | 0.44 | 0.45 | 0.21 | 0.27 | 0.46 | 1.60 | 1.69 | 0.82 | 0.25 |
| 0.04 | 0.02 | 0.02 | 0.03 | 0.09 | 0.10 | 0.20 | 0.23 | 0.20 | 0.08 | 0.10 | 0.20 | 0.82 | 0.69 | 0.30 | 0.08 |
| 0.26 | 0.24 | 0.10 | 0.03 | 0.08 | 0.10 | 0.10 | 0.13 | 0.12 | 0.07 | 0.14 | 0.34 | 0.35 | 0.35 | 0.40 | 0.17 |
| 0.09 | 0.06 | 0.03 | 0.01 | 0.03 | 0.03 | 0.04 | 0.05 | 0.03 | 0.02 | 0.05 | 0.07 | 0.10 | 0.14 | 0.12 | 0.06 |
| 0.08 | 0.05 | 0.03 | 0.01 | 0.02 | 0.02 | 0.04 | 0.04 | 0.05 | 0.02 | 0.03 | 0.06 | 0.09 | 0.13 | 0.12 | 0.03 |
| 0.32 | 0.20 | 0.09 | 0.04 | 0.12 | 0.11 | 0.25 | 0.27 | 0.24 | 0.13 | 0.23 | 0.39 | 0.83 | 1.46 | 0.84 | 0.21 |
| 0.19 | 0.09 | 0.04 | 0.01 | 0.06 | 0.06 | 0.15 | 0.25 | 0.22 | 0.12 | 0.18 | 0.39 | 1.98 | 2.50 | 0.75 | 0.13 |
| 0.04 | 0.06 | 0.01 | 0.01 | 0.01 | 0.02 | 0.05 | 0.17 | 0.14 | 0.03 | 0.07 | 0.20 | 1.19 | 1.60 | 0.32 | 0.06 |
| 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.01 | 0.09 | 0.07 | 0.01 | 0.02 | 0.09 | 0.56 | 0.84 | 0.13 | 0.01 |
| 0.07 | 0.07 | 0.05 | 0.01 | 0.00 | 0.00 | 0.01 | 0.03 | 0.04 | 0.04 | 0.11 | 0.25 | 0.25 | 0.25 | 0.33 | 0.05 |
| 0.02 | 0.03 | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 0.01 | 0.02 | 0.01 | 0.04 | 0.08 | 0.06 | 0.07 | 0.09 | 0.01 |
| 0.02 | 0.03 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.02 | 0.01 | 0.02 | 0.07 | 0.06 | 0.07 | 0.06 | 0.01 |
| 0.10 | 0.10 | 0.03 | 0.01 | 0.00 | 0.01 | 0.03 | 0.07 | 0.10 | 0.11 | 0.25 | 0.38 | 0.58 | 1.14 | 0.50 | 0.05 |
| 0.07 | 0.12 | 0.01 | 0.00 | 0.00 | 0.00 | 0.01 | 0.05 | 0.07 | 0.08 | 0.17 | 0.30 | 0.65 | 1.75 | 0.41 | 0.02 |
| 0.03 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.02 | 0.00 | 0.01 | 0.02 | 0.07 | 0.08 | 0.03 | 0.00 |
| 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 |
| 0.02 | 0.02 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.01 | 0.05 | 0.16 | 0.10 | 0.11 | 0.24 | 0.00 |
| 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 | 0.04 | 0.02 | 0.03 | 0.06 | 0.00 |
| 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.02 | 0.05 | 0.02 | 0.03 | 0.05 | 0.00 |
| 0.02 | 0.04 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 | 0.07 | 0.16 | 0.24 | 0.13 | 0.50 | 0.29 | 0.01 |
| 0.01 | 0.06 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.05 | 0.11 | 0.15 | 0.06 | 0.38 | 0.11 | 0.00 |
| 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 | 0.06 | 0.02 | 0.02 | 0.03 | 0.00 |
| 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.02 | 0.01 | 0.00 | 0.01 | 0.00 |
| 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 | 0.01 | 0.00 | 0.01 | 0.01 | 0.00 |
| 0.02 | 0.03 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 | 0.09 | 0.09 | 0.03 | 0.07 | 0.08 | 0.00 |
| 0.01 | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.04 | 0.02 | 0.01 | 0.05 | 0.03 | 0.00 |
| 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

# TABLE C-1 (CONT)

| NO. | TANK I.D. | TANK TYPE | E/W | START DATE (YR) | AGE (YRS) | LEAKER (NO=N;YES=Y(YR)) | LEAK SIZE (Kgal) | STABILIZED (YR) | SUPERNATANT LIQ Kgal | SUPERNATANT LIQ TYPE | INTER. LIQUOR (Kgal) (INTERIM) | TOTAL LIQUOR (Kgal) | SOLIDS (Kgal) DSS | SOLIDS (Kgal) SLUDGE | SOLIDS (Kgal) SALT | TOTAL SOLIDS (Kgal) | TOTAL WASTE (Kgal) | % MOIST. | ISOLATED | HI TEMP READING 8/91 | HI TEMP READING 10/91 | HI TEMP READING 7/92 | PECK (x1000 g mol) 10/91 | HT LD (BTU/HR) 12/91 | HT LD (BTU/HR) 7/92 | WATCH LISTS HYD | WATCH LISTS ORG | WATCH LISTS FECN | WATCH LISTS HEAT | Level Measurement Method | Level Measurement Frequency | Ventilation |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71 | BY-108 | 100 | E | 48 | 43 | Y(72) | 5 | IS(84) | 0 | NCPLX | 0 | 0 | | 154 | 74 | 228 | 228 | 6% | I | 101 | 102 | 107 | 80 | 23000 | 23000 | | | X | | M | M | N |
| 72 | BY-109 | 100 | E | 48 | 43 | N | | - | 0 | NCPLX | 83 | 83 | | 83 | 340 | 423 | 423 | 20% | P | | | | | | | | | | | A | W | N |
| 73 | BY-110 | 100 | E | 48 | 43 | N | | IS(85) | 0 | NCPLX | 0 | 0 | | 103 | 208 | 311 | 311 | 7% | I | 124 | 128 | 126 | 71 | 20200 | 21200 | | | X | | M | M | N |
| 74 | BY-111 | 100 | E | 48 | 43 | N | | IS(85) | 0 | NCPLX | 0 | 0 | | 21 | 438 | 459 | 459 | 6% | I | 92 | 82 | 88 | 0 | 31200 | 31200 | | | X | | M | M | N |
| 75 | BY-112 | 100 | E | 48 | 43 | N | | IS(85) | 0 | NCPLX | 0 | 0 | | 5 | 286 | 291 | 291 | 3% | I | 83 | 82 | 88 | 2 | <10000 | <10000 | | | X | | M | M | N |
| 76 | C-101 | 100 | E | 46 | 48 | Y(80) | 20 | IS(83) | 0 | NCPLX | 3 | 3 | | 88 | 0 | 88 | 88 | 3% | I | | 88 | | | | | | | | | M | Q | N |
| 77 | C-102 | 100 | E | 46 | 48 | N | | - | 2 | NCPLX | 44 | 47 | | 425 | 0 | 425 | 427 | 11% | P | | | | | | | | | | | I | W | N |
| 78 | C-103 | 100 | E | 46 | 48 | N | | - | 133 | NCPLX | 0 | 133 | | 62 | 0 | 62 | 195 | 40% | P | 124 | 126 | 124 | | | | | X | | | A | W | N |
| 79 | C-104 | 100 | E | 46 | 48 | N | | IS(89) | 0 | CC | 11 | 11 | | 295 | 0 | 295 | 295 | 6% | I | | 82 | | | | | | | | | A | W | P |
| 80 | C-105 | 100 | E | 46 | 48 | N | | - | 0 | NCPLX | 11 | 11 | | 150 | 0 | 150 | 150 | 7% | P | 88(2) | 94(2) | 103(2) | | 42000 | 42000 | | | | X | A | Q | P |
| 81 | C-106 | 100 | E | 46 | 48 | N | | | 32 | NCPLX | 18 | 46 | | 197 | 0 | 197 | 229 | 21% | P | 180(2) | 182(2) | 178(2) | | 180000 | 180000 | | | | X | A | Q | P |
| 82 | C-107 | 100 | E | 46 | 48 | N | | - | 0 | NCPLX | 33 | 33 | | 237 | 0 | 237 | 237 | 10% | P | | 124 | 123 | | | | | | | | A | W | N |
| 83 | C-108 | 100 | E | 46 | 48 | N | | IS(84) | 0 | NCPLX | 0 | 0 | | 88 | 0 | 88 | 88 | 6% | I | 78 | 78 | 78 | 28 | <10000 | <10000 | | | X | | M | Q | N |
| 84 | C-109 | 100 | E | 46 | 48 | N | | IS(83) | 0 | NCPLX | 0 | 4 | | 62 | 0 | 62 | 66 | 8% | I | 81 | 80 | 73 | 30 | <10000 | 2800 | | | X | | M | Q | N |
| 85 | C-110 | 100 | E | 46 | 48 | Y(84) | 2 | - | 0 | NCPLX | 15 | 15 | | 191 | 0 | 191 | 194 | 8% | P | | 88 | 88 | | | | | | | | M | W | N |
| 86 | C-111 | 100 | E | 46 | 48 | Y(68) | 5.5 | IS(84) | 0 | NCPLX | 0 | 0 | | 97 | 0 | 97 | 97 | 6% | I | 78 | 78 | 78 | 33 | <10000 | <10000 | | | X | | M | Q | N |
| 87 | C-112 | 100 | E | 46 | 48 | N | | IS(90) | 0 | NCPLX | 32 | 32 | | 104 | 0 | 104 | 104 | 31% | P | 83 | 83 | 81 | 21 | <10000 | <10000 | | | X | | M | W | N |
| 88 | C-201 | 200 | E | 46 | 48 | Y(88) | 0.5 | IS(82) | 0 | NCPLX | 0 | 0 | | 2 | 0 | 2 | 2 | 6% | I | | 88 | | | | | | | | | M | Q | N |
| 89 | C-202 | 200 | E | 46 | 48 | Y(88) | 0.5 | IS(81) | 0 | EMPTY | 0 | 0 | | 1 | 0 | 1 | 1 | 6% | I | | 88 | | | | | | | | | M | Q | N |
| 90 | C-203 | 200 | E | 46 | 48 | Y(84) | 0.4 | IS(82) | 0 | NCPLX | 0 | 0 | | 5 | 0 | 5 | 5 | 6% | I | | 82 | | | | | | | | | M | Q | N |
| 91 | C-204 | 200 | E | 46 | 48 | Y(88) | 0.4 | IS(82) | 0 | NCPLX | 0 | 0 | | 3 | 0 | 3 | 3 | 6% | I | | | | | | | | | | | M | Q | N |
| 92 | S-101 | 100 | W | 51 | 41 | N | | - | 12 | NCPLX | 88 | 88 | | 244 | 171 | 415 | 427 | 22% | P | | 122 | | | | | | | | | I | W | N |
| 93 | S-102 | 100 | W | 51 | 41 | N | | - | 0 | DSSF | 238 | 238 | | 4 | 545 | 549 | 549 | 42% | P | 103 | 111 | 104 | | | | X | X | | | A | W | N |
| 94 | S-103 | 100 | W | 51 | 41 | N | | - | 17 | DSSF | 88 | 102 | | 10 | 221 | 231 | 248 | 21% | P | | 81 | 78 | | | | | | | | A | W | N |
| 95 | S-104 | 100 | W | 51 | 41 | Y(68) | 24 | IS(84) | 1 | NCPLX | 27 | 28 | | 293 | 0 | 293 | 294 | 10% | I | | 112 | 104 | | | | | | | | M | M | N |
| 96 | S-105 | 100 | W | 51 | 41 | N | | IS(88) | 0 | NCPLX | 31 | 31 | | 2 | 454 | 456 | 456 | 8% | I | | 79 | 77 | | | | | | | | I | W | N |
| 97 | S-106 | 100 | W | 51 | 41 | N | | - | 0 | NCPLX | 188 | 188 | | 28 | 411 | 442 | 442 | 24% | P | | 97 | 82 | | | | | | | | A | W | N |
| 98 | S-107 | 100 | W | 51 | 41 | N | | - | 0 | NCPLX | 41 | 41 | | 293 | 88 | 382 | 388 | 11% | P | | 112 | | | | | | | | | A | W | N |
| 99 | S-108 | 100 | W | 51 | 41 | N | | - | 0 | NCPLX | 127 | 127 | | 4 | 588 | 591 | 591 | 21% | P | | 94 | 81 | | | | | | | | MI | W | N |
| 100 | S-109 | 100 | W | 51 | 41 | N | | - | 0 | NCPLX | 141 | 141 | | 13 | 555 | 568 | 568 | 23% | P | | 77 | 78 | | | | | | | | I | W | N |
| 101 | S-110 | 100 | W | 51 | 41 | N | | - | 0 | NCPLX | 118 | 118 | | 131 | 381 | 392 | 392 | 10% | P | | 118 | | | | | | | | | I | W | N |
| 102 | S-111 | 100 | W | 51 | 41 | N | | - | 18 | NCPLX | 181 | 201 | | 138 | 447 | 585 | 585 | 24% | P | 83 | 97 | 88 | | | | X | | | | A | W | N |
| 103 | S-112 | 100 | W | 51 | 41 | N | | - | 0 | NCPLX | 131 | 131 | | 4 | 631 | 637 | 637 | 21% | P | 88 | 88 | 83 | | | | X | | | | I | W | N |
| 104 | SX-101 | 100 | W | 54 | 38 | N | | - | 1 | CC | 118 | 118 | | 112 | 312 | 412 | 418 | 32% | P | 110 | 115 | 128 | | | | X | | | | I | W | P |
| 105 | SX-102 | 100 | W | 54 | 38 | N | | - | 0 | DSSF | 183 | 183 | | 117 | 428 | 542 | 542 | 34% | P | 105 | 108 | 109 | | | | X | | | | I | W | P |
| 106 | SX-103 | 100 | W | 54 | 38 | N | | - | 1 | NCPLX | 228 | 227 | | 115 | 538 | 653 | 652 | 31% | P | 106 | 102 | 128 | | | | X | | | | A | Q | P |
| 107 | SX-104 | 100 | W | 54 | 38 | Y(88) | 6 | - | 0 | DSSF | 283 | 283 | | 138 | 478 | 611 | 618 | 37% | P | 175 | 178 | 178 | | | | X | | | | I | W | P |
| 108 | SX-105 | 100 | W | 54 | 38 | N | | - | 0 | DSSF | 281 | 281 | | 73 | 610 | 683 | 683 | 38% | P | 158 | 181 | 168 | | | | X | | | | I | W | P |
| 109 | SX-106 | 100 | W | 54 | 38 | N | | - | 61 | NCPLX | 181 | 211 | | 12 | 460 | 472 | 538 | 47% | P | 187 | 114 | 114 | | | | X | X | | | A | W | P |
| 110 | SX-107 | 100 | W | 56 | 36 | Y(64) | 5 | IS(79) | 0 | NCPLX | 0 | 0 | | 104 | 0 | 104 | 104 | 6% | I | 171 | 172 | 173 | | 42000 | 42000 | | | | X | M | Q | P |
| 111 | SX-108 | 100 | W | 56 | 36 | Y(62) | 35* | IS(79) | 0 | NCPLX | 0 | 0 | | 118 | 0 | 118 | 118 | 6% | I | 184 | 208 | 188 | | 41000 | 41000 | | | | X | M | Q | P |
| 112 | SX-109 | 100 | W | 56 | 36 | Y(65) | 0 | IS(81) | 0 | NCPLX | 10 | 10 | | 250 | 0 | 250 | 250 | 6% | I | 161 | 180 | 160 | | 38000 | 38000 | X* | | | X | M | Q | P |
| 113 | SX-110 | 100 | W | 56 | 36 | Y(76) | 5.5 | IS(76) | 0 | NCPLX | 0 | 0 | | 62 | 0 | 62 | 62 | 6% | I | 174 | 178 | 172 | | 42000 | 41000 | | | | X | M | Q | P |
| 114 | SX-111 | 100 | W | 56 | 36 | Y(74) | 0.5 | IS(76) | 0 | NCPLX | 2 | 2 | | 125 | 0 | 125 | 125 | 6% | I | 183 | 182 | 181 | | 45000 | 41000 | | | | X | M | Q | P |
| 115 | SX-112 | 100 | W | 56 | 36 | Y(69) | 30 | IS(75) | 0 | NCPLX | 3 | 3 | | 92 | 0 | 92 | 92 | 3% | I | 181 | 181 | 130 | | 43000 | 43000 | | | | X | M | Q | P |
| 116 | SX-113 | 100 | W | 58 | 34 | Y(58) | 15 | IS(78) | 0 | NCPLX | 0 | 0 | | 26 | 0 | 26 | 26 | 6% | I | | 88 | 74 | | | | | | | | M | Q | N |
| 117 | SX-114 | 100 | W | 56 | 36 | Y(72) | 0 | IS(78) | 0 | NCPLX | 14 | 14 | | 181 | 0 | 181 | 181 | 6% | I | 131 | 131 | 138 | | 18000 | 21000 | | | | X | M | Q | P |
| 118 | SX-115 | 100 | W | 58 | 34 | Y(65) | 50 | IS(78) | 0 | NCPLX | 0 | 0 | | 12 | 0 | 12 | 12 | 6% | I | | | | | | | | | | | M | Q | N |
| 119 | SY-101 | DST | W | 78 | 14 | N | | - | 88 | CC | 237 | 285 | 888 | 0 | 888 | 1111 | 1118 | 21% | | 131 | 131 | 131 | | | | X | | | | | | SY |
| 120 | SY-102 | DST | W | 78 | 14 | N | | - | 681 | DN/PT | 0 | 681 | 0 | 21 | 0 | 21 | 722 | 10% | | | | | | | | | | | | | | SY |
| 121 | SY-103 | DST | W | 78 | 14 | N | | - | 171 | CC | 0 | 171 | 671 | 0 | 1 | 672 | 781 | 23% | | 118 | 113 | 113 | | | | X | | | | | | SY |
| 122 | T-101 | 100 | W | 44 | 48 | N | | - | 28 | NCPLX | 0 | 128 | | 102 | 0 | 102 | 133 | 20% | P | 73 | 73 | 88 | <1 | <10000 | <10000 | | | X | | A | Q | N |
| 123 | T-102 | 100 | W | 44 | 48 | N | | IS(84) | 13 | NCPLX | 0 | 13 | | 19 | 0 | 19 | 32 | 31% | I | | | | | | | | | | | A | Q | N |
| 124 | T-103 | 100 | W | 44 | 48 | Y(74) | 1 | IS(83) | 4 | NCPLX | 0 | 4 | | 23 | 0 | 23 | 27 | 12% | I | | 88 | 88 | | | | | | | | A | Q | N |
| 125 | T-104 | 100 | W | 44 | 48 | N | | - | 1 | NCPLX | 42 | 44 | | 442 | 0 | 442 | 443 | 11% | P | | 87 | | | | | | | | | M | W | N |
| 126 | T-105 | 100 | W | 44 | 48 | N | | IS(87) | 1 | NCPLX | 22 | 23 | | 98 | 0 | 98 | 98 | 23% | I | | | | | | | | | | | I | M | N |
| 127 | T-106 | 100 | W | 44 | 48 | Y(73) | 115 | IS(81) | 2 | NCPLX | 0 | 2 | | 19 | 0 | 19 | 21 | 10% | I | | 88 | 81 | | | | | | | | I | Q | N |
| 128 | T-107 | 100 | W | 44 | 48 | Y(84) | 0 | - | 0 | NCPLX | 32 | 32 | | 173 | 0 | 173 | 180 | 17% | P | 74 | 78 | 88 | 0 | <10000 | <10000 | | | X | | A | W | N |
| 129 | T-108 | 100 | W | 44 | 48 | Y(74) | 1 | IS(78) | 0 | NCPLX | 0 | 0 | | 44 | 0 | 44 | 44 | 6% | I | | | | | | | | | | | M | Q | N |
| 130 | T-109 | 100 | W | 44 | 48 | Y(74) | 1 | IS(83) | 0 | NCPLX | 0 | 0 | | 58 | 0 | 58 | 58 | 6% | I | | | | | | | | | | | I | M | N |
| 131 | T-110 | 100 | W | 44 | 48 | N | | - | 3 | NCPLX | 32 | 42 | | 378 | 0 | 378 | 378 | 11% | P | 83 | 88 | 82 | | | | X | | | | I | W | N |
| 132 | T-111 | 100 | W | 44 | 48 | Y(84) | 1 | - | 2 | NCPLX | 58 | 31 | | 458 | 0 | 458 | 431 | 11% | P | | 72 | 82 | | | | | | | | A | Q | N |
| 133 | T-112 | 100 | W | 44 | 48 | N | | IS(81) | 7 | NCPLX | 0 | 7 | | 88 | 0 | 88 | 87 | 10% | I | | 88 | | | | | | | | | A | Q | N |
| 134 | T-201 | 200 | W | 44 | 48 | N | | IS(81) | 1 | NCPLX | 1 | 1 | | 28 | 0 | 28 | 29 | 11% | I | | 83 | 82 | | | | | | | | M | Q | N |
| 135 | T-202 | 200 | W | 44 | 48 | N | | IS(81) | 0 | NCPLX | 2 | 2 | | 21 | 0 | 21 | 21 | 10% | I | | 83 | 81 | | | | | | | | M | Q | N |
| 136 | T-203 | 200 | W | 44 | 48 | N | | IS(81) | 0 | NCPLX | 4 | 4 | | 35 | 0 | 35 | 35 | 11% | I | | 88 | 82 | | | | | | | | M | Q | N |
| 137 | T-204 | 200 | W | 44 | 48 | N | | IS(81) | 0 | NCPLX | 1 | 1 | | 38 | 0 | 38 | 38 | 11% | I | | 83 | 83 | | | | | | | | M | Q | N |
| 138 | TX-101 | 100 | W | 48 | 44 | N | | IS(84) | 3 | NCPLX | 1 | 1 | | 85 | 0 | 85 | 87 | 6% | I | | | | | | | | | | | A | Q | N |
| 139 | TX-102 | 100 | W | 48 | 44 | N | | IS(83) | 0 | NCPLX | 22 | 22 | | 0 | 113 | 113 | 113 | 12% | I | | | | | | | | | | | M | Q | N |
| 140 | TX-103 | 100 | W | 48 | 44 | N | | IS(83) | 0 | NCPLX | 11 | 11 | | 157 | 0 | 157 | 157 | 10% | I | | | | | | | | | | | I | Q | N |

TABLE E-1 (CONT)

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.01 | 0.00 |
| 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 |
| 0.01 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.03 | 0.03 | 0.02 | 0.00 | 0.00 | 0.00 |
| 0.01 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 0.02 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 0.01 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 0.04 | 0.07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 0.07 | 0.12 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 0.03 | 0.05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

## TABLE E-2

## HANFORD 89-METER JOINT FREQUENCY DATA

200 AREA (HMS) - 89 M - Pasquill A - G (1983 - 1991 Average)
Created 8/26/92 KR
8 7 1 1 89.0
wind speeds 0.89 2.65 4.7 7.15 9.8 12.7 15.6 19.0

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.34 | 0.16 | 0.19 | 0.24 | 0.38 | 0.23 | 0.17 | 0.10 | 0.10 | 0.05 | 0.05 | 0.06 | 0.10 | 0.10 | 0.12 | 0.17 |
| 0.12 | 0.09 | 0.09 | 0.10 | 0.13 | 0.09 | 0.06 | 0.02 | 0.05 | 0.02 | 0.01 | 0.02 | 0.04 | 0.05 | 0.06 | 0.08 |
| 0.11 | 0.09 | 0.08 | 0.10 | 0.13 | 0.09 | 0.07 | 0.04 | 0.03 | 0.02 | 0.02 | 0.02 | 0.05 | 0.03 | 0.08 | 0.07 |
| 0.62 | 0.40 | 0.39 | 0.45 | 0.61 | 0.41 | 0.36 | 0.28 | 0.21 | 0.16 | 0.16 | 0.11 | 0.25 | 0.33 | 0.39 | 0.39 |
| 0.22 | 0.16 | 0.16 | 0.15 | 0.30 | 0.26 | 0.25 | 0.28 | 0.27 | 0.15 | 0.16 | 0.17 | 0.30 | 0.30 | 0.27 | 0.22 |
| 0.13 | 0.08 | 0.08 | 0.09 | 0.19 | 0.19 | 0.25 | 0.29 | 0.32 | 0.15 | 0.16 | 0.19 | 0.41 | 0.34 | 0.27 | 0.15 |
| 0.07 | 0.02 | 0.05 | 0.05 | 0.11 | 0.12 | 0.16 | 0.22 | 0.18 | 0.08 | 0.09 | 0.10 | 0.31 | 0.17 | 0.13 | 0.07 |
| 0.57 | 0.39 | 0.29 | 0.32 | 0.57 | 0.49 | 0.40 | 0.23 | 0.20 | 0.11 | 0.13 | 0.13 | 0.17 | 0.23 | 0.33 | 0.43 |
| 0.18 | 0.14 | 0.06 | 0.09 | 0.16 | 0.10 | 0.11 | 0.07 | 0.07 | 0.03 | 0.02 | 0.04 | 0.05 | 0.07 | 0.14 | 0.13 |
| 0.17 | 0.11 | 0.05 | 0.09 | 0.12 | 0.12 | 0.14 | 0.07 | 0.05 | 0.01 | 0.02 | 0.03 | 0.04 | 0.08 | 0.15 | 0.14 |
| 0.77 | 0.42 | 0.38 | 0.32 | 0.59 | 0.47 | 0.56 | 0.35 | 0.27 | 0.12 | 0.15 | 0.22 | 0.36 | 0.56 | 0.69 | 0.66 |
| 0.25 | 0.13 | 0.15 | 0.12 | 0.25 | 0.22 | 0.24 | 0.29 | 0.29 | 0.12 | 0.17 | 0.25 | 0.48 | 0.55 | 0.52 | 0.26 |
| 0.11 | 0.06 | 0.05 | 0.05 | 0.14 | 0.12 | 0.21 | 0.19 | 0.29 | 0.16 | 0.16 | 0.26 | 0.59 | 0.59 | 0.35 | 0.17 |
| 0.05 | 0.02 | 0.03 | 0.03 | 0.07 | 0.06 | 0.09 | 0.10 | 0.13 | 0.06 | 0.07 | 0.12 | 0.43 | 0.31 | 0.14 | 0.07 |
| 0.38 | 0.27 | 0.12 | 0.05 | 0.13 | 0.13 | 0.15 | 0.15 | 0.14 | 0.06 | 0.14 | 0.28 | 0.27 | 0.29 | 0.34 | 0.24 |
| 0.11 | 0.08 | 0.03 | 0.01 | 0.05 | 0.06 | 0.06 | 0.06 | 0.03 | 0.02 | 0.04 | 0.06 | 0.09 | 0.10 | 0.12 | 0.07 |
| 0.10 | 0.06 | 0.04 | 0.02 | 0.04 | 0.03 | 0.06 | 0.04 | 0.04 | 0.02 | 0.02 | 0.04 | 0.07 | 0.08 | 0.12 | 0.06 |
| 0.40 | 0.26 | 0.16 | 0.08 | 0.19 | 0.17 | 0.30 | 0.25 | 0.19 | 0.10 | 0.19 | 0.22 | 0.55 | 0.81 | 0.75 | 0.34 |
| 0.19 | 0.10 | 0.05 | 0.05 | 0.12 | 0.15 | 0.19 | 0.21 | 0.23 | 0.12 | 0.16 | 0.28 | 0.86 | 0.82 | 0.57 | 0.24 |
| 0.09 | 0.04 | 0.03 | 0.02 | 0.06 | 0.08 | 0.11 | 0.18 | 0.18 | 0.10 | 0.12 | 0.25 | 0.80 | 0.91 | 0.41 | 0.12 |
| 0.02 | 0.01 | 0.01 | 0.01 | 0.02 | 0.02 | 0.05 | 0.07 | 0.07 | 0.02 | 0.04 | 0.08 | 0.44 | 0.52 | 0.17 | 0.03 |
| 0.11 | 0.12 | 0.06 | 0.02 | 0.01 | 0.02 | 0.03 | 0.08 | 0.06 | 0.06 | 0.09 | 0.26 | 0.25 | 0.25 | 0.30 | 0.08 |
| 0.04 | 0.04 | 0.02 | 0.01 | 0.01 | 0.01 | 0.01 | 0.02 | 0.02 | 0.01 | 0.03 | 0.05 | 0.06 | 0.09 | 0.07 | 0.04 |
| 0.03 | 0.02 | 0.02 | 0.01 | 0.01 | 0.00 | 0.01 | 0.02 | 0.03 | 0.01 | 0.02 | 0.06 | 0.08 | 0.11 | 0.07 | 0.01 |
| 0.20 | 0.12 | 0.05 | 0.01 | 0.05 | 0.04 | 0.11 | 0.17 | 0.16 | 0.11 | 0.16 | 0.29 | 0.58 | 0.92 | 0.54 | 0.11 |
| 0.14 | 0.07 | 0.03 | 0.02 | 0.04 | 0.06 | 0.12 | 0.16 | 0.15 | 0.09 | 0.15 | 0.30 | 1.32 | 1.32 | 0.57 | 0.12 |
| 0.04 | 0.02 | 0.01 | 0.01 | 0.02 | 0.02 | 0.06 | 0.11 | 0.10 | 0.04 | 0.09 | 0.17 | 0.85 | 0.90 | 0.31 | 0.07 |
| 0.01 | 0.00 | 0.00 | 0.00 | 0.01 | 0.01 | 0.01 | 0.04 | 0.05 | 0.01 | 0.01 | 0.06 | 0.32 | 0.46 | 0.09 | 0.01 |
| 0.04 | 0.04 | 0.03 | 0.01 | 0.00 | 0.00 | 0.01 | 0.01 | 0.02 | 0.02 | 0.07 | 0.14 | 0.16 | 0.15 | 0.23 | 0.02 |
| 0.02 | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 0.01 | 0.01 | 0.01 | 0.01 | 0.02 | 0.06 | 0.04 | 0.05 | 0.07 | 0.00 |
| 0.01 | 0.02 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.02 | 0.01 | 0.01 | 0.04 | 0.04 | 0.04 | 0.05 | 0.00 |
| 0.08 | 0.07 | 0.02 | 0.01 | 0.01 | 0.01 | 0.04 | 0.09 | 0.08 | 0.07 | 0.18 | 0.27 | 0.44 | 0.79 | 0.32 | 0.04 |
| 0.07 | 0.08 | 0.01 | 0.01 | 0.01 | 0.01 | 0.06 | 0.08 | 0.08 | 0.08 | 0.12 | 0.23 | 1.08 | 1.49 | 0.40 | 0.04 |
| 0.02 | 0.02 | 0.00 | 0.01 | 0.01 | 0.01 | 0.02 | 0.04 | 0.04 | 0.01 | 0.02 | 0.07 | 0.49 | 0.62 | 0.13 | 0.02 |
| 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 | 0.01 | 0.00 | 0.01 | 0.02 | 0.11 | 0.19 | 0.03 | 0.00 |
| 0.01 | 0.02 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.01 | 0.04 | 0.13 | 0.09 | 0.09 | 0.19 | 0.00 |
| 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.03 | 0.04 | 0.02 | 0.03 | 0.05 | 0.00 |
| 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 | 0.03 | 0.02 | 0.03 | 0.04 | 0.00 |
| 0.03 | 0.04 | 0.01 | 0.01 | 0.01 | 0.00 | 0.02 | 0.02 | 0.04 | 0.08 | 0.13 | 0.26 | 0.33 | 0.78 | 0.38 | 0.02 |
| 0.07 | 0.10 | 0.02 | 0.00 | 0.01 | 0.00 | 0.04 | 0.04 | 0.05 | 0.04 | 0.10 | 0.21 | 0.64 | 1.63 | 0.34 | 0.02 |
| 0.02 | 0.03 | 0.00 | 0.00 | 0.01 | 0.01 | 0.02 | 0.03 | 0.02 | 0.00 | 0.01 | 0.04 | 0.23 | 0.38 | 0.06 | 0.01 |
| 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.04 | 0.09 | 0.01 | 0.00 |
| 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.02 | 0.07 | 0.04 | 0.03 | 0.07 | 0.00 |
| 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.01 | 0.01 | 0.01 | 0.02 | 0.02 | 0.00 |
| 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 | 0.02 | 0.00 | 0.01 | 0.02 | 0.00 |
| 0.01 | 0.03 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.01 | 0.01 | 0.04 | 0.13 | 0.14 | 0.09 | 0.49 | 0.21 | 0.01 |

97.13537.1153

TABLE E-2 (CONT)

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.03 | 0.06 | 0.01 | 0.00 | 0.00 | 0.00 | 0.01 | 0.02 | 0.01 | 0.03 | 0.10 | 0.14 | 0.17 | 0.74 | 0.18 | 0.00 |
| 0.02 | 0.03 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 0.06 | 0.10 | 0.01 | 0.00 |
| 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.02 | 0.00 | 0.00 |
| 0.02 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.03 | 0.01 | 0.01 | 0.02 | 0.00 |
| 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.01 | 0.01 | 0.00 | 0.01 | 0.00 |
| 0.01 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.02 | 0.00 | 0.01 | 0.01 | 0.00 |
| 0.02 | 0.06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.03 | 0.12 | 0.11 | 0.08 | 0.14 | 0.07 | 0.00 |
| 0.02 | 0.05 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 | 0.00 | 0.03 | 0.07 | 0.06 | 0.04 | 0.17 | 0.05 | 0.00 |
| 0.02 | 0.04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.02 | 0.00 | 0.00 |
| 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

## TABLE E-3

## HANFORD OFF SITE POPULATION DATA

Population within 80 km of the Hanford 200 Area, 1990 Census (Beck, et al 1991)
Created 10/21/91 KR, Revised 2/4/92 KR

| | | | | | | | | | | Sector Total | Direction |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 0 | 0 | 2842 | 1622 | 237 | 1144 | 5845 | S |
| 0 | 0 | 0 | 0 | 0 | 0 | 713 | 11983 | 503 | 738 | 13937 | SSW |
| 0 | 0 | 0 | 0 | 0 | 0 | 1308 | 19589 | 1132 | 637 | 22666 | SW |
| 0 | 0 | 0 | 0 | 0 | 0 | 1956 | 5406 | 16336 | 7525 | 31223 | WSW |
| 0 | 0 | 0 | 0 | 0 | 0 | 771 | 1295 | 6269 | 94203 | 102538 | W |
| 0 | 0 | 0 | 0 | 0 | 0 | 641 | 1087 | 1189 | 2375 | 5292 | WNW |
| 0 | 0 | 0 | 0 | 0 | 0 | 548 | 738 | 784 | 809 | 2879 | NW |
| 0 | 0 | 0 | 0 | 0 | 0 | 544 | 909 | 876 | 4979 | 7308 | NNW |
| 0 | 0 | 0 | 0 | 0 | 0 | 434 | 822 | 969 | 2418 | 4643 | N |
| 0 | 0 | 0 | 0 | 0 | 0 | 268 | 1030 | 5220 | 17567 | 24085 | NNE |
| 0 | 0 | 0 | 0 | 0 | 0 | 393 | 6176 | 2658 | 1145 | 10372 | NE |
| 0 | 0 | 0 | 0 | 0 | 0 | 423 | 1217 | 1652 | 664 | 3956 | ENE |
| 0 | 0 | 0 | 0 | 0 | 0 | 452 | 1373 | 1416 | 751 | 3992 | E |
| 0 | 0 | 0 | 0 | 0 | 0 | 289 | 1674 | 270 | 767 | 3000 | ESE |
| 0 | 0 | 0 | 0 | 0 | 0 | 1141 | 35519 | 73156 | 4918 | 114734 | SE |
| 0 | 0 | 0 | 0 | 0 | 0 | 2796 | 8309 | 2394 | 5891 | 19390 | SSE |

Population Total

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 0 | 0 | 15519 | 98749 | 115061 | 146531 | 375860 |

| Distance (mi) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 0-1 | 1-2 | 2-3 | 3-4 | 4-5 | 5-10 | 10-20 | 20-30 | 30-40 | 40-50 | TOTAL |
| Midpoint (m) | | | | | | | | | | |
| 805 | 2414 | 4023 | 5633 | 7242 | 12070 | 24140 | 40234 | 56327 | 72421 | |

# TABLE C-1
# HANFORD TANK FARM DATABASE

| NO. | TANK I.D. | TANK TYPE | E/W | START DATE (YR) | AGE (YRS) | LEAKER (NO/YES;YR) | LEAK SIZE (Kgal) | STABILIZED (YR) | SUPERNATANT LIQ Kgal | SUPERNATANT LIQ TYPE | INTER. LIQUIDS (Kgal) INTERS | TOTAL LIQUIDS (Kgal) | SOLIDS (Kgal) DSS | SOLIDS (Kgal) SLUDGE | SOLIDS (Kgal) SALT | TOTAL SOLIDS (Kgal) | TOTAL WASTE (Kgal) | % MOIST. | ISOLATED | HI TEMP READING 8/91 | HI TEMP READING 12/91 | HI TEMP READING 7/92 | FECN (x1000 g mol) 12/91 | HT LD(BTU/HR) 12/91 | HT LD(BTU/HR) 7/92 | WATCH LISTS HYD | WATCH LISTS ORG | WATCH LISTS FECN | WATCH LISTS HEAT | Level Measurement Method | Level Measurement Frequency | Ventilation |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | A-101 | 100 | E | 55 | 37 | N | | - | 0 | DSSF | 412 | 413 | | 3 | 950 | 953 | 953 | 47% | P | 155 | 152 | 150 | | | | X | | | | M | W | P |
| 2 | A-102 | 100 | E | 55 | 37 | N | | IS | 4 | DSSF | 2 | 6 | | 15 | 22 | 37 | 41 | 19% | P | | 92 | 91 | | | | | | | | I | W | P |
| 3 | A-103 | 100 | E | 55 | 37 | Y(87) | 5.5 | IS(80) | 4 | DSSF | 13 | 17 | | 366 | 0 | 366 | 370 | 8% | I | | 117 | 115 | | | | | | | | I | M | P |
| 4 | A-104 | 100 | E | 55 | 37 | Y(75) | 2.5 | IS(78) | 0 | NCPLX | 0 | 0 | | 28 | 0 | 28 | 28 | 0% | I | 188 | 183 | 187 | | 80000 | 80000 | | | | X | M | Q | P |
| 5 | A-105 | 100 | E | 55 | 37 | Y(63) | 277* | IS(79) | 0 | NCPLX | 4 | 4 | | 19 | 0 | 19 | 19 | 21% | I | 133 | 132 | 150 | | 80000 | 80000 | | | | X | M | Q | P |
| 6 | A-106 | 100 | E | 55 | 37 | N | | IS | 0 | CP | 7 | 7 | | 125 | 0 | 125 | 125 | 6% | I | | 130 | | | | | | | | | I | Q | P |
| 7 | AN-101 | DST | W | 81 | 11 | N | | - | 539 | DN | 0 | 539 | 0 | 0 | 0 | 0 | 539 | 100% | | | | | | | | | | | | | | AN |
| 8 | AN-102 | DST | W | 81 | 11 | N | | - | 1012 | CC | 3 | 1015 | 0 | 89 | 0 | 89 | 1101 | 92% | | | | | | | | | | | | | | AN |
| 9 | AN-103 | DST | W | 81 | 11 | N | | - | 15 | DSS | 0 | 15 | 937 | 0 | 0 | 937 | 952 | 2% | | 112 | 113 | 112 | | | | X | | | | | | AN |
| 10 | AN-104 | DST | W | 81 | 11 | N | | - | 801 | DSSF | 28 | 829 | 0 | 264 | 0 | 264 | 1093 | 78% | | 116 | 114 | 116 | | | | X | | | | | | AN |
| 11 | AN-105 | DST | W | 81 | 11 | N | | - | 1129 | DSSF | 0 | 1129 | 0 | 0 | 0 | 0 | 1129 | 100% | | 105 | 108 | 105 | | | | X | | | | | | AN |
| 12 | AN-106 | DST | W | 81 | 11 | N | | - | 6 | CP | 0 | 6 | 0 | 17 | 0 | 17 | 23 | 26% | | | | | | | | | | | | | | AN |
| 13 | AN-107 | DST | W | 81 | 11 | N | | - | 932 | CC | 9 | 941 | 0 | 124 | 0 | 124 | 1065 | 88% | | | | | | | | | | | | | | AN |
| 14 | AP-101 | DST | W | 86 | 6 | N | | - | 1081 | DN | 0 | 1081 | 0 | 0 | 0 | 0 | 1081 | 100% | | | | | | | | | | | | | | AP |
| 15 | AP-102 | DST | W | 86 | 6 | N | | - | 1107 | DN | 0 | 1107 | 0 | 0 | 0 | 0 | 1107 | 100% | | | | | | | | | | | | | | AP |
| 16 | AP-103 | DST | W | 86 | 6 | N | | - | 1132 | DN | 0 | 1132 | 0 | 0 | 0 | 0 | 1132 | 100% | | | | | | | | | | | | | | AP |
| 17 | AP-104 | DST | W | 86 | 6 | N | | - | 19 | DN | 0 | 19 | 0 | 0 | 0 | 0 | 19 | 100% | | | | | | | | | | | | | | AP |
| 18 | AP-105 | DST | W | 86 | 6 | N | | - | 821 | DSSF | 0 | 821 | 0 | 0 | 0 | 0 | 821 | 100% | | | | | | | | | | | | | | AP |
| 19 | AP-106 | DST | W | 86 | 6 | N | | - | 1129 | DN | 0 | 1129 | 0 | 0 | 0 | 0 | 1129 | 100% | | | | | | | | | | | | | | AP |
| 20 | AP-107 | DST | W | 86 | 6 | N | | - | 1115 | DN | 0 | 1115 | 0 | 0 | 0 | 0 | 1115 | 100% | | | | | | | | | | | | | | AP |
| 21 | AP-108 | DST | W | 86 | 6 | N | | - | 981 | DN | 0 | 981 | 0 | 0 | 0 | 0 | 981 | 100% | | | | | | | | | | | | | | AP |
| 22 | AW-101 | DST | W | 80 | 12 | N | | - | 1067 | DSSF | 2 | 1069 | 0 | 84 | 0 | 84 | 1153 | 92% | | | | | | | | | | | | | | AW |
| 23 | AW-102 | DST | W | 80 | 12 | N | | - | 875 | DN | 0 | 875 | 0 | 1 | 0 | 1 | 876 | 100% | | | | | | | | | | | | | | AW |
| 24 | AW-103 | DST | W | 80 | 12 | N | | - | 282 | DN/PD | 37 | 319 | 0 | 363 | 0 | 363 | 682 | 49% | | | | | | | | | | | | | | AW |
| 25 | AW-104 | DST | W | 80 | 12 | N | | - | 834 | DN | 49 | 883 | 0 | 175 | 111 | 286 | 1124 | 78% | | | | | | | | | | | | | | AW |
| 26 | AW-105 | DST | W | 80 | 12 | N | | - | 281 | DN/PD | 29 | 310 | 0 | 287 | 0 | 287 | 598 | 52% | | | | | | | | | | | | | | AW |
| 27 | AW-106 | DST | W | 80 | 12 | N | | - | 778 | DN | 42 | 820 | 0 | 211 | 85 | 296 | 1074 | 76% | | | | | | | | | | | | | | AW |
| 28 | AX-101 | 100 | E | 65 | 27 | N | | - | 0 | DSSF | 320 | 320 | | 3 | 748 | 748 | 748 | 43% | P | 141 | 138 | 140 | | | | X | | | | I | W | N |
| 29 | AX-102 | 100 | E | 65 | 27 | Y(88) | 3 | IS(88) | 3 | CC | 14 | 17 | | 7 | 29 | 36 | 39 | 44% | I | | 77 | | | | | | | | | M | Q | N |
| 30 | AX-103 | 100 | E | 65 | 27 | N | | IS(87) | 0 | CC | 36 | 36 | | 2 | 110 | 112 | 112 | 32% | I | 118 | 118 | 118 | | | | X | | | | I | M | N |
| 31 | AX-104 | 100 | E | 65 | 27 | Y(77) | 8 | IS(81) | 0 | NCPLX | 0 | 0 | | 7 | 0 | 7 | 7 | 0% | I | | 95 | 95 | | | | | | | | M | Q | N |
| 32 | AY-101 | DST | W | 70 | 22 | N | | - | 827 | CC | 2 | 829 | 0 | 83 | 0 | 83 | 910 | 91% | | | | | | | | | | | | | | 702 A |
| 33 | AY-102 | DST | W | 70 | 22 | N | | - | 803 | DN | 0 | 803 | 0 | 32 | 0 | 32 | 835 | 96% | | | | | | | | | | | | | | 702 A |
| 34 | AZ-101 | DST | W | 71 | 21 | N | | - | 837 | AGNG | 0 | 837 | 0 | 35 | 0 | 35 | 872 | 96% | | | | | | | | | | | | | | 702 A |
| 35 | AZ-102 | DST | W | 77 | 15 | N | | - | 867 | AGNG | 3 | 870 | 0 | 92 | 0 | 92 | 962 | 90% | | | | | | | | | | | | | | 702 A |
| 36 | B-101 | 100 | E | 44 | 48 | Y(74) | 0 | IS(81) | 0 | NCPLX | 0 | 0 | | 113 | 0 | 113 | 113 | 5% | I | | 111 | 100 | | | | | | | | I | Q | N |
| 37 | B-102 | 100 | E | 44 | 48 | N | | IS(85) | 4 | NCPLX | 0 | 4 | | 18 | 10 | 28 | 32 | 12% | I | | 78 | 65 | | | | | | | | A | Q | N |
| 38 | B-103 | 100 | E | 44 | 48 | Y(78) | 0 | IS(85) | 0 | NCPLX | 0 | 0 | | 59 | 0 | 59 | 59 | 0% | I | 65 | 65 | 62 | | | | | X | | | I | Q | N |
| 39 | B-104 | 100 | E | 44 | 48 | N | | IS(85) | 1 | NCPLX | 46 | 47 | | 301 | 69 | 370 | 371 | 12% | I | | 65 | 64 | | | | | | | | M | Q | N |
| 40 | B-105 | 100 | E | 44 | 48 | Y(78) | 0 | IS(84) | 0 | NCPLX | 23 | 23 | | 40 | 266 | 306 | 306 | 8% | I | | 65 | | | | | | | | | M | Q | P |
| 41 | B-106 | 100 | E | 44 | 48 | N | | IS(85) | 1 | NCPLX | 6 | 7 | | 116 | 0 | 116 | 117 | 6% | I | | 64 | 63 | | | | | | | | A | Q | N |
| 42 | B-107 | 100 | E | 44 | 48 | Y(80) | 8 | IS(85) | 1 | NCPLX | 12 | 13 | | 165 | 0 | 165 | 166 | 8% | I | | 62 | | | | | | | | | M | Q | N |
| 43 | B-108 | 100 | E | 44 | 48 | N | | IS(85) | 0 | NCPLX | 4 | 4 | | 94 | 0 | 94 | 94 | 4% | I | | 65 | 62 | | | | | | | | I | Q | N |
| 44 | B-109 | 100 | E | 44 | 48 | N | | IS(85) | 0 | NCPLX | 4 | 4 | | 127 | 0 | 127 | 127 | 6% | I | | 65 | 62 | | | | | | | | M | Q | N |
| 45 | B-110 | 100 | E | 44 | 48 | Y(81) | 10 | IS(85) | 1 | NCPLX | 22 | 22 | | 245 | 0 | 245 | 246 | 9% | I | | 65 | 71 | | | | | | | | M | Q | N |
| 46 | B-111 | 100 | E | 44 | 48 | Y(78) | 0 | IS(85) | 1 | NCPLX | 21 | 22 | | 236 | 0 | 236 | 237 | 9% | I | | | 65 | | | | | | | | I | Q | N |
| 47 | B-112 | 100 | E | 44 | 48 | Y(78) | 2 | IS(85) | 3 | NCPLX | 0 | 3 | | 30 | 0 | 30 | 33 | 9% | I | | 67 | 63 | | | | | | | | A | Q | N |
| 48 | B-201 | 200 | E | 44 | 48 | Y(80) | 1.2 | IS(81) | 1 | NCPLX | 3 | 4 | | 28 | 0 | 28 | 29 | 14% | I | | 62 | | | | | | | | | M | Q | N |
| 49 | B-202 | 200 | E | 44 | 48 | N | | IS(85) | 0 | NCPLX | 3 | 3 | | 27 | 0 | 27 | 27 | 11% | I | | 63 | | | | | | | | | M | Q | N |
| 50 | B-203 | 200 | E | 44 | 48 | Y(83) | 0.3 | IS(84) | 1 | NCPLX | 0 | 0 | | 50 | 0 | 50 | 51 | 12% | I | | 62 | | | | | | | | | M | Q | N |
| 51 | B-204 | 200 | E | 44 | 48 | Y(84) | 0.4 | IS(84) | 1 | NCPLX | 0 | 0 | | 49 | 0 | 49 | 50 | 12% | I | | 65 | | | | | | | | | M | Q | N |
| 52 | BX-101 | 100 | E | 47 | 45 | Y(72) | 0 | IS(78) | 1 | NCPLX | 0 | 1 | | 42 | 0 | 42 | 43 | 7% | I | | 71 | | | | | | | | | M | Q | N |
| 53 | BX-102 | 100 | E | 47 | 45 | Y(71) | 70 | IS(78) | 0 | NCPLX | 4 | 4 | | 96 | 0 | 96 | 96 | 6% | I | 71 | 65 | 65 | <1 | <10000 | <10000 | | | X | | M | Q | N |
| 54 | BX-103 | 100 | E | 47 | 45 | N | | IS(83) | 4 | NCPLX | 0 | 4 | | 62 | 0 | 62 | 66 | 6% | I | | | | | | | | | | | A | Q | N |
| 55 | BX-104 | 100 | E | 47 | 45 | N | | IS(89) | 3 | NCPLX | 30 | 33 | | 96 | 0 | 96 | 99 | 33% | I | | | | | | | | | | | A | W | N |
| 56 | BX-105 | 100 | E | 47 | 45 | N | | IS(85) | 8 | NCPLX | 0 | 11 | | 43 | 3 | 46 | 51 | 22% | I | | 71 | | | | | | | | | I | Q | N |
| 57 | BX-106 | 100 | E | 47 | 45 | N | | - | 15 | NCPLX | 0 | 15 | | 31 | 0 | 31 | 46 | 33% | P | 65 | 65 | 65 | <1 | <10000 | <10000 | | | X | | A | W | N |
| 58 | BX-107 | 100 | E | 47 | 45 | N | | IS(90) | 1 | NCPLX | 29 | 30 | | 344 | 0 | 344 | 345 | 8% | P | | | | | | | | | | | I | W | N |
| 59 | BX-108 | 100 | E | 47 | 45 | Y(74) | 2.5 | IS(79) | 0 | NCPLX | 1 | 1 | | 26 | 0 | 26 | 26 | 6% | I | | | | | | | | | | | M | Q | N |
| 60 | BX-109 | 100 | E | 47 | 45 | N | | IS(90) | 0 | NCPLX | 13 | 13 | | 193 | 0 | 193 | 193 | 7% | P | | | | | | | | | | | A | M | N |
| 61 | BX-110 | 100 | E | 47 | 45 | Y(76) | 0 | IS(85) | 1 | NCPLX | 13 | 14 | | 198 | 0 | 198 | 199 | 6% | I/P | 65 | 65 | 63 | <1 | <10000 | <10000 | | | X | | M | M | N |
| 62 | BX-111 | 100 | E | 47 | 45 | Y(84) | 0 | - | 15 | NCPLX | 30 | 45 | | 68 | 143 | 211 | 256 | 30% | P | 73 | 71 | 67 | <1 | <10000 | <10000 | | | X | | M | W | N |
| 63 | BX-112 | 100 | E | 47 | 45 | N | | IS(90) | 1 | NCPLX | 7 | 8 | | 165 | 0 | 165 | 165 | 7% | P | | | | | | | | | | | A | W | N |
| 64 | BY-101 | 100 | E | 49 | 43 | N | | IS(84) | 0 | NCPLX | 1 | 1 | | 109 | 278 | 387 | 387 | 1% | I | 74 | 78 | 73 | <1 | 8200 | 8200 | | | X | | M | M | N |
| 65 | BY-102 | 100 | E | 49 | 43 | N | | - | 0 | NCPLX | 31 | 31 | | 0 | 341 | 341 | 341 | 12% | P | | | | | | | | | | | M | W | N |
| 66 | BY-103 | 100 | E | 49 | 43 | Y(73) | 5 | - | 0 | NCPLX | 150 | 150 | | 5 | 395 | 400 | 400 | 40% | P | 81 | 80* | 73 | 65 | 8800 | 8800 | | | X | | M | W | N |
| 67 | BY-104 | 100 | E | 49 | 43 | N | | IS(85) | 0 | NCPLX | 15 | 15 | | 40 | 365 | 405 | 405 | 4% | I | 130 | 123 | 126 | 63 | 17900 | 3300 | | | X | | M | M | N |
| 68 | BY-105 | 100 | E | 49 | 43 | Y(84) | 0 | - | 0 | NCPLX | 152 | 152 | | 44 | 459 | 503 | 503 | 27% | P | 114 | 113 | 113 | 38 | 32200 | 3300 | | | X | | M | W | N |
| 69 | BY-106 | 100 | E | 49 | 43 | Y(84) | 0 | - | 0 | NCPLX | 231 | 231 | | 95 | 547 | 642 | 642 | 37% | P | 131 | 130 | 128 | 28 | 12200 | 3300 | | | X | | M | W | N |
| 70 | BY-107 | 100 | E | 49 | 43 | Y(84) | 15.1 | IS(79) | 0 | NCPLX | 23 | 23 | | 60 | 266 | 266 | 266 | 7% | I | 83 | 84* | 77 | 42 | 11300 | 11300 | | | X | | M | Q | N |

## TABLE C-1 (CONT)

| NO. | TANK I.D. | TANK TYPE | E/W | START DATE (YR) | AGE (YRS) | LEAKER (NO/YES;YR) | LEAK SIZE (Kgal) | STABILIZED (YR) | SUPERNATANT LIQ Kgal | SUPERNATANT LIQ TYPE | INTER. LIQUIDS (Kgal) [illegible] | TOTAL LIQUIDS (Kgal) | SOLIDS (Kgal) DSS | SOLIDS (Kgal) SLUDGE | SOLIDS (Kgal) SALT | TOTAL SOLIDS (Kgal) | TOTAL WASTE (Kgal) | % MOIST. | ISOLATED | HI TEMP READING 0101 | HI TEMP READING 12101 | HI TEMP READING 7102 | FECN (±1000 g mol) 12101 | HT LD(BTU/HR) 12101 | HT LD(BTU/HR) 7102 | WATCH LISTS HYD | WATCH LISTS ORG | WATCH LISTS FECN | WATCH LISTS HEAT | Level Measurement Method | Level Measurement Frequency | Ventilation |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71 | BY-108 | 100 | E | 49 | 43 | Y(72) | 5 | IS(85) | 0 | NCPLX | 5 | 5 | | 154 | 74 | 228 | 228 | 4% | I | 101 | 102 | 107 | 88 | 23000 | 23000 | | | X | | M | M | BF |
| 72 | BY-109 | 100 | E | 49 | 43 | N | | - | 0 | NCPLX | 83 | 83 | | 83 | 340 | 423 | 423 | 20% | P | | | | | | | | | | | A | W | BF |
| 73 | BY-110 | 100 | E | 49 | 43 | N | | IS(85) | 0 | NCPLX | 0 | 0 | | 103 | 295 | 398 | 398 | 2% | I | 124 | 120 | 120 | 71 | 25200 | 25200 | | | X | | M | M | BF |
| 74 | BY-111 | 100 | E | 49 | 43 | N | | IS(85) | 0 | NCPLX | 0 | 0 | | 21 | 438 | 459 | 459 | 6% | I | 92 | 83 | 88 | 8 | 34200 | 34200 | | | X | | M | M | BF |
| 75 | BY-112 | 100 | E | 49 | 43 | N | | IS(85) | 0 | NCPLX | 0 | 0 | | 0 | 295 | 291 | 291 | 3% | I | 85 | 82 | 88 | 2 | <10000 | <10000 | | | X | | M | M | BF |
| 76 | C-101 | 100 | E | 44 | 48 | Y(80) | 20 | IS(83) | 0 | NCPLX | 3 | 3 | | 88 | 0 | 88 | 88 | 3% | I | | 88 | | | | | | | | | M | Q | BF |
| 77 | C-102 | 100 | E | 44 | 48 | N | | - | 3 | NCPLX | 44 | 47 | | 424 | 0 | 424 | 427 | 11% | P | | | | | | | | | | | I | W | BF |
| 78 | C-103 | 100 | E | 44 | 48 | N | | - | 133 | NCPLX | 0 | 133 | | 62 | 0 | 62 | 195 | 60% | P | 124 | 120 | 124 | | | | | X | | | A | W | BF |
| 79 | C-104 | 100 | E | 44 | 48 | N | | IS(80) | 0 | CC | 11 | 11 | | 295 | 0 | 295 | 295 | 4% | I | | 83 | | | | | | | | | A | W | P |
| 80 | C-105 | 100 | E | 44 | 48 | N | | - | 0 | NCPLX | 11 | 11 | | 150 | 0 | 150 | 150 | 7% | P | 89(2) | 94(2) | 103(2) | | 42000 | 42000 | | | | X | A | D | P |
| 81 | C-106 | 100 | E | 44 | 48 | N | | - | 32 | NCPLX | 16 | 48 | | 197 | 0 | 197 | 229 | 21% | P | 165(2) | 162(2) | 179(2) | | 150000 | 150000 | | | | X | A | D | P |
| 82 | C-107 | 100 | E | 44 | 48 | N | | - | 0 | NCPLX | 33 | 33 | | 337 | 0 | 337 | 337 | 10% | P | | 124 | 123 | | | | | | | | A | W | BF |
| 83 | C-108 | 100 | E | 44 | 48 | N | | IS(84) | 0 | NCPLX | 0 | 0 | | 66 | 0 | 66 | 66 | 6% | I | 76 | 78 | 78 | 28 | <10000 | <10000 | | | X | | M | Q | BF |
| 84 | C-109 | 100 | E | 44 | 48 | N | | IS(83) | 4 | NCPLX | 0 | 4 | | 62 | 0 | 62 | 66 | 6% | I | 81 | 80 | 78 | 30 | <10000 | 3000 | | | X | | M | Q | BF |
| 85 | C-110 | 100 | E | 44 | 48 | Y(84) | 2 | - | 0 | NCPLX | 15 | 15 | | 186 | 0 | 186 | 186 | 8% | P | | 88 | 88 | | | | | | | | M | W | BF |
| 86 | C-111 | 100 | E | 44 | 48 | Y(68) | 5.5 | IS(84) | 0 | NCPLX | 0 | 0 | | 57 | 0 | 57 | 57 | 6% | I | 76 | 76 | 78 | 33 | <10000 | <10000 | | | X | | M | Q | BF |
| 87 | C-112 | 100 | E | 44 | 48 | N | | IS(90) | 0 | NCPLX | 32 | 32 | | 104 | 0 | 104 | 104 | 31% | P | 85 | 88 | 81 | 31 | <10000 | <10000 | | | X | | M | W | BF |
| 88 | C-201 | 200 | E | 44 | 48 | Y(88) | 0.5 | IS(82) | 0 | NCPLX | 0 | 0 | | 2 | 0 | 2 | 2 | 6% | I | | 68 | | | | | | | | | M | Q | BF |
| 89 | C-202 | 200 | E | 44 | 48 | Y(88) | 0.5 | IS(81) | 0 | EMPTY | 0 | 0 | | 1 | 0 | 1 | 1 | 6% | I | | 68 | | | | | | | | | M | Q | BF |
| 90 | C-203 | 200 | E | 44 | 48 | Y(84) | 0.4 | IS(82) | 0 | NCPLX | 0 | 0 | | 5 | 0 | 5 | 5 | 6% | I | | 62 | | | | | | | | | M | Q | BF |
| 91 | C-204 | 200 | E | 44 | 48 | Y(88) | 0.4 | IS(82) | 0 | NCPLX | 0 | 0 | | 3 | 0 | 3 | 3 | 6% | I | | | | | | | | | | | M | Q | BF |
| 92 | S-101 | 100 | W | 51 | 41 | N | | - | 12 | NCPLX | 84 | 96 | | 244 | 171 | 415 | 427 | 22% | P | | 122 | | | | | | | | | I | W | BF |
| 93 | S-102 | 100 | W | 51 | 41 | N | | - | 0 | DSSF | 230 | 230 | | 4 | 545 | 549 | 549 | 42% | P | 109 | 111 | 104 | | | | X | X | | | A | W | BF |
| 94 | S-103 | 100 | W | 51 | 41 | N | | - | 17 | DSSF | 85 | 102 | | 10 | 221 | 231 | 248 | 41% | P | | 81 | 78 | | | | | | | | A | W | BF |
| 95 | S-104 | 100 | W | 51 | 41 | Y(68) | 24 | IS(84) | 1 | NCPLX | 28 | 29 | | 293 | 0 | 293 | 294 | 10% | I | | 112 | 104 | | | | | | | | M | W | BF |
| 96 | S-105 | 100 | W | 51 | 41 | N | | IS(88) | 0 | NCPLX | 38 | 38 | | 2 | 454 | 456 | 456 | 8% | I | | 79 | 77 | | | | | | | | I | W | BF |
| 97 | S-106 | 100 | W | 51 | 41 | N | | - | 0 | NCPLX | 108 | 108 | | 32 | 511 | 543 | 543 | 34% | P | | 87 | 83 | | | | | | | | A | W | BF |
| 98 | S-107 | 100 | W | 51 | 41 | N | | - | 0 | NCPLX | 48 | 81 | | 293 | 68 | 362 | 368 | 14% | P | | 112 | | | | | | | | | A | W | BF |
| 99 | S-108 | 100 | W | 51 | 41 | N | | - | 0 | NCPLX | 122 | 122 | | 4 | 600 | 604 | 604 | 21% | P | | 84 | 81 | | | | | | | | MI | W | BF |
| 100 | S-109 | 100 | W | 51 | 41 | N | | - | 0 | NCPLX | 141 | 141 | | 13 | 555 | 568 | 568 | 25% | P | | 77 | 74 | | | | | | | | I | W | BF |
| 101 | S-110 | 100 | W | 51 | 41 | N | | - | 0 | NCPLX | 118 | 118 | | 131 | 261 | 392 | 392 | 18% | P | | 112 | | | | | | | | | I | W | BF |
| 102 | S-111 | 100 | W | 51 | 41 | N | | - | 10 | NCPLX | 185 | 205 | | 138 | 447 | 585 | 595 | 34% | P | 83 | 87 | 88 | | | | X | | | | A | W | BF |
| 103 | S-112 | 100 | W | 51 | 41 | N | | - | 0 | NCPLX | 134 | 134 | | 6 | 631 | 637 | 637 | 21% | P | 90 | 88 | 83 | | | | X | | | | I | W | BF |
| 104 | SX-101 | 100 | W | 54 | 38 | N | | - | 1 | CC | 158 | 159 | | 112 | 343 | 455 | 456 | 32% | P | 140 | 144 | 138 | | | | X | | | | I | W | P |
| 105 | SX-102 | 100 | W | 54 | 38 | N | | - | 0 | DSSF | 183 | 183 | | 117 | 426 | 543 | 543 | 34% | P | 155 | 158 | 158 | | | | X | | | | I | W | P |
| 106 | SX-103 | 100 | W | 54 | 38 | N | | - | 1 | NCPLX | 226 | 227 | | 115 | 536 | 651 | 652 | 35% | P | 159 | 162 | 176 | | | | X | | | | A | D | P |
| 107 | SX-104 | 100 | W | 54 | 38 | Y(88) | 6 | - | 0 | DSSF | 281 | 281 | | 136 | 478 | 614 | 614 | 37% | P | 174 | 176 | 170 | | | | X | | | | I | W | P |
| 108 | SX-105 | 100 | W | 54 | 38 | N | | - | 0 | DSSF | 281 | 281 | | 73 | 610 | 683 | 683 | 38% | P | 158 | 161 | 160 | | | | X | | | | I | W | P |
| 109 | SX-106 | 100 | W | 54 | 38 | N | | - | 61 | NCPLX | 184 | 245 | | 12 | 465 | 477 | 538 | 47% | P | 107 | 114 | 114 | | | | X | X | | | A | W | P |
| 110 | SX-107 | 100 | W | 54 | 38 | Y(64) | 5 | IS(79) | 0 | NCPLX | 0 | 0 | | 104 | 0 | 104 | 104 | 6% | I | 171 | 172 | 173 | | 42000 | 42000 | | | | X | M | Q | P |
| 111 | SX-108 | 100 | W | 54 | 38 | Y(62) | 35* | IS(79) | 0 | NCPLX | 0 | 0 | | 115 | 0 | 115 | 115 | 6% | I | 194 | 208 | 188 | | 45000 | 45000 | | | | X | M | Q | P |
| 112 | SX-109 | 100 | W | 54 | 38 | Y(65) | 5 | IS(81) | 0 | NCPLX | 10 | 10 | | 250 | 0 | 250 | 250 | 6% | I | 151 | 156 | 146 | | 55000 | 55000 | X* | | | X | M | Q | P |
| 113 | SX-110 | 100 | W | 54 | 38 | Y(76) | 5.5 | IS(79) | 0 | NCPLX | 0 | 0 | | 62 | 0 | 62 | 62 | 6% | I | 176 | 178 | 123 | | 42000 | 42000 | | | | X | M | Q | P |
| 114 | SX-111 | 100 | W | 54 | 38 | Y(74) | 5 | IS(79) | 0 | NCPLX | 2 | 2 | | 125 | 0 | 125 | 125 | 6% | I | 102 | 103 | 101 | | 45000 | 45000 | | | | X | M | Q | P |
| 115 | SX-112 | 100 | W | 54 | 38 | Y(69) | 30 | IS(79) | 0 | NCPLX | 3 | 3 | | 92 | 0 | 92 | 92 | 3% | I | 101 | 101 | 108 | | 42000 | 42000 | | | | X | M | Q | P |
| 116 | SX-113 | 100 | W | 54 | 38 | Y(62) | 15 | IS(78) | 0 | NCPLX | 0 | 0 | | 26 | 0 | 26 | 26 | 6% | I | | 88 | 74 | | | | | | | | M | Q | BF |
| 117 | SX-114 | 100 | W | 54 | 38 | Y(72) | 5 | IS(78) | 0 | NCPLX | 14 | 14 | | 181 | 0 | 181 | 181 | 6% | I | 158 | 193 | 158 | | 55000 | 55000 | | | | X | M | Q | P |
| 118 | SX-115 | 100 | W | 54 | 38 | Y(65) | 50 | IS(78) | 0 | NCPLX | 0 | 0 | | 12 | 0 | 12 | 12 | 6% | I | | | | | | | | | | | M | Q | BF |
| 119 | SY-101 | DST | W | 78 | 14 | N | | - | 88 | CC | 237 | 265 | 530 | 0 | 588 | 1088 | 1118 | 21% | | 131 | 130 | 126 | | | | X | | | | | | BY |
| 120 | SY-102 | DST | W | 78 | 14 | N | | - | 655 | DN/PT | 0 | 655 | 0 | 71 | 0 | 71 | 726 | 90% | | | | | | | | | | | | | | BY |
| 121 | SY-103 | DST | W | 78 | 14 | N | | - | 174 | CC | 0 | 174 | 473 | 0 | 4 | 477 | 751 | 27% | | 116 | 113 | 113 | | | | X | | | | | | BY |
| 122 | T-101 | 100 | W | 44 | 48 | N | | - | 30 | NCPLX | 0 | 130 | | 102 | 0 | 102 | 133 | 28% | P | 73 | 73 | 66 | <1 | <10000 | <10000 | | | X | | A | Q | BF |
| 123 | T-102 | 100 | W | 44 | 48 | N | | IS(84) | 13 | NCPLX | 0 | 13 | | 19 | 0 | 19 | 32 | 41% | I | | | | | | | | | | | A | Q | BF |
| 124 | T-103 | 100 | W | 44 | 48 | Y(74) | 1 | IS(83) | 4 | NCPLX | 0 | 4 | | 23 | 0 | 23 | 27 | 15% | I | | 88 | 88 | | | | | | | | A | Q | BF |
| 125 | T-104 | 100 | W | 44 | 48 | N | | - | 3 | NCPLX | 47 | 50 | | 442 | 0 | 442 | 445 | 11% | P | | 67 | | | | | | | | | M | W | BF |
| 126 | T-105 | 100 | W | 44 | 48 | N | | IS(87) | 0 | NCPLX | 23 | 23 | | 98 | 0 | 98 | 98 | 27% | I | | | | | | | | | | | I | M | BF |
| 127 | T-106 | 100 | W | 44 | 48 | Y(73) | 115 | IS(81) | 2 | NCPLX | 0 | 2 | | 19 | 0 | 19 | 21 | 10% | I | | 66 | 61 | | | | | | | | I | Q | BF |
| 128 | T-107 | 100 | W | 44 | 48 | Y(84) | 5 | - | 0 | NCPLX | 12 | 22 | | 171 | 0 | 171 | 180 | 12% | P | 74 | 78 | 66 | 8 | <10000 | <10000 | | | X | | A | W | BF |
| 129 | T-108 | 100 | W | 44 | 48 | Y(74) | 1 | IS(78) | 0 | NCPLX | 0 | 0 | | 44 | 0 | 44 | 44 | 6% | I | | | | | | | | | | | M | Q | BF |
| 130 | T-109 | 100 | W | 44 | 48 | Y(74) | 1 | IS(84) | 0 | NCPLX | 0 | 0 | | 58 | 0 | 58 | 58 | 6% | I | | | | | | | | | | | I | M | BF |
| 131 | T-110 | 100 | W | 44 | 48 | N | | - | 3 | NCPLX | 38 | 42 | | 376 | 0 | 376 | 379 | 11% | P | 63 | 66 | 62 | | | | X | | | | I | W | BF |
| 132 | T-111 | 100 | W | 44 | 48 | Y(84) | 1 | - | 2 | NCPLX | 48 | 51 | | 456 | 0 | 456 | 458 | 11% | P | | 72 | 68 | | | | | | | | A | Q | BF |
| 133 | T-112 | 100 | W | 44 | 48 | N | | IS(82) | 7 | NCPLX | 0 | 7 | | 60 | 0 | 60 | 67 | 10% | I | | 66 | | | | | | | | | A | Q | BF |
| 134 | T-201 | 200 | W | 44 | 48 | N | | IS(78) | 1 | NCPLX | 3 | 4 | | 28 | 0 | 28 | 29 | 11% | I | | 66 | 62 | | | | | | | | M | Q | BF |
| 135 | T-202 | 200 | W | 44 | 48 | N | | IS(81) | 0 | NCPLX | 2 | 2 | | 21 | 0 | 21 | 21 | 10% | I | | 65 | 61 | | | | | | | | M | Q | BF |
| 136 | T-203 | 200 | W | 44 | 48 | N | | IS(78) | 0 | NCPLX | 4 | 4 | | 35 | 0 | 35 | 35 | 11% | I | | 66 | 63 | | | | | | | | M | Q | BF |
| 137 | T-204 | 200 | W | 44 | 48 | N | | IS(81) | 0 | NCPLX | 4 | 4 | | 38 | 0 | 38 | 38 | 11% | I | | 63 | 63 | | | | | | | | M | Q | BF |
| 138 | TX-101 | 100 | W | 48 | 44 | N | | IS(84) | 3 | NCPLX | 2 | 5 | | 84 | 0 | 84 | 87 | 6% | I | | | | | | | | | | | A | Q | BF |
| 139 | TX-102 | 100 | W | 48 | 44 | N | | IS(84) | 0 | NCPLX | 22 | 22 | | 0 | 113 | 113 | 113 | 12% | I | | | | | | | | | | | M | Q | BF |
| 140 | TX-103 | 100 | W | 48 | 44 | N | | IS(80) | 0 | NCPLX | 15 | 15 | | 157 | 0 | 157 | 157 | 10% | I | | | | | | | | | | | I | Q | BF |

# TABLE C-1 (CONT)

| NO. | TANK I.D. | TANK TYPE | E/W | START DATE (YR) | AGE (YRS) | LEAKER (N=YES; Y=YR) | LEAK SIZE (Kgal) | STABILIZED (YR) | SUPERNATANT LIQ. Kgal | SUPERNATANT LIQ. TYPE | INTER. LIQUIDS (Kgal) | TOTAL LIQUIDS (Kgal) | SOLIDS (Kgal) DRY | SOLIDS (Kgal) SLUDGE | SOLIDS (Kgal) SALT | TOTAL SOLIDS (Kgal) | TOTAL WASTE (Kgal) | % MOIST. | ISO-LATED | HI TEMP READING S101 | HI TEMP READING S101 | HI TEMP READING T102 | PECH (x1000 g mol) | HT LO(BTU/HR) S101 | HT LO(BTU/HR) T102 | WATCH LISTS HYD | WATCH LISTS OPD | WATCH LISTS PECH | WATCH LISTS HEAT | Level Measurement Method | Level Measurement Frequency | Ventilat |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 141 | TX 194 | 100 | W | 48 | 44 | N | | IS(84) | 1 | NCPLX | 14 | 15 | | 0 | 84 | 84 | 85 | 23% | I | | | | | | | | | | | A | Q | W |
| 142 | TX 195 | 100 | W | 48 | 44 | Y(77) | 8 | IS(63) | 0 | NCPLX | 20 | 20 | | 0 | 600 | 600 | 600 | 3% | I | 90 | 101 | 98 | | | | | X | | | M | Q | W |
| 143 | TX 196 | 100 | W | 48 | 44 | N | | IS(77) | 0 | NCPLX | 10 | 10 | | 0 | 483 | 483 | 483 | 3% | I | | | | | | | | | | | M | Q | W |
| 144 | TX 197 | 100 | W | 48 | 44 | Y(84) | 2.8 | IS(78) | 1 | NCPLX | 1 | 2 | | 0 | 38 | 38 | 38 | 8% | I | | | | | | | | | | | A | Q | W |
| 145 | TX 198 | 100 | W | 48 | 44 | N | | IS(63) | 0 | NCPLX | 0 | 0 | | 0 | 134 | 134 | 134 | 0% | I | | | | | | | | | | | I | Q | W |
| 146 | TX 199 | 100 | W | 48 | 44 | N | | IS(63) | 0 | NCPLX | 10 | 10 | | 0 | 384 | 384 | 384 | 3% | I | | | | | | | | | | | I | Q | W |
| 147 | TX 110 | 100 | W | 48 | 44 | Y(77) | 8 | IS(63) | 0 | NCPLX | 18 | 18 | | 0 | 462 | 462 | 462 | 3% | I | | | | | | | | | | | M | Q | W |
| 148 | TX 111 | 100 | W | 48 | 44 | N | | IS(77) | 0 | NCPLX | 9 | 9 | | 0 | 370 | 370 | 370 | 3% | I | | | | | | | | | | | M | Q | W |
| 149 | TX 112 | 100 | W | 48 | 44 | N | | IS(63) | 0 | NCPLX | 24 | 24 | | 0 | 849 | 849 | 849 | 4% | I | | | | | | | | | | | M | Q | W |
| 150 | TX-113 | 100 | W | 48 | 44 | Y(74) | 8 | IS(63) | 0 | NCPLX | 18 | 18 | | 0 | 807 | 807 | 807 | 3% | I | | | | | | | | | | | M | Q | W |
| 151 | TX-114 | 100 | W | 48 | 44 | Y(74) | 8 | IS(63) | 0 | NCPLX | 15 | 15 | | 0 | 535 | 535 | 535 | 3% | I | | | | | | | | | | | M | Q | W |
| 152 | TX 115 | 100 | W | 48 | 44 | Y(77) | 8 | IS(63) | 0 | NCPLX | 15 | 15 | | 0 | 840 | 840 | 840 | 3% | I | | | | | | | | | | | M | Q | W |
| 153 | TX 116 | 100 | W | 48 | 44 | Y(77) | 8 | IS(63) | 0 | NCPLX | 23 | 23 | | 0 | 831 | 831 | 831 | 4% | I | | | | | | | | | | | M | Q | W |
| 154 | TX-117 | 100 | W | 48 | 44 | Y(77) | 8 | IS(63) | 0 | NCPLX | 8 | 8 | | 0 | 828 | 828 | 828 | 1% | I | | | | | | | | | | | M | Q | W |
| 155 | TX 118 | 100 | W | 48 | 44 | N | | IS(63) | 0 | NCPLX | 27 | 27 | | 0 | 347 | 347 | 347 | 8% | I | 74 | 78 | 73 | <1 | 4500 | 4500 | | X | X | | I | Q | W |
| 156 | TY-101 | 100 | W | 52 | 40 | Y(73) | 1 | IS(63) | 0 | NCPLX | 0 | 0 | | 118 | 0 | 118 | 118 | 0% | I | 68 | 71 | 68 | 23 | <10000 | <10000 | | | X | | I | Q | W |
| 157 | TY-102 | 100 | W | 52 | 40 | N | | IS(63) | 0 | NCPLX | 14 | 14 | | 0 | 84 | 84 | 84 | 22% | I | | 85 | | | | | | | | | A | Q | W |
| 158 | TY-103 | 100 | W | 52 | 40 | Y(73) | 2 | IS(63) | 0 | NCPLX | 5 | 5 | | 182 | 0 | 182 | 182 | 3% | I | 78 | 80 | 80 | 28 | <10000 | <10000 | | | X | | I | Q | W |
| 159 | TY-104 | 100 | W | 52 | 40 | Y(81) | 1.4 | IS(63) | 3 | NCPLX | 12 | 15 | | 43 | 0 | 43 | 46 | 33% | I | 71 | 70 | 68 | 12 | <10000 | <10000 | | | X | | A | Q | W |
| 160 | TY 105 | 100 | W | 52 | 40 | Y(80) | 38 | IS(63) | 0 | NCPLX | 0 | 0 | | 231 | 0 | 231 | 231 | 0% | I | | 81 | 80 | | | | | | | | M | Q | W |
| 161 | TY 106 | 200 | W | 52 | 40 | Y(80) | 28 | IS(78) | 0 | NCPLX | 0 | 0 | | 17 | 0 | 17 | 17 | 0% | I | | 83 | 84 | | | | | | | | M | Q | W |
| 162 | U 101 | 100 | W | 44 | 48 | Y(80) | 38 | IS(78) | 3 | NCPLX | 0 | 3 | | 22 | 0 | 22 | 25 | 12% | I | | 87 | 88 | | | | | | | | M | Q | W |
| 163 | U 102 | 100 | W | 44 | 48 | N | | - | 16 | NCPLX | 128 | 144 | | 43 | 313 | 356 | 374 | 39% | P | | 86 | 87 | | | | | | | | I | W | W |
| 164 | U 103 | 100 | W | 44 | 48 | N | | - | 13 | NCPLX | 175 | 188 | | 32 | 423 | 455 | 488 | 40% | P | 90 | 90 | 88 | | | | X | | | | A | W | W |
| 165 | U 104 | 100 | W | 44 | 48 | Y(81) | 8.8 | IS(78) | 0 | NCPLX | 7 | 7 | | 122 | 0 | 122 | 122 | 0% | I | | | | | | | | | | | M | Q | W |
| 166 | U 105 | 100 | W | 44 | 48 | N | | - | 37 | NCPLX | 142 | 179 | | 32 | 369 | 401 | 418 | 43% | P | 82 | 81 | 81 | | | | X | | | | A | W | W |
| 167 | U 106 | 100 | W | 44 | 48 | N | | - | 16 | NCPLX | 83 | 83 | | 28 | 183 | 211 | 226 | 37% | P | 83 | 84 | 81 | | | | | X | | | A | W | W |
| 168 | U 107 | 100 | W | 44 | 48 | N | | - | 31 | DBW | 147 | 178 | | 15 | 360 | 375 | 406 | 44% | P | 81 | 83 | 78 | | | | | X | | | A | W | W |
| 169 | U 108 | 100 | W | 44 | 48 | N | | - | 24 | NCPLX | 172 | 196 | | 38 | 415 | 444 | 468 | 42% | P | 89 | 89 | 88 | | | | X | | | | I | W | W |
| 170 | U 109 | 100 | W | 44 | 48 | N | | - | 19 | NCPLX | 163 | 182 | | 48 | 396 | 444 | 463 | 39% | P | 88 | 88 | 88 | | | | X | | | | A | W | W |
| 171 | U 110 | 100 | W | 44 | 48 | Y(78) | 8.1 | IS(84) | 0 | NCPLX | 15 | 15 | | 188 | 0 | 188 | 188 | 0% | P | | 78 | 77 | | | | | | | | I | M | W |
| 172 | U 111 | 100 | W | 44 | 48 | N | | - | 0 | DBW | 122 | 122 | | 28 | 303 | 329 | 329 | 37% | P | | 81 | 80 | | | | | | | | I | W | W |
| 173 | U 112 | 100 | W | 44 | 48 | Y(80) | 8.8 | IS(78) | 0 | NCPLX | 0 | 0 | | 45 | 0 | 45 | 45 | 0% | I | | 88 | 88 | | | | | | | | M | Q | W |
| 174 | U 201 | 200 | W | 44 | 48 | N | | IS(78) | 1 | NCPLX | 0 | 1 | | 4 | 0 | 4 | 5 | 20% | I | | 88 | | | | | | | | | M | Q | W |
| 175 | U 202 | 200 | W | 44 | 48 | N | | IS(78) | 1 | NCPLX | 0 | 1 | | 4 | 0 | 4 | 5 | 20% | I | | 84 | | | | | | | | | M | Q | W |
| 176 | U 203 | 200 | W | 44 | 48 | N | | IS(78) | 1 | NCPLX | 0 | 1 | | 2 | 0 | 2 | 3 | 33% | I | | | | | | | | | | | M | Q | W |
| 177 | U 204 | 200 | W | 44 | 48 | N | | IS(78) | 1 | NCPLX | 0 | 1 | | 2 | 0 | 2 | 3 | 33% | I | | | | | | | | | | | M | Q | W |

NOTES:

I INTERIM ISOLATED
P PARTIAL INTERIM
S INTERIM STABILIZED

BTU/hr - British Thermal Units per hour
g mol - gram moles
Kgal - thousands of gallons

Temperature - degrees F
Yr - calendar year with the first 2 digits removed
Yrs - number of years

| | |
|---|---|
| DC | Dilute complexed waste. This is characterized by a high content of organic carbon, including organic complexants. |
| DN | Dilute non-complexed. Low-activity liquid waste originating from T and S Plants, 300 and 400 Areas, PUREX (decladding supernatant and miscellaneous wastes), 100 N Area (sulfate waste), B Plant, saltwells, and Plutonium Finishing Plant (supernatant). |
| DSSF | Double-shell slurry feed. Waste evaporated just before reaching the sodium aluminate saturation boundary or 6.5 M hydroxide in the evaporator. This form is not as concentrated as DSS. |
| EMPTY | Has no contents. |
| NCPLX | Non-complexed. General waste term applied to all site liquors not identified as complexed. |
| PD | PUREX decladding or Neutralized Cladding Removal Waste (NCRW). It is the solids portion of the PUREX neutralized cladding removal waste stream, received into tanks as a slurry. It is classified as transuranic waste. |
| PT | Plutonium Finishing Plant transuranic solids, which originate from West Area operations. |

Found within the solids and precipitate below the supernatant is (interstitial) liquid. This is a drainable volume whose quantity is based on either average porosity values for the solid constituents or actual data. The column labeled Inter. Liquids indicates the measured or calculated volume. The next column, Total Liquids, is the sum of the supernatant volume and the interstitial volume. The resultant amount is also known as the drainable volume.

The other major constituent of the tanks is solids. Solids have been categorized into three main groups: double-shell slurry, sludge, and saltcake. These terms are defined as follows.

| | |
|---|---|
| DSS | Double-shell slurry. Waste evaporated nearly to its sodium aluminate saturation boundary or 6.5 M hydroxide in the evaporator. For reporting purposes, DSS is considered a solid. |
| Saltcake | Results from crystallization and precipitation after concentration of liquid waste, usually in an evaporator. If saltcake is layered over sludge, it is only possible to measure total solids volume. In-tank photographs may be used to estimate the volume. |
| Sludge | Solids formed during sodium hydroxide (NaOH) additions to waste. Sludge usually was in the form of suspended solids when the waste was originally received in the tank from the waste generator. In-tank photographs may be used to estimate the volume. |

The column labeled Solids with Interstitial is subdivided into the above three categories. The quantity indicated is the volume of solids including the interstitial liquid. The quantity of solids without the interstitial liquid volume included is the column labeled Solids. This is the volume attributed to solely the solids as if all of the interstitial liquid had been removed.

The measure of all of the waste in a tank can be found in the column titled Total Waste. This is a calculated field in that it is the sum of the Total Liquids column and the Solids column. In other words, the total waste is the sum of all of the liquids (supernatant and interstitial) and all of the solids (DSS, sludge, and salt).

All of the SSTs have been isolated to some degree to minimize the further addition of waste. Two degrees of isolation have been established: partially interim isolated and interim isolated. Interim isolated (I) means that all of the physical efforts needed to minimize the further addition of waste to a tank have been completed. Partially interim isolated (P) means that all of the efforts to minimize the further addition of waste to a tank have been performed, except that risers and piping needed for tank stabilization have not been isolated. The column titled Isolated indicates which degree of isolation has been performed for each tank. DSTs have not been isolated.

Several parameters other than level are being monitored for many tanks. One important parameter is tank temperature, which translates into heat load. The values for several dates can be found in the column titled High Temperature Reading. The associated heat load, if calculated, can be found in the column titled Heat Load.

Many tanks have detectable levels of ferrocyanide (FeCN), and this value is given in the column titled FECN. Those tanks that contain greater than 1000 g-mole of ferrocyanide are placed on the Watch List. The column titled Watch List with the subcolumn title FECN has an "X" for those tanks on the watch list. Other criteria for the Watch List include hydrogen levels above the flammability limit (denoted by the subcolumn title $H_2$), organic salts (subcolumn title ORG) and heat (subcolumn title HEAT).

Each tank is measured periodically for liquid. This is an important measurement because it is used not only to track the inventory of liquid waste at the site, it provides evidence as to whether a tank has been leaking. All of the SSTs are measured by one of three different methods, and these methods are listed in the column titled Level Measurement. The measurements are taken manually (M), automatically (A) or by intrusion (I). The frequency of level measurement varies by tank. The frequencies can either be daily (D), weekly (W), monthly (M) or quarterly (Q).

As the tank volume expands or contracts because of temperature fluctuations or the release of gases, a ventilation system maintains the gas space above the liquid volume constant. Two basic types of tank ventilation systems are used: an active powered system and a passive "breather filter" system. The active powered system takes two forms. One system is a portable, skid-mounted system. The other is a permanent, piped ventilation system that serve a farm. The following designators are used.

| | |
|---|---|
| 702-A | Farms AY and AZ are serviced by ventilation building 702-A. |
| AN | Permanent piped system servicing the AN farm. |
| AP | Permanent piped system servicing the AP farm. |
| AW | Permanent piped system servicing the AW farm. |
| BF | Passive breather filter system. |
| P | Portable, skid mounted, active powered system. |
| SY | Permanent piped system servicing the SY farm. |

The source of each column of information in Table C-1 can be tracked back to the original document via the table of references (Table C-2).

TABLE C-2
TANK DATA REFERENCE CHART

| Subject | Column * | Table(s) | Page | Comment |
|---|---|---|---|---|
| Tank type | 1 | Fig B-8 | B-15/16 | 200 type tanks are smaller radius circles; double shell tanks (DST) are concentric circles; remainder are 100 type. |
| Location E/W | 2 | Fig B-8 | B-15/16 | |
| In-service date | 3 | Fig B-8 | B-15/16 | Assume the tank was placed in service at the end of the construction period. |
| Age (years) | 4 | - | - | Calculated field. |
| Leaker (year) | 5 | H-1 | H-3 to H-6 | Column 2. |
| Leak size (kgal) | 6 | H-1 | H-3 to H-6 | Column 3. |
| Stabilized method (year) | 7 | H-1 | H-3 to H-6 | Column 5 is the date source. |
| | | C-5 | C-9 thru C-18 | Column 4 , first 2 characters for the status. |
| | | 2, 3, 4, 5 | 11, 14, 15, 16 | Addition sources for year. |
| Supernatant liquid (kgal.) | 8A | C-4, 5 | C-6 thru C-18 | 8th and 6th column respectively. |
| Supernatant liquid (type) | 8B | C-4, 5 | C-6 thru C-18 | 2nd column. |
| Interstitial liquid (kgal.) | 9 | C-4, 5 | C-6 thru C-18 | 9th and 7th column respectively. |
| Total liquids (kgal.) | 10 | - | - | Calculated: sum of supernatant and interstitial liquid. |
| Solids (kgal.) DSS | 11A | C-4 | C-6 thru C-8 | 14th column. Applicable to double shell tanks only. |
| Sludge | 11B | C-4, 5 | C-6 thru C-18 | 15th and 12th column respectively. |
| Saltcake | 11C | C-4, 5 | C-6 thru C-18 | 16th and 13th column respectively. |
| Total Solids (kgal.) | 12 | | | DSS + Sludge + Saltcake |
| Total Waste (kgal.) | 13 | - | - | Total solids plus supernatant |
| Moisture (%) | 14 | - | - | Total liquids divided by total waste, multiplied by 100 |
| Isolated (5) | 15 | D-5, D6 | D-9/10, D-11/12 | The status is indicated under the figure for each tank. |

TABLE C-2 (CONT)

| Subject | Column * | Table(s) | Page | Comment |
|---|---|---|---|---|
| High temp. reading: September 1991(3) | 16A | 2, 3, 4, 5 | 5-8 | 2nd column of each. |
| December 1991 | 16B | 2, 3, 4, 5 | 11, 14, 15, 16 | 2nd column of each. |
| July 1992 (1) | 16C | 9 | 19-21 | Column 6. |
| Ferrocyanides (1000g mol) December 1991 | 17 | 2 | 11 | Column 6. |
| Heat load (Btu/h) December 1991 | 18A | 2, 5 | 11, 16 | Column 7 and 6 respectively. |
| July 1992 (1) | 18B | 2, 5 | 6, 12 | Column 7 and 6 respectively. |
| Watch lists Hydrogen | 19A | 1 | 10 | Columns 2, 4, and 6. |
| Organic salts | 19B | 1 | 10 | Columns 2, 4, and 6. |
| Ferrocyanide | 19C | 1 | 10 | Columns 2, 4, and 6. |
| Heat | 19D | 1 | 10 | Columns 2, 4, and 6. |
| Level measurement (4) | 20A, B | 1-25 | 1-349 | Column 2 is the method, column 3 is the frequency. |
| Ventilation (5) | 21 | Hanford Tank Farm Facilities 200 West and East | D-13/14, D-15/16 | The designator is located at 4-o'clock on each tank. |
| Ventilation (4) | | Figures 3-71, 77, 78, 79, 81 | Volume 2 of ISB | These figures depict the configuration of the ventilation systems for farms AN, AP, AW, and SY. |

Notes:
*Column number of tank data table (TANKLEAK.XLS) beginning with Tank Type.

All data are from Ref. 2. except as noted in parenthesis.

## DATA SOURCES


1. B. M. Hanlon, "Tank Farm Surveillance and Waste Status Summary Report for July 1992," Westinghouse Hanford Company report WHC-EP-0182-52.

2. B. M. Hanlon, "Tank Farm Surveillance and Waste Status Summary Report for December 1991," Westinghouse Hanford Company report WHC-EP-0182-45 (March 1992).

3. B. M. Hanlon, "Tank Farm Surveillance and Waste Status Summary Report for September 1991," Westinghouse Hanford Company report WHC-EP-0182-42.

4. "Hanford Tank Farm Interim Safety Basis, August 1993," Westinghouse Hanford Company report WHC-SD-WM-ISB-001, Revision 1.

5. B. M. Hanlon, "Tank Farm Surveillance and Waste Status Summary Report for June 1993," Westinghouse Hanford Company report WHC-EP-0182-63.

# APPENDIX D
# SOURCE-TERM RADIOISOTOPE CONCENTRATION DATA

A tank-by-tank listing of the radioisotope concentrations used in the source terms is given in Table D-1. The source of these data is primarily the WHC Interim Safety Basis document[1] and the ICF Kaiser Historical Tank Content Estimate documents[2,3] with decay corrections to March 1994. Screening analyses were performed for both the airborne and groundwater pathways to establish that the seven radioisotopes listed in the table would give a satisfactory representation of the doses.

In cases where data were given for different layers (e.g., supernate and sludge) the value listed in the table is the mass weighted average of the different layer concentrations. Ideally, it would be desirable to keep track of the separate layer concentrations in developing the source terms; however, because such detailed information was available for only about 15% of the tanks, it was not considered advantageous to do so. References 2 and 3 contain a much more limited data base, in terms of the number of radioisotopes and number of tanks, than Ref. 1. Where data were available from both sources, it was usually averaged unless one of the values appeared to be an outlier.

As discussed in Sec. 6, the dose modeling was based on source terms and release points from four quadrants in the 200 Area of the site. The radioisotope concentrations for each quadrant, based on the averages for the tanks located there, are given in Tables D-2 and D-3. As shown by the statistics in the table, there is a large range in the concentration values going into a specific average and the standard deviations are frequently large.

As an overall check to see if there was a bias in the $^{137}Cs$ and $^{90}Sr$ data comparisons were made for tanks' heating rates estimated by Agnew,[4] based on temperature records, and rates based on the concentrations of those isotopes given in Table D-1. As shown by the results in Table D-4, there is considerable variability in the comparisons; however, the average ratio for tanks with data is 0.85, indicating that there is not a major global error in the data for Sr and Cs.

## REFERENCES

1. "Hanford Site Tank Farm Facilities Interim Safety Basis," Westinghouse Hanford Company report WHC-SD-WM-ISB-001, Rev. 0 (August 1993).

2. "Historical Tank Content Estimate for the Northeast Quadrant of the Hanford 200 East Area," ICF Kaiser Hanford Company report WHC-SD-WM-ER-349, Rev. 0 (June 1994).

3. "Historical Tank Content Estimate for the Southwest Quadrant of the Hanford 200 West Area," ICF Kaiser Hanford Company report WHC-SD-WM-ER-352, Rev. 0 (June 1994).

4. S. Agnew, personal communication (June 1994).

# TABLE D-1
## CONCENTRATIONS OF PRINCIPAL RADIOISOTOPES IN TANKS (CI/KG)

| | AY-101 | AY-102 | AZ-101 | AZ-102 | BY-101 | BY-102 | BY-103 | AN-101 | AN-102 | AN-103 | AN-104 | AN-105 | AN-106 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sr-90 | 5.66E+00 | 1.34E+00 | 1.31E-02 | 3.24E-02 | 1.97E-02 | 5.91E-03 | 2.05E-03 | 1.42E-03 | 1.27E-01 | 7.85E-03 | 8.32E-04 | 1.51E-03 | 3.48E-03 |
| Cs-137 | 7.98E-02 | 1.57E-02 | 1.49E+00 | 6.18E-01 | 3.37E-01 | 1.66E-02 | 1.05E+00 | 1.61E-01 | 4.61E-02 | 4.55E-01 | 4.15E-01 | 2.44E-01 | 2.14E-01 |
| Np-237 | | | 4.26E-07 | | | 1.95E-07 | | 7.80E-06 | | 4.97E-09 | | | |
| Pu-239/240 | | 1.88E-04 | 1.86E-04 | | 9.37E-06 | 1.68E-05 | 3.19E-06 | 3.76E-07 | 1.67E-04 | 1.27E-08 | 8.72E-06 | | |
| Am-241 | | 9.15E-04 | 2.48E-03 | 4.44E-04 | 1.04E-04 | 9.64E-05 | 2.84E-06 | 1.32E-06 | 7.50E-04 | 1.52E-08 | | | |
| Tc-99 | | 2.51E-05 | 3.35E-04 | | | 2.23E-05 | | | 3.46E-04 | 1.13E-04 | | | 7.19E-05 |
| I-129 | | 1.20E-06 | 5.99E-07 | | | 2.40E-07 | | | | 3.53E-07 | | | 1.70E-07 |

| | AN-107 | AP-101 | AP-102 | AP-103 | AP-104 | AP-105 | AP-106 | AP-107 | AP-108 | AW-101 | AW-102 | AW-103 | AW-104 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sr-90 | 1.01E-01 | | | 7.86E-08 | 2.43E-08 | | | | | 8.49E-04 | 1.41E-04 | | 2.44E-02 |
| Cs-137 | 2.44E-01 | | 3.64E-07 | 4.47E-06 | 4.34E-07 | | | | | 3.74E-01 | 5.83E-05 | | 5.80E-01 |
| Np-237 | | | | 2.57E-08 | 3.25E-10 | | | | | 1.83E-06 | 1.83E-08 | | |
| Pu-239/240 | 8.47E-05 | | | 2.38E-08 | 1.09E-06 | | | | | 9.49E-08 | 2.23E-08 | 5.97E-04 | |
| Am-241 | 6.32E-04 | | 6.24E-09 | 1.81E-06 | 6.58E-10 | | | | | 2.52E-05 | 4.13E-06 | 8.48E-05 | |
| Tc-99 | | | | | 4.08E-08 | | | | | 1.29E-04 | | 6.96E-06 | |
| I-129 | | | | | 2.86E-08 | | | | | 2.57E-07 | | 2.12E-08 | |

| | AW-105 | AW-106 | T-101 | T-102 | T-103 | T-104 | T-105 | T-106 | T-107 | T-108 | T-109 | T-110 | T-111 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sr-90 | 2.07E-05 | 1.56E-02 | 3.72E-05 | 2.02E-04 | 1.18E-01 | 3.53E-03 | | 3.14E-01 | 2.44E-04 | | 1.93E-04 | 1.71E-03 | |
| Cs-137 | 7.70E-03 | 1.41E-01 | | 2.02E-03 | 1.19E-02 | | 3.11E-04 | 2.66E-01 | 1.65E-02 | 1.25E-02 | 1.42E-02 | 8.47E-14 | 5.74E-04 |
| Np-237 | 5.18E-06 | 1.84E-08 | | 5.49E-09 | 3.89E-08 | | | | | | 2.14E-08 | 3.27E-09 | |
| Pu-239/240 | 5.63E-05 | 2.29E-07 | 1.29E-07 | 1.78E-10 | 7.78E-07 | 2.49E-04 | | 3.38E-04 | 1.00E-05 | | 1.72E-06 | 1.02E-04 | |
| Am-241 | 1.45E-05 | | 9.34E-08 | 1.10E-05 | 5.79E-05 | | | | 9.92E-06 | | 6.17E-08 | 3.74E-06 | |
| Tc-99 | | | 8.92E-05 | 5.49E-06 | 4.66E-05 | | | | | | 6.08E-06 | 4.65E-17 | |
| I-129 | | | | 1.10E-08 | 6.54E-08 | | | | | | 9.03E-09 | 3.77E-20 | |

| | T-112 | T-201 | T-202 | T-203 | T-204 | TY-101 | TY-102 | TY-103 | TY-104 | TY-105 | TY-106 | U-101 | U-102 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sr-90 | | | | | 9.49E-05 | 1.00E-02 | 3.69E-03 | 9.27E-02 | 2.27E-05 | 1.65E-01 | 1.31E-01 | 1.40E-01 | 2.64E-02 |
| Cs-137 | | | | | 8.42E-06 | 2.31E-04 | 4.11E-03 | 2.01E-02 | 7.79E-02 | 7.74E-03 | 1.37E-05 | 1.91E-01 | 7.19E-02 |
| Np-237 | | | 3.40E-12 | 2.04E-11 | | | | | | | | 5.71E-07 | |
| Pu-239/240 | 1.48E-06 | | 2.95E-06 | 1.76E-05 | 7.54E-05 | | | 1.77E-04 | 1.36E-04 | 2.42E-05 | 2.12E-05 | 7.05E-05 | 1.32E-05 |
| Am-241 | 1.73E-06 | | 4.32E-07 | 2.56E-06 | | 1.28E-05 | 1.20E-05 | 2.64E-05 | 2.20E-05 | 2.11E-05 | 1.40E-05 | 6.28E-05 | |
| Tc-99 | | | | | | 7.36E-06 | 7.88E-07 | 1.51E-05 | 2.40E-05 | 3.29E-05 | 2.32E-04 | 1.41E-04 | |
| I-129 | | | | | | 4.70E-08 | 1.90E-08 | 4.90E-05 | 4.70E-05 | 3.44E-08 | 1.20E-04 | 2.09E-07 | |

| | U-103 | U-104 | U-105 | U-106 | U-107 | U-108 | U-109 | U-110 | U-111 | U-112 | U-201 | U-202 | U-203 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sr-90 | 7.60E-03 | 1.08E-01 | 9.05E-03 | 2.16E-01 | 2.19E-02 | 9.47E-03 | 5.96E-03 | 1.35E-01 | 1.22E-02 | 5.08E-02 | 6.37E-04 | 6.37E-04 | 1.48E-02 |
| Cs-137 | 1.17E-01 | 1.05E-03 | 9.35E-02 | 1.09E-01 | 1.08E-01 | 1.18E-01 | 1.16E-01 | 7.54E-04 | 1.27E-01 | 1.67E-01 | 6.41E-01 | 6.41E-01 | 2.77E-05 |
| Np-237 | 1.12E-11 | 5.84E-16 | 1.71E-11 | | | 4.89E-11 | 3.80E-09 | 1.78E-09 | | 3.60E-07 | 7.04E-07 | 7.04E-07 | |
| Pu-239/240 | 4.25E-06 | 6.20E-05 | 4.86E-06 | 1.01E-05 | 3.29E-04 | 6.56E-05 | 6.30E-05 | 4.38E-05 | 1.16E-05 | 1.63E-04 | 1.27E-03 | 1.27E-03 | 2.53E-03 |
| Am-241 | 3.76E-11 | 1.59E-13 | 8.40E-08 | | | 3.35E-06 | 1.12E-08 | 9.37E-05 | | 1.85E-06 | 4.15E-09 | 4.15E-09 | |
| Tc-99 | 2.54E-09 | 1.44E-13 | 4.22E-09 | | | 7.52E-09 | 2.26E-06 | 2.80E-07 | | 1.07E-04 | 3.76E-09 | 1.81E-04 | |
| I-129 | 3.76E-12 | 2.89E-16 | 8.44E-12 | | | 1.12E-11 | 1.13E-11 | 4.85E-10 | | 1.85E-07 | 6.51E-12 | 2.86E-07 | |

| | U-204 | BX-101 | BX-102 | BX-103 | BX-104 | BX-105 | BX-106 | BX-107 | BX-108 | BX-109 | BX-110 | BX-111 | BX-112 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sr-90 | 2.50E-06 | 1.92E+00 | 1.94E-01 | 9.06E-02 | 1.24E-01 | 1.71E-01 | 1.08E-01 | 3.16E-03 | 1.98E-02 | 3.14E-02 | 2.47E-03 | 4.81E-04 | 2.84E-03 |
| Cs-137 | 2.59E-03 | 2.40E-02 | 2.49E-01 | 5.14E-02 | 4.81E-01 | 3.82E-02 | 3.70E-02 | 9.59E-03 | 1.87E-03 | 5.23E-03 | 7.18E-02 | 1.88E-01 | 2.01E-02 |
| Np-237 | | | 1.64E-06 | | 1.78E-05 | | | | 3.47E-09 | | | | |
| Pu-239/240 | 1.27E-03 | 2.81E-04 | 2.50E-04 | 4.40E-04 | 1.31E-04 | 2.18E-04 | 6.16E-05 | 4.59E-05 | 4.17E-05 | 2.20E-05 | 1.71E-05 | 3.09E-06 | 2.23E-05 |
| Am-241 | | | 1.29E-03 | | 3.56E-05 | 1.06E-03 | 2.43E-07 | 2.03E-07 | 2.01E-06 | 1.17E-07 | 1.89E-07 | 9.52E-08 | 9.84E-07 |
| Tc-99 | | | 1.09E-03 | | 5.28E-03 | 4.95E-05 | | | 6.76E-07 | | | | |
| I-129 | | | 1.83E-06 | | 9.15E-06 | 3.28E-08 | | | 1.35E-09 | | | | |

ok spaces in table denotes no data available

## TABLE D-1 (CONT)

| | A-101 | A-102 | A-103 | A-104 | A-105 | A-106 | AX-101 | AX-102 | AX-103 | AX-104 | TX-101 | TX-102 | TX-103 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sr-90 | 1.92E-02 | 1.39E+01 | 2.51E-02 | 1.41E+01 | 7.35E+00 | 1.00E+00 | 1.08E-01 | 1.80E+00 | 9.34E-01 | 26.85 | 1.49E-02 | | 1.08E-03 |
| Cs-137 | 1.57E-01 | 6.89E-01 | 1.37E-02 | 9.15E-02 | 4.05E-01 | 1.00E-01 | 8.00E-02 | 1.69E-01 | 5.18E-02 | 6.66E-01 | 1.29E-10 | 2.19E-01 | 1.16E-03 |
| Np-237 | | 1.28E-06 | 4.76E-09 | 2.93E-08 | 3.75E-07 | 1.41E-09 | 1.20E-12 | | 3.14E-08 | | 1.64E-14 | | |
| Pu-239/240 | 3.40E-06 | 8.86E-04 | 1.11E-04 | 5.11E-03 | 1.31E-03 | 1.61E-03 | 6.40E-05 | 2.57E-03 | 1.50E-04 | 4.23E-03 | 1.09E-09 | | 3.36E-05 |
| Am-241 | | 1.28E-02 | 2.43E-04 | 5.06E-03 | 9.19E-11 | 4.15E-04 | 6.94E-06 | 8.40E-04 | 3.14E-05 | | 2.02E-09 | | |
| Tc-99 | | 8.59E-04 | 3.35E-05 | 3.74E-22 | 9.26E-05 | 2.82E-13 | 4.71E-15 | | 1.57E-05 | | 2.02E-13 | | |
| I-129 | | 1.28E-06 | 4.76E-08 | 6.29E-25 | 9.26E-08 | 4.18E-16 | 2.35E-18 | | 3.14E-08 | | 1.81E-16 | | |

| | TX-104 | TX-105 | TX-106 | TX-107 | TX-108 | TX-109 | TX-110 | TX-111 | TX-112 | TX-113 | TX-114 | TX-115 | TX-116 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sr-90 | | 7.77E-04 | 1.81E-12 | 4.44E-09 | 6.11E-03 | 4.95E-02 | 3.46E-02 | 2.21E-02 | 2.01E-03 | 2.13E-03 | 2.41E-03 | 7.41E-03 | 1.03E-02 |
| Cs-137 | 1.56E-01 | 5.26E-03 | 1.05E-02 | 4.46E-09 | 1.19E-01 | 3.72E-01 | 1.40E-01 | 3.86E-02 | 1.74E-02 | 5.28E-03 | 2.10E-02 | 1.01E-02 | 5.08E-03 |
| Np-237 | | 5.78E-08 | 1.58E-08 | 9.80E-15 | 1.07E-07 | 9.17E-07 | 3.10E-07 | 4.76E-08 | 2.20E-08 | 8.61E-09 | 2.67E-08 | 8.18E-09 | 5.59E-09 |
| Pu-239/240 | | 2.42E-10 | 2.74E-12 | 5.29E-12 | 9.24E-07 | 1.06E-04 | 4.54E-06 | 5.67E-07 | 1.84E-08 | 8.35E-08 | 1.96E-06 | 1.64E-07 | 2.11E-13 |
| Am-241 | | 8.58E-10 | 2.30E-11 | 3.29E-12 | 1.30E-06 | 5.92E-07 | 1.64E-05 | 2.43E-06 | 8.02E-08 | 7.04E-06 | 1.94E-07 | 1.92E-08 | 2.63E-09 |
| Tc-99 | | 2.89E-05 | 3.68E-06 | 2.51E-12 | 5.32E-05 | 4.09E-04 | 1.13E-04 | 2.44E-05 | 5.43E-06 | 2.35E-06 | 9.77E-09 | 2.75E-06 | 1.66E-06 |
| I-129 | | 2.89E-08 | 3.89E-09 | 2.52E-15 | 7.82E-08 | 4.59E-07 | 1.96E-07 | 3.35E-08 | 1.10E-08 | 2.90E-09 | 9.77E-09 | 5.51E-09 | 2.27E-09 |

| | TX-117 | TX-118 | B-101 | B-102 | B-103 | B-104 | B-105 | B-106 | B-107 | B-108 | B-109 | B-110 | B-111 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sr-90 | 1.79E-02 | 7.16E-05 | 2.38E+00 | 1.22E-02 | 1.75E-02 | 3.47E-03 | 2.11E-03 | 1.51E-04 | 7.26E-03 | 4.47E-02 | 9.18E-03 | 8.20E-02 | 4.60E-01 |
| Cs-137 | 1.42E-03 | 8.64E-02 | 1.52E-01 | 9.72E-03 | 1.61E-02 | 1.81E-03 | 2.61E-03 | 3.97E-03 | 2.85E-04 | 2.70E-02 | 1.08E-02 | 2.12E-02 | 2.14E-02 |
| Np-237 | 2.28E-09 | | | 1.63E-08 | 6.06E-08 | 2.82E-09 | | 3.01E-09 | | 1.52E-07 | 5.56E-08 | 2.12E-08 | 7.41E-08 |
| Pu-239/240 | 2.82E-12 | | 1.00E-03 | 2.24E-04 | 3.78E-04 | 6.33E-05 | 1.08E-05 | 1.67E-06 | 4.70E-05 | 1.15E-05 | 1.90E-04 | 1.80E-04 | 2.07E-04 |
| Am-241 | 5.66E-09 | | | 5.66E-05 | 2.00E-04 | 1.91E-06 | | 3.78E-07 | | 9.63E-06 | 3.76E-06 | 7.28E-04 | 2.99E-06 |
| Tc-99 | 5.63E-07 | | | 4.90E-06 | 1.53E-05 | 9.48E-05 | | 1.06E-06 | | 5.56E-05 | 1.67E-05 | 2.12E-04 | 2.20E-03 |
| I-129 | 8.37E-12 | | | 5.49E-09 | 2.42E-08 | 1.39E-09 | | 1.51E-09 | | 7.58E-08 | 1.87E-08 | 3.67E-07 | 3.81E-06 |

| | B-112 | B-201 | B-202 | B-203 | B-204 | BY-101 | BY-102 | BY-103 | BY-104 | BY-105 | BY-106 | BY-107 | BY-108 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sr-90 | 2.43E-01 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 8.26E-02 | 6.09E-03 | 1.48E-04 | 5.80E-02 | 1.10E-02 | 3.86E-03 | 5.73E-02 | 3.58E-02 |
| Cs-137 | 5.54E-01 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 2.20E-01 | 2.05E-01 | 1.86E-01 | 1.39E-01 | 1.20E-01 | 2.09E-01 | 1.40E-01 | 1.29E-01 |
| Np-237 | 3.18E-06 | | 1.31E-09 | 3.08E-12 | 3.49E-10 | 3.32E-07 | | | | | | 3.40E-07 | 5.45E-07 |
| Pu-239/240 | 4.75E-05 | 9.60E-04 | 1.30E-04 | 4.80E-04 | 4.95E-04 | 6.61E-06 | 7.59E-06 | 6.42E-05 | 3.05E-05 | 1.46E-05 | 4.97E-06 | 1.94E-05 | 3.59E-05 |
| Am-241 | 2.16E-04 | | 2.65E-04 | 3.42E-07 | 3.50E-06 | 3.69E-05 | | | 7.28E-05 | | | 3.94E-05 | 6.87E-05 |
| Tc-99 | 1.07E-03 | | | | | 1.84E-04 | 3.90E-04 | 8.07E-05 | | 2.14E-05 | 7.46E-05 | 1.32E-04 | 1.55E-04 |
| I-129 | 1.59E-06 | | | | | 2.70E-07 | | | | | | 1.32E-07 | 2.30E-07 |

| | BY-109 | BY-110 | BY-111 | BY-112 | C-101 | C-102 | C-103 | C-104 | C-105 | C-106 | C-107 | C-108 | C-109 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sr-90 | 9.26E-03 | 6.39E-02 | 6.71E-02 | 2.27E-02 | 8.71E-02 | 3.71E-03 | 1.02E+00 | 5.77E-01 | 3.43E-01 | 3.07E+00 | 2.61E-01 | 5.01E-02 | 1.13E+00 |
| Cs-137 | 1.53E-01 | 1.81E-01 | 2.08E-01 | 1.19E-01 | 1.82E-01 | 6.45E-03 | 9.00E-02 | 3.55E-02 | 6.66E-02 | 1.72E-01 | 2.72E-02 | 2.75E-02 | 4.41E-01 |
| Np-237 | | 4.42E-07 | 3.83E-07 | 1.21E-07 | 4.00E-07 | | | | | | | 7.97E-10 | 1.59E-08 |
| Pu-239/240 | 1.18E-05 | 2.18E-05 | 3.99E-06 | 2.22E-06 | 6.55E-04 | 1.10E-03 | 6.49E-03 | 6.92E-03 | 2.17E-03 | 2.78E-03 | 3.54E-04 | 1.80E-04 | 5.19E-06 |
| Am-241 | | 5.27E-05 | 3.08E-05 | 6.02E-06 | 1.02E-04 | | | | 8.55E-04 | 2.85E-03 | | 1.08E-04 | 2.65E-07 |
| Tc-99 | 7.86E-05 | 1.79E-04 | 1.55E-04 | 4.92E-05 | | | 9.94E-04 | 2.54E-03 | 1.11E-04 | 2.12E-04 | 7.10E-05 | 2.67E-09 | 2.67E-06 |
| I-129 | | 2.63E-07 | 2.69E-07 | 6.06E-08 | | | 1.94E-07 | | 1.26E-07 | 7.62E-08 | | 5.33E-12 | 5.33E-09 |

| | C-110 | C-111 | C-112 | C-201 | C-202 | C-203 | C-204 | S-101 | S-102 | S-103 | S-104 | S-105 | S-106 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sr-90 | 3.15E-03 | 1.27E-01 | 3.21E-01 | 1.22E-01 | 1.08E-01 | 1.17E-01 | 1.08E-01 | 3.36E-01 | 2.49E-02 | 1.91E-10 | 3.35E-01 | 2.47E-03 | |
| Cs-137 | 9.64E-03 | 5.77E-02 | 4.03E-01 | 2.58E-03 | 1.05E-03 | 1.05E-03 | 1.05E-03 | 1.33E-01 | 1.26E-01 | 1.26E-01 | 4.60E-02 | 1.26E-01 | 1.50E-01 |
| Np-237 | | 1.59E-08 | 7.31E-07 | | 7.13E-06 | 1.43E-12 | 5.25E-15 | | 3.21E-11 | 4.99E-12 | | | |
| Pu-239/240 | 4.09E-05 | 2.60E-04 | 6.20E-03 | 1.13E-03 | 6.57E-05 | 6.01E-05 | 6.00E-05 | 1.99E-04 | 6.34E-06 | 1.71E-06 | 3.23E-04 | 4.65E-07 | 1.02E-04 |
| Am-241 | | 6.17E-05 | 3.37E-03 | | 5.23E-06 | 1.04E-07 | 5.37E-13 | | 3.21E-06 | 7.04E-07 | | | |
| Tc-99 | 5.84E-05 | 3.09E-06 | 1.51E-04 | | 3.52E-20 | 7.04E-14 | 1.75E-12 | | 9.52E-14 | 2.87E-13 | | | |

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## TABLE D-1 (CONT)

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| I-129 | | 6.17E-09 | 1.69E-09 | | 5.23E-23 | 1.05E-16 | 2.38E-15 | | 1.65E-16 | 4.99E-16 | | | |
| | | | | | | | | | | | | | |
| | S-107 | S-108 | S-109 | S-110 | S-111 | S-112 | SX-101 | SX-102 | SX-103 | SX-104 | SX-105 | SX-106 | SX-107 |
| Sr-90 | 1.53E-01 | 4.00E-02 | 9.63E-03 | 3.08E-01 | 1.42E-01 | 1.37E-01 | 3.28E-01 | 3.15E-01 | 1.34E-01 | 6.02E-01 | 9.45E-02 | 3.49E-02 | 1.66E+00 |
| Cs-137 | 7.60E-02 | 2.46E-01 | 1.45E-01 | 1.33E-01 | 2.42E-01 | 7.69E-01 | 4.60E-02 | 2.08E-01 | 3.51E-01 | 1.22E-01 | 1.38E-01 | 1.42E-01 | 4.86E-02 |
| Np-237 | | | | | 8.79E-08 | 1.12E-06 | 7.72E-10 | | 5.41E-07 | | 1.04E-07 | 1.69E-07 | |
| Pu-239/240 | 1.63E-03 | 3.48E-06 | 3.94E-05 | 3.15E-05 | 3.70E-05 | 7.37E-06 | 8.70E-05 | 1.15E-05 | 9.58E-06 | 2.99E-05 | 1.29E-05 | 6.95E-07 | 1.39E-04 |
| Am-241 | | | | | 4.47E-06 | 2.75E-04 | 3.83E-05 | | 8.03E-04 | | 2.58E-04 | 1.32E-04 | |
| Tc-99 | | | | | 8.79E-05 | 5.54E-04 | 3.86E-15 | | 5.41E-04 | | 1.81E-04 | 9.74E-05 | |
| I-129 | | | | | 1.60E-07 | 1.12E-06 | 7.72E-18 | | 8.03E-07 | | 2.58E-07 | 1.33E-07 | |
| | | | | | | | | | | | | | |
| | SX-108 | SX-109 | SX-110 | SX-111 | SX-112 | SX-113 | SX-114 | SX-115 | | | | | |
| Sr-90 | 1.47E+00 | 3.50E-01 | 2.14E+00 | 1.63E+00 | 1.66E+00 | 3.30E+00 | 9.45E-01 | 1.01E+01 | | | | | |
| Cs-137 | 2.39E-02 | 5.80E-02 | 6.05E-02 | 9.47E-02 | 4.04E-02 | 1.28E+00 | 7.05E-02 | 6.65E-02 | | | | | |
| Np-237 | 6.20E-09 | 1.41E-09 | 1.15E-08 | | 4.62E-09 | 3.47E-06 | 4.99E-09 | | | | | | |
| Pu-239/240 | 4.00E-04 | 5.46E-04 | 7.21E-04 | 1.69E-04 | 3.62E-04 | 5.61E-04 | 3.32E-04 | 4.03E-03 | | | | | |
| Am-241 | 7.87E-04 | 1.40E-04 | 1.98E-03 | | 5.69E-04 | 2.72E-04 | 7.82E-04 | | | | | | |
| Tc-99 | 9.11E-11 | 2.09E-12 | 6.67E-13 | | 1.35E-06 | 6.76E-04 | 9.71E-20 | | | | | | |
| I-129 | 7.87E-15 | 3.62E-15 | 5.67E-16 | | 1.92E-09 | 1.35E-06 | 1.94E-22 | | | | | | |

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# TABLE D-2

## AVERAGE CONCENTRATIONS OF PRINCIPAL RADIOISOTOPES FOR AIRBORNE RELEASES BY QUADRANT (CI/KG)

| NE QUADRANT AVERAGES | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Sr-90 | | Cs-137 | | Ru-237 | | Pu-239/240 | | Am-241 | |
| Mean | 0.15870154 | Mean | 0.10019048 | Mean | 1.5476E-06 | Mean | 0.00015466 | Mean | 0.0001443 |
| Error | 0.07479996 | Error | 0.01998915 | Error | #N/A | Error | 3.7492E-05 | Error | #N/A |
| Median | 0.01817458 | Median | 0.03761 | Median | 1.2121E-07 | Median | 0.00004645 | Median | 9.6255E-06 |
| Mode | 0 | Mode | 0 | Mode | #N/A | Mode | #N/A | Mode | #N/A |
| Deviation | 0.47307651 | Deviation | 0.12642249 | Deviation | 4.092E-06 | Deviation | 0.00023712 | Deviation | 0.0003214 |
| Variance | 0.22380138 | Variance | 0.01598265 | Variance | 1.6745E-11 | Variance | 5.6226E-08 | Variance | 1.033E-07 |
| Kurtosis | 16.9211665 | Kurtosis | 4.49176281 | Kurtosis | 13.5747301 | Kurtosis | 6.03328869 | Kurtosis | 7.22367587 |
| Skewness | 4.15256584 | Skewness | 1.92699436 | Skewness | 3.58445222 | Skewness | 2.40136604 | Skewness | 2.79906705 |
| Range | 2.375 | Range | 0.55363102 | Range | 1.7794E-05 | Range | 0.00100133 | Range | 0.00126981 |
| Minimum | 0 | Minimum | 0 | Minimum | 3.0758E-12 | Minimum | 1.6717E-06 | Minimum | 9.52E-08 |
| Maximum | 2.375 | Maximum | 0.55363102 | Maximum | 1.7794E-05 | Maximum | 0.001003 | Maximum | 0.00128991 |
| Sum | 6.34806142 | Sum | 4.00761906 | Sum | 3.25E-05 | Sum | 0.00618644 | Sum | 0.00418479 |
| Count | 40 | Count | 40 | Count | 21 | Count | 40 | Count | 29 |
| Largest (2) | 1.92 | Largest (2) | 0.48146205 | Largest (2) | 7.4074E-06 | Largest (2) | 0.00096 | Largest (2) | 0.00106 |
| Smallest (2) | 0 | Smallest (2) | 0 | Smallest (2) | 3.493E-10 | Smallest (2) | 2.2155E-06 | Smallest (2) | 1.17E-07 |
| Level (95%) | 0.14660502 | Level (95%) | 0.03917796 | Level (95%) | 1.7502E-06 | Level (95%) | 7.3483E-05 | Level (95%) | 0.00011698 |
| **SE QUADRANT AVERAGES** | | | | | | | | | |
| Sr-90 | | Cs-137 | | Ru-237 | | Pu-239/240 | | Am-241 | |
| Mean | 1.83646665 | Mean | 0.20070136 | Mean | 1.0548E-06 | Mean | 0.00115129 | Mean | 0.00100551 |
| Error | #N/A | Error | #N/A | Error | #N/A | Error | #N/A | Error | #N/A |
| Median | 0.108 | Median | 0.09 | Median | 2.205E-08 | Median | 0.00018283 | Median | 0.0000934 |
| Mode | #N/A | Mode | 0.244 | Mode | #N/A | Mode | #N/A | Mode | #N/A |
| Deviation | 4.98515357 | Deviation | 0.2806369 | Deviation | 2.2632E-06 | Deviation | 0.00194251 | Deviation | 0.00244535 |
| Variance | 24.8517561 | Variance | 0.07875707 | Variance | 5.1221E-12 | Variance | 3.7733E-06 | Variance | 5.9797E-06 |
| Kurtosis | 15.6726045 | Kurtosis | 9.19936965 | Kurtosis | 4.61608958 | Kurtosis | 2.94120891 | Kurtosis | 17.944269 |
| Skewness | 3.79107027 | Skewness | 2.60030806 | Skewness | 2.38903279 | Skewness | 1.99131095 | Skewness | 3.98626421 |
| Range | 26.85 | Range | 1.48999964 | Range | 7.8E-06 | Range | 0.00691999 | Range | 0.01275795 |
| Minimum | 2.43E-08 | Minimum | 3.64E-07 | Minimum | 5.2471E-15 | Minimum | 1.27E-08 | Minimum | 5.3706E-13 |
| Maximum | 26.85 | Maximum | 1.49 | Maximum | 0.0000078 | Maximum | 0.00692 | Maximum | 0.01275795 |
| Sum | 80.8046324 | Sum | 9.03156203 | Sum | 2.5315E-05 | Sum | 0.04605149 | Sum | 0.03217637 |
| Count | 44 | Count | 45 | Count | 24 | Count | 40 | Count | 32 |
| Largest (2) | 14.0658805 | Largest (2) | 0.688907 | Largest (2) | 7.1303E-06 | Largest (2) | 0.006485 | Largest (2) | 0.00506289 |
| Smallest (2) | 7.86E-08 | Smallest (2) | 4.34E-07 | Smallest (2) | 1.2E-12 | Smallest (2) | 2.23E-08 | Smallest (2) | 9.1944E-11 |
| Level (95%) | 1.4729695 | Level (95%) | 0.08199473 | Level (95%) | 9.0545E-07 | Level (95%) | 0.00060198 | Level (95%) | 0.00084725 |
| **SW QUADRANT AVERAGES** | | | | | | | | | |
| Sr-90 | | Cs-137 | | Ru-237 | | Pu-239/240 | | Am-241 | |
| Mean | 0.60170368 | Mean | 0.19518759 | Mean | 3.2263E-07 | Mean | 0.00036932 | Mean | 0.00023729 |
| Error | #N/A | Error | 0.03922418 | Error | #N/A | Error | 0.00011154 | Error | #N/A |
| Median | 0.108 | Median | 0.11960601 | Median | 6.2021E-09 | Median | 6.2501E-05 | Median | 6.2817E-05 |
| Mode | 0.00063732 | Mode | 0.64084507 | Mode | 7.0423E-07 | Mode | #N/A | Mode | 4.1549E-09 |
| Deviation | 1.61277567 | Deviation | 0.26603134 | Deviation | 7.2293E-07 | Deviation | 0.0007565 | Deviation | 0.00043305 |
| Variance | 2.60104537 | Variance | 0.07077268 | Variance | 5.2262E-13 | Variance | 5.7229E-07 | Variance | 1.8753E-07 |
| Kurtosis | 28.915365 | Kurtosis | 7.57431917 | Kurtosis | 16.0069218 | Kurtosis | 12.842006 | Kurtosis | 9.71395682 |
| Skewness | 5.0469006 | Skewness | 2.72261323 | Skewness | 3.76703349 | Skewness | 3.34487029 | Skewness | 2.88094645 |
| Range | 10.1405 | Range | 1.28156554 | Range | 3.473E-06 | Range | 0.00403369 | Range | 0.00197734 |
| Minimum | 1.9076E-10 | Minimum | 0.0000277 | Minimum | 5.8442E-16 | Minimum | 4.65E-07 | Minimum | 1.5873E-13 |
| Maximum | 10.1405 | Maximum | 1.28159324 | Maximum | 3.473E-06 | Maximum | 0.00403415 | Maximum | 0.00197734 |
| Sum | 27.0766658 | Sum | 8.97862896 | Sum | 8.0656E-06 | Sum | 0.01698853 | Sum | 0.00640682 |
| Count | 45 | Count | 46 | Count | 25 | Count | 46 | Count | 27 |
| Largest (2) | 3.30378378 | Largest (2) | 1.05 | Largest (2) | 1.1219E-06 | Largest (2) | 0.00253 | Largest (2) | 0.0008027 |
| Smallest (2) | 0.0000025 | Smallest (2) | 0.00075377 | Smallest (2) | 4.9658E-12 | Smallest (2) | 6.9529E-07 | Smallest (2) | 3.7594E-11 |
| Level (95%) | 0.47121071 | Level (95%) | 0.07687787 | Level (95%) | 2.8338E-07 | Level (95%) | 0.00021861 | Level (95%) | 0.00016334 |
| **NW QUADRANT AVERAGES** | | | | | | | | | |
| Sr-90 | | Cs-137 | | Ru-237 | | Pu-239/240 | | Am-241 | |
| Mean | 0.03264551 | Mean | 0.04833147 | Mean | 7.9657E-08 | Mean | 4.2068E-05 | Mean | 7.7182E-06 |
| Error | #N/A | Error | #N/A | Error | #N/A | Error | #N/A | Error | #N/A |
| Median | 0.00353 | Median | 0.01032179 | Median | 1.2184E-08 | Median | 1.7234E-06 | Median | 0.00000173 |
| Mode | #N/A | Mode | #N/A | Mode | #N/A | Mode | #N/A | Mode | #N/A |
| Deviation | 0.06771448 | Deviation | 0.08761973 | Deviation | 2.0908E-07 | Deviation | 8.1846E-05 | Deviation | 1.2429E-05 |
| Variance | 0.00458525 | Variance | 0.00767722 | Variance | 4.3713E-14 | Variance | 6.6988E-09 | Variance | 1.5449E-10 |
| Kurtosis | 9.75353246 | Kurtosis | 5.58306392 | Kurtosis | 15.1865593 | Kurtosis | 5.74679839 | Kurtosis | 8.8850065 |
| Skewness | 2.95934429 | Skewness | 2.37990472 | Skewness | 3.80265671 | Skewness | 2.41476152 | Skewness | 2.65428242 |
| Range | 0.314 | Range | 0.37201835 | Range | 9.1743E-07 | Range | 0.000338 | Range | 5.7908E-05 |
| Minimum | 1.8093E-12 | Minimum | 8.4451E-14 | Minimum | 9.8039E-15 | Minimum | 2.1145E-13 | Minimum | 3.2892E-12 |
| Maximum | 0.314 | Maximum | 0.37201835 | Maximum | 9.1743E-07 | Maximum | 0.000338 | Maximum | 5.7908E-05 |
| Sum | 1.01201095 | Sum | 1.64327 | Sum | 1.5871E-06 | Sum | 0.00130472 | Sum | 0.00022383 |
| Count | 31 | Count | 34 | Count | 20 | Count | 31 | Count | 29 |
| Largest (2) | 0.165 | Largest (2) | 0.266 | Largest (2) | 3.0954E-07 | Largest (2) | 0.000249 | Largest (2) | 0.0000264 |
| Smallest (2) | 4.4412E-09 | Smallest (2) | 1.2935E-10 | Smallest (2) | 1.6417E-14 | Smallest (2) | 2.7354E-12 | Smallest (2) | 2.2994E-11 |
| Level (95%) | 0.02383681 | Level (95%) | 0.02945167 | Level (95%) | 9.163E-08 | Level (95%) | 2.8811E-05 | Level (95%) | 4.5238E-06 |

TABLE D-3

AVERAGE ISOTOPE CONCENTRATIONS OF PRINCIPAL RADIOISOTOPES FOR LIQUID RELEASES BY QUADRANT (CI/KG)

| NE QUADRANT AVERAGES | | | | SW QUADRANT AVERAGES | | | |
|---|---|---|---|---|---|---|---|
| *Tc-99* | | *I-129* | | *Tc-99* | | *I-129* | |
| | | | | | | | |
| Mean | 4.83E-04 | Mean | 9.54E-07 | Mean | 1.04E-04 | Mean | 1.90E-07 |
| Standard Error | #N/A | Standard Error | #N/A | Standard Error | #N/A | Standard Error | #N/A |
| Median | 8.77E-05 | Median | 1.32E-07 | Median | 2.80E-07 | Median | 1.13E-11 |
| Mode | #N/A | Mode | #N/A | Mode | #N/A | Mode | #N/A |
| Deviation | 1.14E-03 | Deviation | 2.20E-06 | Deviation | 1.94E-04 | Deviation | 3.63E-07 |
| Variance | 1.30E-06 | Variance | 4.85E-12 | Variance | 3.76E-08 | Variance | 1.31E-13 |
| Kurtosis | 1.47E+01 | Kurtosis | 1.16E+01 | Kurtosis | 3.66E+00 | Kurtosis | 5.06E+00 |
| Skewness | 3.68E+00 | Skewness | 3.29E+00 | Skewness | 2.15E+00 | Skewness | 2.38E+00 |
| Range | 5.28E-03 | Range | 9.15E-06 | Range | 6.76E-04 | Range | 1.35E-06 |
| Minimum | 6.76E-07 | Minimum | 1.35E-09 | Minimum | 9.71E-20 | Minimum | 1.94E-22 |
| Maximum | 5.28E-03 | Maximum | 9.15E-06 | Maximum | 6.76E-04 | Maximum | 1.35E-06 |
| Sum | 1.16E-02 | Sum | 1.81E-05 | Sum | 2.59E-03 | Sum | 4.75E-06 |
| Count | 2.40E+01 | Count | 1.90E+01 | Count | 2.50E+01 | Count | 2.50E+01 |
| Largest (2) | 2.20E-03 | Largest (2) | 3.81E-06 | Largest (2) | 5.54E-04 | Largest (2) | 1.12E-06 |
| Smallest (2) | 1.06E-06 | Smallest (2) | 1.39E-09 | Smallest (2) | 3.86E-15 | Smallest (2) | 7.72E-18 |
| Level (95%) | 4.56E-04 | Level (95%) | 9.90E-07 | Level (95%) | 7.60E-05 | Level (95%) | 1.42E-07 |
| | | | | | | | |
| SE QUADRANT AVERAGES | | | | NW QUADRANT AVERAGES | | | |
| *Tc-99* | | *I-129* | | *Tc-99* | | *I-129* | |
| | | | | | | | |
| Mean | 2.20E-04 | Mean | 1.87E-07 | Mean | 4.42E-05 | Mean | 9.04E-06 |
| Standard Error | #N/A | Standard Error | #N/A | Standard Error | #N/A | Standard Error | #N/A |
| Median | 4.59E-05 | Median | 3.00E-08 | Median | 6.08E-06 | Median | 1.50E-08 |
| Mode | #N/A | Mode | #N/A | Mode | #N/A | Mode | #N/A |
| Deviation | 5.16E-04 | Deviation | 3.54E-07 | Deviation | 9.17E-05 | Deviation | 2.72E-05 |
| Variance | 2.66E-07 | Variance | 1.25E-13 | Variance | 8.40E-09 | Variance | 7.41E-10 |
| Kurtosis | 1.59E+01 | Kurtosis | 5.58E+00 | Kurtosis | 1.10E+01 | Kurtosis | 1.26E+01 |
| Skewness | 3.79E+00 | Skewness | 2.49E+00 | Skewness | 3.21E+00 | Skewness | 3.45E+00 |
| Range | 2.54E-03 | Range | 1.28E-06 | Range | 4.09E-04 | Range | 1.20E-04 |
| Minimum | 3.74E-22 | Minimum | 6.29E-25 | Minimum | 4.65E-17 | Minimum | 3.77E-20 |
| Maximum | 2.54E-03 | Maximum | 1.28E-06 | Maximum | 4.09E-04 | Maximum | 1.20E-04 |
| Sum | 6.17E-03 | Sum | 4.49E-06 | Sum | 1.11E-03 | Sum | 2.17E-04 |
| Count | 2.80E+01 | Count | 2.40E+01 | Count | 2.50E+01 | Count | 2.40E+01 |
| Largest (2) | 9.94E-04 | Largest (2) | 1.20E-06 | Largest (2) | 2.32E-04 | Largest (2) | 4.90E-05 |
| Smallest (2) | 3.52E-20 | Smallest (2) | 5.23E-23 | Smallest (2) | 2.02E-13 | Smallest (2) | 1.81E-16 |
| Level (95%) | 1.91E-04 | Level (95%) | 1.42E-07 | Level (95%) | 3.59E-05 | Level (95%) | 1.09E-05 |

# TABLE D-4

## COMPARISON OF HEAT GENERATION DATA FOR TANKS

| Tank | Heat Rate Based on Curie Content in Table D-1 * | Heat Rate, Agnew Temp Based Estimate (Ref. D-1) | Ratio Curie Est./Temp. Est. | Tank | Heat Rate Based on Curie Content in Table D-1 * | Heat Rate, Agnew Temp Based Estimate (Ref. D-1) | Ratio Curie Est./Temp. Est. |
|---|---|---|---|---|---|---|---|
| AY-101 | 61916 | | | TX-101 | 169 | 2426 | 0.06972867 |
| AY-102 | 101603 | | | TX-102 | 2589 | 1877 | 1.37957166 |
| AZ-101 | 106222 | | | TX-103 | 28 | 2139 | 0.01314783 |
| AZ-102 | 43649 | | | TX-104 | 10084 | 4634 | 2.17605524 |
| SY-101 | 34135 | 46949 | 0.72707372 | TX-105 | 353 | 7355 | 0.04800408 |
| SY-102 | 1859 | 10282 | 0.18080956 | TX-106 | 432 | 3255 | 0.13271889 |
| SY-103 | 51721 | 28912 | 1.78890255 | TX-107 | 0 | 2806 | 1.2609E-08 |
| AN-101 | 6783 | 8335 | 0.81373917 | TX-108 | 1561 | 2331 | 0.66981982 |
| AN-102 | 18256 | 42728 | 0.4272705 | TX-109 | 15460 | 5160 | 2.99612403 |
| AN-103 | 39765 | 40179 | 0.98968943 | TX-110 | 7972 | 8538 | 0.9336847 |
| AN-104 | 28035 | 41722 | 0.67194676 | TX-111 | 2367 | 4676 | 0.50622327 |
| AN-105 | 19457 | 42270 | 0.46031053 | TX-112 | 1192 | 5292 | 0.22531557 |
| AN-106 | 13315 | 9053 | 1.47082205 | TX-113 | 460 | 3531 | 0.13028037 |
| AN-107 | 30886 | 29194 | 1.05795437 | TX-114 | 1191 | | |
| AP-101 | 0 | 1648 | | TX-115 | 1208 | 2509 | 0.48126744 |
| AP-102 | 0 | 2999 | 9.3215E-06 | TX-116 | 1135 | | |
| AP-103 | 0 | 2709 | 8.0122E-05 | TX-117 | 1543 | | |
| AP-104 | 0 | 3630 | 2.0318E-07 | TX-118 | 80 | 4355 | 0.01846455 |
| AP-105 | 0 | 9317 | 7.916E-08 | B-101 | 33381 | 12134 | 2.7510042 |
| AP-106 | 0 | 5438 | 1.3563E-07 | B-102 | 80 | 2083 | 0.03818056 |
| AP-107 | 0 | 504 | 1.4634E-06 | B-103 | 221 | 1757 | 0.12589246 |
| AP-108 | 0 | 4569 | 1.6142E-07 | B-104 | 229 | 2267 | 0.10117287 |
| AW-101 | 31519 | 29579 | 1.06557073 | B-105 | 95 | 2052 | 0.04613808 |
| AW-102 | 15 | 9390 | 0.00155647 | B-106 | 44 | 1774 | 0.02507463 |
| AW-103 | 0 | 11292 | | B-107 | 207 | 1655 | 0.12533192 |
| AW-104 | 46352 | 30018 | 1.54414191 | B-108 | 780 | 1691 | 0.46112965 |
| AW-105 | 171 | 9893 | 0.0172519 | B-109 | 205 | 1480 | 0.1383307 |
| AW-106 | 6798 | 16530 | 0.41128131 | B-110 | 3115 | 3642 | 0.85528007 |
| T-101 | 1 | 3312 | 0.000341 | B-111 | 14744 | 5368 | 2.7466766 |
| T-102 | 7 | 2446 | 0.00275229 | B-112 | 2701 | 1764 | 1.53090391 |
| T-103 | 445 | 1359 | 0.3277557 | B-201 | 0 | 3452 | |
| T-104 | 203 | 3103 | 0.0654125 | B-202 | 0 | 709 | |
| T-105 | 11 | 3009 | 0.00372084 | B-203 | 0 | 446 | |
| T-106 | 134 | 2184 | 0.06148929 | B-204 | 0 | 340 | |
| T-107 | 11 | 2543 | 0.00430446 | BY-101 | 11909 | 4005 | 2.97362797 |
| T-108 | 492 | 4004 | 0.12287712 | BY-102 | 2501 | 3795 | 0.65904194 |
| T-109 | 76 | 2733 | 0.02787516 | BY-103 | 1767 | 5527 | 0.31966466 |
| T-110 | 98 | 1343 | 0.07308352 | BY-104 | 6076 | 6508 | 0.93361586 |
| T-111 | 3 | 4231 | 0.00069461 | BY-105 | 2245 | 11737 | 0.19126617 |
| T-112 | 0 | 3392 | | BY-106 | 4497 | 9201 | 0.48873082 |
| T-201 | 0 | 1763 | | BY-107 | 5379 | 12633 | 0.42581521 |
| T-202 | 0 | 1528 | | BY-108 | 3725 | 10760 | 0.34617402 |
| T-203 | 0 | 2495 | | BY-109 | 2072 | 6373 | 0.32514583 |
| T-204 | 0 | 1880 | 1.9969E-05 | BY-110 | 9876 | 8014 | 1.23229186 |
| TY-101 | 171 | 2916 | 0.05874457 | BY-111 | 12711 | 4549 | 2.79418433 |
| TY-102 | 55 | 3555 | 0.0155079 | BY-112 | 4004 | 5191 | 0.77129981 |
| TY-103 | 2601 | 3928 | 0.66214919 | C-101 | 2460 | 8992 | 0.27362656 |
| TY-104 | 394 | 2720 | 0.14486301 | C-102 | 37 | 5410 | 0.006828 |
| TY-105 | 5369 | 5945 | 0.90308003 | C-103 | 30133 | 17360 | 1.73574667 |
| TY-106 | 291 | 2215 | 0.13127569 | C-104 | 19912 | 8344 | 2.38633749 |
| U-101 | 891 | 4390 | 0.20302785 | C-105 | 8377 | 19371 | 0.43246446 |
| U-102 | 4394 | 7040 | 0.62414773 | C-106 | 83492 | 34590 | 2.4137745 |
| U-103 | 5423 | 8584 | 0.63180037 | C--107 | 945 | 24335 | 0.03884252 |

* Conversion factor for Sr 0.023 Btu/hr/Ci; 0.016 Btu/hr/Ci fo Cs. Page 1

TABLE D-4 CONT

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| U-104 | 1733 | 4291 | 0.40386832 | C-108 | 597 | 6327 | 0.09442539 |
| U-105 | 4039 | 8480 | 0.47632548 | C-109 | 12351 | 7956 | 1.55244047 |
| U-106 | 992 | 7084 | 0.14008501 | C-110 | 16 | 3135 | 0.00525805 |
| U-107 | 145 | 6192 | 0.02334663 | C-111 | 1243 | 6963 | 0.17850434 |
| U-108 | 5581 | 9876 | 0.56507924 | C-112 | 8176 | 8646 | 0.94562666 |
| U-109 | 5240 | 7306 | 0.71722009 | C-201 | 50 | 1764 | 0.02826885 |
| U-110 | 3306 | 5413 | 0.61078884 | C-202 | 14 | 939 | 0.01512683 |
| U-111 | 230 | 6069 | 0.03786841 | C-203 | 77 | 12 | 6.43395404 |
| U-112 | 1066 | 2873 | 0.3711009 | C-204 | 43 | | |
| U-201 | 292 | 3313 | 0.08802182 | S-101 | 19492 | 13013 | 1.49789518 |
| U-202 | 292 | 2140 | 0.1362693 | S-102 | 8077 | 8819 | 0.9158501 |
| U-203 | 4 | 3614 | 0.00114117 | S-103 | 2843 | 8541 | 0.33281349 |
| U-204 | 8 | 675 | 0.01125043 | S-104 | 11547 | 10279 | 1.12338934 |
| BX-101 | 13096 | 2654 | 4.93444992 | S-105 | 5423 | 3582 | 1.51396064 |
| BX-102 | 4595 | 2581 | 1.78013805 | S-106 | 6082 | 3650 | 1.66633425 |
| BX-103 | 1622 | 4577 | 0.35432625 | S-107 | 8696 | 10279 | 0.84600798 |
| BX-104 | 5933 | 5220 | 1.13667907 | S-108 | 18696 | 5185 | 3.60570878 |
| BX-105 | 1840 | 3116 | 0.59055801 | S-109 | 7805 | 2413 | 3.23449246 |
| BX-106 | 749 | 2626 | 0.28511345 | S-110 | 6852 | 9349 | 0.73290645 |
| BX-107 | 9 | 3297 | 0.0028517 | S-111 | 24092 | 6779 | 3.55395339 |
| BX-108 | 69 | 3792 | 0.01807719 | S-112 | 55789 | 5001 | 11.1555064 |
| BX-109 | 902 | 2509 | 0.35969811 | SX-101 | 21515 | 18293 | 1.17613131 |
| BX-110 | 13 | 2188 | 0.00573105 | SX-102 | 7024 | 14570 | 0.48209761 |
| BX-111 | 315 | 3101 | 0.10152056 | SX-103 | 32234 | 26174 | 1.23153454 |
| BX-112 | 23 | 2138 | 0.01069696 | SX-104 | 15168 | 15136 | 1.00212051 |
| A-101 | 12195 | 19009 | 0.64152686 | SX-105 | 16994 | 14938 | 1.13764975 |
| A-102 | 76825 | 10303 | 7.45660462 | SX-106 | 9396 | 7520 | 1.24943983 |
| A-103 | 1672 | 7307 | 0.22878495 | SX-107 | 21388 | 24075 | 0.88837892 |
| A-104 | 51781 | 44709 | 1.15818764 | SX-108 | 22308 | 31363 | 0.71128112 |
| A-105 | 18958 | 124700 | 0.15202791 | SX-109 | 12740 | 21674 | 0.58778075 |
| A-106 | 17466 | 17700 | 0.98677966 | SX-110 | 17633 | 26647 | 0.66170963 |
| AX-101 | 15997 | 19553 | 0.81813532 | SX-111 | 26757 | 27965 | 0.9568038 |
| AX-102 | 595 | 8284 | 0.07178597 | SX-112 | 20301 | 28253 | 0.71856062 |
| AX-103 | 14193 | 16925 | 0.83858848 | SX-113 | 14281 | 6494 | 2.19909036 |
| AX-104 | 16584 | 14516 | 1.14249292 | SX-114 | 23544 | 30712 | 0.76661533 |
| | | | | SX-115 | 7989 | 4000 | 1.99736232 |
| | | | | | | Average Ratio | 0.85 |

# APPENDIX E
# METEOROLOGICAL AND POPULATION DATA

The Hanford 200 Area joint-frequency data for 10 m and 89 m are given in Tables E-1 and E-2, respectively. The 10-m data were used for the ground-level releases, whereas the 89-m data were used for the elevated releases (fire scenarios). The 16 wind directions start at north and go clockwise across the top of the table. The rows are grouped by wind speed starting with 0.89 m/s and continuing through 19.0 m/s. Within each wind speed group, the stability classes start at A and go through G. For example, the first seven lines correspond to a wind speed of 0.89 m/s and, proceeding from the first line through the seventh line, stability classes A through G. Each wind speed and the associated stability classes are represented in Tables E-1 and E-2 by sequential groups of seven lines. Thus, the total number of entries in the tables is 16 x 8 x 7 = 896.

The offsite population data are given in Table E-3. They are based on the 1990 census, updated to 1992. The data in the table were used for the offsite population estimates (16–80 km). The following data, based on the Hanford site telephone directory, were used for the onsite population (< 16 km).

| Area Location | No. of Workers |
|---|---|
| 200 E | 2772 |
| 200 W | 1873 |
| 400/WPPSS | 1808 |
| 100 N/100 KE/ 100 KW | 485 |
| Total | 6938 |

These workers are distributed as shown in Figs. 6-2 to 6-5 in Sec. 6. Workers in other areas are either too few in number or at too great a distance to contribute significantly the onsite population dose. Actually, the workers in 200 E and 200 W contribute over 95% of the totals in most cases.

## TABLE E-1

## HANFORD 10-METER JOINT FREQUENCY DATA

200 AREA (HMS) - 10 M - Pasquill A - G (1983 - 1991 Average)
Created 8/26/92 KR
8 7 1 1 10.0
wind speeds 0.89 2.65 4.7 7.15 9.8 12.7 15.6 19.0

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.36 | 0.20 | 0.23 | 0.26 | 0.40 | 0.24 | 0.17 | 0.10 | 0.10 | 0.06 | 0.06 | 0.06 | 0.10 | 0.10 | 0.14 | 0.22 |
| 0.15 | 0.13 | 0.10 | 0.11 | 0.16 | 0.09 | 0.07 | 0.03 | 0.05 | 0.02 | 0.01 | 0.03 | 0.04 | 0.05 | 0.07 | 0.10 |
| 0.14 | 0.10 | 0.09 | 0.12 | 0.14 | 0.10 | 0.06 | 0.04 | 0.04 | 0.02 | 0.02 | 0.02 | 0.04 | 0.04 | 0.10 | 0.10 |
| 0.87 | 0.58 | 0.59 | 0.59 | 0.77 | 0.50 | 0.43 | 0.32 | 0.27 | 0.19 | 0.21 | 0.17 | 0.40 | 0.44 | 0.54 | 0.55 |
| 0.39 | 0.26 | 0.28 | 0.25 | 0.46 | 0.34 | 0.31 | 0.30 | 0.34 | 0.21 | 0.25 | 0.29 | 0.49 | 0.44 | 0.45 | 0.39 |
| 0.23 | 0.13 | 0.12 | 0.14 | 0.31 | 0.23 | 0.28 | 0.26 | 0.35 | 0.23 | 0.22 | 0.27 | 0.48 | 0.36 | 0.32 | 0.23 |
| 0.10 | 0.04 | 0.08 | 0.08 | 0.13 | 0.13 | 0.13 | 0.14 | 0.17 | 0.09 | 0.10 | 0.09 | 0.22 | 0.14 | 0.14 | 0.09 |
| 0.69 | 0.44 | 0.29 | 0.32 | 0.60 | 0.51 | 0.45 | 0.29 | 0.24 | 0.12 | 0.17 | 0.19 | 0.25 | 0.30 | 0.42 | 0.48 |
| 0.21 | 0.15 | 0.06 | 0.08 | 0.16 | 0.13 | 0.13 | 0.09 | 0.08 | 0.04 | 0.03 | 0.05 | 0.07 | 0.09 | 0.16 | 0.16 |
| 0.19 | 0.12 | 0.06 | 0.09 | 0.13 | 0.13 | 0.19 | 0.10 | 0.06 | 0.02 | 0.03 | 0.05 | 0.08 | 0.10 | 0.19 | 0.15 |
| 0.84 | 0.48 | 0.40 | 0.33 | 0.66 | 0.57 | 0.75 | 0.53 | 0.35 | 0.18 | 0.24 | 0.28 | 0.69 | 1.09 | 1.05 | 0.77 |
| 0.32 | 0.17 | 0.11 | 0.13 | 0.31 | 0.34 | 0.47 | 0.52 | 0.46 | 0.21 | 0.29 | 0.48 | 1.58 | 1.68 | 1.11 | 0.39 |
| 0.13 | 0.05 | 0.05 | 0.05 | 0.16 | 0.21 | 0.39 | 0.44 | 0.45 | 0.21 | 0.27 | 0.46 | 1.60 | 1.69 | 0.82 | 0.25 |
| 0.04 | 0.02 | 0.02 | 0.03 | 0.09 | 0.10 | 0.20 | 0.23 | 0.20 | 0.08 | 0.10 | 0.20 | 0.82 | 0.69 | 0.30 | 0.08 |
| 0.26 | 0.24 | 0.10 | 0.03 | 0.08 | 0.10 | 0.10 | 0.13 | 0.12 | 0.07 | 0.14 | 0.34 | 0.35 | 0.35 | 0.40 | 0.17 |
| 0.09 | 0.06 | 0.03 | 0.01 | 0.03 | 0.03 | 0.04 | 0.05 | 0.03 | 0.02 | 0.05 | 0.07 | 0.10 | 0.14 | 0.12 | 0.06 |
| 0.08 | 0.05 | 0.03 | 0.01 | 0.02 | 0.02 | 0.04 | 0.04 | 0.05 | 0.02 | 0.03 | 0.06 | 0.09 | 0.13 | 0.12 | 0.03 |
| 0.32 | 0.20 | 0.09 | 0.04 | 0.12 | 0.11 | 0.25 | 0.27 | 0.24 | 0.13 | 0.23 | 0.39 | 0.83 | 1.46 | 0.84 | 0.21 |
| 0.19 | 0.09 | 0.04 | 0.01 | 0.06 | 0.06 | 0.15 | 0.25 | 0.22 | 0.12 | 0.18 | 0.39 | 1.98 | 2.50 | 0.75 | 0.13 |
| 0.04 | 0.06 | 0.01 | 0.01 | 0.01 | 0.02 | 0.05 | 0.17 | 0.14 | 0.03 | 0.07 | 0.20 | 1.19 | 1.60 | 0.32 | 0.06 |
| 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.01 | 0.09 | 0.07 | 0.01 | 0.02 | 0.09 | 0.56 | 0.84 | 0.13 | 0.01 |
| 0.07 | 0.07 | 0.05 | 0.01 | 0.00 | 0.00 | 0.01 | 0.03 | 0.04 | 0.04 | 0.11 | 0.25 | 0.25 | 0.25 | 0.33 | 0.05 |
| 0.02 | 0.03 | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 0.01 | 0.02 | 0.01 | 0.04 | 0.08 | 0.06 | 0.07 | 0.09 | 0.01 |
| 0.02 | 0.03 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.02 | 0.01 | 0.02 | 0.07 | 0.06 | 0.07 | 0.06 | 0.01 |
| 0.10 | 0.10 | 0.03 | 0.01 | 0.00 | 0.01 | 0.03 | 0.07 | 0.10 | 0.11 | 0.25 | 0.38 | 0.58 | 1.14 | 0.50 | 0.05 |
| 0.07 | 0.12 | 0.01 | 0.00 | 0.00 | 0.00 | 0.01 | 0.05 | 0.07 | 0.08 | 0.17 | 0.30 | 0.65 | 1.75 | 0.41 | 0.02 |
| 0.03 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.02 | 0.00 | 0.01 | 0.02 | 0.07 | 0.08 | 0.03 | 0.00 |
| 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 |
| 0.02 | 0.02 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.01 | 0.05 | 0.16 | 0.10 | 0.11 | 0.24 | 0.00 |
| 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 | 0.04 | 0.02 | 0.03 | 0.06 | 0.00 |
| 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.02 | 0.05 | 0.02 | 0.03 | 0.05 | 0.00 |
| 0.02 | 0.04 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 | 0.07 | 0.16 | 0.24 | 0.13 | 0.50 | 0.29 | 0.01 |
| 0.01 | 0.06 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.05 | 0.11 | 0.15 | 0.06 | 0.38 | 0.11 | 0.00 |
| 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 | 0.06 | 0.02 | 0.02 | 0.03 | 0.00 |
| 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.02 | 0.01 | 0.00 | 0.01 | 0.00 |
| 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 | 0.01 | 0.00 | 0.01 | 0.01 | 0.00 |
| 0.02 | 0.03 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 | 0.09 | 0.09 | 0.03 | 0.07 | 0.08 | 0.00 |
| 0.01 | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.04 | 0.02 | 0.01 | 0.05 | 0.03 | 0.00 |
| 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

TABLE E-1 (CONT)

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.01 | 0.00 |
| 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 |
| 0.01 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.03 | 0.03 | 0.02 | 0.00 | 0.00 | 0.00 |
| 0.01 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 0.02 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 0.01 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 0.04 | 0.07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 0.07 | 0.12 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 0.03 | 0.05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

## TABLE E-2

## HANFORD 89-METER JOINT FREQUENCY DATA

200 AREA (HMS) - 89 M - Pasquill A - G (1983 - 1991 Average)

Created 8/26/92 KR

8 7 1 1 89.0

wind speeds 0.89 2.65 4.7 7.15 9.8 12.7 15.6 19.0

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.34 | 0.16 | 0.19 | 0.24 | 0.38 | 0.23 | 0.17 | 0.10 | 0.10 | 0.05 | 0.05 | 0.06 | 0.10 | 0.10 | 0.12 | 0.17 |
| 0.12 | 0.09 | 0.09 | 0.10 | 0.13 | 0.09 | 0.06 | 0.02 | 0.05 | 0.02 | 0.01 | 0.02 | 0.04 | 0.05 | 0.06 | 0.08 |
| 0.11 | 0.09 | 0.08 | 0.10 | 0.13 | 0.09 | 0.07 | 0.04 | 0.03 | 0.02 | 0.02 | 0.02 | 0.05 | 0.03 | 0.08 | 0.07 |
| 0.62 | 0.40 | 0.39 | 0.45 | 0.61 | 0.41 | 0.36 | 0.28 | 0.21 | 0.16 | 0.16 | 0.11 | 0.25 | 0.33 | 0.39 | 0.39 |
| 0.22 | 0.16 | 0.16 | 0.15 | 0.30 | 0.26 | 0.25 | 0.28 | 0.27 | 0.15 | 0.16 | 0.17 | 0.30 | 0.30 | 0.27 | 0.22 |
| 0.13 | 0.08 | 0.08 | 0.09 | 0.19 | 0.19 | 0.25 | 0.29 | 0.32 | 0.15 | 0.16 | 0.19 | 0.41 | 0.34 | 0.27 | 0.15 |
| 0.07 | 0.02 | 0.05 | 0.05 | 0.11 | 0.12 | 0.16 | 0.22 | 0.18 | 0.08 | 0.09 | 0.10 | 0.31 | 0.17 | 0.13 | 0.07 |
| 0.57 | 0.39 | 0.29 | 0.32 | 0.57 | 0.49 | 0.40 | 0.23 | 0.20 | 0.11 | 0.13 | 0.13 | 0.17 | 0.23 | 0.33 | 0.43 |
| 0.18 | 0.14 | 0.06 | 0.09 | 0.16 | 0.10 | 0.11 | 0.07 | 0.07 | 0.03 | 0.02 | 0.04 | 0.05 | 0.07 | 0.14 | 0.13 |
| 0.17 | 0.11 | 0.05 | 0.09 | 0.12 | 0.12 | 0.14 | 0.07 | 0.05 | 0.01 | 0.02 | 0.03 | 0.04 | 0.08 | 0.15 | 0.14 |
| 0.77 | 0.42 | 0.38 | 0.32 | 0.59 | 0.47 | 0.56 | 0.35 | 0.27 | 0.12 | 0.15 | 0.22 | 0.36 | 0.56 | 0.69 | 0.66 |
| 0.25 | 0.13 | 0.15 | 0.12 | 0.25 | 0.22 | 0.24 | 0.29 | 0.29 | 0.12 | 0.17 | 0.25 | 0.48 | 0.55 | 0.52 | 0.26 |
| 0.11 | 0.06 | 0.05 | 0.05 | 0.14 | 0.12 | 0.21 | 0.19 | 0.29 | 0.16 | 0.16 | 0.26 | 0.59 | 0.59 | 0.35 | 0.17 |
| 0.05 | 0.02 | 0.03 | 0.03 | 0.07 | 0.06 | 0.09 | 0.10 | 0.13 | 0.06 | 0.07 | 0.12 | 0.43 | 0.31 | 0.14 | 0.07 |
| 0.38 | 0.27 | 0.12 | 0.05 | 0.13 | 0.13 | 0.15 | 0.15 | 0.14 | 0.06 | 0.14 | 0.28 | 0.27 | 0.29 | 0.34 | 0.24 |
| 0.11 | 0.08 | 0.03 | 0.01 | 0.05 | 0.06 | 0.06 | 0.06 | 0.03 | 0.02 | 0.04 | 0.06 | 0.09 | 0.10 | 0.12 | 0.07 |
| 0.10 | 0.06 | 0.04 | 0.02 | 0.04 | 0.03 | 0.06 | 0.04 | 0.04 | 0.02 | 0.02 | 0.04 | 0.07 | 0.08 | 0.12 | 0.06 |
| 0.40 | 0.26 | 0.16 | 0.08 | 0.19 | 0.17 | 0.30 | 0.25 | 0.19 | 0.10 | 0.19 | 0.22 | 0.55 | 0.81 | 0.75 | 0.34 |
| 0.19 | 0.10 | 0.05 | 0.05 | 0.12 | 0.15 | 0.19 | 0.21 | 0.23 | 0.12 | 0.16 | 0.28 | 0.86 | 0.82 | 0.57 | 0.24 |
| 0.09 | 0.04 | 0.03 | 0.02 | 0.06 | 0.08 | 0.11 | 0.18 | 0.18 | 0.10 | 0.12 | 0.25 | 0.80 | 0.91 | 0.41 | 0.12 |
| 0.02 | 0.01 | 0.01 | 0.01 | 0.02 | 0.02 | 0.05 | 0.07 | 0.07 | 0.02 | 0.04 | 0.08 | 0.44 | 0.52 | 0.17 | 0.03 |
| 0.11 | 0.12 | 0.06 | 0.02 | 0.01 | 0.02 | 0.03 | 0.08 | 0.06 | 0.06 | 0.09 | 0.26 | 0.25 | 0.25 | 0.30 | 0.08 |
| 0.04 | 0.04 | 0.02 | 0.01 | 0.01 | 0.01 | 0.01 | 0.02 | 0.02 | 0.01 | 0.03 | 0.05 | 0.06 | 0.09 | 0.07 | 0.04 |
| 0.03 | 0.02 | 0.02 | 0.01 | 0.01 | 0.00 | 0.01 | 0.02 | 0.03 | 0.01 | 0.02 | 0.06 | 0.08 | 0.11 | 0.07 | 0.01 |
| 0.20 | 0.12 | 0.05 | 0.01 | 0.05 | 0.04 | 0.11 | 0.17 | 0.16 | 0.11 | 0.16 | 0.29 | 0.58 | 0.92 | 0.54 | 0.11 |
| 0.14 | 0.07 | 0.03 | 0.02 | 0.04 | 0.06 | 0.12 | 0.16 | 0.15 | 0.09 | 0.15 | 0.30 | 1.32 | 1.32 | 0.57 | 0.12 |
| 0.04 | 0.02 | 0.01 | 0.01 | 0.02 | 0.02 | 0.06 | 0.11 | 0.10 | 0.04 | 0.09 | 0.17 | 0.85 | 0.90 | 0.31 | 0.07 |
| 0.01 | 0.00 | 0.00 | 0.00 | 0.01 | 0.01 | 0.01 | 0.04 | 0.05 | 0.01 | 0.01 | 0.06 | 0.32 | 0.46 | 0.09 | 0.01 |
| 0.04 | 0.04 | 0.03 | 0.01 | 0.00 | 0.00 | 0.01 | 0.01 | 0.02 | 0.02 | 0.07 | 0.14 | 0.16 | 0.15 | 0.23 | 0.02 |
| 0.02 | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 0.01 | 0.01 | 0.01 | 0.01 | 0.02 | 0.06 | 0.04 | 0.05 | 0.07 | 0.00 |
| 0.01 | 0.02 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.02 | 0.01 | 0.01 | 0.04 | 0.04 | 0.04 | 0.05 | 0.00 |
| 0.08 | 0.07 | 0.02 | 0.01 | 0.01 | 0.01 | 0.04 | 0.09 | 0.08 | 0.07 | 0.18 | 0.27 | 0.44 | 0.79 | 0.32 | 0.04 |
| 0.07 | 0.08 | 0.01 | 0.01 | 0.01 | 0.01 | 0.06 | 0.08 | 0.08 | 0.08 | 0.12 | 0.23 | 1.08 | 1.49 | 0.40 | 0.04 |
| 0.02 | 0.02 | 0.00 | 0.01 | 0.01 | 0.01 | 0.02 | 0.04 | 0.04 | 0.01 | 0.02 | 0.07 | 0.49 | 0.62 | 0.13 | 0.02 |
| 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 | 0.01 | 0.00 | 0.01 | 0.02 | 0.11 | 0.19 | 0.03 | 0.00 |
| 0.01 | 0.02 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.01 | 0.04 | 0.13 | 0.09 | 0.09 | 0.19 | 0.00 |
| 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.03 | 0.04 | 0.02 | 0.03 | 0.05 | 0.00 |
| 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 | 0.03 | 0.02 | 0.03 | 0.04 | 0.00 |
| 0.03 | 0.04 | 0.01 | 0.01 | 0.01 | 0.00 | 0.02 | 0.02 | 0.04 | 0.08 | 0.13 | 0.26 | 0.33 | 0.78 | 0.38 | 0.02 |
| 0.07 | 0.10 | 0.02 | 0.00 | 0.01 | 0.00 | 0.04 | 0.04 | 0.05 | 0.04 | 0.10 | 0.21 | 0.64 | 1.63 | 0.34 | 0.02 |
| 0.02 | 0.03 | 0.00 | 0.00 | 0.01 | 0.01 | 0.02 | 0.03 | 0.02 | 0.00 | 0.01 | 0.04 | 0.23 | 0.38 | 0.06 | 0.01 |
| 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.04 | 0.09 | 0.01 | 0.00 |
| 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.02 | 0.07 | 0.04 | 0.03 | 0.07 | 0.00 |
| 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.01 | 0.01 | 0.01 | 0.02 | 0.02 | 0.00 |
| 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 | 0.02 | 0.00 | 0.01 | 0.02 | 0.00 |
| 0.01 | 0.03 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.01 | 0.01 | 0.04 | 0.13 | 0.14 | 0.09 | 0.49 | 0.21 | 0.01 |

**TABLE E-2 (CONT)**

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.03 | 0.06 | 0.01 | 0.00 | 0.00 | 0.00 | 0.01 | 0.02 | 0.01 | 0.03 | 0.10 | 0.14 | 0.17 | 0.74 | 0.18 | 0.00 |
| 0.02 | 0.03 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 0.06 | 0.10 | 0.01 | 0.00 |
| 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.02 | 0.00 | 0.00 |
| 0.02 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.03 | 0.01 | 0.01 | 0.02 | 0.00 |
| 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.01 | 0.01 | 0.00 | 0.01 | 0.00 |
| 0.01 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.02 | 0.00 | 0.01 | 0.01 | 0.00 |
| 0.02 | 0.06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.03 | 0.12 | 0.11 | 0.08 | 0.14 | 0.07 | 0.00 |
| 0.02 | 0.05 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 | 0.00 | 0.03 | 0.07 | 0.06 | 0.04 | 0.17 | 0.05 | 0.00 |
| 0.02 | 0.04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.02 | 0.00 | 0.00 |
| 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

## TABLE E-3

## HANFORD OFF SITE POPULATION DATA

Population within 80 km of the Hanford 200 Area, 1990 Census (Beck, et al 1991)
Created 10/21/91 KR, Revised 2/4/92 KR

| | | | | | | | | | | Sector Total | Direction |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 0 | 0 | 2842 | 1622 | 237 | 1144 | 5845 | S |
| 0 | 0 | 0 | 0 | 0 | 0 | 713 | 11983 | 503 | 738 | 13937 | SSW |
| 0 | 0 | 0 | 0 | 0 | 0 | 1308 | 19589 | 1132 | 637 | 22666 | SW |
| 0 | 0 | 0 | 0 | 0 | 0 | 1956 | 5406 | 16336 | 7525 | 31223 | WSW |
| 0 | 0 | 0 | 0 | 0 | 0 | 771 | 1295 | 6269 | 94203 | 102538 | W |
| 0 | 0 | 0 | 0 | 0 | 0 | 641 | 1087 | 1189 | 2375 | 5292 | WNW |
| 0 | 0 | 0 | 0 | 0 | 0 | 548 | 738 | 784 | 809 | 2879 | NW |
| 0 | 0 | 0 | 0 | 0 | 0 | 544 | 909 | 876 | 4979 | 7308 | NNW |
| 0 | 0 | 0 | 0 | 0 | 0 | 434 | 822 | 969 | 2418 | 4643 | N |
| 0 | 0 | 0 | 0 | 0 | 0 | 268 | 1030 | 5220 | 17567 | 24085 | NNE |
| 0 | 0 | 0 | 0 | 0 | 0 | 393 | 6176 | 2658 | 1145 | 10372 | NE |
| 0 | 0 | 0 | 0 | 0 | 0 | 423 | 1217 | 1652 | 664 | 3956 | ENE |
| 0 | 0 | 0 | 0 | 0 | 0 | 452 | 1373 | 1416 | 751 | 3992 | E |
| 0 | 0 | 0 | 0 | 0 | 0 | 289 | 1674 | 270 | 767 | 3000 | ESE |
| 0 | 0 | 0 | 0 | 0 | 0 | 1141 | 35519 | 73156 | 4918 | 114734 | SE |
| 0 | 0 | 0 | 0 | 0 | 0 | 2796 | 8309 | 2394 | 5891 | 19390 | SSE |

Population Total

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 0 | 0 | 15519 | 98749 | 115061 | 146531 | 375860 |

| Distance (mi) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 0-1 | 1-2 | 2-3 | 3-4 | 4-5 | 5-10 | 10-20 | 20-30 | 30-40 | 40-50 | TOTAL |
| Midpoint (m) | | | | | | | | | | |
| 805 | 2414 | 4023 | 5633 | 7242 | 12070 | 24140 | 40234 | 56327 | 72421 | |