

**Pacific Northwest
National Laboratory**

Operated by Battelle for the
U.S. Department of Energy

**Geographic and Operational Site
Parameters List (GOSPL) for the
2004 Composite Analysis**

G. V. Last
W. E. Nichols
C. T. Kincaid

July 2004



Prepared for the U.S. Department of Energy
under Contract DE-AC06-76RL01830

DISCLAIMER

This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency thereof, nor Battelle Memorial Institute, nor any of their employees, makes **any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights.** Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof, or Battelle Memorial Institute. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.

PACIFIC NORTHWEST NATIONAL LABORATORY
operated by
BATTELLE
for the
UNITED STATES DEPARTMENT OF ENERGY
under Contract DE-AC06-76RL01830

Printed in the United States of America

Available to DOE and DOE contractors from the
Office of Scientific and Technical Information,
P.O. Box 62, Oak Ridge, TN 37831-0062;
ph: (865) 576-8401
fax: (865) 576-5728
email: reports@adonis.osti.gov

Available to the public from the National Technical Information Service,
U.S. Department of Commerce, 5285 Port Royal Rd., Springfield, VA 22161
ph: (800) 553-6847
fax: (703) 605-6900
email: orders@ntis.fedworld.gov
online ordering: <http://www.ntis.gov/ordering.htm>



This document was printed on recycled paper.

Geographic and Operational Site Parameters List (GOSPL) for the 2004 Composite Analysis

G. V. Last
W. E. Nichols
C. T. Kincaid

July 2004

Prepared for
the U.S. Department of Energy
under Contract DE-AC06-76RL01830

Pacific Northwest National Laboratory
Richland, Washington 99352

Executive Summary

A composite analysis is required by U.S. Department of Energy (DOE) Order 435.1 to ensure public safety through the management of active and planned low-level radioactive waste disposal facilities associated with the Hanford Site. Kincaid et al. (2004) indicated that the System Assessment Capability (SAC) (Kincaid et al. 2000; Bryce et al. 2002; Eslinger 2002a, 2002b) would be used to analyze over a thousand different waste sites.

A master spreadsheet termed the Geographic and Operational Site Parameters List (GOSPL) was assembled to facilitate the generation of keyword input files containing general information on each waste site, its operational/disposal history, and its environmental settings (past, current, and future). This report briefly describes each of the key data fields, including the source(s) of data, and provides the resulting inputs to be used for the 2004 Composite Analysis.

Contents

Executive Summary	iii
1.0 Introduction	1
2.0 Background.....	1
3.0 Geographic and Operational Site Parameter List Definitions	6
3.1 Site-Specific Parameters	6
3.1.1 Site Identifiers.....	6
3.1.2 General Site Design and Operational History Information.....	7
3.1.3 Geographic Information.....	8
3.1.4 Facility Dimensions	9
3.2 Model-Specific Instructions.....	10
3.2.1 Selected for Simulation in the 2004 Composite Analysis.....	10
3.2.2 Release Model Designation	10
3.2.3 Vadose Zone Model Hydrostratigraphy.....	11
3.3 Remediation/Recharge Assumptions.....	18
3.3.1 Pre-Hanford Recharge Class.....	19
3.3.2 Operational Recharge Class	19
3.3.3 Interim Remedial Actions	20
3.3.4 Remediation	21
4.0 Conclusions and Recommendations	24
5.0 References	25
Appendix – Geographic and Operational Site Parameters for Waste Sites To Be Simulated in the 2004 Composite Analysis.....	A.1

Figures

2.1 Conceptual Model of the System Assessment Capability	3
2.2 Information Flow in SAC Rev. 1 Software Design.....	4
3.1 Geographic Areas Used to Define Different Hydrostratigraphic Profiles.....	14

Tables

3.1	Default Site Areas.....	10
3.2	Summary of Release Model Assignments to Waste Source Types	11
3.3	Site Type Codes Used in the Hydrostratigraphic Templates.....	12
3.4	Geographic Area Designations Used in the Hydrostratigraphic Template Codes.....	15
3.5	Site-Specific Area Designations Used in the Hydrostratigraphic Template Codes.....	15
3.6	Waste Chemistry Groups Used in the Base Template Codes.....	16
3.7	General Hydrostratigraphic Templates for Each Geographic Area.....	16
3.8	Site-Specific Templates Established for a Few Key Facilities	18
3.9	Pre-Hanford Recharge Classes for the 2004 Composite Analysis	19
3.10	Operational Recharge Classes for the 2004 Composite Analysis.....	20
3.11	Example of Interim Remedial Actions Defined for the 2004 Composite Analysis.....	21
3.12	Post-Remediation Recharge Classes	23
3.13	Post-Remediation/Barrier Design Life	24

1.0 Introduction

A composite analysis is required by U.S. Department of Energy (DOE) Order 435.1 to ensure public safety through the management of active and planned low-level radioactive waste disposal facilities associated with the Hanford Site. The original composite analysis detailed in Kincaid et al. (1998) must be revised and submitted to DOE Headquarters (DOE-HQ) because of revisions to waste site information in the 100, 200, and 300 Areas; updated performance assessments and environmental impact statements (EIS); changes in inventory estimates for key sites and constituents; and a change in the definition of offsite receptors.

Kincaid et al. (2004) describe the technical scope of the 2004 Composite Analysis for the Hanford Site and the approach to perform this analysis. It will be a site-wide analysis, considering final remedial actions for the Columbia River corridor and the Central Plateau, and will support waste-specific and site-specific assessments throughout the Hanford Site. The 2004 Composite Analysis also will provide supporting information on a regional or site-wide basis for use in important Hanford assessments and decisions such as the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) 5-year review in 2005, tank closure decisions, decisions on final groundwater remedies for the 200 Areas, decisions on final groundwater remedies for the 100 Areas, and the Columbia River corridor final record of decision.

Kincaid et al. (2004) identified 1,046 waste sites from the 2,730 Waste Information Data System (WIDS) sites and several existing and future storage sites for inclusion in the 2004 Composite Analysis.^(a) Each of these sites will be modeled as an individual release or storage site whenever inventory and release data permit. Beginning in fiscal year (FY) 2003, the DOE Richland Operations Office (DOE-RL) initiated activities to develop the input data needed to support the 2004 Composite Analysis. This report describes the compilation of site-specific parameters for incorporation into the Geographic and Operational Site Parameters List (GOSPL) to support the 2004 Composite Analysis. This work was conducted as part of the Characterization of Systems Task of the Groundwater Remediation Project (formerly the Groundwater Protection Program) managed by Fluor Hanford, Inc., Richland, Washington.

2.0 Background

Kincaid et al. (2004) indicated that the System Assessment Capability (SAC) (Kincaid et al. 2000; Bryce et al. 2002; Eslinger 2002a, 2002b) would be used for the analysis. The SAC is a set of models and data that have been assembled since the previous 1998 Composite Analysis (Kincaid et al. 1998) was

(a) Originally 974 of 2,730 Waste Information Data System (WIDS) sites were identified for inclusion in the 2004 Composite Analysis. Further work identified 48 more waste sites bringing the total to 1,022. Subsequent reviews identified an additional 24 sites that have been included, many of which account for offsite transfers of waste and nuclear material. This brings the total to 1,046.

performed to estimate the collective impact of all the waste that will remain at the Hanford Site. Computer codes that have been well tested at the Hanford Site have been used when possible and new software has been written when necessary to simulate the features and processes that affect the release of contaminants into the environment, transport of contaminants through the environment, and the impact those contaminants have on living systems, cultures, and the local economy. The various SAC components have been organized to simulate the transport and fate of contaminants from their presence in Hanford waste sites, through their release into the vadose zone, to their movement in the groundwater, and into the Columbia River. Components of SAC such as the groundwater model, the ecological impact component, and the human health component were originally developed and tested for previous Hanford assessments.

The elements of the SAC computational tool include:

- Inventory Module – develops an inventory of specific waste disposal and storage locations for the period 1944 to Hanford Site closure based on disposal records, process knowledge, the results of tank and field samples, and planned disposals and remedial actions. The year 2035 is used as the Hanford Site closure date for the 2004 Composite Analysis because it has been identified as the time of site closure for the majority of facilities (e.g., tanks, solid waste burial grounds, chemical separations plants). However, the commercial waste site (US Ecology) is assumed to close in 2056 and the graphite cores of the production reactors are moved to the Central Plateau in 2056. Future runs will use the closure date predicted at the time of the run. This module also identifies the material scheduled for disposal in offsite repositories, including high-level waste, transuranic waste, and spent fuel.
- Release Module – simulates the annual release of contaminants to the vadose zone from the variety of waste types in the modeled waste sites. This module also simulates future remediation actions that move waste to the Environmental Restoration Disposal Facility (ERDF) and other permanent disposal locations.
- Air Transport Module – simulates the transport of contaminants through the air pathway from release points to points of deposition.
- Vadose Zone Transport Module – simulates fluid flow and contaminant transport in the vadose zone, which is the unsaturated sediment between the land surface and the unconfined aquifer. The module also simulates the release of volatile contaminants out of the vadose zone into the air pathway.
- Groundwater Transport Module – simulates fluid flow and contaminant transport in the unconfined aquifer that underlies the Hanford Site using the transient inverse calibrated three-dimensional Site-wide groundwater model.
- Soil Module – simulates the buildup of contaminants in the plant root-zone soil layer due to air deposition and irrigation. Solutions are available for the cases of no irrigation, irrigation with groundwater, and irrigation with river water.
- River Module – simulates river flow and contaminant/sediment transport in the Hanford Reach from Vernita Bridge downstream to the city of Richland. This module simulates background concentra-

tions and background plus the Hanford Site concentrations to enable an assessment of the Hanford Site incremental impact to the Columbia River and its ecosystem.

- Riparian Zone Module – uses river and groundwater information to simulate the concentration of contaminants in seep or spring water and in the wet soil near the edge of the Columbia River.
- Risk/Impact Modules – performs risk/impact analysis in four topical areas: human health, ecological health, economic impact, and cultural impact with the latter two being new impact metrics for Hanford assessments. The ecological and human health risk modules will be applied in the 2004 Composite Analysis. The remaining two modules of risk/impact will be applied in a supplemental analysis to inform the public and regulators regarding issues related to the composite analysis (for example, the economic and cultural impacts of chemical hazards).

Each module was assembled so that it could be tested and evaluated independently of the other modules. The inventory, release, environmental pathways, and risk/impact modules were then linked to test the overall performance of the system.

A conceptual illustration of SAC (Figure 2.1) portrays a linear flow of information. In general, inventory feeds release mechanisms, which feed to the atmospheric, vadose zone, groundwater, and Columbia River pathways. At times, release occurs directly to the groundwater through reverse wells and to the Columbia River from the single-pass reactors. During chemical separation plant operation, release also occurred to the atmosphere. The atmosphere, groundwater, Columbia River, riparian zone and soil technical modules provide media-specific concentration estimates used in the risk and impact assessment.

System Assessment Capability Conceptual Model

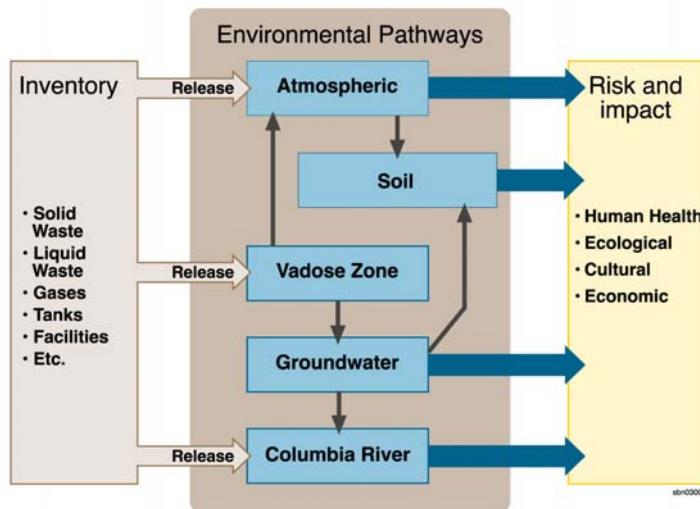


Figure 2.1. Conceptual Model of the System Assessment Capability

Background information for the development of the initial SAC is presented in *Groundwater/Vadose Zone Integration Project: Preliminary System Assessment Capability Concepts for Architecture*,

Platform and Data Management.^(a) This document includes a description of alternate architectures for SAC as well as conceptual models for each technical element of the capability. Design of the initial SAC tool is summarized in Kincaid et al. (2000). Results of an initial assessment performed with the SAC are provided in Bryce et al. (2002).

A description of the software is provided in Eslinger et al. (2002a, 2002b). The system of codes includes existing computer programs, new computer programs, electronic data libraries, and data formatting processors (or data translators). The relationships among code modules that make up the SAC Systems Code are illustrated in Figure 2.2. Major modules appearing on the left side of the diagram perform inventory and transport calculations providing estimates of the concentrations of analytes in various media. Modules shown on the right perform calculations related to the impact from the contaminated media. Impacts include potential effects on humans, the ecology of the area, the economy of the region, and the proximity of contaminants to social and cultural resources.

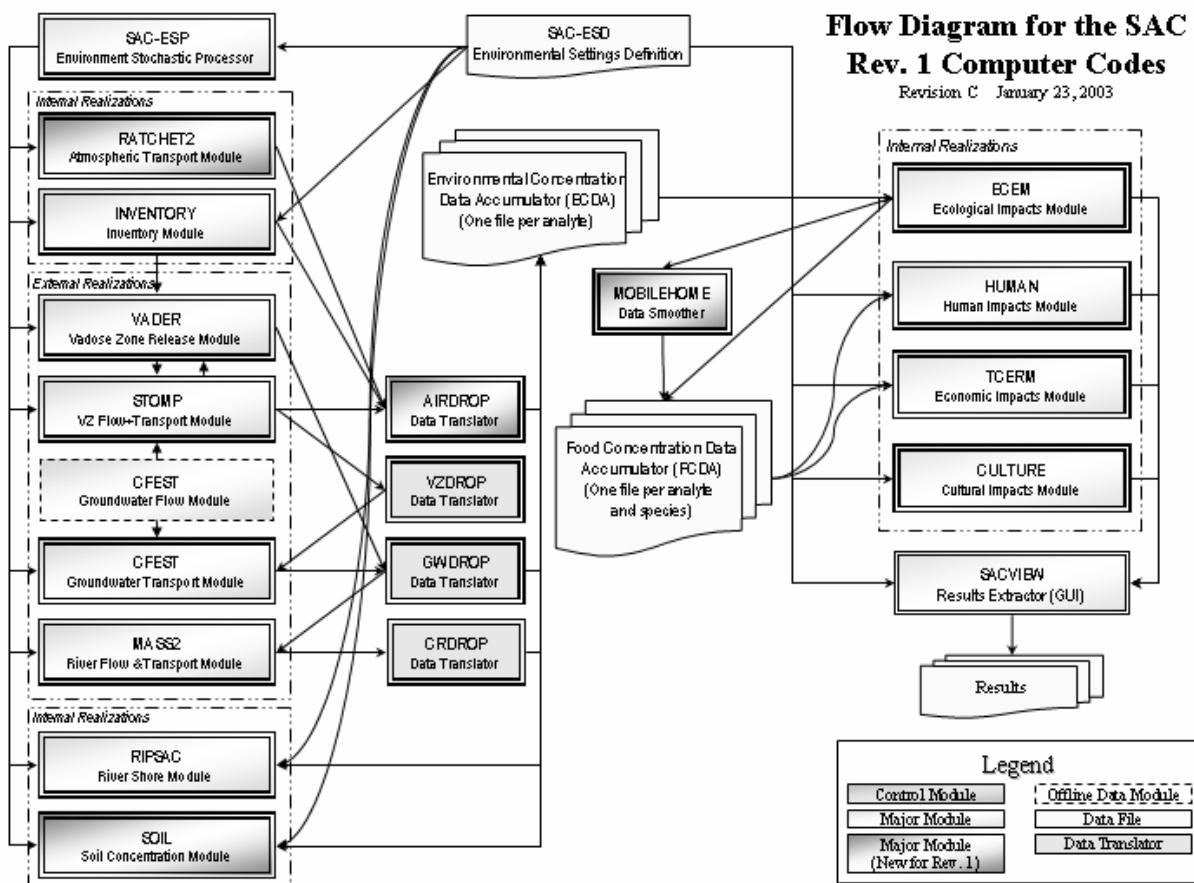


Figure 2.2. Information Flow in SAC Rev. 1 Software Design

- (a) Groundwater/Vadose Zone Integration Project: Preliminary System Assessment Capability Concepts for Architecture, Platform and Data Management. (<http://www.hanford.gov/cp/gpp/modeling/sacarchive/9-30rep.pdf>)

As can be seen in Figure 2.2, the SAC Rev. 1 Systems Code consists of a number of components that can be executed separately. A number of pieces of information, such as the site identification, coordinates, release model, hydrogeologic column (template), remediation action, infiltration class, and the start time and stop time of a simulated problem, are needed for the system components. The environmental settings definition (ESD) keyword file was designed to contain this common information. Generally, if information is needed by one or more modules of the suite of codes, it is entered in the ESD keyword file. A number of the ESD keywords are generated from general information on the waste site, its operational/disposal history, and its environmental settings (past, current, and future). To facilitate the generation of these ESD keyword input files, a database termed the Geographic and Operational Site Parameters List (GOSPL) was assembled.

One of the challenges associated with performing an assessment is appropriately presenting how well the results predict what might actually occur. This is because the attributes of the site that effect transport of contaminants, the impact of contaminants on living systems, and the future conditions used in the assessment, as well as many other factors upon which the predictions depend, are not completely understood. SAC was developed to allow the performance of a probabilistic risk assessment so an indication of the effect of parameter uncertainty on results could be examined. In general, other sources of uncertainty, such as conceptual model uncertainty, will not be handled within the calculations but will be discussed in the interpretation of the results of this analysis.

For the 2004 Composite Analysis, SAC has been modified to enable the import of results from detailed assessments of individual waste sites by other Hanford Site programs/projects. Such results come from selected tank waste analyses (e.g., the Integrated Disposal Facility [IDF] Performance Assessment [Mann 2003]). Information on 1) release to vadose zone or 2) release to water table will be imported into the SAC deterministic analysis. The 2004 Composite Analysis will treat best estimate simulations by other Hanford Site programs as “median” simulations and incorporate them into an overall “median-input” deterministic simulation. For most waste sites simulated by others, the SAC modules will be adjusted to achieve comparable results.

To perform a stochastic analysis, best-estimate data (geologic profile, hydraulic properties, geochemical properties, recharge sequence, etc.) used by other Hanford Site programs to perform assessments will be interpreted as “median” values for distributions where the data range is defined by the Hanford-wide data set previously compiled for SAC. A simplified model (such as, release and one-dimensional vadose zone or release and two-dimensional vadose zone) will be calibrated to reproduce key aspects of the median simulation provided by the detailed assessment. This simplified but calibrated model will be used to generate the stochastic realizations. Where available, comparison will be made between the range of SAC stochastic responses and the range of deterministic sensitivity cases provided by the other Hanford Site program.

Significant differences may exist between the SAC representation of uncertainty and the representation of sensitivity created by other assessments. This is especially true when the site-specific assessment is using sensitivity analyses to explore alternate conceptual models of waste form release (for example, tank residuals modeled with a solubility model, diffusion model, advection-desorption model, linear release-time-model) or barrier performance (for example, alternate surface barriers and engineered containment systems surrounding a glass waste form).

3.0 Geographic and Operational Site Parameter List Definitions

Of the more than 2,730 waste sites at Hanford and several storage sites, a subset of 1,046 sites was selected for inclusion in the 2004 Composite Analysis (Kincaid et al. 2004). A number of pieces of information are needed for the assessment, such as the site location, the release model, the hydrostratigraphic column (template), and the remedial action and infiltration assumptions. If this type of information is needed by one or more module of the suite of codes used by SAC, for a particular site, then the data are assembled for entry in the ESD keyword file. Of the 1,046 sites to be included in the 2004 Composite Analysis, 24 sites are primarily just place holders used to account for offsite transfers and nuclear material that are not directly simulated in any of the SAC codes. Thus, data have been assembled to enable the simulation of each of the 1,022 remaining sites, individually, using their site-specific parameters, and environmental settings. A master spreadsheet termed the Geographic and Operational Site Parameters List (or GOSPL) was developed for the initial assessments conducted using the SAC to define the site-specific location and facility design parameters as well as the key model assumptions for each assessment. GOSPL has continued to evolve as the site information and assessment basis has changed. It can generally be subdivided into three main sections: Site-Specific Parameters, Model-Specific Instructions, and Remediation/Infiltration Assumptions. Brief descriptions of each key data field, including the source(s) of data are provided below. Note that other subordinate data fields that are not directly used by the current SAC modules are not described here. This version of GOSPL (containing the 1,022 sites to be individually simulated for the 2004 Composite Analysis) is provided in the appendix.

3.1 Site-Specific Parameters

Key site-specific geographic parameters used in the SAC include such input as the site identifiers (e.g., Site Code), general site design and operational history information, site geographic information (e.g., location), and facility dimensions. Much of this information is taken from WIDS. Please refer to the WIDS home page on the Hanford Intranet at

<http://apweb02.rl.gov/rapidweb/phmc/cp/wids/index.cfm?PageNum=1>, and in particular the WIDS Data Field Definitions and Criteria <http://apweb02.rl.gov/rapidweb/phmc/cp/wids/docs/5/docs/datacrit1.pdf>.

3.1.1 Site Identifiers

There are three fields used to identify each specific site to be represented in the composite analysis: the WIDS Site Identification Number, the Site Code, and the Site Names.

3.1.1.1 WIDS Site Identification Number (SiteId) – Site Table

The WIDS SiteId (e.g., 575) provides a numeric identification number to uniquely identify each site record within WIDS. The primary data source for this information is the WIDS database, either directly or indirectly via the *Hanford Site Waste Management Units Report* (DOE 2003) or the QMAP geospatial map portal (<http://www7.rl.gov/cfroot/knowledgenet/qmap/index.cfm>). Future sites or facilities not contained in the WIDS database were assigned a SiteId equal to or greater than 9,900.

3.1.1.2 WIDS Site Code (SiteCode) – Site Table

The SiteCode (e.g., 216-Z-9) is a unique alphanumeric identification tag (code) assigned to a site when it is entered into WIDS. The codes have been assigned in accordance with the facility naming conventions in use at the time the site was entered into the database or as modified during database reengineering. The site codes generally consist of a prefix indicating the designed area in which the site is located and its facility type (such as 100-D-, 216-B-, 618-), followed by a sequential number.

The primary data source for the SiteCode is the WIDS database. Planned or proposed future waste sites or facilities not contained in the WIDS database were assigned their own unique identifier by SAC project staff.

3.1.1.3 WIDS Site Names (SiteNames) – Site Table

The SiteNames field (e.g., 216-Z-9, 216-Z-9 Cavern, 234-5 Recuplex Cavern, 216-Z-10, 216-Z-9 Crib, 216-Z-9 Covered Trench) provides the common or working names by which the site is known, including all aliases for a site. The primary data source for this information is from WIDS and was obtained either directly from the WIDS database, or indirectly via the *Hanford Site Waste Management Units Report* (DOE 2003) or the QMAP geospatial map portal. The purpose of this field is to provide a cross reference to previously used site codes and names used in reference documents.

3.1.2 General Site Design and Operational History Information

General information on the design and operational history of the site is captured via four fields: site type, waste type, and start and end dates.

3.1.2.1 Site Type (SiteType) – Site Table

The SiteType (e.g., Trench) describes the structural design of the site. Generally, the site types are defined by the general function of the site (e.g., ground disposal) and its design (e.g., trench). The primary data source for this information is WIDS, and was obtained either directly from the WIDS database, or indirectly via the *Hanford Site Waste Management Units Report* (DOE 2003) or the QMAP geospatial map portal. The purpose of this field is to help describe the manner in which the sites were used to store or dispose of waste.

3.1.2.2 Waste/Material Type (Type) – Waste Table

The waste/material type describes the type of waste at the site in terms of its source, its appearance, its use before becoming a waste, or other general category (e.g., steam condensate, process effluent, bismuth phosphate metal waste). The primary source of this data is WIDS. If the information was missing from WIDS, then it may be that the type of waste was unknown or the information has not been entered. The purpose of this information is to allow grouping of sites into similar waste chemistry groups to aid selection and assignment of linear sorption coefficients.

3.1.2.3 Operational Start Date (StartDate) – Site Table

The start date is the year the site started receiving waste. The primary source of this data is WIDS. If the information was missing from WIDS, then a start date was estimated from other nearby sites receiving similar waste types or servicing the same major process facilities.

3.1.2.4 Operational End Date (EndDate) – Site Table

The end date is the year the site stopped receiving waste. The primary source of this data is WIDS. If the information was missing from WIDS, then an end date was estimated from other nearby sites receiving similar waste types or servicing the same major process facilities.

3.1.3 Geographic Information

The basic geographic information captured for each site includes the site location and the type of feature used to represent the site within the Hanford Geographic Information System (HGIS) and *Hanford Site Atlas* (BHI 1998).

3.1.3.1 Site Location (Center X Coordinate, Center Y Coordinate) – GisSite Table

The X and Y coordinates for the site location are defined in terms of the Washington State Plane Easting and Northing coordinates (respectively), Southern Section, North American Datum 1983, in meters. The coordinate information represents the centroid of the site for sites mapped as a polygon. For sites mapped as a point (e.g., injection/reverse well), it represents the site itself. The primary data source for this information is WIDS, either directly from the WIDS database, or indirectly via the *Hanford Site Waste Management Units Report* (DOE 2003) or the QMAP geospatial map portal. However, coordinates are not recorded in WIDS for sites that are mapped as a line (e.g., sewers). So, for sites mapped as a line, and for sites where coordinate information is not available in WIDS, the centroid coordinates were estimated from HGIS documentation (i.e., the *Hanford Site Atlas* [BHI 1998]).

More detailed coordinate information was provided for large high volume liquid waste sites (e.g., ponds, ditches, cribs, and trenches) that might spatially overlap a number of different groundwater nodes. Rather than representing the centroid of the site, this information provides a number of key X,Y coordinate points that represent the perimeter of the site. Two fields are provided for this input, the number of coordinate points used to define the perimeter of the site, and the actual string of X, Y coordinates.

Number of X, Y Coordinate Points. This field provides the number of distinct X, Y coordinate points included in the X, Y coordinate string defined below.

X, Y Coordinate String. This field provides a string of paired X, Y coordinates used to define the perimeter of the site. The primary source of this information is estimates of selected key points used to represent the gross perimeter of the site as derived from the QMAP geospatial map portal (<http://www7.rl.gov/cfroot/knowledgenet/qmap/index.cfm>) or from HGIS documentation (i.e., the *Hanford Site Atlas* [BHI 1998]).

3.1.3.2 GIS Feature Type (GISFeatureType) – GisSite Table

The Geographic Information System (GIS) feature type describes the spatial representation of the site features in the HGIS. This includes sites mapped as a polygon, point, or line.

3.1.4 Facility Dimensions

Facility dimensions are captured via five fields generally taken from the WIDS database. These data fields include: Site Length, Site Width, Site Depth (or Height), Site Diameter, and Site Area. In general, dimensions are provided in length and width fields or in the diameter field, but not both.

3.1.4.1 Site Length (LengthMtrs) – Dimensions Table

The site length is the longest dimension of a rectangular or nearly rectangular site. The primary source of this data is the WIDS database. If the data were not directly available from WIDS, then the site length was estimated from the QMAP geospatial map portal or HGIS documentation (i.e., the *Hanford Site Atlas* [BHI 1998]). If the value is blank, then it may be that the site length is unknown, or the information has not been entered (i.e., was not readily available for entry in the WIDS database).

3.1.4.2 Site Width (WidthMtrs) – Dimensions Table

The site width is the shortest dimension of a rectangular or nearly rectangular site. The primary source of this data is the WIDS database. If the data were not directly available from WIDS, then the site width was estimated from the QMAP geospatial map portal or HGIS documentation (i.e., the *Hanford Site Atlas* [BHI 1998]). If the value is blank, then it may be that the site width is unknown, or the information has not been entered (i.e., was not readily available for entry in the WIDS database).

3.1.4.3 Site Depth/Height (DepthHeightMtrs) – Dimensions Table

The site depth/height is the maximum depth of the site (in meters) below the ground surface or the maximum height of the unit above the ground surface. This includes the overburden depth. The primary source of this data is the WIDS database. If the value is blank, then it may be that the depth/height is unknown, or the information has not been entered (i.e., was not readily available for entry in the WIDS database).

3.1.4.4 Site Diameter (DiameterMtrs) – Dimensions Table

The site diameter is the distance (in meters) through the center of a circular or cylindrical (or nearly circular or cylindrical) site. The primary source of this data is the WIDS database. If the field is blank then it may be that the site diameter is unknown, there is no diameter (e.g., the site is rectangular), or the information has not been entered.

3.1.4.5 Site Area (AreaSqMtrs) – Dimensions Table

The site area is the surface extent of the site, measured in square meters. The primary source of this data is the WIDS database. If the data were not directly available from WIDS, then the site area was

calculated from other site dimensions (i.e., site width and site length, or site diameter). If site dimension information was unavailable, then the area was estimated from the QMAP geospatial map portal or HGIS documentation (i.e., the *Hanford Site Atlas* [BHI 1998]). If data could not be found with which to estimate the site area, then the site was assigned a default value. Table 3.1 lists the default site area values used for different site types.

Table 3.1. Default Site Areas

Site Type	Default Area (m ²)
Unplanned Release, French Drain	0.999
Storage Tank, Trench	9.99
Radioactive Process Sewer, Crib	99.9
Burial Ground	999

The site area is used to represent the footprint of the release area (e.g., the bottom area of a crib). However, a comparison of facility dimension information in WIDS with that by Maxfield (1979) suggests that the site area as recorded in WIDS is quite a bit bigger than the actual bottom area of the waste sites. It is believed that the site area represents the maximum surface extent of the facility, or perhaps even the fenced boundaries of the radiation zone surrounding the site. Thus, site area, as recorded in WIDS, may over estimate the actual footprint of the release area.

3.2 Model-Specific Instructions

This portion of GOSPL provides key model instructions for various components of the SAC system. This includes information regarding the release models and the vadose zone hydrogeologic templates.

3.2.1 Selected for Simulation in the 2004 Composite Analysis

This field identifies those sites that have been selected for simulation in the 2004 Composite Analysis. This field designates those sites selected for the 2004 Composite Analysis with a “1,” while those that will not be simulated are designated with a “0” or left blank.

3.2.2 Release Model Designation

The Release Models field is used to identify the type of release model that will be used in the SAC simulations. The designation for each site is based in part on the site type (see Section 3.1.2.1), the physical state of the waste (as taken from the PhysicalState field in the Waste Table of WIDS), and the material type (see Section 3.1.2.2). Table 3.2 lists the release model designations generally assigned by site type. Note that the release models assigned to each site are subjective in nature, based on best professional judgment, and may account for a combination of physiochemical processes (i.e., multiple release models).

Table 3.2. Summary of Release Model Assignments to Waste Source Types (after Riley and LoPresti 2004)

Release Model	Site (waste source) Type	Exceptions
Atmosphere	Stacks	
Liquid	Single-shell tanks, ^(a) unplanned releases, ^(b) trenches, cribs, drain/tile fields, radioactive process sewers, French drains, retention basins, ponds, ditches, sumps, injection/reverse wells, storage tanks, diversion boxes, catch tanks, valve pits, settling tanks, receiving vaults, and neutralization tanks	Receiving vault 241-WR_Vault will be modeled using the cement model.
Soil-Debris	Unplanned releases, ^(b) sand filters, burial grounds, laboratories, storage, stacks, ^(c) landfills, surplus production sites (i.e., the soil below and surrounding a site), storage tunnels	The GTF Landfill contains grouted waste, so the cement model should be applied. Site 116-C-2C will be modeled as a liquid release.
Cement	Process unit/plants, control structures, cemented waste in burial grounds	
Salt-cake	Single-shell tanks, ^(a) double-shell tanks ^(d)	
Reactor Block ^(e)	Decommissioned surplus production reactor cores	
Glass ^(f)	Vitrified ILAW waste from single-shell tanks	
River	Process sewer, outfall	

(a) Releases from single-shell tanks will be modeled using a combination of liquid, salt-cake, and/or diffusion (cement) models. Releases include past tank leaks, liquid released during retrieval and contaminant release from dissolution of residual solids following waste retrieval completion.

(b) Modeled as initial liquid release, release from surface contaminated soil or a combination of both.

(c) Modeled as initial atmospheric release, then as soil-debris following its operational period.

(d) Double-shell tanks are assumed not to leak prior to and during retrieval. Release of contaminants from residual solids modeled using salt-cake and/or diffusion (cement) model.

(e) B reactor release occurs entirely in the 100 Area. Following a specified period of time (75 years). The remaining inventories for all other reactors are moved to a 200 Area burial ground where release continues using the reactor block model.

(f) An empirical model that approximates the results from the ILAW STORM model, allowing SAC (VADER) to generate stochastic results through variation of recharge rate.

GTF = Grout Treatment Facility.
ILAW = Immobilized low-activity waste.
STORM = Subsurface Transport Over Reactive Multiphases.
VADER = Vadose Zone Environmental Release.

3.2.3 Vadose Zone Model Hydrostratigraphy

Each site contained in GOSPL was assigned to a general vadose zone hydrostratigraphic profile based on its location within one of 26 geographic areas (representing 17 general geographic areas and 9 site-specific locations), its site type (surface, near surface, tank, or injection well), and its waste chemistry designation. Each hydrostratigraphic profile (template) identifies the hydraulic and geochemical parameters necessary for STOMP to simulate the flow and transport through the vadose zone. As many as five variations of a single hydrostratigraphic template were incorporated to more accurately represent the depth of waste releases and the thickness of the vadose zone beneath the point of release. Additional

variations of the hydrostratigraphic templates were necessary to accommodate variations in K_d values associated with different waste chemistry designations. Thus, a series of 63 base templates were ultimately identified using a unique alphanumeric code consisting of a three-digit number that reflects the waste site type, a letter designating the geographic area, and a number designating the waste chemistry group for assigning K_d values. Nine site-specific hydrostratigraphic templates were created by adding additional alphanumeric characters to the geographic area designation. These codes are explained below. A more complete discussion regarding the development of the vadose zone templates is provided by Last et al. (2004).

3.2.3.1 VZ (Vadose Zone) Template Site Type (reflecting the depth of waste injection)

The VZ Template Site Type Code (e.g., 216) generally consists of a three-digit number, with the first digit indicating the operational area in which the facility is located, and the second and third digits signifying the relative depth of waste release based on its facility type (such as 100-, 241-, 616-). This code is primarily derived from the WIDS SiteCode (see Section 3.1.1.2), the WIDS SiteType (see Section 3.1.2.1), the WIDS DepthHeightMtrs (see Section 3.1.4.3), and the WIDS Site Description (SiteDesc), which are used to classify the sites into six main categories reflecting the relative depth of waste release as defined in Table 3.3. This code identifies variants to the geographic area hydrostratigraphic columns to account for the thickness of the soil column beneath different waste release depths.

Table 3.3. Site Type Codes Used in the Hydrostratigraphic Templates

Site Type Code ^(a)	Relative Depth of Waste Release	Representative WIDS SiteTypes
100, 200, 300, 400	Ground Surface (generally less than 3 m deep).	Surface and/or near surface facilities (e.g., process sewers, reactor buildings, laboratory buildings, storage, stacks, ponds, ditches, valve pits, process unit/plants, unplanned releases except tank leaks).
116, 216, 316, 616	Shallow Subsurface (generally 3-7 m below ground surface)	Shallow liquid and/or dry waste disposal facilities (e.g., cribs, burial grounds, retention basins, trenches, French drains, storage tunnels, drain/tile fields, pipelines, sewers).
241	Intermediate Subsurface (generally 9 to 17 m below ground surface)	High level waste tanks, settling tanks, diversion boxes, catch tanks, tank leak unplanned releases.
166, 266	Deep Subsurface (generally greater than 18 m below ground surface)	Deep injection sites (e.g., reverse wells)
276	Very Deep Subsurface (generally near or into the water table)	Very deep injection sites (e.g., very deep reverse wells)
River ^(b)	River Level	River outfalls and associated pipelines

(a) First digit represents the area: 1 = 100 Area, 2 = 200 Area, 3 = 300 Area, 4 = 400 Area, 6 = 600 Area.
Second and third digits indicate the general facility type and relative release depth.

(b) River outfall discharged waste directly to the river, thus there is no vadose zone flow and transport component for these sites.

WIDS = Waste Information Data System.

3.2.3.2 Geographic Area

Sixteen geographic areas were identified that could each be represented by a single generalized hydrostratigraphic column (Figure 3.1). Each of the six 100 Areas were designated as separate geographic areas because each area is geographically distinct and have distinct hydrogeologic characteristics. The 200 Areas were divided into six aggregate areas based on differences in hydrogeologic characteristics. The 200 West and 200 East Areas were each divided into two geographic areas. Additional geographic areas were designated for the 200 North Area, Gable Mountain Pond area, and the B-Pond area. A single geographic area was designated to encompass waste sites in the 300 Area. Finally, three additional geographic areas were defined for isolated sites in the 400 and 600 Areas. Table 3.4 presents the letter designations and brief descriptions of each geographic area. Nine site-specific designations were created by adding additional alphanumeric characters to two of the geographic area designations (Table 3.5).

3.2.3.3 Waste Chemistry Group (for assigning K_d ranges)

Six waste chemistry types were defined by Kincaid et al. (1998) for use in the first composite analysis published in 1998. These waste chemistry types describe chemically distinct waste streams that impact the sorption of contaminants. These same waste chemistry designations were adapted for use in the initial assessment conducted using SAC to assign K_d values to the vadose zone base templates (Bryce et al. 2002). However, based on the results of a recent compilation of contaminant distribution coefficients (K_d) for Hanford sediments (Cantrell et al. 2003a, 2003b), the six waste stream categories used in these assessments were reduced to four (Table 3.6).^(a) Refer to the vadose zone data package (Last et al. 2004) for additional information regarding the assignment of these waste chemistry designations.

3.2.3.4 VZ Base Templates

A total of 61 base templates were identified based on various combinations of the site types, geographic areas, and waste chemistry types. This field is calculated by combining the information from the VZ Template Site Type, Geographic Area, and Waste Chemistry data fields, unless the VZ Template Site Type is “River,” in which case this field is calculated as “River.” However, if the Site Type is blank or the site is not on the list of sites for the composite analysis (i.e., the On Composite Analysis List field is “0”), then this field is left blank. The general Excel formula used to calculate this field is as follows:

$$= IF(A = 1, IF(B = "River", "River", IF(B = "", "", B & C & "-" & D)), "") \quad (1)$$

where A = On CA List
 B = Site Type
 C = Geographic Area
 D = Waste Chemistry Group.

(a) Cantrell KJ, RJ Serne, and GV Last. *Waste Stream Descriptions, Impact Zones and Associated K_d Estimates Including Rational for Selections* (Revision May 16, 2003).

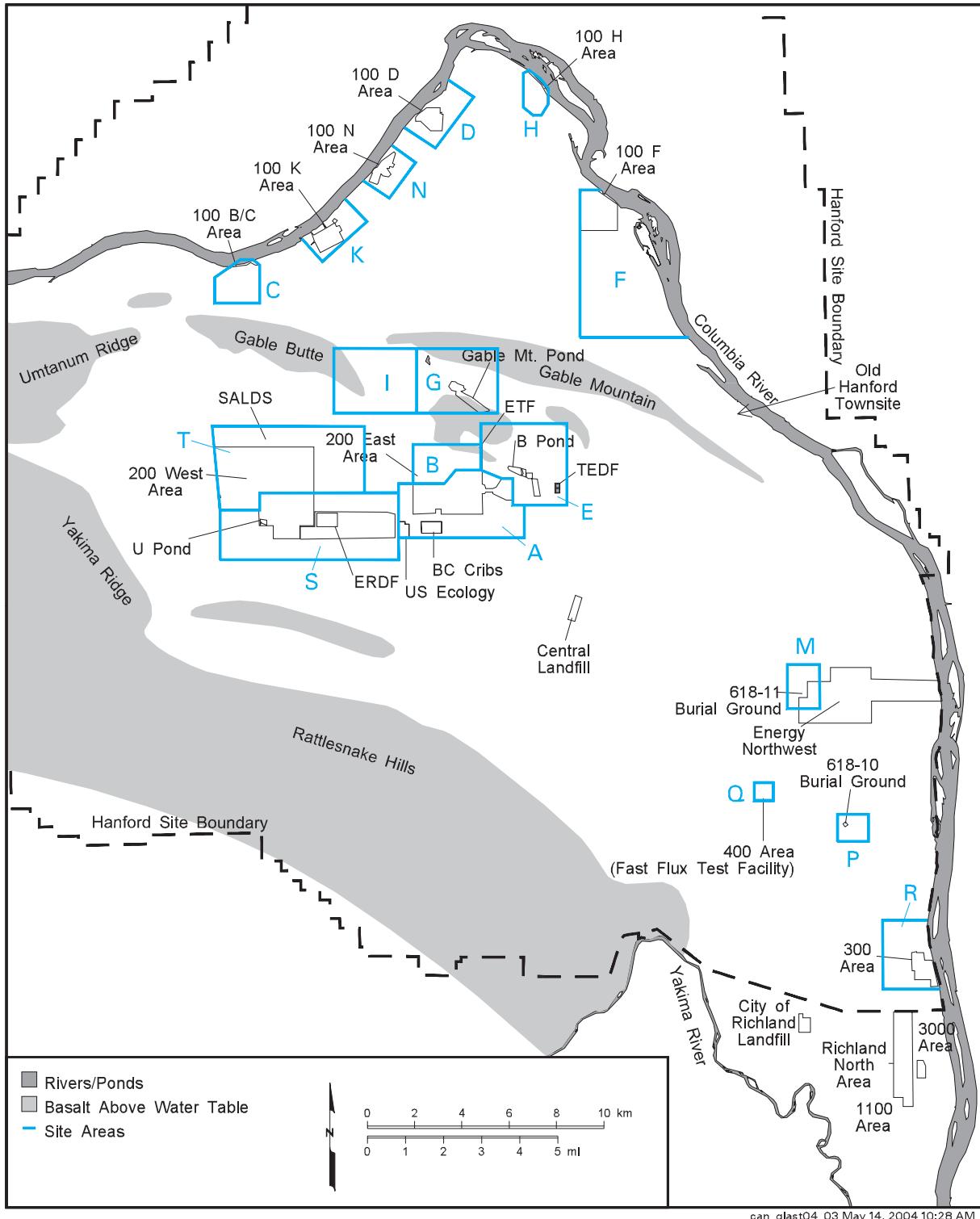


Figure 3.1. Geographic Areas Used to Define Different Hydrostratigraphic Profiles

Table 3.4. Geographic Area Designations Used in the Hydrostratigraphic Template Codes

Designation	Geographic Area Description
A	Southern 200 East Area – encompassing the PUREX (A Plant), Hot Semi-Works (C-Plant), associated facilities (including PUREX tunnels), US Ecology, and the A, AN, AP, AW, AX, AY, AZ, C Tank Farms
B	Northwestern 200 East Area – encompassing the B-Plant Area, associated waste disposal facilities, and the B, BX, BY Tank Farms
C	100-B/C Area
D	100-D/DR Area
E	East of 200 East – B-Pond Area
F	100-F Area
G	Gable Mountain Pond Area
I	200 North Area
H	100-H Area
K	100-KE/KW Area
M	600 Area near Energy Northwest and the 618-11 burial ground
N	100-N Area
P	600 Area southwest of the 400 Area near the 618-10 burial ground
Q	400 Area
R	300 Area (and a few isolated facilities in and near the 400 Area)
S	Southern 200 West Area – encompassing the REDOX (S-Plant), U-Plant, Z-Plant associated facilities, ERDF, and the S, SX, SY, U Tank Farms
T	Northern 200 West Area - encompassing T Plant , associated facilities, and the T, TX, TY Tank Farms
ERDF	= Environmental Restoration Disposal Facility.
PUREX	= Plutonium-Uranium Extraction (Plant).
REDOX	= Reduction Oxidation (Plant).

Table 3.5. Site-Specific Area Designations Used in the Hydrostratigraphic Template Codes

Designation	Site-Specific Area Description
A_BC_W	Southern 200 East Area – representing the western portion of the BC cribs area
A_BC_E	Southern 200 East Area – representing the eastern portion of the BC cribs area
A_BT_N	Southern 200 East Area – representing the northern portion of the BC trench area
A_BT_S	Southern 200 East Area – representing the southern portion of the BC trench area
A_BT_W	Southern 200 East Area – representing the western portion of the BC trench area
A_ILAW_C	Southern 200 East Area – representing the central portion of the ILAW>IDF site
S_U_N	Southern 200 West Area – representing the northern portion of the 216-U-1&2 crib area
S_U_S	Southern 200 West Area – representing the southern portion of the 216-U-1&2 crib area
S_Z9	Southern 200 West Area – representing the 216-Z-9 trench area
IDF	= Integrated Disposal Facility.
ILAW	= Immobilized low-activity waste.

Table 3.6. Waste Chemistry Groups Used in the Base Template Codes

Waste Chemistry Designation	Waste Stream Description
1	Very Acidic
2	High Salt/Very Basic
3	Chelates/High Salt
4	Low Salt/Near Neutral

Table 3.7 provides a description of the general hydrostratigraphic templates established for each geographic area. Table 3.8 describes the site-specific templates set up for a number of key facilities within two of these general geographic areas.

Table 3.7. General Hydrostratigraphic Templates for Each Geographic Area

VZ Base Template Designation	Geographic Area		Waste Site Types		Waste Chemistry Designation ^(d)
	Area	Designation ^(a)	Description	Designation ^(b)	
100C-4	100 B/C	C	Surface Facilities	100	4
116C-4			Near Surface Facilities	116	4
100D-4	100 D	D	Surface Facilities	100	4
116D-4			Near Surface Facilities	116	4
100F-4	100 F	F	Surface Facilities	100	4
116F-4			Near Surface Facilities	116	4
100H-4	100 H	H	Surface Facilities	100	4
116H-4			Near Surface Facilities	116	4
100K-4	100 K	K	Surface Facilities	100	4
116K-4			Near Surface Facilities	116	4
166K-4			Reverse Wells	166	4
100N-4	100 N	N	Surface Facilities	100	4
116N-4			Near Surface Facilities	116	4
200G-4	Gable Mtn. Pond	G	Surface Facilities	200	4
200I-4	200 North	I	Surface Facilities	200	4
200E-4	E 200 E (B-Pond)	E	Surface Facilities	200	4
200B-2	N 200 E (B-Plant)	B	Surface Facilities	200	2
200B-4					4
216B-3			Near Surface Facilities	216	3
216B-4					4
241B-2			Tanks	241	2
266B-4	Reverse Wells			266	4
267B-2				267 ^(c)	2

Table 3.7. (contd)

VZ Base Template Designation	Geographic Area		Waste Site Types		Waste Chemistry Designation ^(d)
	Area	Designation ^(a)	Description	Designation ^(b)	
200A-2	S 200 E (PUREX, BC Cribs)	A	Surface Facilities	200	2
200A-4					4
216A-2			Near Surface Facilities	216	2
216A-4					4
241A-2			Tanks	241	2
241A-3					3
266A-4			Reverse Wells	266	4
200S-2	S 200 W (REDOX, U-Plant, Z-Plant)	S	Surface Facilities	200	2
200S-4					4
216S-1	S 200 W (REDOX, U-Plant, Z-Plant)	S	Near Surface Facilities	216	1
216S-2					2
216S-4					4
241S-2			Tanks	241	2
241S-3					3
241S-4					4
266S-4			Reverse Wells	266	4
200T-2	N 200 W (T-Plant)	T	Surface Facilities	200	2
200T-4					4
216T-2			Near Surface Facilities	216	2
216T-3					3
216T-4					4
241T-2			Tanks	241	2
266T-2			Reverse Wells	266	2
266T-4					4
300R-4	300 Area (North Richland	R	Surface Facilities	300	4
316R-4			Near Surface Facilities	316	4
400Q-4	400	Q	Surface Facilities	400	4
616M-4	600	M	Near Surface Facilities	616	4
616P-4	600	P	Near Surface Facilities	616	4
River	-	-	River	-	-

(a) Assigned letter designation for geographic area.
(b) Assigned number designation for waste site type: first number designates traditional Hanford Site area (i.e., 100, 200, 300, 400, 600 Areas); last two numbers designate waste site type (00 = surface facilities, 16 = near surface facilities, 41 = tanks, 66/67 = reverse wells)
(c) Two designations are used for reverse wells that have very different depths within a single geographic area. The “67” designation distinguishes the very deep reverse wells from those at a more intermediate depth (66).
(d) Assigned number designation for waste chemistry type (see Table 3.6).
PUREX = Plutonium-Uranium Extraction (Plant).
REDOX = Reduction Oxidation (Plant).

Table 3.8. Site-Specific Templates Established for a Few Key Facilities

Template Designation	Site-Specific Area		Waste Site Types		Waste Chemistry Designation ^(d)
	Area	Designation ^(a)	Description	Designation ^(b)	
216A_BC_W-3	S 200 E, BC Cribs, Western Portion	A_BC_W	Near Surface Facilities	216	3
216A_BC_E-3	S 200 E, BC Cribs, Eastern Portion	A_BC_E	Near Surface Facilities	216	3
216A_BT_N-3	S 200 E, BC Trenches, Northern Portion	A_BT_N	Near Surface Facilities	216	3
216A_BT_N-4					4
216A_BT_S-3	S 200 E, BC Trenches, Southern Portion	A_BT_S	Near Surface Facilities	216	3
216A_BT_W-3	S 200 E, BC Trenches, Western Portion	A_BT_W	Near Surface Facilities	216	3
216A_ILAW_C-3	S 200 E, ILAW Site, Central Portion	A_ILAW_C	Near Surface Facilities	216	3
216S_U_N-4	S 200 W, 216-U-1&2 Area, Northern Portion	S_U_N	Near Surface Facilities	216	4
216S_U_S-4	S 200 W, 216-U-1&2 Area, Northern Portion	S_U_S	Near Surface Facilities	216	4
216S_Z9-1	S 200 W, 216-U-1&2 Area, Northern Portion	S_Z9	Near Surface Facilities	216	1

(a) Assigned letter designation for geographic area.
 (b) Assigned number designation for waste site type: first number designates traditional Hanford Site area (i.e., 100, 200, 300, 400, 600 Areas); last two numbers designate waste site type (00 = surface facilities, 16 = near surface facilities, 41 = tanks, 66/67 = reverse wells)
 (c) Two designations are used for reverse wells that have very different depths within a single geographic area. The “67” designation distinguishes the very deep reverse wells from those at a more intermediate depth (66).
 (d) Assigned number designation for waste chemistry type (see Table 3.6).
 ILAW = Immobilized low-activity waste.

3.2.3.5 Site Template

The Site Template uniquely identifies the site for the set of geographic and operational parameters to be used for the vadose zone simulations. For the 2004 Composite Analysis, this field is identical to that of the WIDS Site Code (see Section 3.1.1.2). However, this field has been used to aggregate multiple sites to a single template.

3.3 Remediation/Recharge Assumptions

This portion of GOSPL provides key assumptions regarding the surface soil conditions and deep drainage (recharge) at each waste site. These soil conditions and recharge estimates were derived from a suite of available field data and computer simulation results and assembled into a suite of recharge classes that describe the probability distribution function for recharge at the site. Recharge classes are defined for

a number of different time intervals: Pre-Hanford, Operations, Post-Remediation, and Post-Hanford. Each recharge class was identified with a unique code based on either the primary native soil and vegetation type or the type and size of the surface barrier. Refer to the vadose zone data package (Last et al. 2004) for details.

3.3.1 Pre-Hanford Recharge Class

This field defines the recharge class to be applied to the simulations for the time period prior to the establishment of the Hanford Site in 1943. The source of this information is the vadose zone data package (Last et al. 2004), which generally assumed a natural soil cover with undisturbed shrub-steppe plant community and based on the Hanford soil map produced by Hajek (1966). Table 3.9 lists the Pre-Hanford Recharge Classes used for the 2004 Composite Analysis.

Table 3.9. Pre-Hanford Recharge Classes for the 2004 Composite Analysis

Recharge Class Code	Description	Best Estimate (mm/yr)	Estimated Standard Deviation (mm/yr)	Minimum (mm/yr)	Maximum (mm/yr)
Eb-s	Ephrata stony loam (Eb) - with shrub-steppe (s) plant community	1.5	0.75	0.75	3.0
El-s	Ephrata sandy loam (El) - with shrub-steppe (s) plant community	1.5	0.75	0.75	3.0
Ba-s	Burbank loamy sand (Ba) - with shrub-steppe (s) plant community	3.0	1.5	1.5	6.0
Rpe-s	Rupert sand (Rp) in 200 East (e) - with shrub-steppe (s) plant community	0.9	0.45	0.45	1.8
Rp-s	Rupert sand (Rp) outside 200 East - with shrub-steppe (s) plant community	4.0	2.0	2.0	8.0
River	Assumes discharge directly to the river, no release or vadose zone modeling is required, so recharge rates are not applicable.	NA	NA	NA	NA
NA = Not applicable.					

3.3.2 Operational Recharge Class

This field defines the recharge classes to be used for simulations for the time period during and after site operations, prior to any site remediation. Once again, the source of this information comes directly from the vadose zone data package (Last et al. 2004). This generally assumes that the site is covered by native soils or backfilled soils with or without vegetation; asphalt, buildings, concrete, or gravel covers. Table 3.10 lists the Operational Recharge Classes used for the 2004 Composite Analysis.

Table 3.10. Operational Recharge Classes for the 2004 Composite Analysis

Recharge Class Code	Description	Best Estimate (mm/yr)	Estimated Standard Deviation (mm/yr)	Minimum (mm/yr)	Maximum (mm/yr) ^(a)
Eb-dn	Ephrata stony loam (Eb), disturbed (d) – with no (n) vegetation	17	8.5	8.5	34
El-dn	Ephrata sandy loam (El), disturbed (d) – with no (n) vegetation	17	8.5	8.5	34
Ba-dg	Burbank loamy sand (Ba), disturbed (d) – with cheatgrass (g) plant community	26	13.0	13.0	52
Ba-dn	Burbank loamy sand (Ba), disturbed (d) – with no (n) vegetation	53	26.5	26.5	101
Rpe-dn	Rupert sand (Rp) in 200 East, disturbed (d) – with no (n) vegetation	44	22	22	88
Rp-dn	Rupert sand (Rp) outside 200 East, disturbed (d) – with no (n) vegetation	44	22	22	88
G-dn	Gravel surface (G), disturbed – with no (n) vegetation	89	44.5	44.5	101
ABC	Soil Surface covered by Asphalt, Building, or Concrete	0.1	0.05	0.05	0.2
River	Assumes discharge directly to the river, no release or vadose zone modeling is required, so recharge rates are not applicable.	NA	NA	NA	NA

(a) Note: the maximum recharge was truncated at the mean extended winter precipitation value of 101 mm/yr.
NA = Not applicable.

3.3.3 Interim Remedial Actions (IRA-1 and IRA-2)

Interim remedial actions (IRA) have been identified or proposed for some sites. Currently, GOSPL is configured to handle two different interim remedial action events (IRA-1 and IRA-2). For these particular sites, three additional fields have been defined (Year Interim Remedial Action Complete, Interim Remedial Action Type, and Interim Barrier/Soil Cover Type) for each remedial action event defined. The primary source of this information was from Maxfield (1979) or the WIDS database (via the *Hanford Site Waste Management Units Report* [DOE 2003]). An example for the BC cribs and trenches is shown in Table 3.11, with the fields in that table as defined below.

3.3.3.1 Year Interim Remedial Action Complete (year IRA-1 complete; year IRA-2 complete)

This field defines the year that the interim remedial action was completed.

Table 3.11. Example of Interim Remedial Actions Defined for the 2004 Composite Analysis

WIDS Site Code	IRA-1			IRA-2		
	Year Complete	Type	Barrier/Soil Type	Year Complete	Type	Barrier/Soil Type
216-B-14	1981	ABAR	Rp-ds			
216-B-20	1969	ABAR	G-dn	1982	ABAR	Rpe-ds
ABAR = Aggregate barrier. IRA = Interim remedial actions. WIDS = Waste Information Data System.						

3.3.3.2 Interim Remedial Action Type (IRA-1 type, IRA-2 type)

This field defines the type of interim remedial action that was taken at the site. For the 2004 Composite Analysis, this includes: (1) remove, treat, and dispose (RTD) or (2) surface stabilization (e.g., aggregate barrier [ABAR], isolated barrier [IBAR]).

3.3.3.3 Interim Barrier/Soil Type (recharge class) (IRA-1 barrier/soil type; IRA-2 barrier/soil type)

This field, when populated, defines the recharge class to be applied to the site during the period after interim remediation and prior to any other interim remediation or final site remediation. For the 2004 Composite Analysis only three IRA recharge classes have been identified, G-dn (as described in Table 3.10) and Rp-ds and Rpe-ds (as described in Table 3.12).

3.3.4 Remediation

Some form of remediation (or no action) was identified for each site. A number of data fields were used to define the recharge classes to be used during the period following remediation and prior to the long-term post-remediation/closure design-life. The primary source of this information comes from the Hanford Disposition Baseline and Kincaid et al. (2004). These sources determined the schedule and type of remediation (e.g., engineered surface barriers) to be applied to each site for the 2004 Composite Analysis. The vadose zone data package (Last et al. 2004) describes the assumptions regarding the recharge rates to be used for barriers during the institutional control period, their design life, and after their design life. A key assumption of the 2004 Composite Analysis is that deep drainage beneath barrier side slopes and the surrounding terrain does not appreciably affect contaminant release from immediately below the barrier, nor transport in the vadose zone to the water table. This assumption is consistent with the previous composite analysis as well as recent and ongoing assessments.

3.3.4.1 Year Remedial Action Complete

This field defines the planned (or actual) year that remediation will be (or was) completed at the site. This assumes that all remedial action for that particular site is completed within a given year. For those sites slated for no further action, a value of “NA” was used, indicating that the recharge class would not change from its pre-remediation time period.

3.3.4.2 Remediation Type

This field identifies the type of remedial action planned (or completed) for the site, including: no action; decontamination and decommissioning (D&D); remove, treat, and dispose (RTD); isolated barriers (IBAR), or aggregate barriers (ABAR). This field identifies a number of different aggregate barriers defined by a unique alphanumeric code, with the same code assigned to all sites to be covered by the same aggregate barrier.

3.3.4.3 Barrier Type

This field identifies the type of barrier planned (or completed) for the site. If the remediation type is anything other than an IBAR or ABAR, then this field is blank. Otherwise this field contains either Resource Conservation and Recovery Act (RCRA) C or Hanford to designate the two types of surface barriers currently planned for Hanford waste sites.

3.3.4.4 Barrier Infiltration Class

This field assigns an infiltration (recharge) class to those sites that are to receive a surface barrier. If the remediation type (Section 3.3.6.2) is anything other than an IBAR or ABAR, then this field is blank. Otherwise this field is calculated from a lookup table of barrier infiltration classes based on the estimated barrier top-to-side slope ratio. It was developed to help address the possible effects of side slopes on barrier recharge rates. However, for the 2004 Composite Analysis it is assumed that deep drainage beneath the barrier side slopes and the surrounding terrain does not appreciably affect contaminant release and transport (Last et al. 2004). Thus far, for the baseline case of the 2004 Composite Analysis, the actual values in this field are of no consequence. These infiltration assignments that account for side slope influence may be used in a sensitivity case.

3.3.4.5 Post Remediation Recharge Classes

This field provides the recharge class to be used for the post-remediation time period (i.e., following site remediation and prior to any soil/barrier evolution/degradation). This field is calculated by combining the information from the Barrier Type and Barrier Infiltration Class, if the Barrier Type is not blank, or by modifying the information in the Pre-Operations Recharge Class to replace the suffix with “-ds” (to reflect disturbed shrub-steppe vegetation). If the VZ Template Site Type is “River,” then this field is calculated as “River.” The general Excel formula used to calculate this field is as follows:

$$= IF(A = "", IF(B = "River", "River", REPLACE(C, SEARCH("-", C, 1), 2, "-ds")), D & "-" & A) \quad (2)$$

where A = Barrier Infiltration Class
B = Vadose Zone Template Type
C = Pre-Operations Infiltration Class
D = Barrier Type.

Table 3.12 lists the post-remediation recharge classes for the composite analysis. Note that for this composite analysis all sizes of RCRA C and Hanford Barriers have the same estimated recharge rates (i.e., there are no side-slope effects). Refer to the vadose zone data package (Last et al. 2004) for further discussion.

Table 3.12. Post-Remediation Recharge Classes

Recharge Class Code	Description	Best Estimate (mm/yr)	Estimated Standard Deviation (mm/yr)	Minimum (mm/yr)	Maximum (mm/yr)
RCRA C-Ixx	Modified RCRA C – barrier top during design life	0.1	0.05	0.05	0.20
Hanford-Ixx	Hanford Barrier – barrier top during design life	0.1	0.05	0.05	0.20
Ba-ds	Burbank loamy sand (Ba), disturbed (d) – with young shrub-steppe (s) plant community	6.0	3.0	3.0	12
Eb-ds	Ephrata stony loam (Eb), disturbed (d) - with young shrub-steppe (s) vegetation	3.0	1.5	1.5	6.0
El-ds	Ephrata sandy loam (El), disturbed (d) – with young shrub-steppe (s) vegetation	3.0	1.5	1.5	6.0
Rp-ds	Rupert sand (Rp) outside 200 East, disturbed (d) – with young shrub-steppe (s) plant community	8.0	4.0	4.0	16.0
Rpe-ds	Rupert sand (Rp) in 200 East, disturbed (d) – with young shrub-steppe (s) plant community	1.8	0.9	0.9	3.6
River	Assumes discharge directly to the river, no release or vadose zone modeling is required, so recharge rates are not applicable.	NA	NA	NA	NA
NA = Not applicable.					

3.3.4.6 Post-Remediation/Barrier Design Life

This field defines the design life of the post-remediation period (i.e., that period after remediation is complete and prior to any significant degradation of the surface soils (e.g., barrier) or succession of plant communities). Table 3.13 lists the Post-Remediation/Barrier Design Life.

Table 3.13. Post-Remediation/Barrier Design Life

Post-Remediation Soil Conditions (recharge classes)	Design Life (years)
Native soil with young shrub-steppe plant community (Ba-ds, Eb-ds, El-ds, Rp-ds, Rpe-ds)	30
RCRA C surface barrier	500
Hanford surface barrier	1,000
River	NA

NA = Not applicable.
RCRA = Resource Conservation and Recovery Act.

3.3.4.7 Barrier End Date

This field defines the date at which the post-remediation recharge period ends and the final long-term recharge period begins. This field is calculated by adding the Design Life to the Year Remedial Action Complete. However, if the Release Model Designation is “River,” then this field is calculated as “NA,” or if the Year Remedial Action Complete field is “NA,” then this field is calculated as “2010.” The general Excel formula used to calculate this field is as follows:

$$= IF(A = "River", "NA", IF(B = "NA", 2010, B + C)) \quad (3)$$

where A = Release Model Designation
B = Year Remedial Action Complete
C = Post-remediation/Barrier Design Life.

3.3.4.8 Final Long-Term Recharge Class

This field defines the final long-term recharge class to be used for the final simulation period. This field is calculated as being equal to the Pre-Operational Infiltration Class.

4.0 Conclusions and Recommendations

A composite analysis is required by U.S. Department of Energy (DOE) Order 435.1 to ensure public safety through the management of active and planned low-level radioactive waste disposal facilities associated with the Hanford Site. Kincaid et al. (2004) indicated that the System Assessment Capability (SAC) (Kincaid et al. 2000; Bryce et al. 2002; Eslinger 2002a, 2002b) would be used for the analysis. They also identified 1,046 waste sites from the 2,730 WIDS sites and several existing and future storage sites for inclusion in the 2004 Composite Analysis. Each of these sites will be handled as an individual release or storage site whenever inventory and release data permit.

A number of pieces of information, such as the site identification, coordinates, release model, hydrogeologic column (template), remediation action, infiltration class, and the start time and stop time of a simulated problem, are needed for the numerical assessment. The ESD keyword file was designed to contain this common information. Generally, if information is needed by one or more module of the suite of codes used by SAC, it is entered in the ESD keyword file. A number of the ESD keywords are generated from general information on the waste site, its operational/disposal history, and its environmental settings (past, current, and future). To facilitate the generation of these ESD keyword input files, a master spreadsheet termed the Geographic and Operational Site Parameters List (GOSPL) was assembled. It can generally be subdivided into three main sections: Site-Specific Parameters, Model-Specific Instructions, and Remediation/Infiltration Assumptions. This report briefly describes each of the key data fields, including the source(s) of data, and provides the inputs to be used for the 2004 Composite Analysis.

This master spreadsheet was originally developed for the initial assessments conducted using the SAC to lock down the site-specific location and facility design parameters as well as the key model assumptions for each assessment. GOSPL has continued to evolve as the site information and/or assessment basis has changed. It is recommended that a complete restructuring of GOSPL be developed to interactively retrieve data directly from the record databases (e.g., WIDS) and to streamline the selection of sites and model assumptions.

5.0 References

- BHI. 1998. *Hanford Site Atlas*. BHI-01119, Rev. 1, Bechtel Hanford Inc., Richland, Washington.
- Bryce RW, CT Kincaid, PW Eslinger, and LF Morasch (eds.). 2002. *An Initial Assessment of Hanford Impact Performed with the System Assessment Capability*. PNNL-14027, Pacific Northwest National Laboratory, Richland, Washington.
- Cantrell KJ, RJ Serne, and GV Last. 2003a. *Hanford Contaminant Distribution Coefficient Database and Users Guide*. PNNL-13895, Rev. 1, Pacific Northwest National Laboratory, Richland, Washington.
- Cantrell KJ, RJ Serne, and GV Last. 2003b. *Applicability of the Linear Sorption Isotherm Model to Represent Contaminant Transport Processes in Site-Wide Performance Assessments – A White Paper*. CP-17089, Fluor Hanford, Inc., Richland, Washington.
- Comprehensive Environmental Response, Compensation, and Liability Act. 1980. Public Law 96-150, as amended, 94 Stat. 2767, 42 USC 9601 et seq.
- DOE. 2003. *Hanford Site Waste Management Units Report*. DOE/RL-88-30, Rev. 12, U.S. Department of Energy, Richland, Washington
(http://apweb02.rl.gov/rapidweb/phmc/cp/wids/index2.cfm.cfm?FileName=/docs/5/docs/Rl88-30_R11.pdf)

DOE Order 435.1. 1999. *Radioactive Waste Management*. U.S. Department of Energy, Washington, D.C. Available on the Internet at <http://www.hanford.gov/wastemgt/doe/psg/pdf/doe0435.pdf>

Eslinger PW, DW Engel, LH Gerhardstein, CA Lo Presti, WE Nichols, and DL Strenge. 2002a. *User Instructions for the Systems Assessment Capability, Rev. 0, Computer Codes, Volume 1: Inventory, Release, and Transport Modules*. PNNL-13932, Volume 1, Pacific Northwest National Laboratory, Richland, Washington.

Eslinger PW, C Arimescu, DW Engel, BA Kanyid, and TB Miley. 2002b. *User Instructions for the Systems Assessment Capability, Rev. 0, Computer Codes, Volume 2: Impacts Modules*. PNNL-13932, Volume 2, Pacific Northwest National Laboratory, Richland, Washington.

Hajek BF. 1966. *Soil Survey Hanford Project in Benton County, Washington*. BNWL-243, Pacific Northwest Laboratory, Richland, Washington.

Kincaid CT, MP Bergeron, CR Cole, MD Freshley, NL Hassig, VG Johnson, DI Kaplan, RJ Serne, GP Streile, DL Strenge, PD Thorne, LW Vail, GA Whyatt, and SK Wurstner. 1998. *Composite Analysis for Low-Level Waste Disposal in the 200 Area Plateau of the Hanford Site*. PNNL-11800, Pacific Northwest National Laboratory, Richland, Washington.

Kincaid CT, PW Eslinger, WE Nichols, AL Bunn, RW Bryce, TB Miley, MC Richmond, SF Snyder, and RL Aaberg. 2000. *Groundwater/Vadose Zone Integration Project, System Assessment Capability (Revision 0), Assessment Description, Requirements, Software Design, and Test Plan*. BHI-01365, Draft A, Bechtel Hanford, Inc., Richland, Washington.

Kincaid CT, RW Bryce, and JW Buck. 2004. *Technical Scope and Approach for the 2004 Composite Analysis of Low-Level Waste Disposal at the Hanford Site*. PNNL-14372, Pacific Northwest National Laboratory, Richland, Washington.

Last GV, EJ Freeman, KJ Cantrell, MJ Fayer, GW Gee, WE Nichols, and BN Bjornstad. 2004. *Vadose Zone Hydrogeology Data Package for the 2004 Composite Analysis*. PNNL-14702, Rev. 0, Pacific Northwest National Laboratory, Richland, Washington.

Mann FM. 2003. *Annual Summary of the Immobilized Low-Activity Waste Performance Assessment for 2003, Incorporating the Integrated Disposal Facility Concept*. DOE/ORP-2000-19, Revision 3, U.S. Department of Energy, Richland, Washington.

Maxfield HL. 1979. *Handbook - 200 Areas Waste Sites*. RHO-CD-673, Volumes I, II, and III, Rockwell Hanford Operations, Richland, Washington.

Resource Conservation and Recovery Act. 1976. Public Law 94-580, as amended, 90 Stat. 2795, 42 USC 6901 et seq.

Riley RG and C Lo Presti. 2004. *Release Model Data Package for the 2004 Composite Analysis*. PNNL-14760, Rev. 0, Pacific Northwest National Laboratory, Richland, Washington.

Appendix

Geographic and Operational Site Parameters for Waste Sites To Be Simulated in the 2004 Composite Analysis

Geographic and Operational Site Parameters for Waste Sites To Be Simulated in the 2004 Composite Analysis

Geographic Area	WIDS Site ID	WIDS Site Code	WIDS Site Name	On CA List	NZ Template Site Type	Site Type	Center X-coordinate (E)	Center Y-coordinate (N)	Number of (X,Y) Coordinate Points	(X,Y) Coordinate String	GIS Feature Type	Length (m)	Width (m)	Depth / Height (m)	Diameter (m)	Area (m ²)	Waste/Material Type	Waste Chem. Group	Release Models	VZBase Template	Site Template	Pre-Hanford Infiltration Class	Operational Start	Operational Infiltration Class	Operational End	RA-Y Year Complete	IRA-1 Type	IRA-1 Infiltration Class	IRA-2 Year Complete	IRA-2 Type	IRA-2 Infiltration Class	Year Remedial Action Complete	Remediation Type	Barrier Type	Barrier Design Life	Post Remediation	Barrier End Date	Final/Long Term Infiltration Class
C	4490	100-B-15	100BC River effluent Pipelines	1	River	Radioactive Process Sewer	#####	#####			line	1438.0	1.4			1973.655		NA	River	100-B-15	River	1944	River	1972			2003	RTD			NA	NA	NA					
C	1839	100-B-3		1	116	Burial Ground	565290.00	144369.00			point					999.000		4	Soil-Debris	116C-4	100-B-3	Eb-s	1952	Eb-dn	1952				2003	RTD			Eb-ds	30	2033	Eb-s		
C	1845	100-B-5		1	116	Trench	565437.00	144568.00			point	30.5	3.0	3.0		92.903		4	Liquid	116C-4	100-B-5	Eb-s	1954	Eb-dn	1956				2004	RTD			Eb-ds	30	2034	Eb-s		
C	3912	100-B-8	100-B-8, 100-B Reactor Cooling Water Effluent Underground Pipelines (2 Subsites)	1	100	Radioactive Process Sewer	565342.19	144504.94			line/poly					99.900		4	Liquid	100C-4	100-B-8	Eb-s	1944	Eb-dn	1968				2004	RTD			Eb-ds	30	2034	Eb-s		
C	1844	100-C-3		1	100	French Drair	565392.50	143951.97			point					0.6	0.292		4	Liquid	100C-4	100-C-3	Eb-s	1960	Eb-dn	1960				2005	RTD			Eb-ds	30	2035	Eb-s	
C	3914	100-C-6	100-C-6, 100-C Reactor Cooling Water Effluent Underground Pipelines (3 Subsites)	1	100	Radioactive Process Sewer	565387.81	143991.48			line/poly					99.900		4	Liquid	100C-4	100-C-6	Eb-s	1952	Eb-dn	1969				2005	RTD			Eb-ds	30	2035	Eb-s		
C	13	116-B-1		1	116	Trench	565538.56	145293.56			polygon	112.8	15.2	4.6		1718.706		4	Liquid	116C-4	116-B-1	Eb-s	1950	Eb-dn	1968				1999	RTD			Eb-ds	30	2029	Eb-s		
C	21	116-B-2		1	116	Trench	565413.19	144511.23			point	22.9	3.0	4.6		69.677		4	Liquid	116C-4	116-B-2	Eb-s	1946	Eb-dn	1946				1999	RTD			Eb-ds	30	2029	Eb-s		
C	22	116-B-3		1	116	Crib	565536.00	144527.48			polygon	3.0	3.0	6.1		23.226		4	Liquid	116C-4	116-B-3	Eb-s	1951	Eb-dn	1952				1999	RTD			Eb-ds	30	2029	Eb-s		
C	23	116-B-4		1	116	French Drair	565368.75	144508.84			polygon					4.572	1.2	6.039		4	Liquid	116C-4	116-B-4	Eb-s	1957	Eb-dn	1968				1997	RTD			Eb-ds	30	2027	Eb-s
C	24	116-B-5		1	116	Crib	565289.63	144761.75			polygon	27.0	2.4	3.53568		65.902		4	Liquid	116C-4	116-B-5	Eb-s	1950	Eb-dn	1968				1997	RTD			Eb-ds	30	2027	Eb-s		
C	25	116-B-6A		1	116	Crib	565387.56	144370.98			point	3.7	2.4	4.6		23.226		4	Liquid	116C-4	116-B-6A	Eb-s	1951	Eb-dn	1968				1999	RTD			Eb-ds	30	2029	Eb-s		
C	26	116-B-6B		1	116	Crib	565401.00	144344.00			point	3.7	2.4	4.6		7.897		4	Liquid	116C-4	116-B-6B	Eb-s	1950	Eb-dn	1953				1999	RTD			Eb-ds	30	2029	Eb-s		
C	27	116-B-7		1	116	River Outfall	565257.44	145324.63			polygon	8.2	4.3	6.4		36.697		NA	River	116-B-7	River	1944	River	1972				2001	RTD			NA	NA	NA				
C	29	116-C-1		1	116	Trench	565849.06	145284.91	5(565695.044,145 310.112), (565702.596,145 264.803), (565974.449,145 297.527), (565971.932,145 345.353), (565695.044,145 310.112)		polygon	152.4	15.2	6.096		2322.576		4	Liquid	116C-4	116-C-1	Eb-s	1952	Eb-dn	1968				1997	RTD			Eb-ds	30	2027	Eb-s		
C	30	116-C-2A		1	116	Crib	565501.75	144030.41			polygon	6.8	4.7	7.9		83.613		4	Liquid	116C-4	116-C-2A	Eb-s	1952	Eb-dn	1969				1999	RTD			Eb-ds	30	2029	Eb-s		
C	32	116-C-2C		1	116	Sand Filter	565478.13	144022.31			polygon	12.6	5.5	5.5		34.188		4	Liquid	116C-4	116-C-2C	Eb-s	1952	Eb-dn	1969				1999	RTD			Eb-ds	30	2029	Eb-s		
C	102	118-B-1		1	116	Burial Ground	564387.31	143945.20			polygon	304.8	97.8	6.1		2982.188		4	Soil-Debris	116C-4	118-B-1	Eb-s	1944	Eb-dn	1973				2005	RTD			Eb-ds	30	2035	Eb-s		
C	104	118-B-2		1	116	Burial Ground	565474.00	144578.42			polygon	18.3	9.1	3.0		167.225		4	Soil-Debris	116C-4	118-B-2	Eb-s	1952	Eb-dn	1956				2005	RTD			Eb-ds	30	2035	Eb-s		
C	105	118-B-3		1	116	Burial Ground	565549.69	144596.83			polygon	106.7	8.3	6.096		8941.918		4	Soil-Debris	116C-4	118-B-3	Eb-s	1956	Eb-dn	1960				2006	RTD			Eb-ds	30	2036	Eb-s		
C	106	118-B-4		1	116	Burial Ground	565365.56	144619.52			polygon	15.2	9.1	4.6		139.355		4	Soil-Debris	116C-4	118-B-4	Eb-s	1956	Eb-dn	1958				2006	RTD			Eb-ds	30	2036	Eb-s		
C	107	118-B-5		1	116	Burial Ground	565391.44	144417.39			polygon	15.2	15.2	6.1		232.268		4	Soil-Debris	116C-4	118-B-5	Eb-s	1953	Eb-dn	1953				2004	RTD			Eb-ds	30	2034	Eb-s		
C	108	118-B-6		1	116	Burial Ground	565355.63	144637.66			polygon	4.6	3.0	6.096		13.935		4	Soil-Debris	116C-4	118-B-6	Eb-s	1950	Eb-dn	1953				2006	RTD			Eb-ds	30	2036	Eb-s		
C	109	118-B-7	111-B Solid Waste Burial Site	1	116	Burial Ground	565412.00	144348.20			point	2.1	2.4	2.4		5.950		4	Soil-Debris	116C-4	118-B-7	Eb-s	1951	Eb-dn	1968				2004	RTD			Eb-ds	30	2034	Eb-s		
C	110	118-B																																				

Geographic and Operational Site Parameters for Waste Sites To Be Simulated in the 2004 Composite Analysis

Geographic Area	WIDS Site ID	WIDS Site Code	WIDS Site Name	On CA List	NZ Template Site Type	Site Type	Center X-coordinate (E)	Center Y-coordinate (N)	Number of (X,Y) Coordinate Points	(X,Y) Coordinate String	GIS Feature Type	Length (m)	Width (m)	Depth / Height (m)	Diameter (m)	Area (m ²)	Waste/Material Type	Waste Chem. Group	Release Models	/ZBase Template	Site Template	Pre-Hanford Infiltration Class	Operational Start	Operational End	IRA-1 Year Complete	IRA-1 Type	IRA-1 Infiltration Class	IRA-2 Year Complete	IRA-2 Type	IRA-2 Infiltration Class	Year Remedial Action Complete	Remediation Type	Barrier Type	Barrier Design Life	Post Remediation Class	Barrier End Date	Final/Long Term Infiltration Class	
D	172	122-DR-1	105-DR Sodium Fire Facility	1	100	Laboratory	573748.63	151234.59		polygon			790.000		4	Liquid	100D-4	122-DR-1	El-s	1972	ABC	1986							2010	RTD		El-ds	30	2040	El-s			
D	236	132-DR-2		1	100	Stack	573757.75	151240.20		polygon	61.0		20.400	5.1	4	Soil-Debris	100D-4	132-DR-2	El-s	1950	ABC	1986							2010	RTD		El-ds	30	2040	El-s			
F	1670	100-F-10		1	116	French Drair	580409.19	147590.94		point				0.9	0.657	4	Liquid	116F-4	100-F-10	Rp-s	1944	Rp-dn	1965							2003	RTD		Rp-ds	30	2033	Rp-s		
F	1672	100-F-12		1	116	French Drair	580460.44	147630.00		point				0.9	0.657	4	Liquid	116F-4	100-F-12	Rp-s	1944	Rp-dn	1965							2002	RTD		Rp-ds	30	2032	Rp-s		
F	1850	100-F-19		1	100	Radioactive Process	#####	#####		line	2214.7		99.900		4	Liquid	100F-4	100-F-19	Rp-s	1945	Rp-dn	1965							2003	RTD		Rp-ds	30	2033	Rp-s			
F	3915	100-F-23		1	116	French Drair	580871.00	147790.78		point				0.999		4	Liquid	116F-4	100-F-23	Rp-s	1944	Rp-dn	1965							2003	RTD		Rp-ds	30	2033	Rp-s		
F	3916	100-F-24	145-F Drywel	1	116	French Drair	580864.81	147825.23		point				0.999		4	Liquid	116F-4	100-F-24	Rp-s	1977	Rp-dn	1977							2004	RTD		Rp-ds	30	2034	Rp-s		
F	3917	100-F-25		1	116	French Drair	580925.06	148040.36		point				1.5	1.824	4	Liquid	116F-4	100-F-25	Rp-s	1956	Rp-dn	1975							2005	RTD		Rp-ds	30	2035	Rp-s		
F	3926	100-F-29		1	100	Radioactive Process	#####	#####		line				99.900		4	Liquid	100F-4	100-F-29	Rp-s	1945	Rp-dn	1976							2005	RTD		Rp-ds	30	2035	Rp-s		
F	4173	100-F-33	146-F Aquatic Biology Fish Ponds	1	100	Unplanned Release	580913.94	148056.19		polygon	49.0	19.0			889.310		4	Liquid	100F-4	100-F-33	Rp-s	1952	Rp-dn	1971							2005	RTD		Rp-ds	30	2035	Rp-s	
F	4387	100-F-36	108-F Chemical Pump House, 108-F Biological Laboratory	1	100	Laboratory	580600.56	147613.91				45.87	9.75	17.68		447.233		4	Soil-Debris/Liquid	100F-4	100-F-36	Rp-s	1944	ABC	1973							2005	RTD		Rp-ds	30	2035	Rp-s
F	4469	100-F-37	French Drain Discovered Near Hydrant F-2	1	100	French Drain	580712.81	147677.92								0.999		4	Liquid	100F-4	100-F-37	Rp-s	1969	Rp-dn	1969							2005	RTD		Rp-ds	30	2035	Rp-s
F	4470	100-F-38	Yellow Stained Soil Near Hydrant F-2	1	100	Unplanned Release	580702.44	147672.64								0.999		4	Soil-Debris	100F-4	100-F-38	Rp-s	1969	Rp-dn	1969							2005	RTD		Rp-ds	30	2035	Rp-s
F	4492	100-F-39	100F River Effluent Pipelines, 100F River Lines	1	River	Radioactive Process Sewer	#####	#####				91.0	2.1			194.740		4	River	River	100-F-39	River	1969							2005	RTD		NA	NA	NA	NA		
F	1680	100-F-9		1	116	French Drair	580490.19	147597.64		point				0.9	0.657	4	Liquid	116F-4	100-F-9	Rp-s	1944	Rp-dn	1965							2006	RTD		Rp-ds	30	2036	Rp-s		
F	57	116-F-1		1	116	Trench	579989.19	148050.38		polygon	1744.0	6.1	3.0			10638.400		4	Liquid	116F-4	116-F-1	Rp-s	1953	Rp-dn	1965							2006	RTD		Rp-ds	30	2036	Rp-s
F	58	116-F-10		1	116	French Drair	580453.36	147500.50		point				6.096	0.9	4	Liquid	116F-4	116-F-10	Rp-s	1948	Rp-dn	1965							2006	RTD		Rp-ds	30	2036	Rp-s		
F	59	116-F-11		1	116	French Drair	580450.88	147576.00		point				0.9144	0.9	4	Liquid	116F-4	116-F-11	Rp-s	1953	Rp-dn	1965							2006	RTD		Rp-ds	30	2036	Rp-s		
F	64	116-F-16	PNL Outfall	1	River	Outfall	580963.44	148143.98				30.5	4.6			4.570		4	River/Liquid	River	116-F-16	River	1969							2006	RTD		NA	NA	NA	NA		
F	65	116-F-2		1	116	Trench	581147.88	147681.13		polygon	158.8	6.1	3.4			968.050		4	Liquid	116F-4	116-F-2	Rp-s	1950	Rp-dn	1965							2002	RTD		Rp-ds	30	2032	Rp-s
F	66	116-F-3		1	116	Trench	580440.50	147530.73		polygon	30.5	6.1	3.4			303.514		4	Liquid	116F-4	116-F-3	Rp-s	1947	Rp-dn	1951							2006	RTD		Rp-ds	30	2036	Rp-s
F	67	116-F-4		1	116	Crib	580367.63	147524.25		polygon	1.8	1.8	3.0			9.290		4	Liquid	116F-4	116-F-4	Rp-s	1950	Rp-dn	1952							2001	RTD		Rp-ds	30	2031	Rp-s
F	68	116-F-5		1	116	Crib	580378.81	147504.56		polygon	3.0	3.0	2.7			9.290		4	Liquid	116F-4	116-F-5	Rp-s	1954	Rp-dn	1964							2001	RTD		Rp-ds	30	2031	Rp-s
F	69	116-F-6		1	116	Trench	580482.50	147456.89		polygon	91.4	30.5	3.0			2787.091		4	Liquid	116F-4	116-F-6	Rp-s	1952	Rp-dn	1965							2006	RTD		Rp-ds	30	2036	Rp-s
F	70	116-F-7		1	116	French Drair	580355.13	147450.84		point	6.1	6.1	5.1816			0.999		4	Liquid	116F-4	116-F-7	Rp-s	1960	Rp-dn	1965							2006</td						

Geographic and Operational Site Parameters for Waste Sites To Be Simulated in the 2004 Composite Analysis

Geographic Area	WIDS Site ID	WIDS Site Code	WIDS Site Name	On CA List	WZ Template Site Type	Site Type	Center X-coordinate (E)	Center Y-coordinate (N)	Number of (X,Y) Coordinate Points	(X,Y) Coordinate String	GIS Feature Type	Length (m)	Width (m)	Depth / Height (m)	Diameter (m)	Area (m ²)	Waste/Material Type	Waste Chem. Group	Release Models	WZBase Template	Site Template	Pre-Hanford Infiltration Class	Operational Start	Operational End	IRA-Y Year Complete	IRA-1 Type	IRA-1 Infiltration Class	IRA-2 year Complete	IRA-2 Type	IRA-2 Infiltration Class	Year Remedial Action Complete	Remediation Type	Barrier Type	Barrier Infiltration Class	Post Remediation	Barrier Design Life	Barrier End Date	Final/Long Term Infiltration Class	
K	4181	100-K-56		1	100	Radioactive Process	#####	#####			line	1902.9		4.6		99.900			4	Liquid	100K-4	100-K-56	Eb-s	1955	Eb-dn	1971			2009	RTD			Eb-ds	30	2039	Eb-s			
K	4186	100-K-57		1	100	Ditch	#####	#####			line	570.0		1.5	1.2	868.680			4	Liquid	100K-4	100-K-57	Eb-s	1967	Eb-dn	1971			2003	RTD			Eb-ds	30	2033	Eb-s			
K	1717	100-K-6	Vacuum Pit, Cyclone Separator, 105-KE Vacuum Pit	1	100	Process Unit/Plant	569234.56	146730.44			line					3.1	7.306			4	Cement	100K-4	100-K-6	Eb-s	1969	Eb-dn	1969			2009	RTD			Eb-ds	30	2039	Eb-s		
K	4203	100-K-61	117-KW Filter Building	1	100	Process Unit/Plant	568697.19	146487.72			line					9.8	99.900			4	Cement	100K-4	100-K-61	Eb-s	1960	Eb-dn	1971			2009	RTD			Eb-ds	30	2039	Eb-s		
K	4204	100-K-62	17-KE Filter Building	1	100	Process Unit/Plant	569239.06	146767.63			line					9.8	99.900			4	Cement	100K-4	100-K-62	Eb-s	1960	Eb-dn	1971			2009	RTD			Eb-ds	30	2033	Eb-s		
K	4431	100-K-78	Fenced Contamination Area	1	100	Unplanned Release	569254.06	147388.81			line					19.4	16.4	318.160			4	Soil-Debris	100K-4	100-K-78	Eb-s	1969	Eb-dn	1969			2003	RTD			Eb-ds	30	2033	Eb-s	
K	4494	100-K-80	100K River Effluent Pipelines, 100K River Lines	1	River	Radioactive Process Sewer	#####	#####			line						99.900			4	River	100-K-80	River	Eb-s	1969	River	1969			2003	RTD			NA	NA	NA	NA		
K	81	116-K-1		1	116	Crib	569261.06	147222.53			polygon	121.9		121.9	6.1	14864.486			4	Liquid	116K-4	116-K-1	Eb-s	1955	Eb-dn	1956			2004	RTD			Eb-ds	30	2034	Eb-s			
K	82	116-K-2		1	116	Trench	569797.50	147715.88	8	(569351.648,147 244.796), (569750.756,147 732.450), (570149.832,148 265.777), (570247.303,148 206.928), (569993.512,147 837.276), (569634.895,147 384.867), (569437.889,147 180.810), (569351.648,147 244.796)		polygon	1249.7		17.2	5.3	21520.989			4	Liquid	116K-4	116-K-2	Eb-s	1955	Eb-dn	1971			2004	RTD			Eb-ds	30	2034	Eb-s		
K	83	116-K-3		1	River	Outfall	568911.56	146964.88			polygon	10.7		10.1	7.0104	107.3030112			NA	River	River	116-K-3	River	1969	River	1969						2004	RTD			NA	NA	NA	NA
K	84	116-KE-1		1	116	Crib	569249.88	146744.31			point					7.8	12.2	116.746			4	Liquid	116K-4	116-KE-1	Eb-s	1955	Eb-dn	1971			2010	RTD			Eb-ds	30	2040	Eb-s	
K	85	116-KE-2		1	116	Crib	569082.06	146636.06			polygon	4.9		4.9		24.248			4	Liquid	116K-4	116-KE-2	Eb-s	1955	Eb-dn	1971			2010	RTD			Eb-ds	30	2040	Eb-s			
K	86	116-KE-3		1	116	Injection/Reverse Wel	569133.69	146750.81			point					6.1	24.248	4	Liquid	116K-4	116-KE-3	Eb-s	1955	Eb-dn	1971			2010	RTD			Eb-ds	30	2040	Eb-s				
K	87	116-KE-4		1	116	Retention Basin	569096.75	146960.16			polygon					3.9	76.2	27870.912			4	Liquid	116K-4	116-KE-4	Eb-s	1955	Eb-dn	1971			2004	RTD			Eb-ds	30	2034	Eb-s	
K	88	116-KE-5	150-KE Heat Recovery Station	1	100	Process Unit/Plant	569165.19	146871.94			line						99.900			4	Soil-Debris	100K-4	116-KE-5	Eb-s	1955	ABC	1971			2010	RTD			Eb-ds	30	2040	Eb-s		
K	92	116-KE-6D	1706-KE Ion Exchange Column, 1706-KE Waste Treatment System	1	100	Process Unit/Plant	569132.38	146663.73			line						99.900			4	Cement	100K-4	116-KE-6D	Eb-s	1984	ABC	1984			2010	RTD			Eb-ds	30	2040	Eb-s		
K	93	116-KW-1		1	116	Crib	568718.06	146478.16			point					7.8	12.2	116.745			4	Liquid	116K-4	116-KW-1	Eb-s	1955	Eb-dn	1971			2010	RTD			Eb-ds	30	2040	Eb-s	
K	94	116-KW-2		1	116	Injection/Reverse Wel	568591.56	146470.45			point					6.1	5.388	4	Liquid	166K-4	116-KW-2	Eb-s	1955	Eb-dn	1970			2010	RTD			Eb-ds	30	2040	Eb-s				
K	95	116-KW-3		1	116	Retention Basin	568593.13	146668.14			polygon					3.9	76.2	13759.312			4	Liquid	116K-4	116-KW-3	Eb-s	1954	Eb-dn	1970			2004	RTD			Eb-ds	30	2034	Eb-s	
K	96	116-KW-4	150-KW Heat Recovery Station	1	100	Process Unit/Plant	568649.06	146576.28			line						99.900			4	Cement	100K-4	116-KW-4	Eb-s	1955	ABC	1970			2010	RTD			Eb-ds	30	2040	Eb-s		
K	139	118-K-1		1	116	Burial Grounc	569452.31	146895.86			polygon	365.8		182.9	6.1	66890.189			4	Soil-Debris	116K-4	118-K-1	Eb-s	1953	Eb-dn	1975			2010	RTD			Eb-ds	30	2040	Eb-s			
K	140	118-KE-1		1	100	Reactor	569184.31	146717.02			polygon					5343.500			4	Reactor Block/Soil-Debris	100K-4	118-KE-1	Eb-s	1955	ABC	1971			2010	RTD			Eb-ds	30	2040	Eb-s			
K	141	118-KE-2		1	100	Storage	569267.75	146808.50			polygon	12.2		7.6		92.903			4	Soil-Debris	100K-4	118-KE-2	Eb-s	1955	Eb-dn	1971			2010	RTD			Eb-ds	30	2040	Eb-s			
K	142	118-KW-1		1	100	Reactor	568644.25	146433.25			polygon					4567.700			4	Reactor Block/Soil-Debris	100K-4	118-KW-1</																	

Geographic and Operational Site Parameters for Waste Sites To Be Simulated in the 2004 Composite Analysis

Geographic Area	WIDS Site ID	WIDS Site Code	WIDS Site Name	On CA List	NZ Template Site Type	Site Type	Center XCoordinate (E)	Center YCoordinate (N)	Number of (X,Y) Coordinate Points	(X,Y) Coordinate String	GIS Feature Type	Length (m)	Width (m)	Depth / Height (m)	Diameter (m)	Area (m ²)	Waste/Material Type	Waste Chem. Group	Release Models	ZBase Template	Site Template	Pre-Hanford Infiltration Class	Operational Start	Operational Infiltration Class	Operational End	RA-1 Year Complete	RA-1 Type	RA-1 Infiltration Class	RA-2 Year Complete	RA-2 Type	RA-2 Infiltration Class	Year Remedial Action Complete	Remediation Type	Barrier Type	Barrier Infiltration Class	Post Remediation	Barrier Design Life	Barrier End Date	Final/Long Term Infiltration Class					
N	100	116-N-4		1	116	Retention Basin	571105.50	149501.52			polygon	39.6	24.4			809.371			4	Liquid	116-N-4	116-N-4	Eb-s	1963	Eb-dn	1973				2010	RTD			Eb-ds	30	2040	Eb-s							
N	164	120-N-1		1	100	Pond	571326.56	149166.67			polygon					2694.188			4	Liquid	100N-4	120-N-1	Eb-s	1977	Eb-dn	1991				2001	RTD			Eb-ds	30	2031	Eb-s							
N	165	120-N-2	1324-N Surface Impoundment	1	116	Surface Impoundment	571292.75	149210.33			polygon		42.67	21.34	4.57		910.578			4	Liquid	116N-4	120-N-2	Eb-s	1986	ABC	1988				2001	RTD			Eb-ds	30	2031	Eb-s						
N	166	120-N-3	163-N Neutralization Pit and French Drair	1	116	French Drain	571136.13	149352.11					10.2	2.8	2.4		28.560			4	Liquid	116N-4	120-N-3	Eb-s	1963	Eb-dn	1988				2010	RTD			Eb-ds	30	2040	Eb-s						
N	170	120-N-7	108-N Acid Unloading Facility French Drair	1	116	French Drain	571276.38	149242.17								1.2	0.9	0.650			4	Liquid	116N-4	120-N-7	Eb-s	1963	Eb-dn	1987				2010	RTD			Eb-ds	30	2040	Eb-s					
N	221	130-N-1		1	100	Pond	571551.81	148677.50			polygon					20000.000			4	Liquid	100N-4	130-N-1	Eb-s	1983	Eb-dn	1983				2011	RTD			Eb-ds	30	2041	Eb-s							
N	1725	1908-NE		1	River	Outfall	570870.75	149317.84			polygon	30.5	24.4			743.224			NA	River	River	River	1969	River	1969				2011	RTD			NA	NA	NA									
N	1249	UPR-100-N-1		1	100	Unplanned Release	571079.31	149536.08			point					1858.061			4	Liquid	100N-4	UPR-100-N-1	Eb-s	1974	Eb-dn	1974				2011	RTD			Eb-ds	30	2041	Eb-s							
N	1250	UPR-100-N-10		1	100	Unplanned Release	571142.88	149537.78			point	3.0	3.0			9.290			4	Liquid	100N-4	UPR-100-N-10	Eb-s	1975	Eb-dn	1975				2011	RTD			Eb-ds	30	2041	Eb-s							
N	1252	UPR-100-N-12		1	100	Unplanned Release	571142.88	149537.78			point	0.6	0.9	18.3		0.557			4	Liquid	100N-4	UPR-100-N-12	Eb-s	1979	Eb-dn	1979				2011	RTD			Eb-ds	30	2041	Eb-s							
N	1265	UPR-100-N-25		1	100	Unplanned Release	571411.69	149614.75			point					0.999			4	Liquid	100N-4	UPR-100-N-25	Eb-s	1971	Eb-dn	1971				2011	RTD			Eb-ds	30	2041	Eb-s							
N	1269	UPR-100-N-30		1	100	Unplanned Release	571068.31	149543.88			polygon	15.2	15.2			232.258			4	Liquid	100N-4	UPR-100-N-30	Eb-s	1971	Eb-dn	1971				2012	RTD			Eb-ds	30	2042	Eb-s							
N	1270	UPR-100-N-31		1	100	Unplanned Release	571410.94	149699.39			point					0.999			4	Liquid	100N-4	UPR-100-N-31	Eb-s	1971	Eb-dn	1971				2012	RTD			Eb-ds	30	2042	Eb-s							
N	1274	UPR-100-N-35		1	100	Unplanned Release	571182.19	149521.22			point					0.999			4	Liquid	100N-4	UPR-100-N-35	Eb-s	1986	Eb-dn	1986				2012	RTD			Eb-ds	30	2042	Eb-s							
N	1276	UPR-100-N-5		1	100	Unplanned Release	571397.13	149628.16			point			18.3		0.999			4	Liquid	100N-4	UPR-100-N-5	Eb-s	1972	Eb-dn	1972				2012	RTD			Eb-ds	30	2042	Eb-s							
N	1278	UPR-100-N-7		1	100	Unplanned Release	#####	#####			line					0.999			4	Liquid	100N-4	UPR-100-N-7	Eb-s	1985	Eb-dn	1985				2012	RTD			Eb-ds	30	2042	Eb-s							
N	1279	UPR-100-N-8		1	100	Unplanned Release	571398.63	149671.23			point					2.323			4	Liquid	100N-4	UPR-100-N-8	Eb-s	1975	Eb-dn	1975				2012	RTD			Eb-ds	30	2042	Eb-s							
G	348	216-A-25		1	200	Pond	574970.88	139650.36	8	576090.770,139 387.189, 575744.373,139 040.792, 574283.012,139 787.710), (574185.588,140 350.604), (574748.483,140 458.853), (574889.206,140 047.507), (575127.354,139 820.184), (576090.770,139 387.189)	polygon	1423.7	243.8	1.5		347160.080							4	Liquid	200G-4	216-A-25	El-s	1957	El-dn	1987							2017	RTD			El-ds	30	2047	El-s
G	470	216-N-8		1	200	Pond	573191.88	141319.23			polygon	85.0	85.0			7231.666			4	Liquid	200G-4	216-N-8	El-s	1944	El-dn	1952							NA	No Action			El-ds	30	2010	El-s				
G	328	600-108	213-J&K Vaults	1	200	Storage	579282.19	140170.25			polygon	12.2	3.7	2.4		44.615			4	Soil-Debris	200G-4	600-108	El-s	1944	ABC	2020				2004	RTD			El-ds	30	2034	El-s							
I	324	212-N		1	200	Storage	569874.00	140328.19			polygon					555.000			4	Soil-Debris	200I-4	212-N	El-s	1945	ABC	1945				2010	D&D			El-ds	30	2040	El-s							
I	325	212-P		1	200	Storage	570678.50	140330.02			polygon					555.000			4	Soil-Debris	200I-4	212-P	El-s	1945	ABC	1945				2010	D&D			El-ds	30	2040	El-s							
I	326	212-R		1	200	Storage	571483.38	140331.81			polygon					555.000			4	Soil-Debris	200I-4	212-R	El-s	1945	ABC	1952				2010	D&D			El-ds	30	2040	El-s							
I	463	216-N-1		1	200	Pond	569885.63	140044.59			point	152.4	30.5	1.8																														

Geographic and Operational Site Parameters for Waste Sites To Be Simulated in the 2004 Composite Analysis

Geographic Area	WIDS Site ID	WIDS Site Code	WIDS Site Name	On CA List	WZ Template Site Type	Site Type	Center X-coordinate (E)	Center Y-coordinate (N)	Number of (X,Y) Coordinate Points	(X,Y) Coordinate String	GIS Feature Type	Length (m)	Width (m)	Depth / Height (m)	Diameter (m)	Area (m ²)	Waste/Material Type	Waste Chem. Group	Release Models	VZbase Template	Site Template	Pre-Hanford Infiltration Class	Operational Start	Operational Infiltration Class	Operational End	IRA-1 Year Complete	IRA-1 Type	IRA-1 Infiltration Class	IRA-2 Year Complete	IRA-2 Type	IRA-2 Infiltration Class	Year Remedial Action Complete	Remediation Type	Barrier Type	Barrier Infiltration Class	Post Remediation Class	Barrier Design Life	Barrier End Date	Final/Long Term Infiltration Class
A	4297	200-E-65	200-E-65, 202A Building Steam Condensate, Miscellaneous Stream #466 Injection Well (R)	1	216	Injection/Reverse Well	575275.00	135620.00			point				1.2	1.131	Steam Condensate	4	Liquid	216A-4	200-E-65	Ba-s	1955	Ba-dn	1996				NA	No Action			Ba-ds	30	2010	Ba-s			
A	4299	200-E-67	202A Building Stem Condensate, Miscellaneous Stream #494	1	216	Injection/Reverse Well	575141.88	135614.28			point					9.990	Steam Condensate	4	Liquid	216A-4	200-E-67	Ba-s	1996	Ba-dn	1996				NA	No Action			Ba-ds	30	2010	Ba-s			
A	4300	200-E-68	200-E-68, 291A Control House Steam Condensate, Miscellaneous Stream #59, Injection Well (L)	1	216	Injection/Reverse Well	575205.00	135555.00			point				1.2	1.131	Steam Condensate	4	Liquid	216A-4	200-E-68	Ba-s	1955	Ba-dn	1996				NA	No Action			Ba-ds	30	2010	Ba-s			
A	4301	200-E-69	200-E-69, Line #8801 Steam Condensate, Miscellaneous Stream #56, Injection Well (A)	1	216	Injection/Reverse Well	574933.00	135719.00			point				1.3	1.327	Steam Condensate	4	Liquid	216A-4	200-E-69	Rpe-s	1955	Rp-dn	1997				NA	No Action			Rpe-ds	30	2010	Rpe-s			
A	4302	200-E-70	200-E-70, Line #8801 Steam Condensate, Miscellaneous Stream #64, Injection Well (Q)	1	216	Injection/Reverse Well	575272.00	135601.00			point				0.9	0.636	Steam Condensate	4	Liquid	216A-4	200-E-70	Ba-s	1955	Ba-dn	1997				NA	No Action			Ba-ds	30	2010	Ba-s			
A	4303	200-E-71	200-E-71, Line #8801 Steam Condensate, Miscellaneous Stream #63, Injection Well (O)	1	216	Injection/Reverse Well	575252.00	135602.00			point				0.9	0.6	0.292	Steam Condensate	4	Liquid	216A-4	200-E-71	Ba-s	1955	Ba-dn	1997				NA	No Action			Ba-ds	30	2010	Ba-s		
A	4304	200-E-72	200-E-72, Line #8801 Steam Condensate, Miscellaneous Stream #60, Injection Well (G)	1	216	Injection/Reverse Well	575104.00	135513.00			point				0.9	0.636	Steam Condensate	4	Liquid	216A-4	200-E-72	Ba-s	1955	Ba-dn	1997				NA	No Action			Ba-ds	30	2010	Ba-s			
A	4305	200-E-73	200-E-73, Line #8801 Steam Condensate, Miscellaneous Stream #61, Injection Well (M)	1	216	Injection/Reverse Well	575185.00	135607.00			point				0.9	0.636	Steam Condensate	4	Liquid	216A-4	200-E-73	Ba-s	1955	Ba-dn	1996				NA	No Action			Ba-ds	30	2010	Ba-s			
A	4306	200-E-74	200-E-74, Line #8801 Steam Condensate, Miscellaneous Stream #62, Injection Well (N)	1	216	Injection/Reverse Well	575244.00	135552.00			point				0.9	0.636	Steam Condensate	4	Liquid	216A-4	200-E-74	Ba-s	1955	Ba-dn	1997				NA	No Action			Ba-ds	30	2010	Ba-s			
A	4307	200-E-75	200-E-75, Line #8801 Steam Condensate, Miscellaneous Stream #57, Injection Well (B)	1	216	Injection/Reverse Well	574936.00	135614.00			point				0.9	0.636	Steam Condensate	4	Liquid	216A-4	200-E-75	Ba-s	1955	Ba-dn	1997				NA	No Action			Ba-ds	30	2010	Ba-s			
A	4308	200-E-76	200-E-76, Line #8801 Steam Condensate, Miscellaneous Stream #67, Injection Well (U)	1	216	Injection/Reverse Well	575284.00	135903.00			point				1.5	1.767	Steam Condensate	4	Liquid	216A-4	200-E-76	Rpe-s	1955	Rp-dn	1997				NA	No Action			Rpe-ds	30	2010	Rpe-s			
A	4309	200-E-77	200-E-77, Line #8801 Steam Condensate, Miscellaneous Stream #65, Injection Well (S)	1	216	Injection/Reverse Well	575274.00	135645.00			point				1.2	1.131	Steam Condensate	4	Liquid	216A-4	200-E-77	Rpe-s	1955	Rp-dn	1997				NA	No Action			Rpe-ds	30	2010	Rpe-s			
A	4310	200-E-78	200-E-78, Line #8801 Steam Condensate, Miscellaneous Stream #70, Injection Well (Y)	1	200	Injection/Reverse Well	575110.00	135736.00			point					0.999	Steam Condensate	4	Liquid	200A-4	200-E-78	Rpe-s	1955	Rp-dn	1996				NA	No Action			Rpe-ds	30	2010	Rpe-s			
A	4311	200-E-79	200-E-79, Line #8801 Steam Condensate, Miscellaneous Stream #66, Injection Well (T)	1	216	Injection/Reverse Well	575284.00	135658.00			point				0.9	0.636	Steam Condensate	4	Liquid	216A-4	200-E-79	Rpe-s	1955	Rp-dn	1997				NA	No Action			Rpe-ds	30	2010	Rpe-s			
A	4312	200-E-80	200-E-80, Line #8801 Steam Condensate, Miscellaneous Stream #68, Injection Well (V)	1	216	Injection/Reverse Well	575222.00	135656.00			point					0.999	Steam Condensate	4	Liquid	216A-4	200-E-80	Rpe-s	1955	Rp-dn	1996				NA	No Action			Rpe-ds	30	2010	Rpe-s			
A	4313	200-E-81	200-E-81, MO-035 Facility Water Valve, Miscellaneous Stream #533	1	216	Injection/Reverse Well	575007.00	135717.00			point					0.999	Steam Condensate	4	Liquid	216A-4	200-E-81	Rpe-s	1955	Rp-dn	1996	1997	Surface Stabilization	G-dn			NA	No Action			Rpe-ds	30	2010	Rpe-s	
A	4314	200-E-82	200-E-82, Steam Trap 2P, Yard-MSS-TRP-040, Miscellaneous Stream #115	1	216	Injection/Reverse Well	575052.75	135814.66			point				1.52	1.37	1.478	Steam Condensate	4	Liquid	216A-4	200-E-82	Rpe-s	1997	Rp-dn	1997				NA	No Action			Rpe-ds	30	2010	Rpe-s		
A	4323	200-E-84	200-E-84, 202A Building Steam Condensate, Miscellaneous Stream #58, Injection Well (C)	1	216	Injection/Reverse Well	574959.00	135624.00			point				0.90	0.636	Steam Condensate	4	Liquid	216A-4	200-E-84	Ba-s	1955	Ba-dn	1996				NA	No Action			Ba-ds	30	2010	Ba-s			
A	4324	200-E-85	202A Building Pump Seal Water, Miscellaneous Stream #459	1	216	Injection/Reverse Well	#####	#####			point					0.999	Water	4	Liquid	216A-4	200-E-85	Ba-s	1969	Ba-dn	1969				NA	No Action			Ba-ds	30	2010	Ba-s			
A	297	201-C	201-C Process Building	1	200	Process Unit/Plant	574591.78	136348.45			polygon	42.67	24.38			1040.514	Chemicals/Equipment	4	Cement/Liquid	200A-4	201-C	Rpe-s	1949	ABC	1967				2020	D&D			Rpe-ds	30	2050	Rpe-s			
A	308	202-A-WS-1	202-A-WS-1, PUREX Waste Piles	1	200	Storage	575159.13	135629.47			point					9.990	Equipment	4	Soil-Debris	200A-4	202-A-WS-1	Rpe-s	1956	ABC	1956				2024	D&D			Rpe-ds	30	2054	Rpe-s			
A	1642	207-A-NORTH		1	200	Retention Basin	575568.25	136023.98			polygon	16.8	3.0	2.1		51.097		4	Liquid	200A-4	207-A-NORTH	Rpe-s	1977	Rp-dn	1989				2014	RTD			Rpe-ds	30	2044	Rpe-s			
A	1643	207-A-SOUTH		1	200	Retention Basin	575568.38	135975.22			polygon	16.8	3.0	2.1		51.097		4	Liquid	200A-4	207-A-SOUTH	Rpe-s	1977	Rp-dn	1989														

Geographic and Operational Site Parameters for Waste Sites To Be Simulated in the 2004 Composite Analysis

Geographic Area	WIDS Site ID	WIDS Site Code	WIDS Site Name	On CA List	WZ Template Site Type	Site Type	Center X-coordinate (E)	Center Y-coordinate (N)	Number of (X,Y) Coordinate Points	(X,Y) Coordinate String	GIS Feature Type	Length (m)	Width (m)	Depth / Height (m)	Diameter (m)	Area (m²)	Waste/Material Type	Waste Chem. Group	VBase Template	Site Template	Pre-Hanford Infiltration Class	Operational Start	Operational Infiltration Class	Operational End	RA-1 Year Complete	RA-1 Type	RA-1 Infiltration Class	RA-2 Year Complete	RA-2 Type	RA-2 Infiltration Class	Year Remedial Action Complete	Remediation Type	Barrier Type	Post Remediation Infiltration Class	Post Remediation Life	Barrier End Date	Final/Long Term Infiltration Class				
A	336	216-A-15		1	216	French Drain	575064.13	135527.72			point				13.4	1.0	0.795	Drainage from the 216-A-10 Process Condensate Sampler Pit #4. The waste is acidic.	Liquid	216A-4	216-A-15	Rpe-s	1955	Rp-dn	1972				2017	RTD			Rpe-ds	30	2047	Rpe-s					
A	337	216-A-16		1	216	French Drair	575432.38	136039.22			point				5.1816	1.1	0.894	Low in salt, neutral to basic	4	Liquid	216A-4	216-A-16	Rpe-s	1956	Rp-dn	1969				2010	RTD			Rpe-ds	30	2040	Rpe-s				
A	338	216-A-17		1	216	French Drair	575429.38	136036.16			point	1.8			1.1	0.894	Low in salt, neutral to basic	4	Liquid	216A-4	216-A-17	Rpe-s	1956	Rp-dn	1969				2010	RTD			Rpe-ds	30	2040	Rpe-s					
A	339	216-A-18		1	216	Trench	575580.19	136235.69			polygon	24.4	24.4				594.579			4	Liquid	216A-4	216-A-18	Rpe-s	1955	Rp-dn	1956				2014	IBAR	RCRA C	RCRA C-I13	RCRA C-I13	500	2514	Rpe-s			
A	340	216-A-19		1	216	Trench	575665.31	136277.81			polygon	7.6	7.6	4.6			58.064			4	Liquid	216A-4	216-A-19	Rpe-s	1955	Rp-dn	1956				2014	ABAR2E09	RCRA C	RCRA C-I14	RCRA C-I14	500	2514	Rpe-s			
A	341	216-A-20		1	216	Crib	575180.13	135528.66			polygon	6.1	6.1	8.2			37.161			4	Liquid	216A-4	216-A-2	Rpe-s	1956	Rp-dn	1963				2013	ABAR2E16A	RCRA C	RCRA C-I11	RCRA C-I11	500	2513	Rpe-s			
A	342	216-A-20		1	216	Trench	575707.00	136248.50			polygon	7.6	7.6	4.6			58.064			4	Liquid	216A-4	216-A-20	Rpe-s	1955	Rp-dn	1955				2014	ABAR2E09	RCRA C	RCRA C-I14	RCRA C-I14	500	2514	Rpe-s			
A	343	216-A-21		1	216	Crib	575214.56	135462.39			polygon	18.3	4.9				89.187			4	Liquid	216A-4	216-A-21	Rpe-s	1957	Rp-dn	1965				2016	IBAR	RCRA C	RCRA C-I11	RCRA C-I11	500	2516	Rpe-s			
A	344	216-A-22		1	216	Crib	575093.06	135778.17			point				3.0	4.9	18.674			4	Liquid	216A-4	216-A-22	Rpe-s	1956	Rp-dn	1969				2016	RTD			Rpe-ds	30	2046	Rpe-s			
A	345	216-A-23A		1	216	French Drair	575426.63	136025.23			point				1.8288	1.1	0.893727244	Low in salt, neutral to basic	4	Liquid	216A-4	216-A-23A	Rpe-s	1957	Rp-dn	1969				2010	RTD			Rpe-ds	30	2040	Rpe-s				
A	346	216-A-23B		1	216	French Drair	575423.56	136025.22			point				1.8288	1.1	0.893727244	Low in salt, neutral to basic	4	Liquid	216A-4	216-A-23B	Rpe-s	1957	Rp-dn	1969				2010	RTD			Rpe-ds	30	2040	Rpe-s				
A	347	216-A-24		1	216	Crib	57582.88	136395.78			polygon	426.7	6.1				2601.285			4	Liquid	216A-4	216-A-24	Rpe-s	1958	Rp-dn	1966				2013	IBAR	RCRA C	RCRA C-I12	RCRA C-I12	500	2513	Rpe-s			
A	349	216-A-26		1	216	French Drair	575200.69	135533.89			point				4.6	0.9	1.167			4	Liquid	216A-4	216-A-26	Rpe-s	1965	Rp-dn	1991				2016	ABAR2E16A	RCRA C	RCRA C-I11	RCRA C-I11	500	2516	Rpe-s			
A	350	216-A-26A		1	216	French Drair	575200.69	135538.45			point				4.6	1.2	1.167			4	Liquid	216A-4	216-A-26A	Rpe-s	1959	Rp-dn	1965				2016	ABAR2E16A	RCRA C	RCRA C-I11	RCRA C-I11	500	2516	Rpe-s			
A	351	216-A-27		1	216	Crib	575197.38	135400.69			polygon	61.0	3.0				185.806			4	Liquid	216A-4	216-A-27	Rpe-s	1965	Rp-dn	1970				2016	IBAR	RCRA C	RCRA C-I11	RCRA C-I11	500	2516	Rpe-s			
A	352	216-A-28		1	216	Crib	575082.63	135778.98			point				1219.2	1.8		26304.567			4	Liquid	216A-4	216-A-28	Rpe-s	1958	Rp-dn	1967				2014	RTD			Rpe-ds	30	2044	Rpe-s		
A	353	216-A-29		1	216	Ditch	575675.69	135885.03			polygon																														
A	354	216-A-3		1	216	Crib	575099.50	135819.53			polygon	6.1	6.1	4.9			37.161			4	Liquid	216A-4	216-A-3	Rpe-s	1956	Rp-dn	1981				2015	RTD			Rpe-ds	30	2045	Rpe-s			
A	355	216-A-30		1	216	Crib	575980.88	135507.75	5(575756.467, 135597.169), (576270.785, 135293.759), (576315.186, 135373.928), (57598.401,135 661.305), (575756.467,135 597.169)	(575756.467, 135597.169), (576270.785, 135293.759), (576315.186, 135373.928), (57598.401,135 661.305), (575756.467,135 597.169)	polygon	426.7	3.0					1300.643			4	Liquid	216A-4	216-A-30	Rpe-s	1961	Rp-dn	1992				2015	IBAR	RCRA C	RCRA C-I12	RCRA C-I12	500	2515	Rpe-s		
A	356	216-A-31		1	216	Crib	575166.38	135483.80			polygon	21.3	3.0				65.032			4	Liquid	216A-4	216-A-31	Rpe-s	1964	Rp-dn	1966				2013	IBAR	RCRA C	RCRA C-I9	RCRA C-I9	500	2513	Rpe-s			
A	357	216-A-32		1	216	Crib	575325.56	135730.81			polygon	21.3	2.4	3.7			52.026			4	Liquid	216A-4	216-A-32	Rpe-s	1959	Rp-dn	1972				2016	IBAR	RCRA C	RCRA C-I10	RCRA C-I10	500	2516	Rpe-s			
A	358	216-A-33		1	216	French Drair	575169.50	135558.78			point						3.7	1.8	2.626			216A-4	216-A-33	Rpe-s	1955	Rp-dn	1964				2016	RTD			Rpe-ds	30	2046	Rpe-s			

Geographic and Operational Site Parameters for Waste Sites To Be Simulated in the 2004 Composite Analysis

Geographic Area	WIDS Site ID	WIDS Site Code	WIDS Site Name	On CA List	WZ Template Site Type	Site Type	Center X-coordinate (E)	Center Y-coordinate (N)	Number of (X,Y) Coordinate Points	(X,Y) Coordinate String	GIS Feature Type	Length (m)	Width (m)	Depth / Height (m)	Diameter (m)	Area (m ²)	Waste/Material Type	Waste Chem. Group	Release Models	ZBase Template	Site Template	Pre-Hanford Infiltration Class	Operational Start	Operational End	RA-1 Year Complete	RA-1 Type	RA-1 Infiltration Class	RA-2 Year Complete	RA-2 Type	RA-2 Infiltration Class	Year Remedial Action Complete	Remediation Type	Barrier Type	Barrier Infiltration Class	Post Remediation Infiltration Class	Barrier Design Life	Barrier End Date	Final/Long Term Infiltration Class
A	455	216-C-3		1	216	Crib	574533.50	136299.98			polygon	15.2	3.0	3.0		46.452			4	Liquid	216A-4	216-C-3	Rpe-s	1953	1954					2008	ABAR2E17	RCRA C	Hanford-19	Hanford-19	500	2508	Rpe-s	
A	456	216-C-4		1	216	Crib	574521.69	136304.64			polygon	6.1	3.0	4.9		18.581			4	Liquid	216A-4	216-C-4	Rpe-s	1955	Rp-dn	1965					2014	ABAR2E17	RCRA C	Hanford-19	Hanford-19	500	2514	Rpe-s
A	457	216-C-5		1	216	Crib	574542.69	136292.39			point	6.1	3.0	4.9		18.581			4	Liquid	216A-4	216-C-5	Rpe-s	1955	Rp-dn	1965					2008	ABAR2E17	RCRA C	Hanford-19	Hanford-19	500	2508	Rpe-s
A	458	216-C-6		1	216	Crib	574632.19	136288.22			polygon	6.1	3.0	4.9		18.581			4	Liquid	216A-4	216-C-6	Rpe-s	1955	Rp-dn	1964					2013	IBAR	RCRA C	Hanford-19	Hanford-19	500	2513	Rpe-s
A	459	216-C-7		1	216	Crib	574447.00	136281.13			polygon	6.1	6.1	3.7		37.161			4	Liquid	216A-4	216-C-7	Rpe-s	1961	Rp-dn	1983					2009	RTD				30	2039	Rpe-s
A	460	216-C-8		1	216	French Drain	575210.25	136475.59			point					4.8768	2.4		4.670	Ion exchange waste from 271-CR	216A-4	216-C-8	Rpe-s	1962	Rp-dn	1965					2008	RTD				30	2038	Rpe-s
A	461	216-C-9		1	216	Pond	574585.38	136478.14			polygon	243.8	30.5	7.6		7432.243			4	Liquid	216A-4	216-C-9	Rpe-s	1953	Rp-dn	1983					2016	ABAR2E10	RCRA C	Hanford-16	Hanford-16	500	2516	Rpe-s
A	577	218-C-9		1	216	Burial Ground	574657.56	136464.67			polygon	86.3	86.3			16982.676			4	Soil-Debris	216A-4	218-C-9	Rpe-s	1985	Rp-dn	1989					2014	ABAR2E10	RCRA C	Hanford-16	Hanford-16	500	2514	Rpe-s
A	578	218-E-1		1	216	Burial Ground	574754.69	135574.91			polygon	148.1	88.4			7440.512			4	Soil-Debris	216A-4	218-E-1	Rpe-s	1945	Rp-dn	1953					2014	IBAR	RCRA C	Hanford-15	Hanford-15	500	2514	Rpe-s
A	583	218-E-14		1	216	Storage Tunnel	575259.13	135486.86			polygon	109.1	5.8	6.9		631.926			4	Cement/Soil-Debris	216A-4	218-E-14	Rpe-s	1960	Rp-dn	1964					2010	D&D				30	2040	Rpe-s
A	584	218-E-15		1	216	Storage Tunnel	575277.31	135225.56			polygon	514.5	10.4	6.7		5331.891			4	Cement/Soil-Debris	216A-4	218-E-15	Rpe-s	1967	Rp-dn	1996					2010	D&D				30	2040	Rpe-s
A	9907	218-E-ILAW		1	216	Burial Ground	574600.00	135400.00								100000.000			4	Glass	216A_ILAW_C	218-E-ILAW	Rpe-s	2010	Rp-dn	2035					2035	IBAR	RCRA C	RCRA C-5	RCRA C-	500	2535	Rpe-s
A	9910	218-E-Melter		1	216	Burial Ground	574800.00	135200.00								174.0	70.0		4	Glass	216A-4	218-E-Melter	Rpe-s	2010	Rp-dn	2035					2035	IBAR	RCRA C	RCRA C-	RCRA C-	500	2535	Rpe-s
A_ILAW_C	9915	218-E-RCRA	Cell 1 - Portion of IDF that receives RCRA waste including ILAW, melters, on and off site MLLW	1	216	Burial Ground	574382.72	135354.65			polygon	205.0	218.5	12.2		44791.848			4	Glass/Soil Debris	216A_ILAW_C-4	218-E-RCRA	Rpe-s	2008	Rp-dn	2035					2035	IBAR	RCRA C	RCRA C-8	RCRA C-8	500	2535	Rpe-s
A_ILAW_C	9916	218-E-LLW	Cell 2 - Portion of IDF that receives all LLW.	1	216	Burial Ground	574547.36	135354.65			polygon	205.0	218.5	12.2		44791.848			4	Soil-Debris	216A_ILAW_C-4	218-E-LLW	Rpe-s	2008	Rp-dn	2035					2035	IBAR	RCRA C	RCRA C-8	RCRA C-8	500	2535	Rpe-s
A_ILAW	9917	218-E-Cores	"IDF Cores"	1	216	Burial Ground	574600.00	135400.00								10000.000			4	Reactor Block/Soil-Debris	216A_ILAW_C	218-E-Cores	Rpe-s	2065	Rp-dn	2065					2066	IBAR	RCRA C	RCRA C-	RCRA C-	500	2566	Rpe-s
A	652	241-A-101		1	241	Single-Shell Tank	575222.38	136043.30			polygon					15.24	22.9	410.433	2	Liquid/Salt Cake	241A-2	241-A-101	Rpe-s	1956	G-dn	1980					2024	ABAR2EATF	RCRA C	Hanford-15	Hanford-15	500	2524	Rpe-s
A	653	241-A-102		1	241	Single-Shell Tank	575353.50	136043.38			polygon					15.24	22.9	410.433	2	Liquid/Salt Cake	241A-2	241-A-102	Rpe-s	1956	G-dn	1980					2024	ABAR2EATF	RCRA C	Hanford-15	Hanford-15	500	2524	Rpe-s
A	654	241-A-103		1	241	Single-Shell Tank	575384.56	136043.47			polygon					15.24	22.9	410.433	2	Liquid/Salt Cake	241A-2	241-A-103	Rpe-s	1956	G-dn	1980					2024	ABAR2EATF	RCRA C	Hanford-15	Hanford-15	500	2524	Rpe-s
A	655	241-A-104		1	241	Single-Shell Tank	575322.31	136074.38			polygon					15.24	22.9	410.433	2	Liquid/Salt Cake	241A-2	241-A-104	Rpe-s	1958	G-dn	1975					2024	ABAR2EATF	RCRA C	Hanford-15	Hanford-15	500	2524	Rpe-s
A	656	241-A-105		1	241	Single-Shell Tank	575353.38	136074.45			polygon					15.24	22.9	410.433	2	Liquid/Salt Cake	241A-2	241-A-105	Rpe-s	1962	G-dn	2024					2024	ABAR2EATF	RCRA C	Hanford-15	Hanford-15	500	2524	Rpe-s
A	657	241-A-106		1	241	Single-Shell Tank	575384.50	136074.55			polygon					15.24	22.9	410.433	2	Liquid/Salt Cake	241A-2	241-A-106	Rpe-s	1957	G-dn	1980					2024	ABAR2EATF	RCRA C	Hanford-15	Hanford-15	500	2524	Rpe-s
A	648	241-A-431	241-A-431, 241-A-431 Ventilation Building, 241-A-431 Tank Farm Ventilation Building	1	200	Process Unit/Plant	575424.80	136303.79			polygon	6.10	4.88																									

Geographic and Operational Site Parameters for Waste Sites To Be Simulated in the 2004 Composite Analysis

Geographic Area	WIDS Site ID	WIDS Site Code	WIDS Site Name	On CA List	WZ Template Site Type	Site Type	Center XCoordinate (E)	Center Ycoordinate (N)	Number of (X,Y) Coordinate Points	(X,Y) Coordinate String	GIS Feature Type	Length (m)	Width (m)	Depth / Height (m)	Diameter (m)	Area (m ²)	Waste/Material Type	Waste Chem. Group	Release Models	WZBase Template	Site Template	Pre-Hanford Infiltration Class	Operational Start	Operational Infiltration Class	Operational End	IRA-1 Year Complete	IRA-1 Type	IRA-1 Infiltration Class	IRA-2 Year Complete	IRA-2 Type	IRA-2 Infiltration Class	Year Remedial Action Complete	Remediation Type	Barrier Type	Barrier Infiltration Class	Post Remediation Infiltration Class	Barrier Design Life	Barrier End Date	Final/Long Term Infiltration Class
A	682	241-AW-104		1	241	Double-Shell Tank	575371.38	135858.16				polygon		16.764	22.9	410.433			2	Salt Cake	241A-2	241-AW-104	Rpe-s	1980	G-dn	2024					2024	ABAR2EAWT	RCRA C	Hanford-I15	Hanford-I15	500	2524	Rpe-s	
A	683	241-AW-105		1	241	Double-Shell Tank	575338.88	135825.45				polygon		16.764	22.9	410.433			2	Salt Cake	241A-2	241-AW-105	Rpe-s	1980	G-dn	2024					2024	ABAR2EAWT	RCRA C	Hanford-I15	Hanford-I15	500	2524	Rpe-s	
A	684	241-AW-106		1	241	Double-Shell Tank	575371.50	135825.55				polygon		16.764	22.9	410.433			2	Salt Cake	241A-2	241-AW-106	Rpe-s	1980	G-dn	2024					2024	ABAR2EAWT	RCRA C	Hanford-I15	Hanford-I15	500	2524	Rpe-s	
A	692	241-AX-101		1	241	Single-Shell Tank	575422.19	136203.86				polygon		15.24	22.9	410.433	Double shell slurry feed is waste concentrated just before reacting the sodium aluminate saturator		2	Liquid/Salt Cake	241A-2	241-AX-101	Rpe-s	1965	G-dn	1980					2024	ABAR2EXATF	RCRA C	Hanford-I14	Hanford-I14	500	2524	Rpe-s	
A	693	241-AX-102		1	241	Single-Shell Tank	575422.31	136172.78				polygon		15.24	22.9	410.433	Concentrated complexant from the evaporation of dilute complexed waste		3	Liquid/Salt Cake	241A-3	241-AX-102	Rpe-s	1966	G-dn	1980					2024	ABAR2EXATF	RCRA C	Hanford-I14	Hanford-I14	500	2524	Rpe-s	
A	694	241-AX-103		1	241	Single-Shell Tank	575394.75	136203.78				polygon		15.24	22.9	410.433	Concentrated complexant from the evaporation of dilute complexed waste		3	Liquid/Salt Cake	241A-3	241-AX-103	Rpe-s	1965	G-dn	1980					2024	ABAR2EXATF	RCRA C	Hanford-I14	Hanford-I14	500	2524	Rpe-s	
A	695	241-AX-104		1	241	Single-Shell Tank	575394.88	136172.70				polygon		15.24	22.9	410.433	Non-complexed waste		2	Liquid/Salt Cake	241A-2	241-AX-104	Rpe-s	1966	G-dn	1976					2024	ABAR2EXATF	RCRA C	Hanford-I14	Hanford-I14	500	2524	Rpe-s	
A	698	241-AY-101		1	241	Double-Shell Tank	575312.19	136204.31				polygon		16.764	22.9	410.433	Dilute complexed waste - including organic complexants: ethylenediaminetetra-acetic acid, citric acid, and hydroxyethyl-ethylenediaminetriacetic acid		3	Salt Cake	241A-3	241-AY-101	Rpe-s	1971	G-dn	2024					2024	ABAR2EAYTF	RCRA C	Hanford-I14	Hanford-I14	500	2524	Rpe-s	
A	699	241-AY-102		1	241	Double-Shell Tank	575312.31	136171.70				polygon		16.764	22.9	410.433	Neutralized high-level waste and double-shell slurry feed		2	Salt Cake	241A-2	241-AY-102	Rpe-s	1972	G-dn	2024					2024	ABAR2EAYTF	RCRA C	Hanford-I14	Hanford-I14	500	2524	Rpe-s	
A	703	241-AZ-101		1	241	Double-Shell Tank	575412.44	136310.17				polygon		16.764	22.9	410.433	Complexed waste, double-shell slurry feed waste, non-complexed waste, water, evaporator waste, residual liquor, and complexant concentrate waste		3	Salt Cake	241A-3	241-AZ-101	Rpe-s	1976	G-dn	2024					2024	ABAR2EAZTF	RCRA C	Hanford-I14	Hanford-I14	500	2524	Rpe-s	
A	704	241-AZ-102		1	241	Double-Shell Tank	575379.81	136310.09				polygon		16.764	22.9	410.433	Waste from PUREX, non-complexed waste, complexant concentrate waste, complexed waste, residual liquor waste		3	Salt Cake	241A-3	241-AZ-102	Rpe-s	1976	G-dn	2024					2024	ABAR2EAZTF	RCRA C	Hanford-I14	Hanford-I14	500	2524	Rpe-s	
A	772	241-C-101		1	241	Single-Shell Tank	575161.44	136504.28				polygon		11.7348	22.9	410.433	Bismuth phosphate metal waste, tributyl phosphate waste, and PUREX coating waste.		2	Liquid/Salt Cake	241A-2	241-C-101	Rpe-s	1946	G-dn	1970					2024	ABAR2ECTF	RCRA C	Hanford-I16	Hanford-I16	500	2524	Rpe-s	
A	773	241-C-102		1	241	Single-Shell Tank	575182.94	136525.89				polygon		9.525	22.9	410.433	Bismuth phosphate metal waste, tributyl phosphate waste, PUREX coating waste, high-level waste, PUREX organic wash waste, supernatant containing organic wash wastes and coating wastes		2	Liquid/Salt Cake	241A-2	241-C-102	Rpe-s	1946	G-dn	1976					2024	ABAR2ECTF	RCRA C	Hanford-I16	Hanford-I16	500	2524	Rpe-s	
A	774	241-C-103		1	241	Single-Shell Tank	575204.44	136547.50				polygon		11.7348	22.9	410.433	PUREX coating waste, tributyl phosphate waste, coating waste, PUREX high-level waste, B Plant high-level waste, B Plant waste fractionization low-level waste, PUREX sludge supernatant, PUREX low-level waste, waste fractionization PUREX sludge, PUREX organ		2	Liquid/Salt Cake	241A-2	241-C-103	Rpe-s	1946	G-dn	1979					2024	ABAR2ECTF	RCRA C	Hanford-I16	Hanford-I16	500	2524	Rpe-s	
A	775	241-C-104		1	241	Single-Shell Tank	575139.81	136525.77				polygon		11.7348	22.9	410.433	Metal waste, strontium-leached sluicing solids, and fissile material (including uranium-223) from PUREX thorium campaigns		2	Liquid/Salt Cake	241A-2	241-C-104	Rpe-s	1946	G-dn	1980					2024	ABAR2ECTF	RCRA C	Hanford-I16	Hanford-I16	500	2524	Rpe-s	
A	776	241-C-105		1	241	Single-Shell Tank	575161.31	136547.38				polygon		11.7348	22.9	410.433	PUREX sludge supernatant enroute to B Plant, and metal waste		2	Liquid/Salt Cake	241A-2	241-C-105	Rpe-s	1946	G-dn	1979					2024	ABAR2ECTF	RCRA C	Hanford-I16	Hanford-I16	500	2524	Rpe-s	
A	777	241-C-106		1	241																																		

Geographic and Operational Site Parameters for Waste Sites To Be Simulated in the 2004 Composite Analysis

Geographic Area	WIDS Site ID	WIDS Site Code	WIDS Site Name	On CA List	WZ Template Site Type	Site Type	Center X-coordinate (E)	Center Y-coordinate (N)	Number of (X,Y) Coordinate Points	(X,Y) Coordinate String	GIS Feature Type	Length (m)	Width (m)	Depth / Height (m)	Diameter (m)	Area (m²)	Waste/Material Type	Waste Chem. Group	Release Models	ZBase Template	Site Template	Pre-Hanford Infiltration Class	Operational Start	Operational Infiltration Class	Operational End	RA-Year Complete	RA-1 Type	RA-1 Infiltration Class	RA-2 Year Complete	RA-2 Type	RA-2 Infiltration Class	Year Remedial Action Complete	Remediation Type	Barrier Type	Barrier Infiltration Class	Post Remediation Class	Barrier Design Life	Barrier End Date	Final/Long Term Infiltration Class
R	1053	303-M-SA	303-M-SA, 303-M Storage Area, 303-M Building Storage Area	1	300	Storage	594001.50	116273.07			Polygon	13.65504	10.60704	0.1270102		144.840	Barrels/Drums/Buckets/Cans	4	Soil and Liquid	300R-4	303-M-SA	Rp-s	1983	ABC	1987						2010	RTD			Rp-ds	30	2040	Rp-s	
R	1054	303-M-UOF	303-M UOF, 303-M Uranium Oxide Facility	1	300	Process Unit/Plant	594012.88	116273.00			Polygon					99.900	Chemicals	4	Cement	300R-4	303-M-UOF	Rp-s	1983	ABC	1987						2010	RTD			Rp-ds	30	2040	Rp-s	
R	1057	305-B_SF	305-B_SF, 305-B Storage Facility	1	300	Storage	593723.38	116159.29			Polygon	36.8808	11.5824	5.4864		427.168	Chemicals	4	Soil and Liquid	300R-4	305-B_SF	Rp-s	1978	ABC	1978						2010	RTD			Rp-ds	30	2040	Rp-s	
R	1058	307_RB		1	300	Retention Basin	594163.31	115909.95			polygon	8.5	5.2	2.7		44.222		4	Liquid	300R-4	307_RB	Rp-s	1953	Rp-dn	2005						2007	RTD			Rp-ds	30	2037	Rp-s	
R	1661	309-WS-1	The 309-WS-1 Vault is a below grade, reinforced concrete structure containing two levels. The vault has connecting piping to the dome. The upper (main vault) level housed the ion exchangers (IX) used for moderator cleaning, while the lower (resin dispos	1	316	Process Unit/Plant	594148.88	115693.64			Point	4.2672	4.2672	4.8768		18.209	Chemicals	4	Cement/Liquid	316R-4	309-WS-1	Rp-s	1961	ABC	1969						2009	RTD			Rp-ds	30	2039	Rp-s	
R	1662	309-WS-2	309-WS-2, Rupture Loop Ion Exchange Pit, Ion Exchange Vault, Rupture Loop Annex Ion Exchange Loop Vault, RLAIIX_PRTR Rupture Loop	1	316	Process Unit/Plant	594127.63	115705.52			Point	7.9735681	4.8249841	4.8768		38.462	Equipment	4	Cement	316R-4	309-WS-2	Rp-s	1960	ABC	1969						2009	RTD			Rp-ds	30	2039	Rp-s	
R	1070	313_ESSP	313 ESSP, 313 East Side Storage Pad, 313 Building East Site Storage Pad	1	300	Storage	593877.56	116107.71			Polygon					99.900	Barrels/Drums/Buckets/Cans	4	Soil and Liquid	300R-4	313_ESSP	Rp-s	1969	ABC	1969						2010	RTD			Rp-ds	30	2040	Rp-s	
R	1076	316-1		1	300	Pond	594283.63	116106.10	6	(594161.253,116 polygon (208.892), (594299.780,116 227.251), (594438.307,116 170.505), (594454.997,116 015.288), (594191.295,116 006.943), (594161.253,116 208.892))		182.9	114.3			32000.000			4	Liquid	300R-4	316-1	Rp-s	1943	Rp-dn	1975						2001	RTD			Rp-ds	30	2031	Rp-s
R	1077	316-2		1	300	Pond	594238.69	116566.36	7	(594331.491,116 polygon 724.613), (594131.211,116 642.832), (594126.204,116 492.622), (594166.260,116 389.144), (594379.892,116 392.482), (594379.892,116 554.375), (594331.491,116 724.613))		189.0	182.9			40000.000			4	Liquid	300R-4	316-2	Rp-s	1949	Rp-dn	1974						1999	RTD			Rp-ds	30	2029	Rp-s
R	1078	316-3		1	316	Trench	594273.63	115861.58			polygon	182.9	3.0	6.1		557.418		4	Liquid	316R-4	316-3	Rp-s	1953	Rp-dn	1963						2011	RTD			Rp-ds	30	2041	Rp-s	
P	1079	316-4		1	616	Crib	590974.44	121671.41			point	7.9	7.9			62.802		4	Liquid	616P-4	316-4	Rp-s	1948	Rp-dn	1956						2006	RTD			Rp-ds	30	2036	Rp-s	
R	1080	316-5		1	316	Trench	594083.81	116715.63	5	(594114.705,116 polygon 392.304), (594105.094,116 887.288), (593992.961,116 887.288), (593992.961,116 392.304), (594114.705,116 392.304))		467.9	3.0	3.7		1426.062			4	Liquid	316R-4	316-5	Rp-s	1975	Rp-dn	1994						1998	RTD			Rp-ds	30	2028	Rp-s
R	1086	325_WTF	325 WTF, 325 Waste Treatment Facility, 325 Hazardous Waste Treatment Units	1	300	Process Unit/Plant	593983.22	115804.51			Polygon					99.900	Chemicals	4	Cement/Liquid	300R-4	325_WTF	Rp-s	1969	ABC	1969						2011	RTD			Rp-ds	30	2041	Rp-s	
R	1087	331_LSLDF		1	316	Drain/Tile Field	594641.25	115364.73			polygon					831.109		4	Liquid	316R-4	331_LSLDF	Rp-s	1970	Rp-dn	1974						2010	RTD			Rp-ds	30	2040	Rp-s	
R	1089	331_LSLT2	331 LSLT2, 331 LSL Trench 2, 331 Life Sciences Laboratory Trench #2	1	316	Trench	594592.13	115395.33			point			2.1		99.900	Animal Waste	4	Liquid	316R-4	331_LSLT2	Rp-s	1966	Rp-dn	1974						2011	RTD			Rp-ds	30	2041	Rp-s	
R	1091	333_ESHWSA	333 ESHWSA, 333 East Side HWSA, 333 Building East Side Hazardous Waste Storage Area	1	300	Storage	594003.44	116284.65			Polygon					99.900	Barrels/Drums/Buckets/Cans	4	Liquid	300R-4	333_ESHWSA	Rp-s	1964	ABC	1964						2011	RTD			Rp-ds	30	2041	Rp-s	
R	1103	3712_USSA	3712 USSA, 3712 Uranium Scrap Storage Area, 3712 Building Uranium Scrap Storage Area, 3712 Fuels Warehouse	1	300	Storage	593907.44	116149.45			Polygon					99.900	Chemicals	4	Soil-Debris	300R-4	3712_USSA	Rp-s	1961	ABC	1961						2011	RTD			Rp-ds	30	2041	Rp-s	
R	1563	UPR-300-1		1	300	Unplanned Release	594171.31	115927.14			point					3.7	0.999		4	Liquid	300R-4	UPR-300-1	Rp-s	1969	Rp-dn	1969						2011	RTD			Rp-ds	30	2041	Rp-s
R	1564	UPR-300-10		1	300	Unplanned Release	593949.25	115795.88			point					0.999		4	Liquid	300R-4	UPR-300-10	Rp-s	1977	Rp-dn	1977						2012	RTD			Rp-ds	30	2042	Rp-s	
R	1565	UPR-300-11		1	300	Unplanned Release	594171.00	115929.57			point	0.6	0.9	7.6		0.557		4	Liquid	300R-4	UPR-300-11	Rp-s	1977	Rp-dn	1977						2011	RTD			Rp-ds	30	2041	Rp-s	
R	1566	UPR-300-12		1	300	Unplanned Release	594024.81	115789.26			polygon	12.2	0.3			3.716		4	Liquid	300R-4	UPR-300-12	Rp-s	1979	Rp-dn	1979						2012	RTD			Rp-ds	30</td			

Geographic and Operational Site Parameters for Waste Sites To Be Simulated in the 2004 Composite Analysis

Distribution

No. of Copies			No. of Copies
ONSITE			8 Fluor Hanford, Inc.
2 DOE Office of River Protection			J. V. Borghese E6-35 F. M. Coony E6-35 B. H. Ford E6-35 T. W. Fogwell E6-35 R. Jackson E6-35 V. J. Rohay E6-35 L. C. Swanson E6-35 M. E. Todd-Robertson E6-35
R. M. Yasek	H6-60		
R. W. Lober	H6-60		
9 DOE Richland Operations Office			Stoller
B. L. Charboneau	A6-33		R. G. McCain B2-62
B. L. Foley	A6-38		
J. P. Hanson	A5-13		
R. D. Hildebrand	A6-38		
J. G. Morse	A6-38		
K. M. Thompson	A6-38		
S. H. Wisness	A3-04		
DOE Public Reading Room (2)	H2-53		
5 Bechtel Hanford Inc.			50 Pacific Northwest National Laboratory
P. G. Doctor	H9-01		R. L. Aaberg K3-54 C. Arimescu K6-04 M. P. Bergeron K9-36
K. R. Fecht	H9-04		B. N. Bjornstad K6-81 R. W. Bryce E6-35
K. A. Gano	H6-60		A. L. Bunn K6-85 K. J. Cantrell K6-81
J. K. Linville	H0-23		Y. J. Chien K6-81 R. L. Dirkes K6-75
S. G. Weiss	H0-23		J. L. Downs K6-85 D. W. Engle K5-12
9 CH2M HILL Hanford Group, Inc.			P. W. Eslinger K6-04 M. J. Fayer K9-33 E. J. Freeman K9-36 M. D. Freshley K9-33
F. J. Anderson	E6-35		G. W. Gee K9-33 T. J. Gilmore K6-81
A. J. Knapp	H6-03		D. G. Horton K6-81 C. T. Kincaid K9-33
M. N. Jarayssi	H6-03		G. V. Last (5) K6-81 C. A. LoPresti K5-12
F. M. Mann	E6-35		W. J. Martin K6-81 T. B. Miley K6-04
W. J. McMahon	E6-35		C. J. Murray K6-81
C. W. Miller	H6-62		
D. A. Myers	E6-35		
C. D. Wittreich	H6-62		
M. I. Wood	H8-44		
2 Fluor Federal Services			
R. Khaleel	E6-17		
R. J. Puigh	E6-17		

No. of Copies		No. of Copies	
B. A. Napier	K3-54	D. L. Strenge	K3-54
W. E. Nichols	K9-33	M. B. Triplett	K6-04
G. W. Patton	K6-75	P. D. Thorne (5)	K9-33
J. V. Ramsdell, Jr.	K3-54	A. L. Ward	K9-33
S. P. Reidel	K6-81	M. D. White	K9-36
M. C. Richmond	K9-33	M. D. Williams	K9-36
R. G. Riley	K6-96	S. K. Wurstner	K9-36
M. L. Rockhold	K9-36	S. B. Yabusaki	K9-36
R. J. Serne	P7-22	Hanford Technical Library (2)	H2-53