CHAPTER 3

RISK ASSESSMENT DATA AND TASKS DURING THE REMEDIAL INVESTIGATION

Project Management Guidelines. Remedial project managers should establish the schedule of submission for the deliverables for the RI Reports and Baseline Risk Assessment Reports. The schedule may vary from site to site, as appropriate. Interested parties (States, Commonwealths, tribes and other stakeholders) may be involved in the scheduling and review process, as appropriate. Refer to your regional office for guidance regarding the order of the deliverables. These deliverables should also be defined in the Workplan.

General RI Guidelines. Generally, RI guidance should be followed in performing the remedial investigation. The following items are of particular importance to risk assessments. If the risk assessment is being prepared as a stand-alone document, the following items should be included. If, instead, the risk assessment is a section of the RI Report, the items which follow should be addressed in the RI Report and clearly referenced in the Baseline Risk Assessment Report.

- Present a general map of the site depicting boundaries and surface topography, which illustrates site features, such as fences, ponds, structures, as well as geographical relationships between potential receptors and the site.
- Discuss historical site activity.
- Discuss chronology of land use (specify agriculture, industry, recreation, waste deposition, and residential development at the site).
- Present an overview of the nature and extent of contamination, including when samples were collected and the kinds of contaminants and media potentially contaminated.

- Describe the analytical and data validation methods used.
- If modeling was used to estimate exposure point concentrations, document the parameters related to soil/sediment, hydrogeology, hydrology, and meteorology either in the risk assessment or the RI Report.

Risk Assessment Guidelines. The risk assessment should be conducted in accordance with all appropriate guidance and policies. Consult with your EPA risk assessor regarding the most appropriate guidance.

Interim Deliverables should be prepared as described in Section 3.1.1 and should ultimately be incorporated into the Baseline Risk Assessment Report. The Interim Deliverables prepared by the risk assessment author should be reviewed by the EPA risk assessor prior to submission of the Baseline Risk Assessment Report. Hazard identification and exposure parameters, among others, may require discussion, refinement, and revision. Review and modification of Interim Deliverables should greatly reduce the Baseline Risk Assessment Report preparation and review time. Discussions of the three categories of risk assessment deliverables (Interim Deliverables, Draft Baseline Risk Assessment Report, and Final Baseline Risk Assessment Report) follow.

3.1 INTERIM DELIVERABLES

This section presents an outline of the Planning Tables, Worksheets, and Supporting Recommended Information that should be prepared as Interim Deliverables for each site. The Workplan discussed in Section 2.2.1 should also describe the Planning Tables, Worksheets, and Supporting Recommended Information for a particular site. Exhibit 3-1 presents a list of recommended Interim Deliverables. Use of these deliverables for each site should improve standardization in risk assessment reporting and

should improve the transparency, clarity, and consistency of risk assessments.

3.1.1 PLANNING TABLES, WORKSHEETS, AND SUPPORTING INFORMATION

More standardized reporting of Superfund human health risk assessments can be achieved through the preparation of Planning Tables, Worksheets, and Supporting Information. These documents should be prepared as Interim Deliverables and reviewed by the EPA risk assessor prior to preparation of the Baseline Risk Assessment Report. After review and revision, as necessary, these documents should be included in the Baseline Risk Assessment Report.

This section describes the Planning Table formats that should be used in EPA CERCLA risk assessments. The Planning Table formats normally should not be altered (i.e., columns should not be added, deleted, or changed); however, rows and footnotes should be added as appropriate. Standardization of the Tables should help to achieve Superfund program-wide reporting consistency. Note that multiple versions of some Planning Tables may be used to address different Media, different Exposure Pathways, or different Exposures (i.e., reasonable maximum exposure [RME] versus central tendency [CT]). Exhibit 3-2 summarizes the relationship between five traditional risk assessment activities and the corresponding Planning Tables that should help standardize risk assessment reporting. The five risk assessment activities follow:

- Data collection
- Data evaluation
- Exposure assessment
- Toxicity assessment
- Risk characterization.

Copies of the blank Planning Tables are provided in both Lotus® and Excel® spreadsheet formats associated with the Part D guidance. Blank Planning Table templates and completed examples of typical Planning Tables are provided in Appendix A. Detailed Instructions for the completion of the Planning Tables are provided in Appendix B. Additional example scenarios and selected Planning Tables are provided in Appendix D.

In addition to the Planning Tables, six Planning Worksheets are provided in Appendix C. These include Worksheets for Data Useability, TARA Schedule, Dermal, Radiation Dose Assessment, Lead, and ROD Risk. Use of the Worksheets is strongly encouraged to improve transparency, clarity, and consistency.

The Planning Tables and Worksheets document the majority of the data and assumptions used to evaluate risk, as well as the risks and hazards calculated. In most cases, other data and rationale can be used to support the information presented in the Planning Tables. This additional Supporting Information should also be provided to the EPA risk assessor as an Interim Deliverable and later incorporated in the Baseline Risk Assessment Report.

Refer to Exhibit 3-3 for a brief summary of the Revision 1 improvements to the Planning Tables and Worksheets as compared to Revision 0. Descriptions of the RAGS Part D Revision 1 Planning Tables, Worksheets, and Supporting Information follow:

Planning TABLE 0: Site Risk Assessment Identification Information. The purposes of **Planning Table 0** are:

- To uniquely identify the risk assessment
- To identify the relevant contacts for the risk assessment.

The information documented in **Planning Table 0** should include:

- Site Information
- Contact information
- Risk assessment document information.

The data elements that should be presented in **Planning Table 0** are listed in the Planning Table 0 highlight box.

KEY DATA ELEMENTS IN PLANNING TABLE 0

Regions should provide the following information: Site Name/OU, Region, EPA ID Number, State, Status, Federal Facility (Y/N), EPA Project Manager, EPA Risk Assessor, Prepared by, Prepared for, Document Title, Document Date, Probabilistic Risk Assessment (Y/N), and Comments.

Regions should perform the following steps associated with the preparation of **Planning Table 0:**

1. Provide the identification information for the risk assessment.

2. Include Planning Table 0 with the other Planning Tables, Worksheets, and Supporting Information to facilitate tracking of the relevant contacts.

TARA SCHEDULE WORKSHEET. The **TARA Schedule of Risk-Related Activities Worksheet** (TARA Schedule Worksheet) is the first Worksheet that should be developed for each risk assessment to document the applicability, responsibility, and schedule for each risk-related activity. As the first interim deliverable, the Worksheet documents the plan for a particular site, identifying which Planning Tables, Worksheets, and Supporting Information should be provided as interim deliverables for EPA risk assessor review, and when they are expected to be available. The TARA Schedule Worksheet should be prepared in consultation with the EPA risk assessor assigned to the site.

Regions should perform the following steps associated with the preparation of the TARA Schedule Worksheet:

1. **Complete the TARA Schedule Worksheet** prior to initiation of any other Planning Tables, Worksheets, or Supporting Information.

2. **Obtain EPA risk assessor consensus** regarding which interim deliverables should be submitted and the schedules for each.

The recommended blank TARA Schedule Worksheet may be found in Appendix C. An example TARA Schedule Worksheet accompanies the Dean Company example in Appendix A.

PLANNING TABLE 1: Selection of Exposure Pathways. The purposes of **Planning Table 1** are:

- To assist in project planning
- To accompany the site conceptual model
- To present possible Receptors, Exposure Routes, and Exposure Pathways
- To present the rationale for selection or exclusion of each Exposure Pathway
- To communicate risk information to interested parties outside EPA
- To establish a framework for the generation of subsequent Planning Tables. All subsequent tables should be built from the information contained in Planning Table 1.

The information that should be documented in **Planning Table 1** includes:

- Exposure Pathways that were examined and excluded from analysis
- Exposure Pathways that are expected to be qualitatively or quantitatively evaluated in the risk assessment.

The data elements that should be presented in **Planning Table 1** are listed in the Planning Table 1 highlight box.

KEY DATA ELEMENTS IN PLANNING TABLE 1

Regions should provide the following information: Scenario Timeframe, Medium, Exposure Medium, Exposure Point, Receptor Population, Receptor Age, Exposure Route, Type of Analysis, Rationale for Selection or Exclusion of Exposure Pathway.

Region should perform the following steps associated with the preparation of **Planning Table 1**:

1. Refine site conceptual model which identifies all potential sources of contamination, all potential Exposure Pathways, the Medium associated with each, and the potentially exposed populations (Receptors).

2. Select realistic Exposure Pathways for detailed analyses.

3. Include rationale for exclusion of potential Exposure Pathways.

4. **Modify Planning Table 1, where appropriate .**

5. **Planning Table 1** should later be incorporated in the Baseline Risk Assessment Report.

DATA USEABILITY WORKSHEET. Data quality is an important component of the risk assessment and the evaluation of data quality should be documented. A recommended Data Useability Worksheet is included to address this need.

The Regional EPA risk assessor and the EPA document *Guidance for Data Useability in Risk Assessment (Part A,* U.S. EPA 1990a*),* should be consulted before completing the Data Useability Worksheet to define the appropriate level of detail to be reflected in the comment fields in the Worksheet. This Worksheet should be prepared as soon as all data validation reports have been completed for each medium. A medium-specific Data Useability Worksheet should be completed only after the project team (i.e., lead chemist, lead hydrogeologist, risk assessor, etc.) has collectively discussed the data useability criteria. The Worksheet should be used to record and identify the impact of data quality issues as they relate to data useability. For example, deviations from approved site Workplans which occurred during sample collection, laboratory analysis, or data review should be assessed. Also, the Worksheet preparer should refer to the Superfund regional office for guidance on data validation when preparing the Worksheet.

Regions should perform the following steps associated with the preparation of the **Data Useability Worksheet**:

1. **Complete the *Data Useability Worksheet*** for each Medium prior to screening of chemicals of potential concern (COPCs).

2. Incorporate the **Data Useability Worksheet** in the Baseline Risk Assessment Report.

A recommended blank Data Useability Worksheet may be found in Appendix C. An example Data Useability Worksheet accompanies the Dean Company example in Appendix A.

PLANNING TABLE 2: Occurrence, Distribution, and Selection of COPCs. The purposes of **Planning Table 2** are:

- To provide information useful for data evaluation of chemicals and radionuclides detected
- To provide adequate information so the user/reviewer gets a sense of the chemicals and radionuclides detected at the site and the potential magnitude of the potential problems at the site
- To provide chemical screening data and rationale for selection of COPCs.

The information documented in **Planning Table 2** should include:

- Statistical information about chemicals and radionuclides detected in each Medium
- The detection limits of chemicals and radionuclides analyzed
- The toxicity screening values for COPC selection
- The chemicals and radionuclides selected and deleted as COPCs.

The data elements presented in **Planning Table 2** are listed in the Planning Table 2 highlight box.

Regions should perform the following steps

associated with the preparation of **Planning Table 2**. Refer to the regional office for guidance when performing these steps.

KEY DATA ELEMENTS IN PLANNING TABLE 2

For each unique combination of Scenario Timeframe, Medium, and Exposure Medium, Regions should provide the following information: Exposure Point, CAS Number, Chemical, Minimum Concentration (Qualifier), Maximum Concentration (Qualifier), Units, Location of Maximum Concentration, Detection Frequency, Range of Detection Limits, Concentration Used for Screening, Background Value, Screening Toxicity Value (N/C), Potential ARAR/TBC Value, Potential ARAR/TBC Source, COPC Flag (Y/N), and Rationale for Selection or Deletion.

1. Discuss selection criteria for COPCs; including toxicity screening values, frequency of detection, and background comparison, as appropriate.

2. Perform screening; select COPCs that will be carried into the risk assessment (include comparison to regulatory standards and criteria where appropriate).

3. **Submit Supporting Information to substantiate the available Background Value shown for each chemical in Planning Table 2** and to enable verification of those values by EPA. The format of the summary should be determined by each region. The Supporting Information should provide relevant information for each chemical used to determine the background concentration, including (but not limited to) average, maximum, hypothesis testing of equality of the mean, and other information that may be required to fully describe the background selection process.

4. Incorporate the Background Supporting Information in the Baseline Risk Assessment Report.

5. **Complete Planning Table 2** for each combination of Scenario Timeframe, Medium, and Exposure Medium.

6. **Incorporate Planning Table 2** in the Baseline Risk Assessment Report.

PLANNING TABLE 3: Exposure Point Concentration Summary. The purposes of **Planning Table 3** are:

- To provide the EPCs for measured and modeled values
- To provide statistical information on the derivation of the EPCs.

The information documented in **Planning Table 3** should include:

- Statistical information which was used to calculate the EPCs for chemicals and radionuclides detected in each Medium
- EPCs (RME and/or CT)
- The statistics which were used to make the determinations as well as the rationale for the selection of the statistics for each chemical or radionuclide (i.e., discuss statistical derivation of measured data or approach for modeled data).

The data elements presented in **Planning Table 3** are listed in the Planning Table 3 highlight box.

KEY DATA ELEMENTS IN PLANNING TABLE 3

For each unique combination of Scenario Timeframe, Medium, and Exposure Medium, Regions should provide the following information: Exposure Point, Chemical of Potential Concern, Units, Arithmetic Mean, 95% upper confidence level (UCL), Maximum Concentration (Qualifier), EPC Value, EPC Units, EPC Statistic, and EPC Rationale.

Region should perform the following steps associated with the preparation **of Planning Table 3**.

1. Discuss how samples will be grouped (e.g., how hot spots in soil will be considered; how groundwater data will be combined; how temporal and chemical phases will be addressed; how upgradient, downgradient, and cross gradient samples will be addressed).

2. Discuss approach to determine how data are distributed (e.g., normal, log-normal).

3. Discuss evaluation of lead, total chromium and any other special chemicals.

4. **Submit Supporting Information to document the EPC summary presented in Planning Table 3** and to enable verification of those values by EPA. The format of the summary should be determined by each region. The Supporting Information should discuss EPCs statistically derived from measured data, including identification of the samples used in each calculation, results of distribution testing (Wilk-Shapiro, D'Agostino), mean (transformed if appropriate), maximum (transformed if appropriate), Planning deviation (transformed if appropriate), t- or H-statistic, 95% UCL (including non-parametric methods, where applicable), and other protocols as required. The Supporting Information should also present information for EPCs, including derivation of modeled values, assumptions and values used, statistical derivation of measured values and associated calculations, and other protocols as required.

5. Incorporate the **EPC Supporting Information** in the Baseline Risk Assessment Report.

6. **Complete Planning Table 3** for each combination of Scenario Timeframe, Medium, Exposure Medium, and Exposure Point. Create separate sets of Planning Table 3 for RME and CT, when appropriate.

7. Incorporate **Planning Table 3** in the Baseline Risk Assessment Report.

Planning TABLE 4: Values Used for Daily Intake Calculations. The purposes of **Planning Table 4** are:

- To provide the exposure parameters used for intake calculations for each Exposure Pathway (Scenario Timeframe, Medium, Exposure Medium, Exposure Point, Receptor Population, Receptor Age, and Exposure Route)
- To provide the intake equations or models used for each Exposure Route/Pathway.

The information documented in **Planning Table 4** should include:

- Values used for each intake equation for each Exposure Pathway and the reference/rationale for each
- Intake equation or model used to calculate the intake for each Exposure Pathway.

The data elements presented in **Planning Table 4** are listed in the Planning Table 4 highlight box.

KEY DATA ELEMENTS IN PLANNING TABLE 4

For each unique combination of Scenario Timeframe, Medium, and Exposure Medium, Regions should provide the following information: Exposure Route, Receptor Population, Receptor Age, Exposure Point, Parameter Code, Parameter (Definition, Value, and Units), Rationale/Reference, and Intake Equation/Model Name.

Regions should perform the following steps associated with the preparation of **Planning Table 4**.

1. Provide references for all exposure

parameters.

2. **Submit Supporting Information to summarize the Modeled Intake Methodology and Parameters used to calculate modeled intake values** and to enable verification of those values by EPA. The Supporting Information should be limited to summary level information. The format of the summary should be structured to accommodate the variability and complexity associated with different models.

3. Incorporate the **Modeled Intake Supporting Information** in the Baseline Risk Assessment Report.

4. **Submit Supporting Information on Chemical-Specific Parameters**, which apply to all Planning Tables to be completed for the risk assessment and to enable verification of those values by EPA. The summary should identify and display chemical parameters and constants that are used to calculate risks and hazards, but are not included on Planning Tables. The format of the summary should be determined by each region. The values and constants that are used to calculate risk and hazards, including molecular weight, vapor pressure, K_{oc}, K_{ow}, dermal permeability constant, Henry's Law constant, and other information that the reader would find useful for understanding the risk assessment discussion should be included.

5. Incorporate the **Chemical-Specific Parameter Supporting Information** summary into the Baseline Risk Assessment Report.

6. **Complete Planning Table 4** for each combination of Scenario Timeframe, Medium, and Exposure Medium. Create separate sets of Planning Table 4 for RME and CT, where appropriate.

7. Incorporate **Planning Table 4** into the Baseline Risk Assessment Report.

DERMAL WORKSHEET. The recommended Dermal Worksheet presents intermediate variables for calculating absorbed dose per event DA (event). A version of this Worksheet should be developed for each medium for which the dermal exposure route will be quantitatively assessed. Available data should be provided for each COPC under evaluation.

Regions should perform the following steps associated with preparation of the **Dermal Worksheet**:

1. **Complete the Dermal Worksheet** prior to calculation of risks and hazards.

2. Provide interim deliverables to the EPA risk assessor, as appropriate.

3. Incorporate the **Dermal Worksheet** in the Baseline Risk Assessment Report.

A recommended blank Dermal Worksheet may be found in Appendix C. An example Dermal Worksheet accompanies the Dean Company example in Appendix A.

PLANNING TABLES 5 AND 6: Non-Cancer and Cancer Toxicity Data. The purposes of **Planning Tables 5.1, 5.2, and 5.3** are:

- To provide information on reference doses (RfDs), reference concentrations (RfCs), Target organs, and adjustment factors for chemicals
- To provide oral to dermal adjustment factors
- To provide RfC to RfD adjustment factors
- To verify references for non-cancer toxicity data
- To provide non-cancer toxicity information for "special-case" chemicals.

KEY DATA ELEMENTS IN
PLANNING TABLE 5.1

Region should provide the following information: Chemical of Potential Concern, Chronic/Subchronic, Oral RfD Value and Units, Oral Absorption Efficiency for Dermal, Absorbed RfD for Dermal Value and Units, Primary Target Organ(s), Combined Uncertainty/Modifying Factors, Source(s) RfD: Target Organ(s), and Dates of RfD: Target Organ(s).

The information documented in **Planning Tables 5.1, 5.2, and 5.3** should include:

- The RfDs for each of the COPCs, as well as modifying factors and reference concentration (RfC) to RfD adjustments
- The organ effects of each of the COPCs
- References for RfCs and organ effects.

The data elements presented in **Planning Tables 5.1, 5.2, and 5.3** are listed in the Planning Tables 5.1, 5.2, and 5.3 highlight boxes.

KEY DATA ELEMENTS IN
PLANNING TABLE 5.2

Regions should provide the following information: Chemical of Potential Concern, Chronic/Subchronic, Inhalation RfC Value and Units, Extrapolated RfD Value and Units, Primary Target Organ(s), Combined Uncertainty/Modifying Factors, Source(s) of RfC: Target Organ(s), and Date(s) of RfC: Target Organ(s).

KEY DATA ELEMENTS IN
PLANNING TABLE 5.3

Regions should provide the following information: Chemical of Potential Concern, Chronic/Subchronic, Parameter Name, Value, and Units), Primary Target Organ(s), Combined Uncertainty/Modifying Factors, Source(s) of Parameter: Target Organ(s), and Date(s) of

The purposes of **Planning Tables 6.1, 6.2, 6.3, and 6.4** are:

- To provide the oral, dermal, and inhalation cancer toxicity information (values and sources of information) for chemicals and radionuclides of potential concern
- To provide the methodology and adjustment factors used to convert oral cancer toxicity values to dermal toxicity values and to convert inhalation unit risks to inhalation cancer slope factors
- To provide weight of evidence/cancer guideline descriptions for each chemical and radionuclide of potential concern
- To provide cancer toxicity information for "special case" chemicals.

The information documented in **Planning Tables 6.1, 6.2, 6.3, and 6.4** should include:

- Oral, dermal, and inhalation toxicity values for chemicals and radionuclides of potential concern

- Weight of evidence/cancer guidelines descriptions for chemicals of potential concern

- The source/reference for each toxicity value.

The data elements presented in **Planning Tables 6.1, 6.2, 6.3, and 6.4** are listed in the Planning Tables 6.1, 6.2, 6.3, and 6.4 highlight box.

KEY DATA ELEMENTS IN PLANNING TABLE 6.1

Regions should provide the following information: Chemical of Potential Concern, Oral Cancer Slope Factor Value and Units, Oral Absorption Efficiency for Dermal, Absorbed Cancer Slope Factor for Dermal Value and Units, Weight of Evidence/Cancer Guideline Description, Source(s) and Date(s) of Oral CSF.

KEY DATA ELEMENTS IN PLANNING TABLE 6.2

Regions should provide the following information: Chemical of Potential Concern, Unit Risk Value and Units, Inhalation Cancer Slope Factor Value and Units, Weight of Evidence/Cancer Guideline Description, Source(s) and Date(s) of Unit Risk: Inhalation CSF.

KEY DATA ELEMENTS IN PLANNING TABLE 6.3

Regions should p rovide the following information: Chemical of Potential Concern, Parameter (Name, Value, and Units), Source(s), and Dates(s).

KEY DATA ELEMENTS IN PLANNING TABLE 6.4

Regions should provide the following information: Chemical of Potential Concern, Cancer Slope Factor Value and Units, Source(s), and Dates(s).

Regions should perform the following steps associated with the preparation of **Planning Tables 5 and 6.**

1. Refer to the end of Section 3.1.1 for Lead Worksheets.

2. Ensure that chronic and subchronic toxicity values are applied correctly based on the duration of exposure. Provide rationale for selection of surrogate toxicity values not in IRIS or HEAST, or provided by NCEA. (EPA may require additional review.)

3. **Submit Supporting Information regarding Toxicity Data for Special Case Chemicals** (i.e., those chemicals with cancer risks and non-cancer hazards calculated using methods or toxicity parameters different from those presented on Planning Tables 5.1, 5.2, 6.1, or 6.2). The Supporting Information should be be used to enable verification of those values by EPA. Examples may include selection of potency factors for polychlorinated biphenyls (PCBs), use of relative potencies for polynuclear aromatic hydrocarbons (PAHs) and chlorinated dioxins and furans, and valence species assumptions for metals. Consult the EPA risk assessor regarding the use of these tables.

4. Incorporate the **Special Case Chemicals Supporting Information** in the Baseline Risk Assessment Report.

5. **Complete Planning Tables 5 and 6** for the exposure routes and chemicals under evaluation.
   Planning Table 5.1: Non-Cancer Toxicity Data - Oral/Dermal
   Planning Table 5.2: Non-Cancer Toxicity Data - Inhalation
   Planning Table 5.3: Non-Cancer Toxicity Data - Special Case Chemicals
   Planning Table 6.1: Cancer Toxicity Data - Oral/Dermal
   Planning Table 6.2: Cancer Toxicity Data - Inhalation
   Planning Table 6.3: Cancer Toxicity Data - Special Case Chemicals
   Planning Table 6.4: Cancer Toxicity Data -External (Radiation).

6. Incorporate **Planning Tables 5 and 6** in the Baseline Risk Assessment Report.

PLANNING TABLE 7: Calculation of

Chemical Cancer Risks and Non-Cancer Hazards. The purposes of **Planning Table 7** are:

- To provide a summary of the variables used to calculate chemical cancer risks and non-cancer hazards
- To show the EPC and intake used in the non-cancer hazard and cancer risk calculations
- To present the result of the calculation for each Exposure Route/Pathway for each COPC
- To provide the total hazard index and cancer risks for all Exposure Routes/Pathways for the Scenario Timeframe and Receptor presented in this table.

The information documented in **Planning Table 7** should include:

- The non-cancer hazard quotient (HQ) and cancer risk value for each COPC for each Exposure Route/Pathway
- The values used for EPC, non-cancer intake, cancer intake, reference doses and concentrations, and cancer slope factors for each COPC for each Exposure Route.

The data elements presented in **Planning Table 7** are listed in the Planning Table 7 highlight box.

KEY DATA ELEMENTS IN PLANNING TABLE 7

For each unique combination of Scenario Timeframe, Receptor Population, and Receptor Age, Regions should provide the following information: Medium, Exposure Medium, Exposure Point, Exposure Route, Chemical of Potential Concern, EPC Value and Units, Cancer Risk Calculations (Intake/Exposure Concentration Value and Units, CSF/Unit Risk Value and Units, and Cancer Risk), and Non-Cancer Hazard Calculations (Intake/Exposure Concentration Value and Units, RfD/RfC Value and Units, and Hazard Quotient).

Regions should perform the following steps associated with the preparation of **Planning Table 7.**

1. Address non-cancer hazards and cancer risks including the calculations and supporting information by Exposure Route.

2. Include RME and CT results in separate tables. Ensure that risks and hazards from multiple chemicals are combined appropriately across Pathways that affect the same individual or population subgroup, for all site-related chemicals.

3. Discuss definitions of Planning Tables
   Planning Table 7.n.RME: Calculation of Chemical Cancer Risks and Non-Cancer Hazards (RME)
   Planning Table 7.n.CT: Calculation of Chemical Cancer Risks and Non-Cancer Hazards (CT)

4. If it is preferred to segregate cancer and non-cancer evaluations, see the blank Planning Tables 7.a.1 and 7.b.1 shown in Appendix A as well as Example Scenario 7 in Appendix D.

5. **Submit Supporting Information that summarizes the approach used to perform Special Chemical Risk and Hazard Calculations** and to enable verification of those values by EPA. This summary should address the calculation of non-cancer hazards and cancer risks for chemicals that do not use RfD or cancer slope factor (CSF) values, respectively. The format of the summary should be determined by each region.

6. Incorporate the **Special Chemical Risk and Hazard Calculations Supporting Information** in the Baseline Risk Assessment Report.

7. **Complete Planning Table 7** for each combination of Scenario Timeframe, Receptor Population, and Receptor Age.

8. Incorporate **Planning Table 7** in the Baseline Risk Assessment Report.

PLANNING TABLE 8: **Calculation of Radiation Cancer Risks.**
The purposes of **Planning Table 8** are:

- To provide a summary of the variables used to calculate radiation cancer risks
- To show the EPC used in the radiation cancer risk calculations
- To show, based on the documented risk calculation approach, the intake and cancer slope factors
- To present the result of the calculation for each Exposure Route/Pathway for each COPC
- To provide the radiation cancer risks for all Exposure Routes/Pathways for the Scenario Timeframe and Receptor presented in this table.

The information documented in **Planning Table 8** should include:

- The approach for calculating the radiation cancer risk for each COPC for each Exposure Route/Pathway
- The values used for EPC, intake, and cancer slope factor for each COPC for each Exposure Route
- The Cancer risk value for each COPC for each Exposure Route/Pathway
- Total cancer risk values by Exposure Route, Exposure Point, and across all media for the Scenario Timeframe and Receptor presented in this table.

KEY DATA ELEMENTS IN PLANNING TABLE 8

For each unique combination of Scenario Timeframe, Receptor Population, and Receptor Age, Regions should provide the following information: Medium, Exposure Medium, Exposure Point, Exposure Route, Radionuclide of Potential Concern, EPC Value and Units, Risk Calculation Approach, and Cancer Risk Calculations (Intake/Activity Value and Units, CSF Value and Units, and Cancer Risk).

The data elements presented in **Planning Table 8** are listed in the Planning Table 8 highlight box.

Regions should perform the following steps associated with the preparation of **Planning Table 8**.

1. Address radiation cancer risks including the calculations and supporting information by Exposure Route.

2. Include RME and CT results in separate tables. Ensure that risks from multiple radionuclides are combined appropriately across pathways that affect the same individual or population subgroup, for all site-related radionuclides.

3. Discuss definitions of Planning Tables
   Planning Table 8.n.RME: Calculation of Cancer Radiation Risks (RME)
   Planning Table 8.n.CT: Calculation of Cancer Radiation Risks (CT)

4. **Complete Planning Table 8** for each combination of Scenario Timeframe, Receptor Population, and Receptor Age.

5. Incorporate **Planning Table 8** in the Baseline Risk Assessment Report.

RADIATION DOSE ASSESSMENT WORKSHEET. The recommended Radiation Dose Assessment Worksheet has been provided to document alternate radionuclide cancer risk calculations, performed using a dose approach rather than the standard CERCLA risk calculation method.

The Regions should perform the following steps associated with preparation of the **Radiation Dose Assessment Worksheet,** if applicable to the risk assessment:

1. Complete the **Radiation Dose Assessment Worksheet** for each Receptor.

2. Provide interim deliverables to the EPA risk assessor, as appropriate.

3. Incorporate the **Radiation Dose Assessment Worksheet** in the Baseline Risk Assessment Report.

A recommended blank Radiation Dose Assessment Worksheet may be found in Appendix C. An example Radiation Dose Assessment Worksheet is presented in Appendix D, Example Scenario 11.

PLANNING TABLE 9: Summary of Receptor Risk and Hazards for COPCs.

The purpose of **Planning Table 9** is:

- To provide a summary of cancer risks and non-cancer hazards for each Receptor, by Medium, Exposure Medium, Exposure Route, and Exposure Point.

The information documented in **Planning Table 9** should include:

- The cancer risk and non-cancer hazard to each Receptor for each COPC by Exposure Route and Exposure Point
- The total cancer risk and non-cancer hazard for each Exposure Point, Exposure Medium and Medium across all Exposure Routes
- The total cancer risk and non-cancer hazard for a Receptor across all media
- The primary target organs for non-carcinogenic hazard effects.

The data elements presented in **Planning Table 9** are listed in the Planning Table 9 highlight box.

Regions should perform the following steps associated with the preparation of **Planning Table 9.**

1. Address non-cancer hazards and cancer risks including the calculations and supporting information by Exposure Route.

2. Include RME and CT results. Ensure that risks and hazards from multiple chemicals are combined appropriately across Pathways that affect the same individual or population subgroup, for all site-related chemicals.

KEY DATA ELEMENTS IN PLANNING TABLE 9

For each unique combination of Scenario Timeframe, Receptor Population, and Receptor Age, Regions should provide the following information: Medium, Exposure Medium, Exposure Point, Chemical of Potential Concern, Carcinogenic Risk (Ingestion, Inhalation, Dermal, External (Radiation) and Exposure Routes Total), and Non-Carcinogenic Hazard Quotient (Primary Target Organ(s), Ingestion, Inhalation, Dermal, and Exposure Routes Total).

3. Discuss definitions of Planning Tables
   Planning Table 9.n.RME: Summary of Receptor Risks and Hazards for COPCs (RME)
   Planning Table 9.n.CT: Summary of Receptor Risks and Hazards for COPCs (CT)

4. **Complete Planning Table 9** for each combination of Scenario Timeframe, Receptor Population, and Receptor Age.

5. Incorporate **Planning Table 9** in the Baseline Risk Assessment Report.

PLANNING TABLE 10: Risk Summary. The purpose of **Planning Table 10** is:

- To provide a summary of cancer risks and non-cancer hazards for each Receptor, by Medium, Exposure Medium, Exposure Route, and Exposure Point, that may trigger the need for remedial action.

The information documented in **Planning Table 10** should include:

- The cancer risk and non-cancer hazard to each Receptor for each chemical or radionuclide by Exposure Route and Exposure Point for risk drivers
- The total cancer risk and non-cancer hazard for each Exposure Point, Exposure Medium, and Medium across all Exposure Routes for

risk drivers
- The total cancer risk and non-cancer hazard for a Receptor across all media for risk drivers
- The primary target organs for non-carcinogenic hazard effects for risk drivers.

The data elements presented in **Planning Table 10** are listed in the Planning Table 10 highlight box.

KEY DATA ELEMENTS IN PLANNING TABLE 10

For each unique combination of Scenario Timeframe, Receptor Population, and Receptor Age, Regions should provide the following information: Medium, Exposure Medium, Exposure Point, Chemical, Carcinogenic Risk (Ingestion, Inhalation, Dermal, External (Radiation) and Exposure Routes Total), and Non-Carcinogenic Hazard Quotient (Primary Target Organ(s), Ingestion, Inhalation, Dermal, and Exposure Routes Total).

Regions should perform the following steps associated with the preparation of **Planning Table 10**.

1. Address non-cancer hazards and cancer risks including the calculations and supporting information by Exposure Route.

2. Include RME and CT results. Ensure that risks and hazards from multiple chemicals are combined appropriately across Pathways that affect the same individual or population subgroup, for all site-related chemicals.

3. Discuss definitions of Planning Tables
   Planning Table 10.n.RME: Risk Summary (RME)
   Planning Table 10.n.CT: Risk Summary (CT)

4. **Complete Planning Table 10** for each combination of Scenario Timeframe, Receptor Population, and Receptor Age.

5. Incorporate **Planning Table 10** in the Baseline Risk Assessment Report.

LEAD WORKSHEETS. Two recommended Lead Worksheets have been provided to document lead risk evaluations performed for young children and adult receptors at a site.

Regions should perform the following steps associated with the preparation of **Lead Worksheets**:

1. **Complete the Lead Worksheets** for Child and Adult. Also attach the appropriate graphs and results from the Integrated Exposure Uptake Biokinetic Model (IEUBK) model (if used) to the Child Worksheet. Also attach results from the adult lead spreadsheet to the Adult Worksheet.

2. The **Lead Worksheets** should later be incorporated in the Baseline Risk Assessment Report.

Blank recommended Lead Worksheets may be found in Appendix C. Example Lead Worksheets are presented in Appendix D Example Scenario 10.

3.1.2 ASSESSMENT OF CONFIDENCE AND UNCERTAINTY

Uncertainty assessment is important in risk assessment. Although the risk assessment should indicate sources of variability and uncertainty throughout the process, it will generally be appropriate to include a separate section of the Baseline Risk Assessment Report that also focuses on the uncertainties associated with data evaluation, toxicity assessment, exposure assessment, and risk characterization, as well as overall uncertainty of the final risk numbers. The region may choose to defer presentation of this specific section to the Draft Baseline Risk Assessment Report.

Regions should perform the following steps associated with the **Assessment of Confidence and Uncertainty**:

1. **Summarize the Assessment of Confidence and Uncertainty.**

2. Incorporate the **Assessment of Confidence and Uncertainty** in the Baseline Risk Assessment Report.

3.1.3 PROBABILISTIC ANALYSIS INFORMATION

Based upon the results from a deterministic risk characterization calculation (Planning Table 7) a decision should be made if a Probabilistic Analysis will be performed to calculate cancer risks and non-cancer hazards in accordance with Agency policy.

Regions should perform the following steps associated with the **Probabilistic Analysis:**

1. **Summarize the Probabilistic Analysis** (if performed) in a non-standard format. (Planning formats have not been developed to document probalistic analysis.) Refer to probabilistic analysis guidance (U.S. EPA 1997e, 1997g and 2001d) to determine the information to be documented.

2. Incorporate the **Probabilistic Analysis** summary in the Baseline Risk Assessment Report.

3.2 DRAFT BASELINE RISK ASSESSMENT REPORT

Regions should Submit the Draft Baseline Risk Assessment Report after the completion and acceptance of the Interim Deliverables described above. EPA guidance should be consulted in preparing the Draft Baseline Risk Assessment Report. EPA anticipates that this report preparation will be greatly expedited, since it should incorporate the following Interim Deliverables:

- Planning Tables 0 through 10
- Worksheets on Data Useability, Dermal, Radiation Dose Assessments, and Lead, as applicable
- Supporting Information
- The Assessment of Confidence and Uncertainty
- Probabilistic Analysis information (if applicable).

However, the report should not consist exclusively of the Interim Deliverables, because additional narrative should be necessary for a clear and comprehensible Baseline Risk Assessment Report. For example, information such as definition of hazard indices and cancer slope factors, toxicological profiles for COPCs, and other information indicated by risk assessment guidance should be incorporated.

Every risk assessment should contain a Risk Characterization appropriate to the assessment. Risk assessments submitted to the Agency or performed by the Agency should incorporate any current Agency guidance applicable on Risk Characterization (e.g., RAGS/HHEM, EPA 1989c; Memorandum from Carol Browner on Risk Characterization, EPA 1995b).

3.3 FINAL BASELINE RISK ASSESSMENT REPORT

Regions should submit the Final Baseline Risk Assessment Report as a revision of the draft, incorporating review comments as necessary and appropriate.

Regions should Prepare Draft ROD Risk Worksheet (ROD Risk Highlights) as directed by the EPA RPM and EPA risk assessor, upon completion of the Final Baseline Risk Assessment Report. Refer to the ROD guidance (U.S. EPA, 1999a) for human health risk data needs. The draft ROD Risk Worksheets present the Exposure Pathways and Chemicals that help justify the need for remedial action. Regions should prepare these recommended Worksheets when the Final

Baseline Risk Assessment Report is completed, in order to facilitate the EPA risk manager's preparation of the ROD at a later date.

Exhibit 3-4 identifies the RAGS Part D

information sources (Planning Table and column) for ROD Risk Worksheets (Highlights) 6-15, 6-16A, 6-16B, 6-18A, and 6-18B. Blank templates for the five ROD Risk Worksheets (Highlights) may be found in Appendix C

.

3.4 INFORMATION TRANSFER TO SUPERFUND RISK DATA COLLECTION

Upon the completion of the Final Baseline Risk Assessment Report, provide the Lotus® or Excel® version of the Planning Tables and Worksheets to the EPA risk assessor, who should submit them to the EPA Headquarters Risk Information Manager responsible for the Superfund Risk Data Collection.

EXHIBIT 3-4

RAGS PART D INFORMATION SOURCES FOR ROD RISK GUIDANCE HIGHLIGHTS

ROD RISK HIGHLIGHT	PURPOSE OF ROD RISK HIGHLIGHT	ROD FIELDS	ASSOCIATED RAGS D TABLE	ASSOCIATED RAGS D FIELDS
Highlight 6-15	Summary of Chemicals of Concern and Medium-Specific Exposure Point Concentrations	Scenario Timeframe	Planning Tables 2 & 3	Scenario Timeframe
		Medium	Planning Tables 2 & 3	Medium
		Exposure Medium	Planning Tables 2 & 3	Exposure Medium
		Exposure Point	Planning Tables 2 & 3	Exposure Point
		Chemical of Concern	Significant Chemicals from Planning Table 2 (site specific definition)	Chemical
		Concentration Detected - Min	Planning Table 2	Minimum Concentration
		Concentration Detected - Max	Planning Table 2	Maximum Concentration
		Units	Planning Table 2	Units
		Frequency of Detection	Planning Table 2	Detection Frequency
		Exposure Point Concentration	Planning Table 3	Exposure Point Concentration Value
		Exposure Point Concentration Units	Planning Table 3	Exposure Point Concentration Units
		Statistical Measure	Planning Table 3	Exposure Point Concentration Statistic

Notes:
-A version of ROD Highlight 6-15 is to be prepared for each combination of Scenario Timeframe, Medium, and Exposure Medium with "significant routes of exposure". The definition of "significant" will be site specific.
-Only Exposure Points with "Significant Routes of Exposure" are to be included.

EXHIBIT 3-4

RAGS PART D INFORMATION SOURCES FOR ROD RISK GUIDANCE HIGHLIGHTS (continued)

ROD RISK HIGHLIGHT	PURPOSE OF ROD RISK HIGHLIGHT	ROD FIELDS	ASSOCIATED RAGS D TABLE	ASSOCIATED RAGS D FIELDS
Highlight 6-16A	Cancer Toxicity Data Summary	Pathway: Ingestion, Dermal	Planning Table 6.1 (Cancer Toxicity Data-Oral/Dermal)	
		Chemical of Concern	Chemicals of Concern from Planning Table 6.1 (site specific definition)	Chemical of Potential Concern
		Oral Cancer Slope Factor	Planning Table 6.1	Oral Cancer Slope Factor
		Dermal Cancer Slope Factor	Planning Table 6.1	Absorbed Cancer Slope Factor for Dermal Value
		Slope Factor Units	Planning Table 6.1	Oral Cancer Slope Factor Units and Absorbed Cancer Slope Factor for Dermal Units
		Weight of Evidence/ Cancer Guideline Description	Planning Table 6.1	Weight of Evidence/Cancer Guideline Description
		Source	Planning Table 6.1	Oral CSF Source(s)
		Date	Planning Table 6.1	Oral CSF Date(s)
		Pathway: Inhalation	Planning Table 6.2 (Cancer Toxicity Data - Inhalation)	
		Chemical of Concern	Chemicals of Concern from Planning Table 6.2 (site specific definition)	Chemical of Potential Concern
		Unit Risk	Planning Table 6.2	Unit Risk Value
		Units	Planning Table 6.2	Unit Risk Units

EXHIBIT 3-4

RAGS PART D INFORMATION SOURCES FOR ROD RISK GUIDANCE HIGHLIGHTS (continued)

ROD RISK HIGHLIGHT	PURPOSE OF ROD RISK HIGHLIGHT	ROD FIELDS	ASSOCIATED RAGS D TABLE	ASSOCIATED RAGS D FIELDS
Highlight 6-16A (continued)	Cancer Toxicity Data Summary (continued)	Inhalation Cancer Slope Factor	Planning Table 6.2	Inhalation Cancer Slope Factor Value
		Units	Planning Table 6.2	Inhalation Cancer Slope Factor Units
		Weight of Evidence/ Cancer Guideline Description	Planning Table 6.2	Weight of Evidence/Cancer Guideline Description
		Source	Planning Table 6.2	Unit Risk : Inhalation CSF Source(s)
		Date	Planning Table 6.2	Unit Risk : Inhalation CSF Date(s)
		Pathway: External (Radiation)	Planning Table 6.4 (Cancer Toxicity Data - Radiation)	
		COC	Chemicals of Concern from Planning Table 6.4 (site specific definition)	Chemical of Potential Concern
		Cancer Slope or Conversion Factor	Planning Table 6.4	Cancer Slope Factor Value
		Exposure Route	Planning Table 1	Exposure Route
		Units	Planning Table 6.4	Cancer Slope Factor Units
		Weight of Evidence/ Cancer Guideline Description	Not Available	Not Available
		Source	Planning Table 6.4	Source(s)
		Date	Planning Table 6.4	Date(s)

Note:
-A version of ROD Highlight 6-16A is to be prepared for the Chemicals of Concern. This definition will be site specific.

EXHIBIT 3-4

RAGS PART D INFORMATION SOURCES FOR ROD RISK GUIDANCE HIGHLIGHTS (continued)

ROD RISK HIGHLIGHT	PURPOSE OF ROD RISK HIGHLIGHT	ROD FIELDS	ASSOCIATED RAGS D TABLE	ASSOCIATED RAGS D FIELDS
Highlight 6-16B	Non-Cancer Toxicity Data Summary	Pathway: Ingestion, Dermal	Planning Table 5.1 (Non-Cancer Toxicity Data - Oral/Dermal)	
		Chemical of Concern	Chemicals of Concern from Planning Table 5.1 (site specific definition)	Chemical of Potential Concern
		Chronic/ Subchronic	Planning Table 5.1	Chronic/Subchronic
		Oral RfD Value	Planning Table 5.1	Oral RfD Value
		Oral RfD Units	Planning Table 5.1	Oral RfD Units
		Dermal RfD	Planning Table 5.1	Absorbed RfD for Dermal Value
		Dermal RfD Units	Planning Table 5.1	Absorbed RfD for Dermal Units
		Primary Target Organ	Planning Table 5.1	Primary Target Organ(s)
		Combined Uncertainty/ Modifying Factors	Planning Table 5.1	Combined Uncertainty/ Modifying Factors
		Sources of RfD:Target Organ	Planning Table 5.1	RfD:Target Organ(s) Source(s)
		Dates of RfD:Target Organ	Planning Table 5.1	RfD:Target Organ(s) Date(s)
		Pathway: Inhalation	Planning Table 5.2 (Non-Cancer Toxicity Data - Inhalation)	
		Chemical of Concern	Chemicals of Concern from Planning Table 5.2 (site specific definition)	Chemical of Potential Concern

EXHIBIT 3-4

RAGS PART D INFORMATION SOURCES FOR ROD RISK GUIDANCE HIGHLIGHTS (continued)

ROD RISK HIGHLIGHT	PURPOSE OF ROD RISK HIGHLIGHT	ROD FIELDS	ASSOCIATED RAGS D TABLE	ASSOCIATED RAGS D FIELDS
Highlight 6-16B (continued)	Non-Cancer Toxicity Data Summary (continued)	Chronic/ Subchronic	Planning Table 5.2	Chronic/ Subchronic
		Inhalation RfC	Planning Table 5.2	Inhalation RfC Value
		Inhalation RfC Units	Planning Table 5.2	Inhalation RfC Units
		Inhalation RfD	Planning Table 5.2	Extrapolated RfD Value
		Inhalation RfD Units	Planning Table 5.2	Extrapolated RfD Units
		Primary Target Organ	Planning Table 5.2	Primary Target Organ(s)
		Combined Uncertainty/ Modifying Factors	Planning Table 5.2	Combined Uncertainty/ Modifying Factors
		Sources of RfC:RfD: Target Organ	Planning Table 5.2	RfC:Target Organ(s) Source(s)
		Dates	Planning Table 5.2	RfC:Target Organ(s) Date(s)

Notes:
-A version of ROD Highlight 6-16B is to be prepared for the Chemicals of Concern. This definition will be site specific.

EXHIBIT 3-4

RAGS PART D INFORMATION SOURCES FOR ROD RISK GUIDANCE HIGHLIGHTS (continued)

ROD RISK HIGHLIGHT	PURPOSE OF ROD RISK HIGHLIGHT	ROD FIELDS	ASSOCIATED RAGS D TABLE	ASSOCIATED RAGS D FIELDS
Highlight 6-18A	Risk Characterization Summary - Carcinogens	Scenario Timeframe	Planning Table 9 or 10	Scenario Timeframe
		Receptor Population	Planning Table 9 or 10	Receptor Population
		Receptor Age	Planning Table 9 or 10	Receptor Age
		Medium	Planning Table 9 or 10	Medium
		Exposure Medium	Planning Table 9 or 10	Exposure Medium
		Exposure Point	Planning Table 9 or 10	Exposure Point
		Chemical of Concern	Chemicals of Concern from Planning Table 9 or 10 (site specific definition)	Chemical
		Carcinogenic Risk–Ingestion	Planning Table 9 or 10	Carcinogenic Risk–Ingestion
		Carcinogenic Risk–Inhalation	Planning Table 9 or 10	Carcinogenic Risk–Inhalation
		Carcinogenic Risk–Dermal	Planning Table 9 or 10	Carcinogenic Risk–Dermal
		Carcinogenic Risk–External (Radiation)	Planning Table 9 or 10	Carcinogenic Risk–External (Radiation)
		Carcinogenic Risk Exposure Routes Total	Planning Table 9 or 10	Carcinogenic Risk - Exposure Routes Total
		Medium Risk Total	Planning Table 9 or 10	Medium Total (Risk)
		Total Risk	Planning Table 9 or 10	Receptor Risk Total

Notes:
-A version of Highlight 6-18A is to be prepared for each Receptor (combination of Scenario Timeframe, Receptor Population, and Receptor Age) with "Significant Exposure". The definition of "Significant Exposure" will be site specific.

EXHIBIT 3-4

RAGS PART D INFORMATION SOURCES FOR ROD RISK GUIDANCE HIGHLIGHTS (continued)

ROD RISK HIGHLIGHT	PURPOSE OF ROD RISK HIGHLIGHT	ROD FIELDS	ASSOCIATED RAGS D TABLE	ASSOCIATED RAGS D FIELDS
Highlight 6-18B	Risk Characterization Summary - Non-Carcinogens	Scenario Timeframe	Planning Table 9 or 10	Scenario Timeframe
		Receptor Population	Planning Table 9 or 10	Receptor Population
		Receptor Age	Planning Table 9 or 10	Receptor Age
		Medium	Planning Table 9 or 10	Medium
		Exposure Medium	Planning Table 9 or 10	Exposure Medium
		Exposure Point	Planning Table 9 or 10	Exposure Point
		Chemical of Concern	Chemicals of Concern from Planning Table 9 or 10 (site specific definition)	Chemical
		Primary Target Organ	Planning Table 9 or 10	Non-Carcinogenic Hazard Quotient - Primary Target Organ(s)
		Non-Carcinogenic Hazard Quotient - Ingestion	Planning Table 9 or 10	Non-Carcinogenic Hazard Quotient - Ingestion
		Non-Carcinogenic Hazard Quotient - Inhalation	Planning Table 9 or 10	Non-Carcinogenic Hazard Quotient - Inhalation
		Non-Carcinogenic Hazard Quotient - Dermal	Planning Table 9 or 10	Non-Carcinogenic Hazard Quotient - Dermal
		Non-Carcinogenic Hazard Quotient - Exposure Routes Total	Planning Table 9 or 10	Non-Carcinogenic Hazard Quotient - Exposuse Routes Total

EXHIBIT 3-4

RAGS PART D INFORMATION SOURCES FOR ROD RISK GUIDANCE HIGHLIGHTS (continued)

ROD RISK HIGHLIGHT	PURPOSE OF ROD RISK HIGHLIGHT	ROD FIELDS	ASSOCIATED RAGS D TABLE	ASSOCIATED RAGS D FIELDS
Highlight 6-18B (continued)	Risk Characterization Summary - Non-Carcinogens (continued)	Medium Hazard Index Total	Planning Table 9 or 10	Medium Total (Hazard)
		Receptor Hazard Index	Planning Table 9 or 10	Receptor HI Total
		Organ Hazard Index	Planning Table 9 or 10	Total Organ HI Across All Media

Notes:
-A version of Highlight 6-18B is to be prepared for each Receptor (combination of Scenario Timeframe, Receptor Population, and Receptor Age) with "Significant Exposure". The definition of "Significant Exposure" will be site specific.