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02/19/2015

### INFORMATION CLEARANCE FORM

A. Information Category

<input type="checkbox"/> Abstract	<input type="checkbox"/> Journal Article
<input type="checkbox"/> Summary	<input type="checkbox"/> Internet
<input type="checkbox"/> Visual Aid	<input type="checkbox"/> Software
<input type="checkbox"/> Full Paper	<input type="checkbox"/> Report
<input checked="" type="checkbox"/> Other <u>Environmental</u>	

B. Document Number PRC-PRO-EP-40205, Rev. 1, Change 3

C. Title  
CHPRC Environmental Calculation Preparation and Issue

D. Proposed Internet Address N/A

E. Required Information (MANDATORY)

1. Is document potentially Classified?  No  Yes 2/20/2015  
Richard H. Engelmann  
Manager Required (Print and Sign)

If Yes ADC Required (Print and Sign)  No  Yes Classified

2. Official Use Only  No  Yes Exemption No. \_\_\_\_\_

3. Export Controlled Information  No  Yes OOU Exemption No. 3

4. UCNI  No  Yes

5. Applied Technology  No  Yes OOU Exemption No. 5

6. Other (Specify) N/A

7. Does Information Contain the Following:

a. New or Novel (Patentable) Subject Matter?  No  Yes  
If "Yes", OOU Exemption No. 3  
If "Yes", Disclosure No.: \_\_\_\_\_

b. Commercial Proprietary Information Received in Confidence, Such as Proprietary and/or Inventions?  No  Yes  
If "Yes", OOU Exemption No. 4

c. Corporate Privileged Information?  No  Yes  
If "Yes", OOU Exemption No. 4

d. Government Privileged Information?  No  Yes  
If "Yes", Exemption No. 5

e. Copyrights?  No  Yes If "Yes", Attach Permission.

f. Trademarks?  No  Yes If "Yes", Identify in Document.

8. Is Information requiring submission to OSTI?  No  Yes

9. Release Level?  Public  Limited

F. Complete for a Journal Article

1. Title of Journal N/A

G. Complete for a Presentation

1. Title for Conference or Meeting N/A

2. Group Sponsoring N/A

3. Date of Conference N/A

4. City/State N/A

5. Will Information be Published in Proceedings?  No  Yes

6. Will Material be Handed Out?  No  Yes

H. Information Owner/Author/Requestor Brett M. Barnes Brett M Barnes 2/19/15  
(Print and Sign)

Responsible Manager Richard H. Engelmann R.H. Eng 2/20/2015  
(Print and Sign)

Approval by Direct Report to President (Speech/Articles Only) N/A  
(Print and Sign)

I. Reviewers	Yes	Print	Signature	Public Y/N (If N, complete J)
General Counsel	<input checked="" type="checkbox"/>	<u>Raymond T. Swenson</u>	<u>Raymond Swenson</u>	<input checked="" type="radio"/> Y / N
Office of External Affairs	<input type="checkbox"/>	_____	_____	Y / N
DOE	<input type="checkbox"/>	_____	_____	Y / N
Other	<input type="checkbox"/>	_____	_____	Y / N
Other	<input type="checkbox"/>	_____	_____	Y / N
Other	<input type="checkbox"/>	_____	_____	Y / N

J. Comments  
N/A

Information Clearance Approval

**APPROVED**  
By Janis D. Aardal at 3:21 pm, Feb 23, 2015

**Approved for Public Release;  
Further Dissemination Unlimited**

**Administrative Procedure**

# **PRC-PRO-EP-40205**

## **CHPRC Environmental Calculation Preparation and Issue**

Revision 1, Change 3

Published: 02/03/2015

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Program: Procedures

Topic: Environmental Protection

Technical Authority: Ferries, Steven

Functional Manager: Brunke, Ronald

# **Use Type: Administrative**



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**JHA: Administrative****Periodic Review Due Date: 03/26/2015**

Rev. 1, Chg. 3

USQ Screen Number:

- 100 K Facility : **Categorical Exclusion: GCX-8** (Not in Safety Basis Compliance Matrices)  
**Screener: Williams, James**
- Canister Storage Building/Interim Storage Area : **Categorical Exclusion: GCX-8** (Not in Safety Basis Compliance Matrices)  
**Screener: Covey, Lori**
- Central Plateau Surveillance and Maintenance : **Categorical Exclusion: GCX-7** (Minor Change)  
**Screener: Olsen, Ashley**
- Less Than HazCat 3 : Excluded from USQ  
**Exclusion Reason:**  
Excluded per PRC-PRO-NS-062, Rev. 2-0, Scope.
- Plutonium Finishing Plant : **Categorical Exclusion: GCX-8** (Not in Safety Basis Compliance Matrices)  
**Screener: King, Jeffrey**
- Solid Waste Operations Complex : **Categorical Exclusion: GCX-7** (Minor Change)  
**Screener: Olsen, Ashley**
- Transportation : Excluded from USQ  
**Exclusion Reason:**  
Excluded "N/A" per PRC-PRO-NS-062, Rev. 2-0, Appendix B, Bulleted List.
- Waste Encapsulation Storage Facility : **Categorical Exclusion: GCX-8** (Not in Safety Basis Compliance Matrices)  
**Screener: Covey, Lori**

## CHANGE SUMMARY

### Description of Change

Minor grammatical changes, page 4 of 19 removed "and document the basis of qualifications on the Environmental Calculation Cover Page; page 4 of 19 deleted "Appendix B Environmental Calculation Cover Page Form and Appendix C and replaced with Appendix B Calculation Format. Also Appendix A updated link to correct form location; under section 3.1 step 2 added "Environmental Calculation Cover Page (A-6005-812)" and removed "that it" and "A copy of the Environmental Calculation Cover Page is provided in Appendix B." from this step. Page 6 of 19, step 6 removed "Appendix C and replaced with Appendix B. In step 7, same page changed the information from 3.1.11 to 3.1.10. Subpart b of step 8 changed Appendix C to Appendix B. Step 9 changed the step 3.1.13 to 3.1.12. Page 7 of 19, step 10 changed Appendix C to Appendix B. Step 12 Removed "Obtain a Calculation Number" to Obtain a Calculation Number and added "Hanford Document Numbering System (HDNS)." In Step 13 in format, added "(40 CFR 300, Appendix

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B)". Page 8 of 19 Step 3 added "PRC Environmental Program and Strategic Planning Document Review and Comment Form (A-6005-233)" to the step. Page 9 or 19, step 5 added "Environmental Calculation Cover Page – (A-6005-812)" and removed "Appendix B". Step 6 added "Environmental Calculation Cover Page – (A-6005-812)" and removed "Environmental Calculation Cover Page (Appendix B)"; Page 9 of 19, step 5 removed "final" and added "final Environmental Calculation Cover Page (A-6005-812)" and removed "Environmental Calculation Cover Page (Appendix B)". Step 6 removed "final" added "final Environmental Calculation Cover Page (A-6005-812) and removed "Environmental Calculation Cover Page (Appendix B)"

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**1.0 INTRODUCTION****1.1 Purpose**

This procedure establishes the process used for the preparation, documentation, review, approval, and retention of environmental calculations.

This procedure implements the requirements of PRC-RD-EP-15332, *Environmental Protection Requirements*, and CHPRC-00189, *Environmental Quality Assurance Program Plan*, including Section 5, *Documents and Records*.

**1.2 Scope and Applicability**

This Level 2 Management Control Procedure applies to CH2M HILL Plateau Remediation Company (CHPRC) employees and sub-contractors performing environmental calculations in support of environmental regulatory decisions and documentation. This procedure, at a minimum, applies to personnel performing environmental calculations intended to support;

- Development of environmental permit applications,
- Reports to regulatory agencies documenting compliance with regulatory or permit requirements, or
- Environmental documentation supporting cleanup decisions.

This procedure does not apply to calculation preparation, review, approval and documentation requirements specified in other CHPRC procedures.

**NOTE:** *An environmental calculation is defined as a process that assembles inputs (such as assumptions, bases, requirements, restraints, physical or chemical properties, and algorithms) to develop outputs based on physical or mathematical laws.*

Table 1, *Example of Environmental Calculations*, provides examples of technical areas that require environmental calculations commonly found in CHPRC environmental documents. Table 1 is not an inclusive list of technical areas or example calculations.

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**Table 1. Example Environmental Calculations**

Technical Area	Example Calculation(s)
Effluent and Air Emissions	Facility effluent releases and fugitive air emissions, Constituents lists, potential-to-emit.
Contaminated Media	Constituents lists, contaminants of potential concern, contaminants of concern, plume maps, water table maps, geologic cross sections, permeability, contaminant fate and transport, mass removal, time series plots, treatment system capacity, remediation duration.
Risk Assessment	Constituents lists, contaminants of potential concern, contaminants of concern, exposure point concentrations, excess lifetime cancer risks, hazard quotient, hazard index, cumulative risk, groundwater protection, surface water protection.
Cost Estimates	Cost elements, cost models and project inputs.
Remediation Goals	Constituents lists, contaminants of potential concern, contaminants of concern, preliminary remediation goals, remediation goals, removal action levels, cleanup levels.

**1.3 Implementation**

This procedure is effective upon publication. If environmental calculations are being used to support other decision documents or regulatory reports, those environmental calculations must be completed with all required signatures prior to the parent document being submitted for formal internal review.

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**2.0 RESPONSIBILITIES**

Each role included within this procedure is identified below along with the associated responsibility.

- **Responsible Manager (RM):**

The RM or their designee;

- Identifies the need for and authorizes preparation of an environmental calculation,
- Identifies qualified individuals to perform, check and review the calculation, and the basis for their qualification,
- Provides the final approval of the completed calculation, and
- Ensures that the calculation is developed, checked, reviewed and maintained in compliance with this procedure.

- **Preparer:**

Develops the calculation methodology and gains early concurrence from the senior reviewer (SR); identifies project conditions, assumptions, and inputs, and prepares the calculation. The preparer has the calculation file released in accordance with Section 5.0 of this procedure.

- **Checker:**

Reviews calculation to verify that it is clearly developed and that the calculation was performed as described and without error. Checker ensures that all inputs are consistent with original referenced material. The Checker does NOT determine the appropriateness of the calculation, or any portion of it.

The Checker answers the following questions:

- Did the Preparer clearly and completely describe what they intended to do and the basis for what they intended to do?
- Did the Preparer do what they intended to do and without error?

- **Senior Reviewer (SR):**

Reviews the calculation methodology, assumptions and criteria and verifies they are appropriate and that the calculation was developed correctly. The SR will be a designated CHPRC Subject Matter Expert (SME). If no SME is designated for the calculation type being performed, the RM will identify a qualified SR.

The SR answers the following question:

- Was the Preparer's intent and basis correct?

**NOTE:** *The RM may require additional SRs if necessary to ensure all aspects of the calculation are adequately reviewed.*

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**3.0 PROCESS**

This process is defined in the following activities and associated sections:

- Section 3.1 Calculation Preparation
- Section 3.2 Calculation Checking
- Section 3.3 Calculation Review and Approval
- Section 4.0 Forms
- Section 5.0 Record Identification
- Appendix A Environmental Calculations Flow Sheet
- Appendix B Calculations Format

A flow sheet depicting the key elements of the process is provided in Appendix A.

**3.1 Calculation Preparation / Revision**

<i>Actionee</i>	<i>Step</i>	<i>Action</i>
RM	1.	IDENTIFY the need, scope, and requirements of the calculation (or revision).
	2.	INITIATE the calculation (or revision) by completing Part 1 of the <u>Environmental Calculation Cover Page (Site Form A-6005-812)</u> and providing it to the preparer.
	3.	ASSIGN a calculation preparer, SR and checker qualified for the work contemplated (individuals should have education, experience, and/or expertise commensurate with the planned calculation's complexity). These are three independent functions and shall be performed by separate individuals.
	a.	DOCUMENT the basis of their qualifications on the form.
	4.	ENSURE that any persons or subcontractors performing, checking or reviewing the calculation by subcontractors are aware of, understand and are able to complete the requirements of this procedure.
<b>NOTE:</b>		<i>The RM may choose to fulfill the duties of the preparer. Also the RM may identify the need for additional reviewers to ensure all aspects of the calculation are adequately reviewed.</i>
Preparer	5.	COORDINATE with the SR to gain concurrence on the objective(s) and methodology before completing the calculation (or revision).

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<i>Actionee</i>	<i>Step</i>	<i>Action</i>
Preparer	6.	<p>DEVELOP calculation using the format in <u>Appendix B</u> or the <u>Environmental Calculations Template</u> .</p> <p>a. <u>IF</u> the calculation (or revision) is associated with a Risk Assessment or an environmental model, <u>THEN EXIT</u> this procedure <u>AND PERFORM</u> the calculation (or revision) in accordance with <u>PRC-PRO-EP-40253, Risk Assessment and Modeling Integration</u>.</p> <p>1) Once the Risk Assessment/environmental model has been completed, RETURN to this procedure to continue to the next step 3.1.7.</p>

**NOTE:** *The Technical Publications group is available for assistance if desired. If the calculation is handwritten, ensure that each page is uniquely numbered and contains the document number as illustrated.*

7. IF this is a revision to an existing calculation,  
THEN PROCEED to step 3.1.10.
8. DESCRIBE the calculation in a neat, logical manner, with sufficient detail and notes to allow another person to understand and check the calculation without assistance from the preparer.
  - a. USE the same format for both manually generated and electronically generated calculations (such as MATHCAD®) as described in Appendix A.
  - b. Software and spreadsheet applications with or without user-generated macros require documentation within the calculations. In particular, the software verification/validation and installation checkout documentation must be completed and fully described, as described in Appendix B.
9. PROCEED TO step 3.1.12.

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<i>Actionee</i>	<i>Step</i>	<i>Action</i>
Preparer	10.	<p>MAKE revisions to calculations according to the following and <u>Appendix B</u>.</p> <p><u>Electronic documents:</u></p> <ul style="list-style-type: none"> <li>• To delete language, use the strikeout option</li> <li>• To identify new language, use the redline option</li> </ul> <p><u>Handwritten documents:</u></p> <ul style="list-style-type: none"> <li>• To delete language, use a single line through the words, with each strikeout initialed and dated by the reviser</li> <li>• To identify new language, underline the new language and initial and date each addition</li> </ul>
	11.	IDENTIFY the revised portion by a change bar in the left margin (same for either electronic documents or handwritten documents).
	12.	<p>OBTAIN a Calculation Number (or revision number) from the <u>Hanford Document Numbering System (HDNS)</u>. Environmental calculation files (ECFs) have been added to the HDNS under CHPRC selection and uses the format A-B-C-D, where:</p> <p>A = <u>environmental calculation file (ECF)</u>: All calculation files will begin with the ECF to indicate its purpose.</p> <p>B = <u>project acronym</u>: The acronym for the project is defined as either the National Priorities List (<u>40 CFR 300, Appendix B</u>) (NPL) or operable unit. The applicability of the environmental calculation will determine either use of NPL site listing or operable unit. These options are identified within HDNS.</p> <p>C = <u>calendar year</u>: The year the environmental calculation was written.</p> <p>D = <u>sequence number</u>: A sequential number is an automated feature within HDNS.</p> <p>Examples:    ECF-200UR1-09-0001                   ECF-200NPL-09-0002</p>
	13.	IDENTIFY Calculation (or revision) Number on Part 2 of the Environmental Calculation Cover Page Form.

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**3.2 Calculation Checking**

<i>Actionee</i>	<i>Step</i>	<i>Action</i>
Preparer	1.	PROVIDE a copy of completed calculation (or revision) to the assigned checker.
Checker	2.	<p>PERFORM a check of the entire calculation (or revision), including:</p> <ul style="list-style-type: none"> <li>• VERIFY that the following elements are clearly described: <ul style="list-style-type: none"> <li>a. purpose</li> <li>b. calculation approach</li> <li>c. assumptions</li> <li>d. inputs</li> <li>e. equations used</li> <li>f. conclusions</li> <li>g. references</li> </ul> </li> <li>• <u>IF</u> a software application (including spreadsheets) is used, <u>THEN</u> VERIFY the software used: <ul style="list-style-type: none"> <li>a. Is appropriate for this application</li> <li>b. Is approved and properly validated in accordance with PRC-PRO-IRM-309, <i>Controlled Software Management</i>.</li> <li>c. Is properly documented in calculation</li> </ul> </li> <li>• VERIFY that the data was input correctly to approved software or spreadsheets. If the calculation uses a spreadsheet that has not been approved in accordance with PRC-PRO-IRM-309, <i>Controlled Software Management</i>, the Checker will also repeat every calculation performed by the spreadsheet to ensure its accuracy.</li> <li>• PERFORM the calculation as described to verify it is free of errors.</li> </ul> <p>3. SUBMIT calculation (or revision) copy with comments and mark-ups to the preparer. Comments should be provided on a <u><i>PRC Environmental Program and Strategic Planning Document Review and Comment Form (Site Form A-6005-233)</i></u> or via other accepted methods such as redline/strikeout of electronic or hard copy files and documents, email, or equivalent comment form as directed by the preparer.</p>

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<i>Actionee</i>	<i>Step</i>	<i>Action</i>
Preparer	4.	RESOLVE comments with the checker and revise the calculation (or revision) document based on resolution of the checker's comments.
	5.	SIGN <u>AND</u> DATE the final <u>Environmental Calculation Cover Page (A-6005-812)</u> .
	6.	OBTAIN signature on the final <u>Environmental Calculation Cover Page (A-6005-812)</u> from the Checker.
	7.	SUBMIT calculation (or revision) for final review and approval to RM and SR.

## 3.3 Calculation Review and Approval

<i>Actionee</i>	<i>Step</i>	<i>Action</i>
RM, SR	1.	REVIEW the calculation (or revision) for correctness and completeness. The RM and SR will review the calculation (or revision) to determine the appropriateness of the approach, methodology, assumptions, criteria, software used, and conclusions.
	2.	SUBMIT calculation (or revision) copy with comments and mark-ups to the preparer. Comments should be provided on a CHPRC Review Comment Record or via other accepted methods such as redline/strikeout of electronic or hard copy files and documents, email, or equivalent comment form as directed by the preparer.
Preparer	3.	RESOLVE comments with the RM and SR and revise the calculation (or revision) based on resolution of the RM and SR comments.
	4.	CONSULT with the Checker to determine if a recheck is necessary. Return to step 3.2.1 if changes justify a re-check.
	5.	OBTAIN signature on the final <u>Environmental Calculation Cover Page (A-6005-812)</u> from the SR.
	6.	OBTAIN signature on the final <u>Environmental Calculation Cover Page (A-6005-812)</u> from the RM.

- NOTES:**
- *Reminder; if this calculation has used safety software graded as level C or higher, its use must be logged in accordance with PRC-PRO-IRM-309.*
  - *Comments provided and resolved prior to finalization of the environmental calculation (obtaining all signatures) are not considered record material.*
7. INITIATE the clearance of the calculation (or revision) using the Records Management Access Portal (RMAP) Clear a Document Module (CDM). RMAP CDM is found at [REDACTED]
  8. UPLOAD the Environmental Calculation and signed Environmental Calculation Coversheet into RMAP CDM.

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<i>Actionee</i>	<i>Step</i>	<i>Action</i>
Preparer	9.	SUBMIT the calculation package for clearance to an Information Clearance Specialist for review using the "Submit for Clearance" button in the RMAP CDM.
	10.	NOTIFY Information Clearance of the new document to be processed via email to ^Information Clearance.
Information Clearance	11.	PERFORM review, enter review comments into the IDMS Workflow Comments section, and assign other required reviewers in accordance with PRC-PRO-IRM-184, <i>Information Protection and Clearance</i>
	12.	APPLY Clearance and Release approvals and appropriate stamps or markings on the <i>Environmental Calculation Cover Sheet</i> , as applicable.
	13.	DISTRIBUTE, <u>AND</u> ANNOUNCE the availability of, the electronic document to the U.S. Department of Energy (DOE) Office of Scientific and Technical Information (OSTI) via the uploaded or scanned image, as necessary.

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**4.0 FORMS***Environmental Calculation Cover Page (A-6005-812)**PRC Environmental Programs and Strategic Planning Document Review and Comment Form (A-6005-233)***5.0 RECORD IDENTIFICATION**

All records are required to be managed in accordance with PRC-PRO-IRM-10588, *Records Management Processes*.

Records created during the performance of OCRWM activities shall be managed and additionally submitted to the OCRWM Records Coordinator, in accordance with PRC-PRO-QA-19579, *OCRWM Records Management*.

**Records Capture Table**

<b>Name of Document</b>	<b>Submittal Responsibility</b>	<b>Retention Responsibility</b>
Final Signed Environmental Calculation File (including but not limited to environmental calculation, and Environmental Calculation Cover Sheet)	Preparer	IRM Service Provider

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**6.0 SOURCES**

Sources include material referenced within the procedure and requirements used as a basis for the procedure.

**6.1 Requirements**

CHPRC-00189, *Environmental Quality Assurance Program Plan, Section 5, Documents and Records*

PRC-MP-QA-599, *Quality Assurance Program*

PRC-PRO-IRM-10588, *Records Management Processes*

PRC-PRO-IRM-184, *Information Protection and Clearance*

PRC-RD-EP-15332, *Environmental Protection Requirements*

**6.2 References**

*Environmental Engineering Reference Manual, 2<sup>nd</sup> Ed*

PRC-PRO-IRM-309, *Controlled Software Management*

PRC-PRO-EP-40253, *Risk Assessment and Modeling Integration*

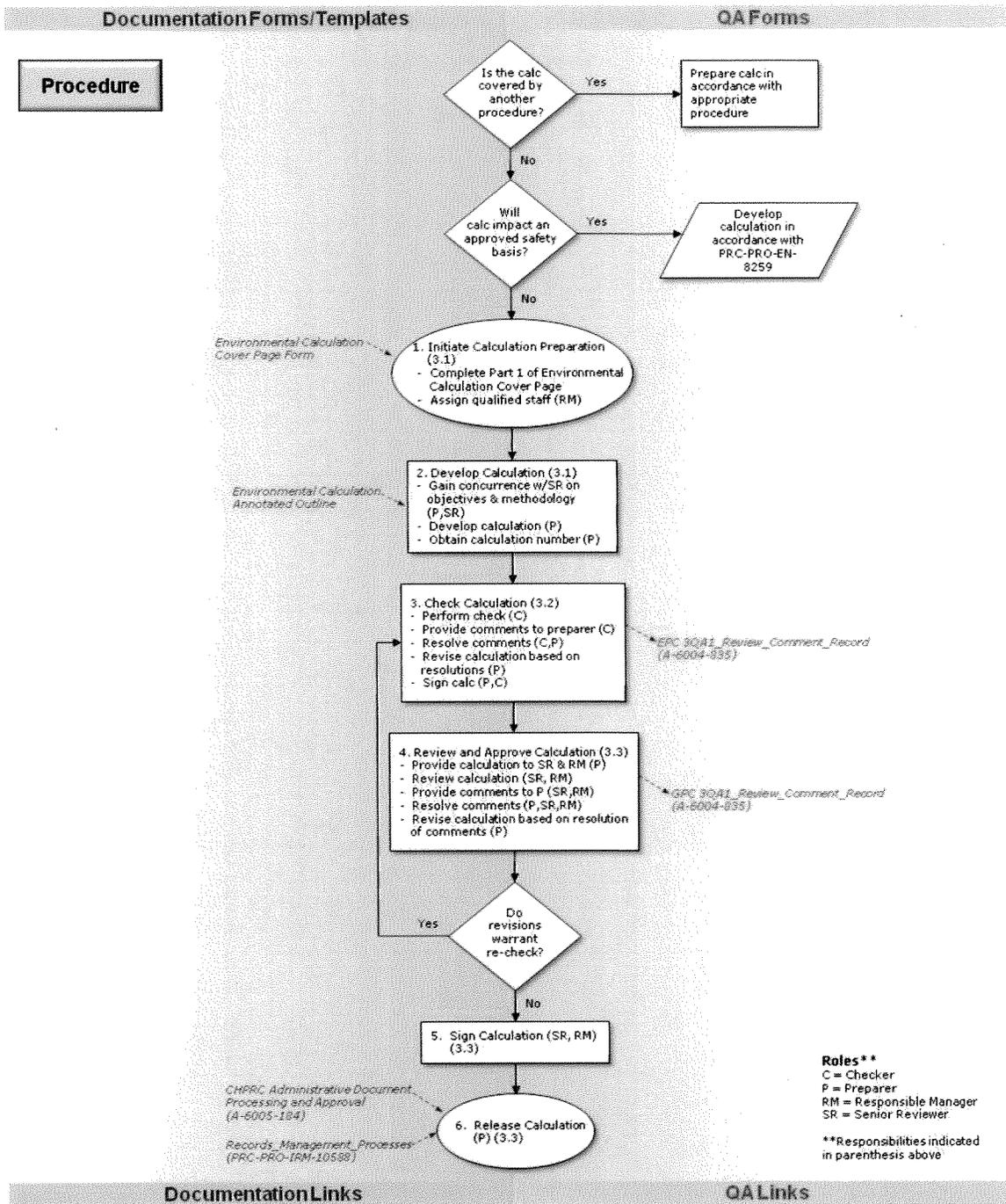
PRC-PRO-QA-19579, *OCRWM Records Management*

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Appendix A - Environmental Calculations Flow Sheet



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**Appendix B - Environmental Calculations Format**

The document number, revision number, and page number (using "1 of X" format where X is the total number of pages) are included on each page of the calculation. Computer sheets inserted into the calculations are numbered in sequence where they appear. Computer sheets used in an appendix are numbered as appendices, using uppercase letters and numbered within each appendix (e.g., A-1, A-2, B-1). The cover sheet of the calculation requires the preparer's, checker's, SR's, and RM's signatures and date. In handwritten calculations, inserted pages from calculation revisions are identified with alpha suffixes. For example, if two pages are inserted after page 3, they are identified as pages 3a and 3b, respectively. The total number of pages is reflected on the calculation cover sheet. Calculations are initially issued Revision 0. Future revisions, if required, are numbered (e.g., Revision 1, 2). Signatures on the *Environmental Calculation Cover Page* must be in ink.

Provide the following sections in the calculation.

1. **Cover Page.** Use the *Environmental Calculation Cover Page* (A-6005-812).
2. **Table of Contents.** A Table of Contents is required for calculations greater than 5 pages.
3. **Purpose.** Describes the reason for performing the calculation, the end result sought, and any alternatives examined.
4. **Background (Optional).** Based on the broad usage of the procedure, a background section may be useful for the reader. When needed, use this section to describe any history or further justification for the methodology to follow.
5. **Methodology.** Provides the steps and associated calculation approach, including the equation and basis for the equation where used. This section should be kept as succinct as possible, identifying only the specific steps to be followed. This section should not include lengthy justifications or history behind the steps. If those are needed, they can be provided in the background section. The basis for the equation is meant to be a very brief reference supporting the use of the equation. Footnotes and references are encouraged to provide the basis. Steps should be numbered.
6. **Assumptions and Inputs.** Provides all the relevant assumptions and inputs necessary to perform the calculation, including a very brief explanation of the basis for each and the methodology step it is supporting. Copies of the original material should be provided as part of the ECF to provide a complete stand alone and reproducible package.

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7. **Software Applications.** Software can consist of commercially available or custom developed applications including spreadsheets and utility calculations, such as Excel and MathCAD. All software used by CHPRC must be approved and controlled in accordance with PRC-PRO-IRM-309. Section 3.1.2.1 of PRC-PRO-IRM-309 provides the criteria to determine if a spreadsheet or utility calculation is considered software and governed by the procedure requirements. This section applies to software that has been approved for use in accordance with PRC-PRO-IRM-309.
- a. Approved Software and Utility Calculation Software (e.g., STOMP, RESRAD) shall comply with requirements of PRC-PRO-IRM-309. Software used shall be registered on the Hanford Information System Inventory (HISI) and identified as approved for use. Each use of Approved Software shall be logged in HISI in accordance with PRC-PRO-IRM-309. For Approved Software, provide a section that includes the following information.
- 1) Description:  
Identify the following for the software package used in the calculation:
    - Software Title
    - Software Version
    - HISI Identification Number
    - Workstation type and property number (from which software is run).
  - 2) Software Installation and Checkout  
Reference or include a copy of the Software Installation and Checkout form for the workstation used.
  - 3) Statement of Valid Software Application
    - Brief statement confirming correct application of the particular software to the problem being solved.
    - Brief statement confirming software has been used within its limitations (e.g., comparison of the problem inputs against the software's required range of variables to determine if the problem fits within the software limitations).
8. **Calculation.** Perform the calculation including any revisions. The calculation is presented using the steps defined in the Methodology.
- Per section 1.2 of PRC-PRO-IRM-309, "Flat-file" spreadsheets that are wholly incorporated into the calculation documentation where the calculations, mathematical formulas, and input data can be exactly verified during the technical review of the report are exempt from the requirements of PRC-PRO-IRM-309. If this is the case this section shall include identification of the program name and version (e.g., Microsoft Excel, Version 11.0), a printout showing the input data, results and a printout of all cell formulas used to produce the results. In the case of a large input data, e.g. a HEIS data export, a protected electronic file may be used. The location of this protected file (non-editable) shall be identified in the ECF document. The intent of these requirements is to permit the checker to reproduce the results from the documentation without recourse to the preparer.

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9. **Results/Conclusions.** Presents the calculation results and conclusions, along with any limits or criteria needed to evaluate the results. Conclusions should include a discussion of uncertainties or implications due to sensitivity analyses where appropriate.
  
10. **References.** List all references used to develop the calculation and the results of literature searches or other background data. This includes previous calculations used and preexisting operable unit or National Priorities List listing. References should be specific enough to allow the reader to locate the requirements used in the calculation. A reference should be provided for each input, along with a copy of the reference information (such as a table providing the Kd value).