

REC Work Phase and Document Content Checklists

Checklists are provided as a tool to aid or assist the Registered Site Manager (RSM) through the REC Program work phase planning and documentation requirements. The checklists are provided as a convenience to RECs and **DO NOT** need to be completed and returned with any documents. They are adapted from the REC Rules (15A NCAC 13C .0300) and the Branch's *Guidelines for Assessment and Cleanup of Contaminated Sites*. The checklists and guidance are tools to assist the REC and do not alter any REC Rule. They should be used in conjunction with the REC Rules.

1. Remedial Investigation Work Plan
2. Remedial Investigation Report
3. Remedial Action Plan
4. Remedial Action Progress Report
5. Remedial Action Completion Report

**Component Checklist – Remedial Investigation (RI) Work Plan (WP)
REC Rules (15A NCAC 13C)**

Note: This checklist and the IHSB Guidelines for Assessment and Cleanup of Contaminated Sites (Guidelines) should only be used as a supplement to the REC Rules.

NOTIFICATION REQUIREMENTS:

Report to REC Program staff within 24 hours upon discovery of any of the following, if applicable [.0305(b)(2)&(3)]:

- _____ an imminent hazard at the site
- _____ the presence of sensitive environments
- _____ off-site migration of hazardous substances
- _____ mixed chemical & radioactive wastes

The plan shall include the following or an explanation as to why, in the professional judgement of the REC, the component is not relevant to the remedial investigation.

RI WORK PLAN EVALUATION AND DOCUMENT CONTENT - [0306(h)]:

_____ .0306(h)(1) **Site background information.** Include street address, latitude-longitude, site and surrounding property land use.

_____ .0306(h)(2) **Hazardous waste management practices.** Include discussion of:

- List of types and amounts of waste generated (with RCRA waste codes), treatment and storage methods, and ultimate disposition of wastes;
- Description of facility’s past and current RCRA status;
- Location and condition of all identified vessels currently or previously used to store chemical products, hazardous substances or wastes; and
- Summary of the nature of all identified on-site hazardous substance(s) release(s), including disposal or spills.

_____ .0306(h)(3) **Topographic maps.** Maps must be sufficient to cover area within 1-mile radius of site. *Maps should be most recent original USGS quad series maps.*

_____ .0306(h)(4) **A map, drawn to scale.** The map must include:

- Scale, benchmarks, north arrow, locations of property boundaries, buildings, structures;
- All perennial and non-perennial surface water features, drainage ditches, and dense veg.;
- Known and suspected spill or disposal; areas identified pursuant to Paragraph (f) of this Rule,
- Underground utilities, storage vessels, existing on-site wells; and
- Identification of all adjacent property owners and land usage.

Maps may be updated following the Remedial Investigation and included in the RI Report.

_____ .0306(h)(5) **Local geologic and hydrogeologic conditions.** Include description.

_____ .0306(h)(6) **Sources of potable water.** Include inventory and map of all identifiable wells, springs, and surface-water intakes used for potable water within a 1,500-foot radius of each source area or contaminant perimeter, or if source area unknown, within a 1,500-foot radius of each point where

contamination has been identified at the site. *A thorough survey of private and municipal water-supply wells and surface water intakes must be conducted.*

- _____ .0306(h)(7) **Areas potentially affected by the site contamination.** Include evaluation of site and all adjacent properties for sensitive environments, sensitive populations or property uses, and above and below ground structures and utilities
- _____ .0306(h)(8) **Property ownership.** Discuss chronological listing of all previous owners and each period of ownership since the property was originally developed.
- _____ .0306(h)(9) **Operational history.** Discuss and provide aerial photographs and Sanborn Fire Insurance maps if used to support land-use history.
- _____ .0306(h)(10) **Hazardous substance list.** List all hazardous substances which have been used or stored at the site, and approximate amounts and dates of use or storage as revealed by available written documentation and interviews with a representative number of former and current employees or occupants possessing relevant information;
- _____ .0306(h)(11) **Environmental permit history.** Include copies of all federal, state and local environmental permits, past and present, issued to RP or within its custody or control.
- _____ .0306(h)(12) **Regulatory history.** Include the following:
- Summary of all previous and ongoing environmental investigations and environmental regulatory involvement with the site; and
 - Reference and/or attach all associated reports and lab data within the custody or control of the REC or RP unless the REC confirms that the documents are already present in the Department's electronic document system.
- _____ .0306(h)(13) **Risk of contaminant migration.** Discuss plans to evaluate contaminant migration potential to identified receptors specified in (6) and (7) above.
- _____ .0306(h)(14) **Intended procedures for site characterization.** Discuss procedures for characterizing site geologic and hydrogeologic conditions, for identifying and delineating each contamination source as to each affected environmental medium, including any plan for special assessment such as a geophysical survey. *See Appendix B of Guidelines.*
- _____ .0306(h)(15) **Sample collection points.** Describe intended methods, locations, depths of, and justification for, all collection points for all media sampled, including monitoring well locations and anticipated screened intervals. *See Appendix B of Guidelines for sampling procedures.*
- _____ .0306(h)(16) **Field and lab procedures.** Describe QA/QC procedures. *See Appendix B of Guidelines.*
- _____ .0306(h)(17) **Analytical parameters and methods.** Discuss for all media sampled. *See Appendix B of Guidelines for sample analyses.*
- _____ .0306(h)(18) **Decontamination procedures.** Describe for equipment and personnel.
- _____ .0306(h)(19) **Community health and safety.** Describe measures implemented to protect the health and safety of nearby residential and business communities in relation to the RI activities. *The scope and detail of measures shall be commensurate with the degree and nature of risks posed. See .0306(e) of REC Rules for items to consider.*

_____ .0306(d) **QA/QC and investigation protocol must ensure that the appropriate sample collection and analytical procedures will be followed:**

- Analytical and environmental data which are scientifically valid and provide a level of precision and accuracy commensurate with their stated or intended use;
- Procedures and methodologies for collection and analysis of soil, sediment, water, vapor, air and waste samples that are published by USEPA, ASTM, APHA, NIOSH, AWWA, or other organizations with expertise in the development of standardized testing methods; or modifications of published methods, provided all modifications are completely documented;
- Use of labs certified to analyze applicable certifiable parameters under 15A NCAC 2H .0800, or a USEPA contract lab;
- Lab and other reports list analyses for aqueous samples in units of mass per unit volume and for solid samples in units of mass per unit mass;
- Sample collection and analysis performed by persons qualified by education, training, & experience; and
- Sample collection and analyses documentation [see .0306(d)(6)(A)-(K) and Appendix B of Guidelines].

_____ .0306(f) **The REC must plan and implement the remedial investigation so that, to the extent practicable, all areas of concern are evaluated:**

- The location and identity of all hazardous substances discharged to the environment at a site will be established;
- All areas known, suspected, or having a reasonable probability of being contaminated by hazardous substances will be investigated;
- The areal and vertical extent of contam. will be delineated for each area of concern; and
- The potential for vapor intrusion will be evaluated as a possible exposure route.

See Appendix B of Guidelines for procedures.

SCHEDULE AND CERTIFICATIONS:

_____ .0306(b)(1-2) **RI Work Plan will be/is properly certified by RP and RSM.**
Ensure proper document certification (Forms DC-1 and DC-II downloaded from website), notary and dates. Ensure that date of RSM signature follows date of RP signature.

_____ .0302(i) **RI Work Plan will be/is submitted to REC Program staff within 30 days of certification.**

_____ .0306(b)(4) **RI Work Plan will be/is certified (and submitted to REC Program staff for the public record) prior to implementing the remedial investigation.**

_____ .0302(h) **RI Report will be completed within three years of Administrative Agreement execution.**

**Component Checklist – Remedial Investigation (RI) Report
REC Rules (15A NCAC 13C)**

Note: This checklist and the IHSB Guidelines for Assessment and Cleanup of Contaminated Sites (Guidelines) should only be used as a supplement to the REC Rules.

NOTIFICATION REQUIREMENTS:

Report to REC Program staff within 24 hours upon discovery of any of the following, if applicable [.0305(b)(2)&(3)]:

- _____ an imminent hazard at the site
- _____ the presence of sensitive environments
- _____ off-site migration of hazardous substances
- _____ mixed chemical & radioactive wastes

RI EVALUATION AND DOCUMENT CONTENT - [0306(i)]:

- _____ .0306(i)(1) **Regulatory deadline update.** Include discussion of how work is on track to meet the deadlines required by Rule .0302(h).
- _____ .0306(i)(2) **Narrative description.** Include discussion of any variances from certified RI Work Plan.
- _____ .0306(i)(3) **Well construction information.** Include the following:
 - Well design, installation procedures, and drilling methods used;
 - Geologic logs, completed drilling logs, “as built” drawings of all wells, and techniques and materials used; and
 - Copies of all well installation permits.
- _____ .0306(i)(4) **Sampling locations.** Include a scaled map and/or completed site survey map with all sample locations shown in relation to known disposal areas or other sources of contamination. Include test pits, surficial soil samples, soil borings, soil vapor samples, surface water samples, sediment samples, and monitoring wells.
 - Groundwater elevations should be surveyed to a known datum.
 - All sample locations were surveyed to a known benchmark or flagged with a secure marker until after remedial action is completed.

Any survey performed pursuant to this Paragraph shall be performed by a registered land surveyor duly authorized under North Carolina law to conduct such activities
- _____ .0306(i)(5) **Quality assurance/quality control.** Describe all field and lab QA/QC. *See Appendix B of Guidelines.*
- _____ .0306(i)(6) **Investigation-derived waste.** Describe procedures used to manage drill cuttings, purge water, and decontamination water.
- _____ .0306(i)(7) **Geologic conditions.** Summarize soils and vadose zone characteristics.
- _____ .0306(i)(8) **Hydrogeologic conditions.** If groundwater contamination is known or suspected to be present, include the following:
 - Current uses of groundwater;

- Notable aquifer characteristics;
- A water table elevation contour map with groundwater flow patterns depicted; and
- Tabulated groundwater elevation data.

- _____ .0306(i)(9) **Analytical results.** Include the following:
- Tabulation of analytical data for all samples with sampling dates and soil sampling depths;
 - Copies of all laboratory reports including QA/QC documentation.
- _____ .0306(i)(10) **Maps.** Include soil, groundwater, surface water and sediment contamination delineation maps, including scale and sampling points with contaminant concentrations, where contaminant concentrations exceed cleanup levels.
- _____ .0306(i)(11) **Cross sections.** If contaminants exceed cleanup levels, include cross-sections with a scale and sampling points with contaminant concentrations.
- _____ .0306(i)(12) **Contaminant migration.** Discuss contaminant migration in any media to receptors, and above and below ground structures and utilities.
- _____ .0306(i)(13) **Special assessments.** Describe procedures and results of geophysical surveys, immunoassay testing, soil gas surveys or test pit excavations. Include vapor intrusion potential evaluation. *See Appendix B of the Guidelines.*
- _____ .0306(i)(14) **Color copies of site photographs.** Include photos if used to provide documentation of the investigation results

INVESTIGATION CONSIDERATIONS:

- _____ .0306(d) **Have the appropriate sample collection and analytical procedures been followed?** See criteria specified in RI Work Plan Checklist.
- _____ .0306(e) **Was the community health and safety plan (prepared and included as part of the RI Work Plan) followed?**
- _____ .0306(g) **Was the scope of the RI sufficient for the phase being conducted?**
See criteria specified in RI Work Plan Checklist.

SCHEDULE AND CERTIFICATIONS:

- _____ .0306(b)(4) **A RI Work Plan was certified (and submitted to REC Program staff for the public record) prior to conducting RI work.**
- _____ .0302(h) **Final RI Report will be/is completed within three years of Administrative Agreement execution.**
- _____ .0306(b)4 **The RI Report will be/is properly certified by the RP and RSM.**
Ensure proper document certification (Forms DC-I and DC-II downloaded from the website), notary and dates. Ensure that date of RSM signature follows date of RP signature.
- _____ .0306(b)(5) **The report includes RI work phase completion statement**
- _____ .0302(i) **RI Report will be/is submitted to REC Program staff within 30 days of certification.**

**Component Checklist –Remedial Action Plan (RAP)
REC Rules (15A NCAC 13C)**

Note: This checklist and the IHSB Guidelines for Assessment and Cleanup of Contaminated Sites (Guidelines) should only be used as a supplement to the REC Rules.

NOTIFICATION REQUIREMENTS:

Report to REC Program staff within 24 hours upon discovery of any of the following, if applicable [.0305(b)(2)&(3)]:

- _____ an imminent hazard at the site
- _____ the presence of sensitive environments
- _____ off-site migration of hazardous substances
- _____ mixed chemical & radioactive wastes

PROPOSED RAP EVALUATION AND DOCUMENT CONTENT - [0306(n)]:

_____ .0306(n)(1) **RI results.** Discuss and summarize RI results including media contaminated, contaminants of concern, the areal and vertical extent of contamination, the risk of contaminant migration in any media to receptors and above and below ground structures or utilities.

_____ .0306(n)(2) **Remedial action objectives.** *Summarize the areas to be remediated, the affected media and contaminants of concern, and the remedial design goals, including preliminary remediation goals.*

_____ .0306(n)(3) **Feasibility study.** Provide evaluation of at least 3 available remedial alternatives using the following feasibility study criteria:
(A) Protection of human health and the environment, including attainment of cleanup levels;
(B) Compliance with applicable federal, State and local regulations;
(C) Long-term effectiveness and permanence;
(D) Reduction of toxicity, mobility and volume;
(E) Short-term effectiveness, such as effectiveness at minimizing the impact of the site remedial action on the environment and local community;
(F) Implementability, such as technical and logistical feasibility and an estimate of time required for completion;
(G) Cost; and
(H) Community acceptance.

_____ .0306(n)(4) **Pilot or treatability studies.** Describe the results of site characterization, pilot studies, or treatability studies that support the design and a description and schedule for the selected remedy.

_____ .0306(k) **Branch concurrence is required for the following proposed remedies:**
(1) A remedy conducted entirely on site and for which a permit waiver is desired under N.C.G.S. 130A-310.3(e);
(2) On-site containment with land-use restrictions; or
(3) An exceedance of the cost set forth in G.S. 130A-310.9(a).

_____ .0306(n)(5) **Detailed description of proposed remedy.** Include conceptual (*preliminary*) design of proposed remedy, including process flow diagrams and pre-design drawings of all major components of all treatment.

_____ .0306(n)(6) **Justification for selection of proposed remedy.** A demonstration must be made that the proposed remedy is supported by the feasibility study.

- _____ .0306(n)(7) **Activities necessary for implementation.** Describe activities required to implement the proposed methods of remedial action in compliance with applicable laws and regulations in such a manner that cleanup standards are met. These activities shall include, well installation and abandonment, sampling, run-on or run-off control, discharge of treated waste streams, and management of investigation and remedial action derived wastes;
- _____ .0306(n)(8) **Proposed criteria for remedial action completion.** Describe criteria for RA completion, including procedures for post-remedial and confirmatory sampling. *A plan for monitoring and evaluating the remedy's performance must also be included.*
- _____ .0306(n)(9) **Community health and safety.** Describe measures to protect the health and safety of nearby residential and business communities. . *See .0306(e) of REC Rules for items to consider.*
- _____ .0306(n)(10) **Decontamination procedures.** Describe for equipment and personnel.
- _____ .0306(s) **Removal of hazardous waste from site.** Include discussion of how remedial action-derived wastes will be managed in a manner that provides for the protection of human health and the environment and that complies with all applicable federal, state, and local laws, rules, and regulations.

SCHEDULE AND CERTIFICATIONS:

- _____ .0306(b)(1-2) **The Proposed RAP has been properly certified by the RP and RSM.** *Ensure proper document certification (Forms DC-1 and DC-II downloaded from the website), notary and dates. Ensure that date of RSM signature follows date of RP signature.*
- _____ .0302(i) **RAP will be/is submitted to the Branch within 30 days of certification.**
- _____ .0306(l) **The REC will provide public notice for the Proposed RAP following certified document submittal.** *Contact REC Program staff for instructions.*
- _____ .0306(b)(5)(B) **The RAP work phase completion statement will be completed after contacting REC Program staff following conclusion of a public notice period.** *Note: This certified statement (WPC-III) is submitted **after** public notice of the proposed RAP has been completed and all comments, if any, received have been properly addressed by the REC. The work phase completion statement WPC-III must be certified by document certification forms DC-1 and DC-II.*
- _____ .0306(b)(5) **RAP implementation/remedial construction will not begin until work phase completion statement WPC-III is submitted to REC Program staff.**

**Component Checklist – Remedial Action Progress Report
REC Rules (15A NCAC 13C)**

Note: This checklist and the IHSB Guidelines for Assessment and Cleanup of Contaminated Sites (Guidelines) should only be used as a supplement to the REC Rules.

NOTIFICATION REQUIREMENTS:

Report to REC Program staff within 24 hours upon discovery of any of the following, if applicable [.0305(b)(2)&(3)]:

- _____ an imminent hazard at the site
- _____ the presence of sensitive environments
- _____ off-site migration of hazardous substances
- _____ mixed chemical & radioactive wastes

REMEDIAL ACTION PROGRESS EVALUATION AND DOCUMENT CONTENT - [0306(q)]:

- _____ .0302(h) **Regulatory deadlines.** Provide an update on meeting the remedial action deadlines in the Rules And in the Administrative Agreement with the Department.
- _____ .0306(q)(1) **Work completed since RAP.** Summarize the results of all site characterization, pilot studies or treatability studies completed.
- _____ .0306(q)(2) **Final design.** Briefly describe the process design, plans and specifications. Update project schedule.
- _____ .0306(q)(3) **Final registrations permits, and approvals.** Include.
- _____ .0306(q)(4) **“As built” plans and specifications.** Include.
- _____ .0306(q)(5) **Problems encountered during construction.** Summarize.
- _____ .0306(q)(6) **Operation and maintenance results.** Summaries of remedial action operating and maintenance requirements and a discussion of major problems encountered.
- _____ .0306(q)(7) **Performance evaluation results.** Tabulated and graphical presentations of monitoring data and a comparison of remedial action performance to design goals.
- _____ .0306(q)(8) **Quality assurance/quality control.** Description of all field and laboratory procedures followed during sampling and analysis. Monitoring data must meet the quality assurance requirements of section .0306(d).
- _____ .0306(q)(9) **Analytical results.** Tabulation of analytical results for all sampling and copies of all laboratory reports, including QA/QC documentation.
- _____ .0306(q)(10) **Sampling maps.** Drawn to scale and showing all soil sample and monitoring well locations.
- _____ .0306(q)(11) **Contaminant delineation maps.** Drawn to scale and showing all sample locations and contaminant concentrations.

- _____ .0306(q)(12) **Receptor survey update.** Provide an update of the information required pursuant to Subparagraphs (h)(6) and (7) and include an evaluation if there is a need to address a risk of contaminant migration in any environmental media to any identified receptor.
- _____ .0306(q)(13) **Results.** Discuss the sampling and analytical results that demonstrate progress toward achieving remedial goals.
- _____ .0306(s) **Remedial action-derived wastes.** REC has managed investigation and remediation-derived wastes in a manner to provide for the protection of human health and the environment and that complies with all applicable federal, state, and local laws, rules, and regulations. *The REC should describe the generation, treatment, handling, and ultimate disposition of wastes produced.*

SCHEDULE AND CERTIFICATIONS:

- _____ .0302(h) **Groundwater remediation was implemented within two years of RI completion. Non-groundwater remediation was completed within eight years of AA execution.**
- _____ .0306(b)(5)(C) **The Groundwater Remedial Action Initiation work phase completion statement was provided for the first field event.** *If the form is submitted separately from the first field event's progress monitoring report, the work phase completion statement must be certified by document certification forms DC-1 and DC-II.*
- _____ .0306(b)(1-2) **The Progress Report will be/is properly certified by the RP and RSM.** *Ensure proper document certification (Forms DC-1 and DC-II downloaded from the website), notary and dates. Ensure that date of RSM signature follows date of RP signature.*
- _____ .0302(i) **The Progress Report will be/is submitted to REC Program staff within 30 days of certification.**

**Component Checklist – Remedial Action (RA) Completion Report
REC Rules (15A NCAC 13C)**

Note: This checklist and the IHSB Guidelines for Assessment and Cleanup of Contaminated Sites (Guidelines) should only be used as a supplement to the REC Rules.

RA COMPLETION EVALUATION AND DOCUMENT CONTENT - [0306(r)]:

- _____ .0306(r)(1) **Progress report.** A final progress report including information required under .0306(q).
- _____ .0306(r)(2) **Remedial action summary.** Summary of RA operating experience and effectiveness in meeting design goals, based on all performance monitoring data and progress reporting to date.
- _____ .0306(r)(3) **Remedial action completion.** Discussion of criteria for completing the remedial action and a demonstration, supported by confirmatory sampling data (*see Guidelines*), that such criteria have been satisfied. *This section should demonstrate that the final remediation goals at the time of remedial action completion, established in accordance with section .0308, have been met.*
- _____ .0306(s) **Investigation/remedial action-derived wastes.** REC has managed investigation and Remediation-derived wastes to provide for the protection of human health and the environment and comply with all applicable federal, State, and local laws, rules, and regulations. *The REC should describe the generation, treatment, handling, and ultimate disposition of wastes produced.*

SCHEDULE AND CERTIFICATIONS:

- _____ .0302(h) **Work toward site cleanup has met deadlines in the REC Rules based on the execution date of the Administrative Agreement.**
- _____ .0306(b)(1-2) **The Report will be/is properly certified by the RP and RSM.**
Ensure proper document certification (Forms DC-1 and DC-II downloaded from the website), notary and dates. Ensure that date of RSM signature follows date of RP signature.
- _____ .0306(b)(5) **The RA Completion Report includes the RA work phase completion Statement.**
- _____ .0302(i) **The RA Completion Report will be/is submitted to the Branch within 30 days of certification.**