

Green and Sustainable Remediation (GSR) and Climate Resiliency FAQs

1. Are there internal and external webpages for GSR and climate resiliency?

Yes!

External: [DEC's GSR and Climate Resiliency in Environmental Cleanups - NYDEC](#)

2. Is GSR considered towards tax credits on a BCP site? Can BCP get tax credits for renewable energy usage?

The GSR evaluation would likely be covered under the consultant costs, which are eligible as site prep costs for tax credits but not for Tangible Property Credit (TCPs) except as a multiplier of the site prep.

There is a tangible credit gateway and a 5% tangible property credit for renewable energy sites accepted in the BCP after January 1, 2023. The citations for the credit are in ECL 27-1407(1-a)(e) and Tax Law 21(5)(B)(vi). A renewable energy site is defined as real property that has a “primary use” for a renewable energy system. Therefore, solar panels on a newly built warehouse does not qualify as a “renewable energy site.”

3. When is the DER-31 certification required for workplans and reports?

From new technologies to best management practices, GSR and climate resiliency should be evaluated throughout all phases of the remedial process.

1. **Beginning January 1, 2024**, all work plans and reports submitted to NYSDEC pursuant to one of the remedial programs under Part 375 shall address GSR
2. **Beginning January 1, 2024**, DER-10 certifications for workplans and reports will be required as follows:

For a work plan:

“I _____ certify that I am currently a [NYS registered professional engineer or Qualified Environmental Professional as defined in 6 NYCRR Part 375] and that this Report [Remedial Design, Remedial Action Work Plan] was prepared in accordance with all applicable statutes and regulations and in substantial conformance with the DER Technical Guidance for Site Investigation and Remediation (DER-10) and DER Green Remediation (DER-31).”;

For a report/design document:

“I _____ certify that I am currently a [NYS registered professional engineer or Qualified Environmental Professional as defined in 6 NYCRR Part 375] and that this Report [Remedial Design, Remedial Action Work Plan] was prepared in accordance with all applicable statutes and regulations and in substantial conformance with the DER Technical

Guidance for Site Investigation and Remediation (DER-10) and DER Green Remediation (DER-31) and that all activities were performed in full accordance with the DER-approved work plan and any DER-approved modifications.”;

4. Has GSR and climate resiliency been incorporated into the FER, SMP and RAWP templates?

- Feasibility Study/Decision Document – Each Alternative presented during a Feasibility Study must include evaluation and selection of GSR methods to be incorporated. Depending on the complexity of the site, either a BMP analysis, footprint analysis, or both may be required. The DER Project Manager will determine the required level of detail for each site and approve of the analyses. If not completed previously, a Climate Screening should be conducted. If a Climate Screening was conducted and identified potential climate impacts at the site, a CVA should be completed and included in the Feasibility Study Report.
- The Site Management Plan template has been updated to include Section 6.1 Climate Change Vulnerability Assessment and Section 6.2 Green Remediation Evaluation, along with text detailing what information is required for each section (<https://dec.ny.gov/sites/default/files/2023-12/smptemplate1.pdf>)
- FER – the FER template has been updated to include text requiring language indicating how the remedial incorporated measures to minimize the impact of climate change, what BMPs were used during the remedial construction, and how GSR metrics were tracked during construction. (<https://dec.ny.gov/sites/default/files/2023-12/fertemplate.pdf>)
- RAWP – a RAWP template for DER Managed Projects has been updated to include text requiring language indicating how climate resiliency will be built into the remedial design, how BMPs will be incorporated, requirement of a footprint analysis, and how metrics will be tracked, and an SMP that includes methods to incorporate and track GSR.

5. When is a Best Management Practices assessment required?

Best Management Practices should be implemented through every stage of the remedial process. The Green and Sustainable Remediation and Climate Resiliency BMP analysis is often overlooked when considering a footprint analysis and very often it can be implemented immediately without the latter. The BMP analysis can be used to evaluate which concepts and tools will reduce the environmental footprint of activities associated with assessing and remediating contaminated sites. BMPs need to be researched based on the stage of the remedial program and the site-specific remedy. Each work plan provided to the DEC should include a discussion on identifying and selecting BMPs to be implemented during the work. The subsequent report provided should include a discussion on implementation of the BMPs and a qualitative evaluation supporting a reduced footprint.

6. What does a Best Management Practices assessment involve?

The BMP analysis should consider NYSDEC's and EPA's green remediation BMP fact sheets and select appropriate methods to be incorporated into the environmental program. The ASTM Standard Guide for Greener Cleanups provides direction on how to conduct a BMP analysis. Some examples include:

- Consider potential land uses such as greenways and pollinator habitats, as appropriate. Greenways and pollinator habitats may improve the ecosystem and result in fewer greenhouse gas emissions due to operation and maintenance. For example, landfill caps may be created/converted to pollinator habitats. and reduce the need for mowing.
- Implement responses in a more energy-efficient manner. There may be equally protective ways to implement the selected response action such that it uses dramatically less electricity or fuel. Examples include:
 - in-situ groundwater treatment and bioremediation that use materials generated near the site, and
 - reuse of the heat generated as part of treatment for other purposes on-site.
- Use Cleaner and More Energy-Efficient Equipment and Construction Techniques. Examples include:
 - use high efficiency, variable speed pumps for groundwater extraction and treatment plant operations;
 - optimize pump-and-treat systems to minimize excess extraction or energy usage:
 - use the extracted groundwater itself to provide heating and cooling (through heat exchangers) of the structure housing a pump-and-treat system;
 - thoroughly insulate structures such as treatment plants;
 - design structures to take full advantage of passive solar heating and cooling;
 - use 2007 or newer diesel trucks or retrofitted diesel trucks with equivalent emissions reductions that get better fuel mileage. reduce air toxics. and/or use low sulfur fuel or alternative fuel;
 - include idling restrictions on all construction equipment on the site such as meeting idling regulations, or in the absence of such regulations, limiting engine idling time to less than three minutes in any sixty-minute period;
 - use EPA Tier 2 or higher non-road construction equipment or non-road construction equipment retrofitted with EPA-verified technology

- to meet equivalent emissions reductions. (This equipment is readily available as much of it has been in the market since 2007); and
- use resource recovery in construction projects (e.g., recycling steel and other materials from demolition projects as appropriate)
- Use more "sustainable" materials: The choice of cleanup materials can have a profound impact on the project's overall environmental footprint. For example, many projects require a significant amount of concrete (e.g., for the construction of an onsite treatment plant or storage pads, etc.). Concrete generally has a relatively high carbon footprint, primarily because manufacture of the Portland cement that hardens and binds it together is very energy intensive. Examples of sustainable materials include:
- Reused PVC pipe;
 - Green concrete;
 - Sustainable building materials; and
 - Plant native vegetation.
- Generate renewable energy on-site: In some situations, electricity can be generated on-site using wind, solar, or geothermal energy. For example:
- electricity generated onsite by windmills and solar arrays can be used to drive pumps. Inappropriate settings, fans for vapor intrusion mitigation systems can be powered by roof-top solar panels or wind-driven vacuum systems.
 - Captured landfill gas (methane) can be used to produce energy at closed landfills.

7. What resources are available related to the Best Management Practices assessment?

EPA provides an overview on the BMP analysis here:

https://clu-in.org/greenremediation/docs/GR_BMP_factsheet_overview.pdf

DER Newsletter: <https://dec.ny.gov/environmental-protection/site-cleanup/brownfield-and-state-superfund-programs/decs-gsr-and-climate-resiliency-in-environmental-cleanups>

There are technology specific BMP fact sheets here:

<https://clu-in.org/greenremediation/bmps>

And BMPs apply to climate resiliency as well, EPA provides some fact sheets for some remedial approaches, such as groundwater systems, sediment cleanups and waste containment:

https://www.epa.gov/sites/default/files/2019-12/documents/cr_groundwater_systems_fact_sheet_2019_update.pdf

https://www.epa.gov/sites/default/files/2019-12/documents/cr_sediment_sites_fact_sheet_update.pdf

https://www.epa.gov/sites/default/files/2019-12/documents/cr_containment_fact_sheet_2019_update.pdf

8. When is an Environmental Footprint Analysis required?

An Environmental Footprint Analysis (EFA) is required to be submitted as part of the FS/RAWP package. The EFA will outline BMPs and define the goal project metrics for tracking. The FS/RAWP is a projection of the RA environmental footprint.

An EFA will also be submitted as part of the FER. The FER EFA should be compared to the FS/RAWP goal metrics. The FER EFA will be a quantifiable accounting of actions completed during the remedial action.

Finally, a site management EFA will be incorporated into the SMP to outline BMPs of site management activities.

9. What does a Environmental Footprint Analysis involve and what should the outputs look like?

Examples of inputs and generalized outputs for EPAs Spreadsheets for Environmental Footprint Analysis “SEFA” section found here:

[CLU-IN | Strategies & Initiatives | Green Remediation Focus > Footprint Assessment](#)

SiteWise™: [Library - Sustainable Remediation Forum](#)

Example outputs from DEC sites can be found here.

10. What is the minimum number of alternatives to be included in an Environmental Footprint Analysis in the FS/RAWP?

In the FS/RAWP an EFA should be completed for all alternatives included in the Feasibility Study. The project manager should review the EFA of the selected remedy to ensure appropriate BMPs are included.

11. How do I evaluate an Environmental Footprint Analysis?

Read the methodology documents available on the EPA's website for the SEFA tool. The project EFA workbooks should be provided as an excel file for review. Review the excel file to ensure all elements of the FS/RA are included in calculations.

[Methodology for Understanding and Reducing a Project's Environmental Footprint \(February 2012 version\) \(clu-in.org\)](#)

12. Where should questions on GSR and climate resiliency be directed?

Questions for project stakeholders should be directed to the DEC project manager. Questions about the guidance can be directed to Michael Cruden at Michael.Cruden@dec.ny.gov

13. How is GSR and climate resiliency incorporated into DEC's standard remedial elements for Decision Documents?

Common remedial elements have been updated to include text which incorporate GSR. Specifically, the design phase element has been updated to require a remedy be evaluated with response to GSR principles, complete a footprint analysis and include a climate change vulnerability assessment.

14. How is GSR and climate resiliency incorporated into sites when citing renewable energy systems?

GSR and climate resiliency incorporated into sites when siting renewable energy systems by incorporating best management practice that support the NYSDEC Program Policy DER-31, which may include but not limited to: Maximizing the reuse of land and the reuse/recycling of on-site materials (e.g., mulching and composting of vegetation clippings) Reducing Green House Gas Emissions through use of local sourcing options. Reducing energy consumption in operations and build out (e.g., optimize staging storage areas, reduced vehicle idling, and install insulation and energy saving fixtures.) Establish sustainable cover systems to promote habitat environments (e.g., pollinator seed mix, drought resistant species for revegetation).

15. What training on aspects of GSR and climate resiliency have been completed and where can the presentations be found?

Trainings given on GSR and climate resiliency can be found on the DER Public Webpage.

16. How are GSR and climate resiliency metrics tracked throughout an environmental cleanup?

GSR metrics are tracked in a variety of ways and reports. A footprint analysis will present energy usage, waste generation, and emission metrics for remedial alternatives

and active remedies. The footprint analysis should be completed during the FS. These metrics will also be monitored during active remediation and summarized in daily reports or in remedial action summary reports. The footprint analysis will be completed again for the FER and compared to the one reported in the FS.

Best Management Practice analyses will identify techniques to be implemented, any reports following a BMP analysis will include a summary of measures that were successfully implemented and the positive impact that these measures had. BMPs should be incorporated throughout all phases of a remedial project.

Climate Screenings and Climate Vulnerability Assessments (when necessary) will assess a site's resilience to climate change related hazards and provide recommendations to increase resiliency of remedies. The Climate Screening and, when needed, subsequent CVA should be performed during the FS to inform the Remedial Design of any required recommendations.

17. What is the difference between a Climate Screening and a Climate Vulnerability Assessment?

A climate screening is a high-level review of publicly available data to identify potential future exposures to climate hazards at a site. If projected changes in climate exposures are identified as having the potential to impact a site or remedy, a full-scale Climate Vulnerability Assessment (CVA) must be conducted. A CVA consists of an in-depth evaluation of projected changes to climate hazards and proposed methods or technologies to be implemented to address these impacts at the site.

18. When is a Climate Screening required?

A climate screening is required for all sites at any stage under any remedial program. If the results of a screening indicate that changes in climate hazards will not impact a site remedy, then no further action is required at that time. Generally, a climate screening should occur before/during the remedy selection in the RI/FS stage. If site or remedy conditions change, it may be necessary to revisit the Climate Screening. The Climate Screening Checklist can be used to help complete this process, this can be found on the GSR public webpage.

19. When is a Climate Vulnerability Assessment (CVA) required?

A climate vulnerability assessment (CVA) should be completed after a climate vulnerability screening (CVS) indicates the potential for climate hazard related impacts at a site. A climate screening checklist is available for PM and external use. A CVA serves to provide more information and deeper analysis of the projected impacts and presents potential adaptive measures to be implemented. CVAs should also be conducted for sites in a climatologically dynamic environment (coastal areas, near waterways, etc.) or sites that are currently experiencing damage or disruption for climate related events.

20. What does a Climate Vulnerability Assessment involve?

A CVA involves the identification of climate hazards and projected changes at a site using various data sources. This includes the selection and justification of appropriate climate projection models. Based on the anticipated impacts, multiple adaptation measures should be identified and evaluated for inclusion into the site's remedy to ensure that it remains resilient. The most appropriate adaptation methods to address all identified climate related impacts should be recommended. A CVA report will summarize these findings and recommendations for decision making. Implementation of the adaptation measures will be assessed periodically, and the process may be conducted again if site conditions change.

21. What resources are available related to the Climate Vulnerability assessment?

DER-31 provides further details and some guidance on how to proceed with development of a CVA. Potential data sources that can be used in the assessment include NYSERDA, USDA, EPA, FEMA, NOAA, USGS. A list of links to some of these sources will be included as part of the Climate Screening checklist. Additionally, EPA has published a white paper which provides an outline and thorough details on the process of implementing a CVA step by step with some examples ([Conducting Climate Vulnerability Assessments at Superfund Sites \(epa.gov\)](https://www.epa.gov/assessing-and-managing-climate-change/vulnerability-assessments-at-superfund-sites)). Examples of completed CVAs can be found on the GSR public webpage.

22. What document should a Climate Vulnerability assessment be documented in?

Ideally, a CVS/CVA should be conducted in the RI/FS stage and should be included as an appendix in these reports.

However, if a CVS/CVA has not been completed previously, one can be completed at any phase of the remedial program. Screenings and assessments can be incorporated into site documents as an appendix or submitted as a standalone report if the site is past the RI/FS stage.

23. How would GSR be incorporated into Final Engineering Reports (FER) after January 1, 2024, if a previously approved (prior to January 1, 2024) Remedial Action Work Plan (RAWP) did not include GSR?

In general, for work being finished up in the first quarter of 2024, there is some flexibility related to GSR and the FER provided that, at a minimum, any subsequent site management phase accounts for applicable GSR best management practices and an appropriate climate screening and/or vulnerability assessment has been performed. For work extending beyond the first quarter of 2024, the remedial party should work with DEC's project manager on amending the RAWP appropriately for GSR.

24. In the climate vulnerability assessment, what is an approved DEC's climate projection model? What constitutes a conservative approach to a climate projection model?

CMIP5 or CMIP6- based upon the EPA white paper – both of these models can be found here [Climate Change Portal: NOAA Physical Sciences Laboratory](#)

25. How can a site’s emissions or electricity demand be offset if renewable energy sources aren’t directly available? How are offsets and renewable energy certificates (RECs) obtained?

DER requires RECs:

- New York State RECs (come from a facility in New York State)
- Come from a technology that is considered renewable under the CLCPA
- Are of a vintage that matches the vintage of the load
 - Ex. If a project is using electricity from 2025 to 2030, they buy 2025 RECs for their 2025 electricity load, 2026 RECs for their 2026 load, etc.
- Are retired in the New York Generation Attribute Tracking System (NYGATS)
 - They also said to let folks know up front that they can contract to have someone do this for them. This way they don't have to set up a NYGATS account and figure the system out.

EPA has developed a [Guide to Purchasing Green Power](#) that provides information on renewable energy purchasing options from other voluntary markets. For more information on the variety of renewable energy purchasing options and their differences, see the below resources from EPA:

- [Green Power Supply Options | US EPA](#)
- [Offsets and RECs: What's the Difference? \(epa.gov\)](#)
- [Renewable Energy Certificate \(REC\) Arbitrage \(epa.gov\)](#)

26. Is GSR required by any guidance documents or laws?

Yes, GSR is required by DER-31. DER-10 is being updated to include requirements of GSR be incorporated in all phases of remedial projects. The Climate Leadership and Community Protection Act also adopts measures which allows State agencies (the DEC) to implement GSR in the goal of reduction of greenhouse gas emissions.

[Climate Leadership and Community Protection Action](#)