



How to Incorporate Changing Climate Conditions in an Analysis of Brownfield Cleanup Alternatives (ABCA) to Support Grant-funded Activities

An Analysis of Brownfield Cleanup Alternatives (ABCA) is a report¹ that compares site cleanup options based on site-specific conditions, effectiveness, feasibility, and cost. Typically, an ABCA [includes](#) descriptions of the background and current conditions of the site (i.e. maps, previous uses, assessment findings, reuse goals, etc.), applicable regulations and cleanup standards, an evaluation of cleanup alternatives, and a recommended remedial action. The evaluation of cleanup alternatives outlined in the ABCA is based on the effectiveness, ease of implementation, and cost of each remedial action.

EPA Brownfields Cleanup Grant applicants must submit a draft ABCA to meet site eligibility requirements. A publicly reviewed and finalized ABCA or equivalent state Brownfields program document must be in place before EPA-funded on-site cleanup activities can begin. Preparing and updating an ABCA, or equivalent state Brownfields program document, is an eligible expense under all Brownfields Multipurpose, Assessment, Revolving Loan Fund (RLF), and Cleanup Grants.

Why Do Changing Climate Conditions Need to be Included in the ABCA?

Current and forecasted changes to local climate conditions may affect the long-term effectiveness of a site remedy and how the site can be safely reused. Evaluating these changing conditions before and during site cleanup and reuse planning is important to protect human health and the environment.

An ABCA, or the equivalent alternative analysis document required by a [state voluntary cleanup program](#), is **the best opportunity** to efficiently document whether each cleanup approach under consideration will withstand anticipated changing climate conditions over the long term to remain protective.

To ensure that brownfield site cleanups remain effective as the climate changes, EPA requires that grant recipients prepare an ABCA, or equivalent state Brownfield program document, and include in the ABCA consideration of “the resilience of the remedial options to address potential adverse impacts caused by extreme weather events and changing climate conditions (e.g., sea level rise, drought, increased frequency and intensity of flooding, etc.).”

Brownfields Grant recipients can follow the two steps on the next page to assist with including changing climate conditions in the ABCA report. This guidance is optional and its use is not required.



The information in an ABCA will help guide decisions about how to remediate a site to ensure a safe reuse.

¹<https://www.epa.gov/brownfields/programmatic-requirements-brownfield-grants#environ>

Step 1: Identify Current and Forecasted Climate Change Conditions

Examples of changing climate conditions include, but are not limited to:

- Increased/decreased temperatures
 - Increased/decreased precipitation (resulting in flooding and/or drought)
 - Sea level rise
 - Increased storm surge
 - Increased risk of wildfire
 - Extreme weather events (e.g., storms of unusual intensity, increased frequency, and intensity of localized flooding events)
 - Changing dates for ground thaw/freezing
 - Coastal subsidence of land
 - Changing flood zones
 - Changing environmental/ecological zones
 - Increased salt-water intrusion
 - Higher/lower groundwater tables
 - Heat island impacts
- Review authoritative resource(s) to identify observed and potential changing climate conditions and any existing climate or hazard mitigation planning that covers the same area. Examples of federal resources include:
- [Climate Mapping for Resilience and Adaptation](#)
 - [Climate Resources on Data.gov](#)
 - [Climate Resilience Toolkit](#)
 - [FEMA National Flood Hazard Layer](#)
 - [NOAA Sea Level Rise Viewer](#)
 - [NASA Sea Level Rise Scenario Tool](#)
 - [National Risk Index](#)
 - [USDA Wildfire Risk to Communities Tool](#)
- Determine site-specific risk factors based on known site conditions and climate risks identified above. Some examples of known site conditions include proximity to the ocean, property affected by a revised FEMA flood plain map, infrastructure vulnerabilities, vulnerability of soil type due to moisture and hydraulic changes, ground and surface drinking water vulnerabilities, potential exposure of contaminated sediments during drought conditions, etc.

Local data and resources may be obtained from regional planning or county governments, municipalities, or [EPA Regional Offices](#).

Step 2: Incorporate Changing Climate Conditions Into the ABCA

- Evaluate and document the extent to which current and forecasted climate conditions pose a risk to the effectiveness of **each site cleanup alternative**. These risk factors need to be considered in the effectiveness portion of the ABCA.
- Include in your effectiveness evaluation how well each alternative can accommodate the identified climate change risk factors. Remember to consider all stages of the cleanup and long-term reuse of the site. For example:
 - Will increased flooding events compromise a site with an engineered cap?
 - Will sea level rise or salt-water intrusion reduce the ability of vegetation to control erosion?
 - Will a suggested phytotechnology approach remain protective during periods of drought?
 - Consider how to optimize the preferred cleanup alternative with best practices from resilient and green remediation standards, climate vulnerability assessments, and any resilient and sustainable site reuse planning or regulations that may be in place. See the best practice guidance below.

Note: EPA does not expect grant recipients to generate new site-specific climate change measurements to complete this analysis. Through the ABCA, grant recipients must demonstrate they have reviewed available current and authoritative information for the assessment and cleanup analysis. The level of analysis expected depends on the proposed reuse and site location, the complexity of the project, and the degree of risk involved given the feasible remedial options and targeted reuse of the site.

Additional Resources and Best Practice Guidance:

- Technical Fact Sheets for Climate Resiliency Best Practices for Common Remediation Approaches: [Contaminated Sediment Sites](#), [Contaminated Waste Containment Systems](#), and [Groundwater Remediation Systems](#)
- Optional Standards and Best Practices Green and Resilient Cleanups: [Sustainable Resilient Remediation](#)