



**RCRA Corrective Action Training
Program: Getting to YES!**
Strategies for Meeting the 2020 Vision



This training and training documents do not create any legally binding requirements on the U.S. Environmental Protection Agency (EPA), states, or the regulated community, and do not create any right or benefit, substantive or procedural. The training and documentation are not a complete representation of the Resource Conservation and Recovery Act or of EPA's regulations and views.



November 2009 Module 2 – How to Achieve the 2020 Vision 1

Notes:Purpose of Slide

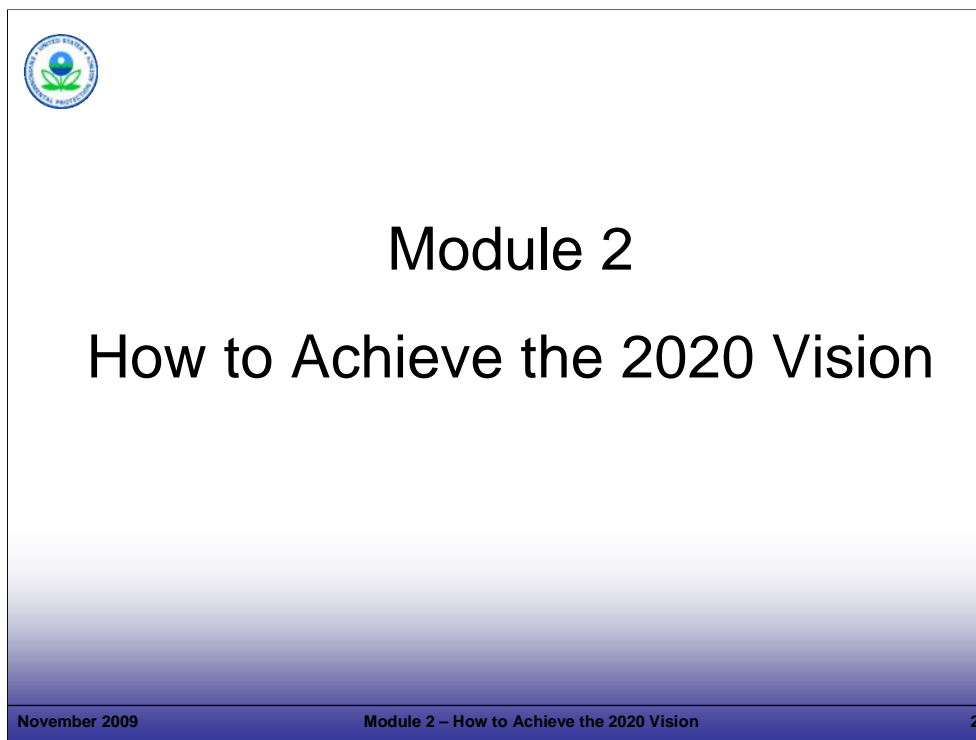
- Holder slide for Module 2, How to Achieve the 2020 Vision.

Key Points

- No specific key points.

References

- None.



Notes:

Purpose of Slide


- Transition slide to the next topic, Module 2, How to Achieve the 2020 Vision.

Key Points

- This module lays the foundation for where we are and where we are headed.
- The module is presented in two parts:
 - First – A representative of the U.S. Environmental Protection Agency (EPA) will present an update on progress toward meeting the 2008 Goals and the 2020 Vision, including the status of, and approach to, the 2020 universe of facilities.
 - Second – The instructors will present how this course is designed to help CHANGE how CA implementation proceeds. It focuses on the regulatory framework for corrective action (CA), illustrates the inherent flexibility in the Resource Conservation and Recovery Act (RCRA) CA process, and presents key principles that skilled professionals can apply to support rapid CA progress.
- This presentation will show that meeting the RCRA CA goals and vision will require rapid progress. This course was designed to provide concepts and tools that can support that progress.

References

- None.



Module Overview

- ❖ Defining the 2020 Vision
- ❖ Region 7 Goals and Progress
- ❖ Principles for Achieving the 2020 Vision

November 2009 Module 2 – How to Achieve the 2020 Vision 3

Notes:

Purpose of Slide

- Overview slide for Module 2, How to Achieve the 2020 Vision.

Key Points

- This module lays the foundation for Day 1 – Establishing a Blueprint for Success.
- The module is presented in two parts: (1) EPA will present information regarding the CA universe and goals/vision, which lays the foundation for changing our approach to RCRA CA implementation and (2) the instructors will present principles that will support regulatory representatives and the regulated community to achieve the RCRA 2020 Vision for CA.

References

- None.

**Notes:**Purpose of Slide

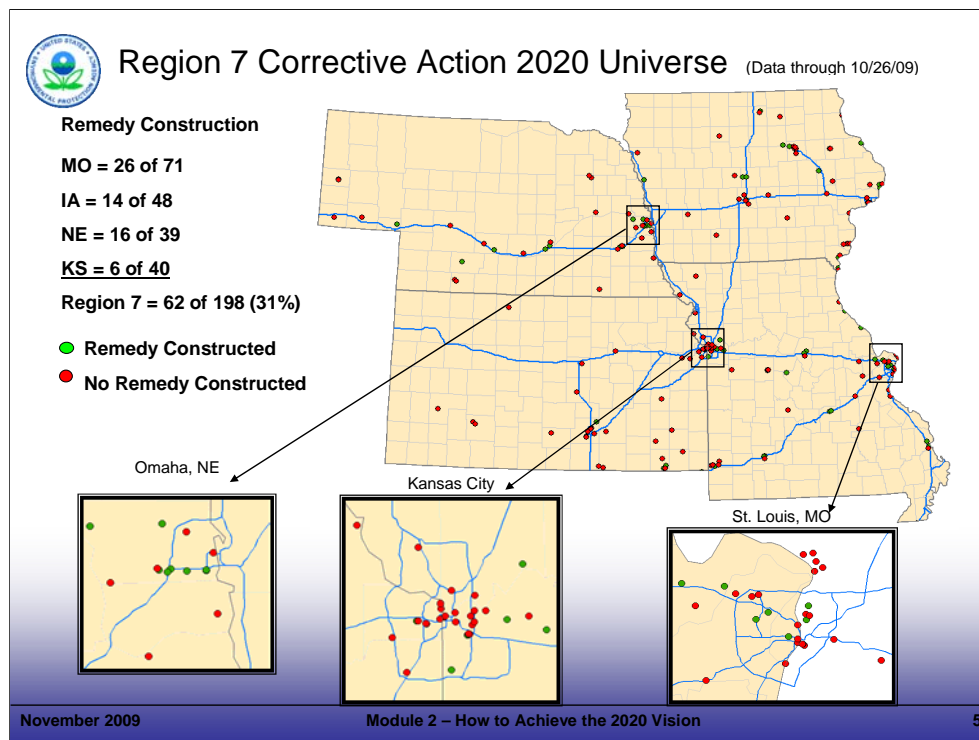
- Transition slide.

Key Points

- This slide provides a transition to the discussion of the background for the vision and goals and the current status of the 2020 CA Universe.

References

- None.

**Notes:**Purpose of Slide

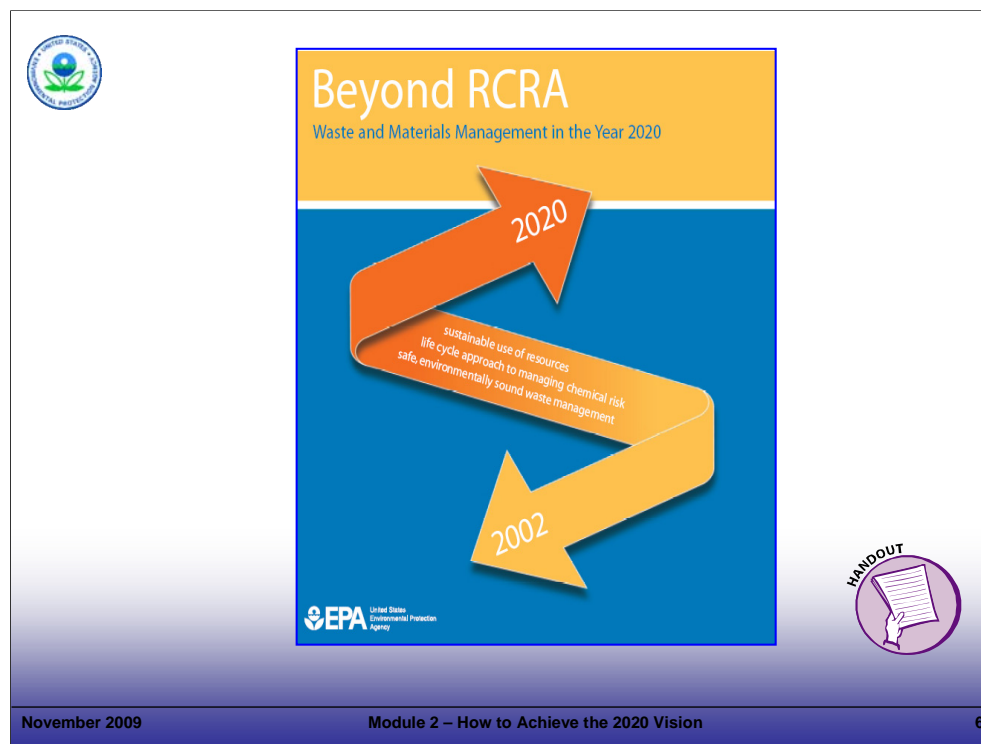
- Show how many facilities need to be addressed in this Region; a regional EPA and/or state representatives can speak here.

Key Points

- An EPA Regional and/or state representative(s) will overview the Regional and local challenges and approaches to meeting the 2020 Vision.
- This slide will be modified for each regional delivery of the course. Data current through October 26, 2009.

References

- EPA. 2009. Slide Updated by Office of Resource Conservation and Recovery. October.



Notes:

Purpose of Slide

- Introduce EPA's White Paper that describes the CA 2020 Vision and how it aligns with the course approach.


Key Points

- *Beyond RCRA: Waste and Materials Management in the Year 2020* is a discussion paper which was developed jointly by EPA and state environmental agencies. It aims to open and inspire dialogue on what the future could hold for the RCRA program. The paper identifies a number of trends that could affect the future of waste and materials management, resource conservation, and human and environmental health. The paper also suggests certain general strategies and tools that might be used to build a new vision for the future of the RCRA program.
- The excerpt below is from the 2020 Vision:

The year is 2020, and America's wasteful ways are a thing of the past. New technologies and a changed economic climate, combined with enlightened government policies and a pronounced shift in societal and corporate attitudes have resulted in dramatic decreases in the volumes and toxicity of industrial wastes generated by the country's industries. Materials that were once considered wastes suitable only for landfilling are now continually reused and recycled, and "industrial ecology" has become the mantra of corporate executives across the nation. Landfills are becoming obsolete – the small volumes of wastes that actually need disposal are carefully managed under an efficient and environmentally protective system that features a mix of economic incentives, voluntary measures, and regulatory controls. Cleanup of most contaminated sites has been largely completed, and thousands of areas once known as Brownfields have been put back into productive use.

References

- EPA. 2002. *Beyond RCRA: Waste and Materials Management in the Year 2020*.



2020 Vision for CA

By the year 2020, cleanup of existing contamination problems at RCRA-regulated facilities will largely be complete.

November 2009 Module 2 – How to Achieve the 2020 Vision 7

Notes:

Purpose of Slide


- Explain the relationship between the 2020 Vision and the specific goals for RCRA CA.

Key Points

- 2020 Vision Goal 3 – “Manage wastes and cleanup chemical releases in an environmentally sound manner.”
- Goal 3 states that “Ideally, of course, all wastes would be used and reused in a continuous cycle, in much the same way natural ecological systems work.”
- Achieving the vision involves meeting individual goals; the RCRA CA goal is one of these and is presented as follows: *“By the year 2020, cleanup of existing contamination problems at RCRA-regulated facilities will largely be complete.”*
- The owner/operator (o/o) has a statutory obligation to conduct CA. In some cases, enforcement approaches will be necessary to ensure that this obligation is fulfilled.
- The RCRA CA goal established in the White Paper leads to the specific Government Performance and Results Act (GPRA) goals of achieving Remedy Decision and Remedy Construction.
- The 1993 GPRA holds federal agencies accountable for using resources wisely and achieving program results. GPRA requires agencies to develop plans for what they intend to accomplish, measure how well they are doing, make appropriate decisions based on the information they have gathered, and communicate information about their performance to Congress and to the public. Additional information is available at: <http://www.epa.gov/ocfo/planning/gpra.htm>.

References

- EPA. 2002. Beyond RCRA: Waste and Materials Management in the Year 2020.



Measuring Progress

- ❖ Environmental Indicators
- ❖ Performance Measures
- ❖ RCRA Info Event Codes

November 2009 Module 2 – How to Achieve the 2020 Vision 8

Notes:

Purpose of Slide

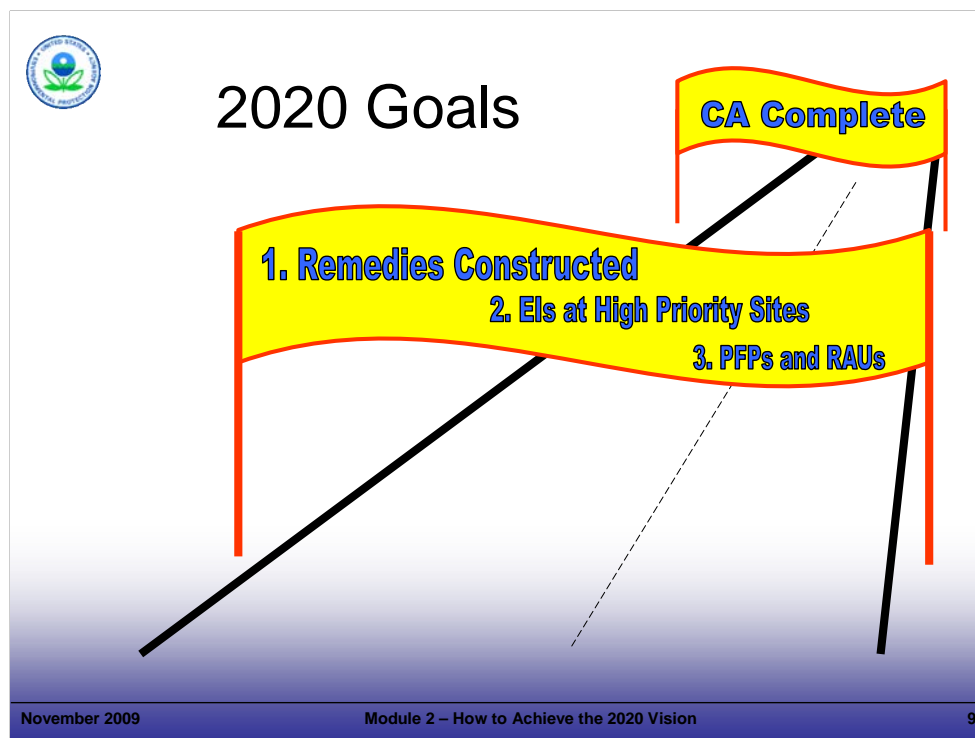
- Review how EPA measures progress at RCRA-regulated facilities and how this relates to the 2008 and 2020 goals for CA.

Key Points

- Remediation of the highest-priority sites involves numerous steps and often takes years. To document stabilization of these sites prior to a final remedy, the CA Program created two Environmental Indicators (EIs):
 - The Current Human Exposures Under Control EI (also known as RCRA event code CA 725) documents that people near a particular site are not exposed to unacceptable levels of contaminants.
 - The Migration of Contaminated Groundwater Under Control EI (also known as RCRA event code CA 750) documents that contaminated groundwater does not spread and further contaminate groundwater resources.
- EPA also established land revitalization performance measures in 2007 to improve EPA's ability to promote and communicate cleanup and revitalization accomplishments and associated benefits/values to society.
 - The Protective for People under Current Conditions (PFP) measure recognizes the near-term progress associated with preventing human exposures based on current uses at the site.
 - The Ready for Anticipated Use (RAU) measure enables EPA and States to track acres determined to be protective for current and reasonably anticipated uses.
- RCRA Info is a database used to track progress at RCRA-regulated facilities according to a series of event codes. The 2020 CA Vision is based on progress in achieving EIs, performance measures, and the following event codes:
 - Remedy Decision (CA 400), which is when a facility-wide remedy is selected.
 - Remedy Construction (CA 550), which is when construction of the facility-wide remedy is complete.

References

- EPA. 1999. Interim Final. RCRA Corrective Action Environmental Indicator (EI) RCRIS Code (CA725) Current Human Exposures Under Control and (CA 750) Groundwater Migration Controlled. February 5.
- EPA. 2005. Permitting and Corrective Action (PCA) Program Area Analysis (PAA) Report: Appendix D, National Details for Corrective Action Event Codes. Final Report. Win/Informed Executive Steering Committee. July 28.



Notes:

Purpose of Slide


- Discuss the 2020 Vision in terms of the specific goals to be achieved.

Key Points

- Progress is measured when facilities meet milestones. EPA has designated RCRA Event Codes for some of the milestones. Remedy decision (CA 400) is covered in Module 7 and Remedy Construction (CA 550) is covered in Module 11. PFP and RAU are addressed in Module 6. CA Complete (CA 900 or 999) is covered in Module 12. RCRA CA progress is tracked in the RCRA Information System (RCRIS) using RCRA Info Status Codes that tie to each event code.
- Remedy Decision (CA 400) – *the event when the State or EPA formally selects a remedy designed to meet RCRA CA long-term goals of protection of human health and the environment. This event code also applies when no further RCRA CA is required because stabilization measure(s) have already been implemented or because the site characterization has demonstrated attainment of the long-term RCRA CA goals. When the site-wide remedy decision has been made, Remedy Decision must be linked to the "Entire Facility." Phased or partial remedies, or other remedy decisions pertaining only to specific areas of the facility, are to be linked only to the specific areas of implementation and not to the "Entire Facility."*
- Remedy Construction (CA 550) – *reflects that a RCRA facility has completed and certified construction of its final remedy and that the remedy is fully functional, whether or not final cleanup levels or other requirements have been achieved.*
- EPA has designated RCRA Event Codes for various environmental indicators (EIs).
- PFP – *same as the Current Human Exposures Under Control EI, but allows tracking by acres as well as by facility (not entire facility).*
- RAU – *The following criteria are necessary to meet the RAU measure: (1) criteria for PFP are met; (2) cleanup goals have been achieved for media that may affect current and reasonably anticipated future land uses of the facility so that there are no unacceptable risks; and (3) all institutional or other controls identified as part of a response action or remedy as required to help ensure long-term protection, are in place.*
- CA Complete (CA 900 or 999) – *The following criteria are necessary to meet the CA complete measure: (1) full set of corrective measures is defined; (2) the facility has completed construction and installation of all required remedial actions; and (3) site-specific media cleanup objectives, which were selected based on current and reasonably anticipated future land use, and maximum beneficial groundwater use, have been met.*

References

- EPA. 2005. Permitting and Corrective Action (PCA) Program Area Analysis (PAA) Report: Appendix D, National Details for Corrective Action Event Codes. Final Report. Win/Informed Executive Steering Committee. July 28.
- EPA. 2007. Guidance for Documenting and Reporting RCRA Subtitle C Corrective Action Land Revitalization Indicators and Performance Measures. February 21.
- Federal Register (FR). 2003. Final Guidance on Completion of Corrective Action Activities at RCRA Facilities. 68 FR 8757. February 25.



2020 Measures

2020 Universe	3,746 facilities
Remedy: Design and Construct	3,559
Environmental Indicators: Human Exposures and Groundwater Migration	3,559

C
h
a
l
l
e
n
g
e

November 2009 Module 2 – How to Achieve the 2020 Vision 10

Notes:

Purpose of Slide

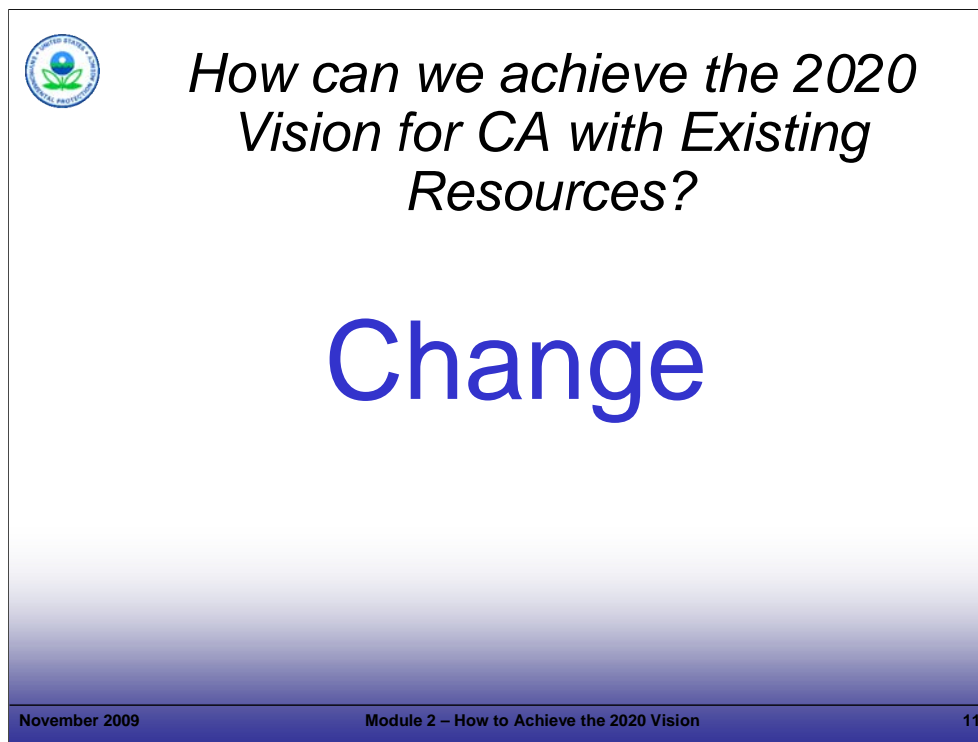
- Show how many facilities need to be addressed. Emphasize the difference between the 2008 CA Baseline and 2020 CA Universe.


Key Points

- Explain how the 2008 Baseline and 2020 Universe were established. These facilities were identified and evaluated under the National Corrective Action Prioritization effort in the 1990s.
 - 2008 Baseline: all of the high priority RCRA CA facilities
 - 2020 Universe: all of the high, medium, and low priority RCRA CA facilities
- The speaker will review the above numbers. The 2020 CA Universe is posted on EPA's web site. Regions that may now have 20% complete based on the 2008 CA Baseline will have far less of a percentage complete based on the 2020 CA Universe, which is much larger than the 2008 CA Baseline. This 2020 CA Universe represents all facilities that EPA and States will address as part of working towards the 2020 Vision.
- The universe of facilities to be addressed and the amount of work to be accomplished are significant.
- This presents a significant challenge for the RCRA CA program, considering the resources we expect to be available.

References

- EPA. EPA Corrective Action Web Site. 2020 Universe. Accessed On-line at: <http://www.epa.gov/epaoswer/hazwaste/ca/facility.htm>.



 *How can we achieve the 2020 Vision for CA with Existing Resources?*

Change

November 2009 Module 2 – How to Achieve the 2020 Vision 11

Notes:

Purpose of Slide


- Emphasize that CHANGE is absolutely necessary to achieve the 2020 Vision for CA.

Key Points

- The 2020 CA Universe (3,746 facilities) is much larger than the 2008 CA Baseline (1,968 facilities); however, personnel and resources to manage the additional workload likely will not have a proportional increase. Therefore, each Project Manager will be responsible for more facilities and it will be necessary to manage those facilities efficiently.
- If we continue at the current pace, EPA estimates it will take until the year 2060 (or longer) for construction to be complete at most RCRA CA facilities.
- It will not be possible to meet the 2020 Vision for CA if we continue with the traditional approach of moving in a sequential manner, including, for example: detailed review-comment cycles for each report before moving on to the next step, evaluating each well installed and sampled, and examining the flow rate of each recovery well.
- It will be necessary to move toward a more holistic and results-based approach to evaluating and achieving cleanups, supported by performance standards.
- We will need to CHANGE to achieve the ambitious goals laid out for the RCRA CA program, and we will present 8 principles in this course that will facilitate the change required.

References

- None.



Why is it O.K. to Change?

Because we've learned through our collective experience

November 2009 Module 2 – How to Achieve the 2020 Vision 12

Notes:

Purpose of Slide

- Point out that the RCRA CA process has evolved and matured; many facilities have advanced beyond the initial stages of RCRA CA – so the focus can, and should, change. Acknowledge that RCRA CA can be handled in a more efficient, effective manner.

Key Points

- We have more than 20 years of experience in CA – we do not need to reinvent the wheel at each facility.
- For characterization activities, EPA and many states have standard operating procedures (SOPs), so detailed work plans (e.g., specifying drilling and sampling methods, etc.) are generally not necessary.
- There are numerous expedited site characterization techniques that can be used; a good resource for these techniques is at <http://clu-in.org/char1.cfm>.
- We have developed a number of presumptive remedies for sites. Therefore, it is generally not necessary to report a laundry list of remedies, evaluate each remedy in detail, and present the selection method for the remedy, as in the traditional Corrective Measures Study (CMS) approach. We can streamline the investigation and remedy selection process.
- Remedies are easier for facilities to select and agencies to approve because there is a better understanding of how much information (for example, hydrogeology and chemistry data for a site) is sufficient to proceed with remedy selection and design. We also have more experience in implementing remedies for different types of facilities and uses (operating, multiple land uses) and for a variety of contamination scenarios (different media, chemicals, and contaminant levels) using available information.
- Over time, we have found that it is often more cost effective to install a remediation system and then make system modifications in response to effectiveness monitoring data – than it is to require exhaustive site investigations, engineering evaluations, and design iterations in an attempt to predict exactly how a system will operate over time.

References

- None.



How Can We Achieve the 2020 Vision for CA?

Follow 8 principles, beginning with:

1. Get an Exit Strategy established.

(continued)

November 2009

Module 2 – How to Achieve the 2020 Vision

13

Notes:

Purpose of Slide

- Introduce the concept of an Exit Strategy and explain how development of an Exit Strategy will help to focus cleanup and provide measurable milestones and endpoints against which to evaluate progress.

Key Points

- An Exit Strategy is established based on current and reasonably anticipated use of the facility. Future use dictates a range of factors that should be considered in implementing CA (including the schedule, appropriate cleanup criteria, etc.).
- Knowing whether a site will be revitalized for a new use or continue to operate as an active facility will support planning decisions regarding effective CA implementation.
- It is important to establish metrics as part of the Exit Strategy. Metrics may be technical, such as groundwater concentrations or mass removed from groundwater, or metrics may be regulatory, such as meeting performance measures (e.g., remedy decision or remedy construction). Establishing these metrics will help to meet the 2020 Vision for CA.
- Once milestones and endpoints are established, informed and timely decisions on a project path can be made. For example, if a portion of a facility is ready for a new use (with its associated potential exposure pathways evaluated), while the remainder of the facility continues operating, more aggressive remedial technologies may be chosen for the area designated for a new use, while passive technologies may be considered for the continued use area (though the passive approach likely will require institutional controls and monitoring to ensure current uses and exposure assumptions remain valid).
- Reaching consensus is easier when an Exit Strategy supported by all stakeholders is available. For example, if the strategy is long-term with passive technologies to be implemented, parties are more likely to agree on less frequent sampling than for an Exit Strategy that calls for rapid cleanup. Having a clear end point and Exit Strategy at the facility can assist communication and understanding between multiple stakeholders.

References

- None.



How Can We Achieve the 2020 Vision for CA?

2. Environmental cleanup to protective levels is the goal.

(continued)

November 2009

Module 2 – How to Achieve the 2020 Vision

14

Notes:

Purpose of Slide

- Emphasize that cleanup, not the cleanup process, is the goal. In other words, clean water, soil, sediment and air are the goals – not completion of RCRA Facility Investigation Reports (RFIs), CMSs, etc. By “protective levels,” we mean levels that are protective of human health and the environment for current and reasonably anticipated uses. Cleanup is a statutory obligation (as we will discuss in Module 3); however, the process is flexible – it is not necessary to follow a particular sequence of activities or develop a series of reports; in some cases, institutional controls (ICs) may need to be in place.

Key Points

- One of the basic operating principles of RCRA is that it should focus on achieving “environmental cleanup,” which, in the context of RCRA CA, refers to meeting cleanup criteria that are protective of human health and the environment for current and reasonably anticipated uses. Thus, EPA expects cleanup criteria for facilities that will continue to operate to be different than for facilities that will be reused for residential or other purposes. In some cases, ICs will be associated with cleanups where cleanup criteria are associated with a particular anticipated land use (e.g., continued industrial use); we discuss ICs in detail in later modules.
- Innovative approaches to management and oversight are encouraged.
- The concept of the RCRA CA program focusing on results is not new:
 - The 1996 Advance Notice of Proposed Rulemaking (ANPR) encouraged program implementers to focus on cleanup results rather than cleanup processes.
 - The 1999 RCRA Cleanup Reforms reiterated the emphasis on flexibility and encouraged implementers to foster maximum use of program flexibility and practical approaches to achieving cleanup results.
 - The 2003 Results-Based CA and Tailored Oversight Guidance encourages flexible approaches that focus on environmental progress, rather than on the reporting process.
 - EPA’s Handbook of Groundwater Protection and Cleanup Policies for RCRA CA, first published in 2001, encourages flexible approaches and states that the process is flexible.

References

- FR. 1996. Corrective Action for Releases from Solid Waste Management Units at Hazardous Waste Management Facilities; Advance Notice of Proposed Rulemaking (ANPR). 61 FR 19432. May 1.
- EPA. 1999. RCRA Cleanup Reforms. EPA 530-F-99-018 (Fact Sheet #1). July.
- EPA. 2003. Results-Based Approaches and Tailored Oversight Guidance for Facilities Subject to Corrective Action under Subtitle C of the Resource Conservation and Recovery Act. EPA 530-R-03-012. September.
- EPA. 2004. Handbook of Groundwater Protection and Cleanup Policies for RCRA Corrective Action for Facilities Subject to Corrective Action Under Subtitle C of the Resource Conservation and Recovery Act. EPA 530-R-04-030. Update. April.
- EPA. 2006. Interim Guidance on OSWER Cross-Program Revitalization Measures. October 20.
- EPA. 2007. Guidance for Documenting and Reporting RCRA Subtitle C Corrective Action Land Revitalization Indicators and Performance Measures. February 21.



How Can We Achieve the 2020 Vision for CA?

3. Think performance standards.

(continued)

November 2009

Module 2 – How to Achieve the 2020 Vision

15

Notes:

Purpose of Slide: Emphasize the importance of using performance standards to streamline the RCRA CA process.

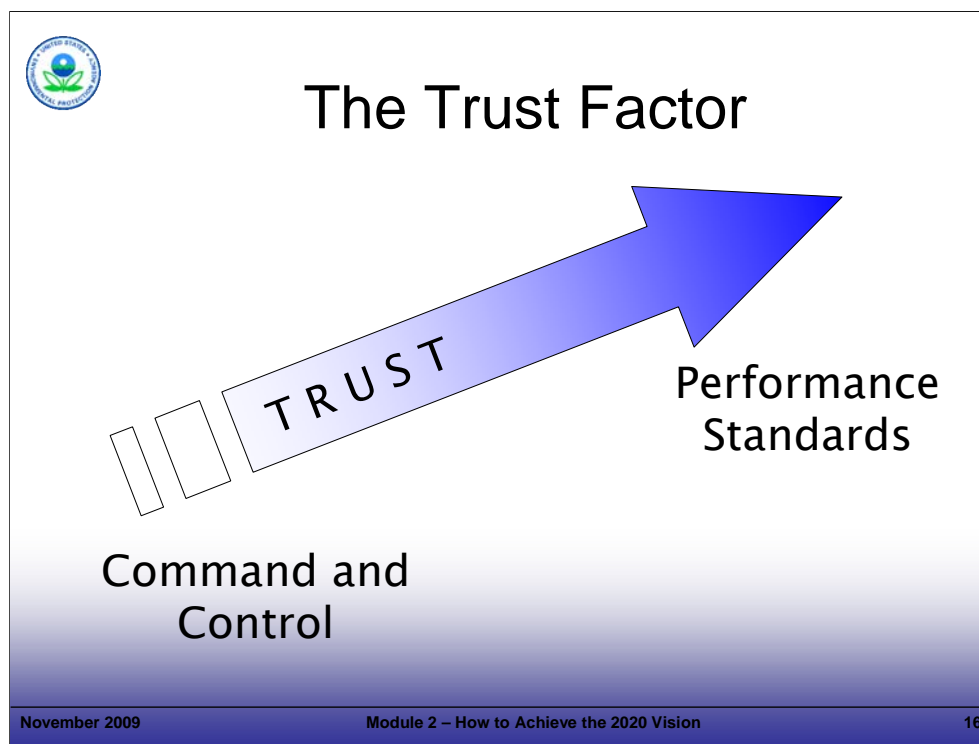
Key Points

- The effective use of performance standards can reduce the traditional comment-response cycle between the regulator and the facility. As long as clear, specific performance standards are established by the regulator and facility, the facility can proceed with CA implementation without separate approvals for each task, as long as the standards are met. In other words, the facility has the flexibility to decide how to meet the performance standard.
- Specific examples of performance standards and how they can be used are provided in later modules. However, just as an example, EPA's threshold criteria can serve as the basis of performance standards. These threshold criteria include:
 - Protect human health and the environment;
 - Attain media cleanup objectives; and
 - Control sources of release.
- Here is an example of replacing a technical standard with a performance standard:
 - Technical Standard: Monitor the following wells on a quarterly basis: PW-1 to PW-20.
 - Performance Standard: Maintain a groundwater monitoring system that adequately characterizes the lateral and vertical extent of contamination over time.

The regulatory agency evaluates whether the performance standard is being achieved through communication with the facility and review of technical reports and documentation.
- EPA's support of performance standards spans two decades:
 - *EPA favors performance-based approaches provided that the remedial goals for the facility are clear, the oversight during remedy implementation is appropriate to the complexity of the facility-specific circumstances, and the public is substantively involved* (FR. 1996. ANPR, page 19448).
 - *Performance-based permitting will now be the preferred approach, wherever feasible and appropriate, for all of EPA's permitting programs, and State, tribal, and local governments will be provided the flexibility and guidance to implement similar approaches* (EPA. 1996. Permit Improvement Team's Concept Paper and Task Force Recommendations).
- Other performance standards can be developed for final remedies or to streamline other phases of RCRA CA (e.g., assessment). It is the Project Manager's responsibility to establish clear, reasonable, and protective performance standards. It is the o/o's responsibility to meet the established performance standards.

References

- FR. 1996. ANPR. 61 FR 19432. May 1. Page 19448.
- EPA. 1996. Permits Improvement Team Final Draft of Concept Paper on Environmental Permitting and Task Force Recommendations. July.
- EPA. 2003. Results-Based Approaches and Tailored Oversight Guidance for Facilities Subject to Corrective Action under Subtitle C of the Resource Conservation and Recovery Act. EPA 530-R-03-012. September.
- ITRC 2007. Improving Environmental Site Remediation Through Performance-Based Environmental Management. November



Notes:

Purpose of Slide

- A level of trust between the facility and regulatory agency is important when developing and implementing effective performance standards. As described in EPA's Tailored Oversight guidance, effective oversight of corrective action requires a clear, documented understanding of facility-specific cleanup goals.

Key Points

- A command and control approach tends to be used when trust is lacking. This approach can slow down the CA process significantly, especially when it consists of only actions such as formal document exchanges and the associated lengthy comment cycles.
- The degree to which one party trusts another is a measure of belief in the honesty, and competence of the other party. Placement of trust allows actions to be conducted based on incomplete information and, as we know, CA decisions are often made in the face of incomplete information.
- A key to building mutual trust between regulators and a facility, and thereby streamlining the CA process, is communication. Regular, informal discussions and other information exchanges are important in communicating expectations, issues, and uncertainties associated with establishing and implementing performance-based standards. Working out these details informally helps to build a rapport between the regulators and facility as well as serving to streamline the review and approval of submitted documents.

References

- EPA. 2003. Results-Based Approaches and Tailored Oversight Guidance for Facilities Subject to Corrective Action under Subtitle C of the Resource Conservation and Recovery Act. EPA 530-R-03-012. September.



How Can We Achieve the 2020 Vision for CA?

4. Tailor sustainable solutions considering risk management and revitalization.

(continued)

November 2009

Module 2 – How to Achieve the 2020 Vision

17

Notes:

Purpose of Slide

- Emphasize that decisions relating to final remedies evaluate the human and ecological risk posed by the contaminants at the site – this is risk management.
- Stress that decisions relating to final remedies should consider current and reasonably anticipated uses – that is, whether the site will continue operating or if redevelopment for other uses is planned. In addition, a robust tailored risk management approach should consider long-term stewardship (LTS) implications, authorities, limitations, costs, and responsibilities.

Key Points

- At continued use sites (e.g., operating facilities), it is often reasonable to take a long-term approach to cleanup (including monitoring only or natural attenuation), as long as:
 - there are no unacceptable risks given current use and exposure scenarios;
 - contamination is not spreading to the extent it will create human or ecological risk and media cleanup criteria will eventually be achieved, especially after the facility closes in the future; and
 - sources are controlled to protect humans and prevent ecological exposure.
- Sustainable solutions relate to wise energy and resource use.
- Facilities undergoing revitalization are commonly under tight time schedules. Property sales, closing dates, and leasing agreements all require a quick turnaround on decisions. Therefore, it is important for the regulatory agency to be aware of these constraints in order to tailor the solution, as appropriate.
- Land development will often affect cleanup decisions. Generally, it is prudent to allow remedies to move forward on a fast track under these circumstances, as long as (1) the decisions are backed by registered professionals – for example, Professional Geologists (PGs), Professional Engineers (PEs), or state-licensed professionals (e.g., Licensed Site Professionals in MA or Licensed Environmental Professionals in CT) and (2) the site cleanup meets the State's or EPA's criterion of being protective of human health and the environment.

References

- EPA. 2000. Final Remedy Selection for Results-Based RCRA Corrective Action (Fact Sheet #3). March.
- EPA. 2000. Results-Based Approaches to Corrective Action. July 26.



How Can We Achieve the 2020 Vision for CA?

5. Okay for remedy to change over time to improve overall performance.

(continued)

November 2009

Module 2 – How to Achieve the 2020 Vision

18

Notes:

Purpose of Slide

- Make the point that a remedy can be selected and constructed without perfect site characterization data, because the remedy can be modified based on how it performs.

Key Points

- A remedy is designed based on predictions of how the hydrogeology and chemistry of a site will react to some external influence – for example, pumping, chemical additives, or the injection of air. Therefore, it is common to modify the operating conditions of a remedy after it is installed and is operating, based on evaluations of its effectiveness. For example, a pump and treat system may yield more or less water than anticipated, so flow rates and treatment systems are adjusted accordingly. As another example, air sparge wells may have a different radius of influence than expected and systems may need to be adjusted to achieve the desired radius. In short, improvements through modifications to a technology or remedy, once installed and operating, are not uncommon.
- Other changes may be longer-term. For instance, pump and treat systems may reduce concentrations by orders of magnitude for several years – but over time, concentration changes may reach asymptotic levels. At this point, a different technology may be appropriate. These longer-term changes or improvements to the remedy or a technology are often identified through Remedial System Evaluation or Remedial System Optimization, which is discussed in Module 11. The most effective remedies may require the most changes; as cleanup occurs, site conditions no longer meet the design parameters.
- A remedy also may change due to land use changes, which can lead to modifications of cleanup goals.
- Effective long-term stewardship of both engineering and ICs will help identify changes that may be needed to maintain remedy effectiveness.
- The bottom line is that all efforts and resources should not focus only on selecting the remedy, because the remedy can be adjusted over time – and likely will need to be.

References

- EPA. 2002. Elements for Effective Management of Operating Pump and Treat Systems. Fact Sheet. OSWER 9355.4-27FS-A. 542-R-02-009. December.
- Interstate Technology and Regulatory Council (ITRC). 2004. Remediation Process Optimization: Identifying Opportunities for Enhanced and More Efficient Site Remediation. September.



How Can We Achieve the 2020 Vision for CA?

6. Yield to changes in focus:

- ❖ From assessment to remediation
- ❖ From procedures to results

(continued)

November 2009

Module 2 – How to Achieve the 2020 Vision

19

Notes:

Purpose of Slide

- Point out the need for implementers to change their focus -- from assessment to operation -- *and* -- from procedures to results.

Key Points

- The focus should be (1) to get a remedy operating (including passive remedies, such as monitored natural attenuation [MNA]) once sufficient characterization data are available and (2) to evaluate the effectiveness of the remedy over time.
- Constructing and implementing a remedy prior to complete characterization is often environmentally and economically beneficial. This approach may shorten the CA timeline by focusing early on areas of higher concentration, which in turn can reduce contaminant migration.
- Changing focus requires the Project Manager to be a Risk Manager, approving investigations and cleanup plans in the face of uncertainties. A critical component of risk evaluation and risk management, which is the basis of CA, is that uncertainties associated with environmental investigation and remediation are inherent (e.g., are there enough wells to demonstrate a plume is not migrating?, is there another source of contamination?). Basing CA on risk recognizes the need to strive for the appropriate balance between reducing uncertainties via data collection and managing uncertainties via remedial action and contingencies.
- For years now, EPA has emphasized that results are more important than procedures. EPA made this point strongly as part of the RCRA Reforms in 1999 and has reiterated this message in its courses and conferences since that time.

References

- FR. 1996. ANPR. 61 FR 19432. May 1.
- EPA. 1999. RCRA Cleanup Reforms. EPA 530-F-99-018 (Fact Sheet #1). July.
- EPA. 2001. RCRA Cleanup Reforms 2. EPA 530-F-01-001 (Fact Sheet #2). January.
- EPA. 2003. Results-Based Approaches and Tailored Oversight Guidance for Facilities Subject to Corrective Action under Subtitle C of the Resource Conservation and Recovery Act. EPA 530-R-03-012. September.
- EPA. 2004. Handbook of Groundwater Protection and Cleanup Policies for RCRA Corrective Action for Facilities Subject to Corrective Action Under Subtitle C of the Resource Conservation and Recovery Act. EPA 530-R-04-030. Update. April.
- EPA. 1999. RCRA CA Workshop on Results-Based Project Management. June 10. Accessed On-line at: <http://www.epa.gov/osw/hazard/correctiveaction/workshop/>.

	Regulatory Mechanism Negotiation	Assessment and Interim Measures	Remedy Selection/ Construction	Remedy Operation
Agency Staff Time				
Facility Costs	\$\$\$	\$\$\$\$\$\$	\$\$\$\$\$\$\$\$ \$\$\$\$	\$\$\$\$\$\$\$\$ \$\$\$\$\$\$\$\$
Public Participation				
Human Health & Environmental Benefit				

November 2009 Module 2 – How to Achieve the 2020 Vision 20

Notes:

Purpose of Slide

- Illustrate that most of the regulatory agency time and focus has traditionally been on site characterization; however, the largest facility expenditures and greatest environmental benefits occur during remedy selection/construction and remedy operation.

Key Points

- Project Managers should strive to achieve a balance between having sufficient information to proceed with remedy selection and gathering additional information that adds to the overall understanding of the site.
- Some considerations for moving forward with less than perfect site information include:
 - The Pareto Principle – chasing down the last 20% of characterization information may eat up 80% of the budget without positively affecting the remedial design;
 - Interim remedial measures can be used to focus on source areas, where relative cleanup benefits are generally the greatest compared to overall site cleanup costs (e.g., \$ per pound of contaminant removed);
 - At many facilities, successful interim measures have been converted to final measures;
 - If a remedy is implemented as a pilot or in a phased approach, the remedy’s design can be improved as it is expanded over time; and
 - Even selected final remedies may change over time to achieve more efficient operation and better results.

References

- None.



How Can We Achieve the 2020 Vision for CA?

7. Engineering and Science are the solution (not reports!)

(continued)

November 2009

Module 2 – How to Achieve the 2020 Vision

21

Notes:

Purpose of Slide

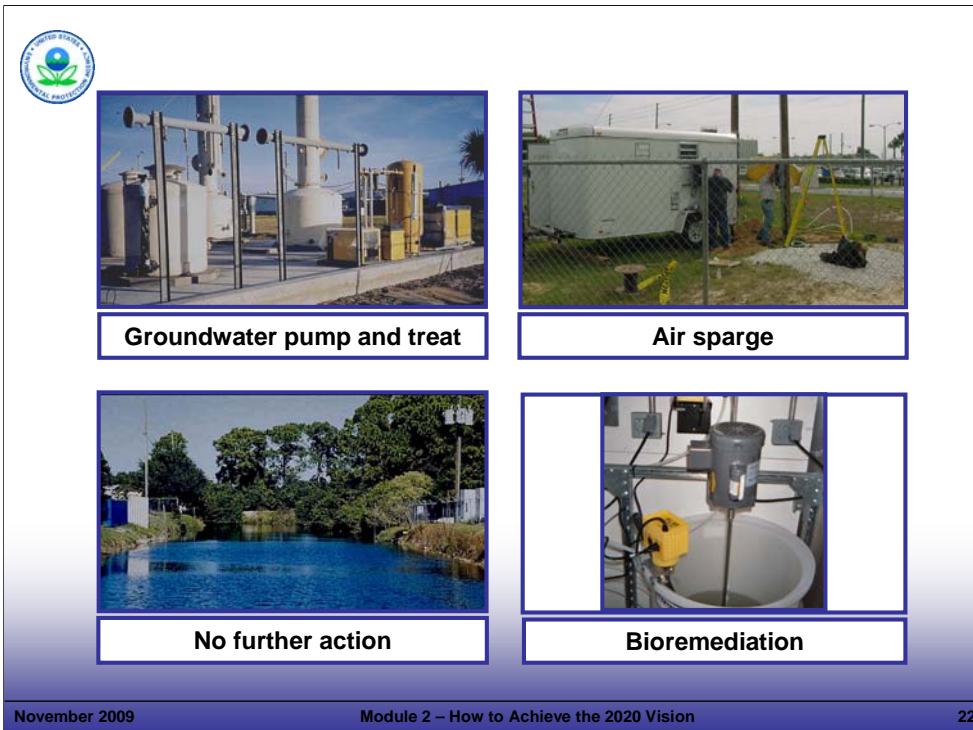
- Environmental remediation does not occur through the preparation and review of reports – it occurs through the design and implementation of effective remedies, which are based on sound engineering and science.

Key Points

- The Agency requires certain documentation for decision-making purposes. In addition, reports are necessary for planning, communicating, and documenting decisions. However, in themselves, reports and documents do not remediate a site.
- Engineering and scientific results drive decisions related to risk and support remedy implementation.

References

- None.



The slide features a 2x2 grid of images illustrating remediation methods. In the top-left corner is the United States Environmental Protection Agency (EPA) logo. The top-left image shows industrial equipment for groundwater pumping and treatment, labeled "Groundwater pump and treat". The top-right image shows a worker near a large white container with a hose, labeled "Air sparge". The bottom-left image shows a clear blue pond in a natural setting, labeled "No further action". The bottom-right image shows a close-up of a bioremediation tank with a stirrer, labeled "Bioremediation". At the bottom of the slide, the text "November 2009" is on the left, "Module 2 – How to Achieve the 2020 Vision" is in the center, and "22" is on the right.

Notes:

Purpose of Slide


- Point out that the best way to meet the 2020 CA Vision is by focusing on science, engineering, and construction – not on process and reports.

Key Points

- Achieving Remedy Decision and Remedy Construction measures requires that remedial solutions (e.g., pump and treat, air sparge, no further action, bioaugmentation) be selected, engineered, and constructed. The Project Manager can help streamline this process by keeping the focus on remediation goals, including land revitalization. Reports and other documents support this effort and are necessary, but in themselves, are not the driving force behind an effective cleanup.
- Real environmental progress occurs when the remedy is constructed, not when the report is completed.
- However, we should remember that while reports may not drive progress, regulatory agency decision makers need adequate and sound documentation to support their actions.

References

- None.



How Can We Achieve the 2020 Vision for CA?

8. Success – document it!

November 2009 Module 2 – How to Achieve the 2020 Vision 23

Notes:

Purpose of Slide


- Implementation of these principles will lead to environmental successes – Remedy Decision and Remedy Construction – and while we don't want to *focus* on process, we still need to document those successes.

Key Points

- The Project Manager should document the achievement of Remedy Decision (CA 400) and Remedy Construction (CA 550) following the actual date each measure is met.
- The "actual date" for the Remedy Decision measure is defined as follows:
The date that the EPA or State decision maker signs the Remedy Decision and Response to Comments or other appropriate document.
- The "actual date" for the Remedy Construction measure is defined as follows:
(1) The date the State or EPA acknowledges, in writing, that any necessary physical construction of the last corrective measure is complete and all remedial systems are fully functional as designed, whether or not final cleanup levels or other requirements have been achieved, or (2) the scheduled date for the remedy decision if no further physical construction of a remedy is needed.
- The Agency requires sufficient documentation from the o/o to support these decisions.
- We will focus more on these specific measures in later modules.
- Ultimately, success is achieved when sites are cleaned up for continued or new uses.

Reference

- EPA. 2005. Permitting and Corrective Action (PCA) Program Area Analysis (PAA) Report: Appendix D, National Details for Corrective Action Event Codes. Final Report. Win/Informed Executive Steering Committee. July 28.



Get an Exit Strategy

Environmental cleanup to protective levels is the goal

Think performance standards

Tailor sustainable solutions considering risk management and revitalization

Okay for remedy to change

Yield to changes in focus

Engineering and science are the solution

Success – document it!

November 2009 Module 2 – How to Achieve the 2020 Vision 24

Notes:

Purpose of Slide

- Review the 8 principles identified in this module.

Key Points

- This slide summarizes the principles associated with achieving CHANGE and RCRA CA progress.

References

- None.

**Notes:**Purpose of Slide

- Generate enthusiasm for meeting the 2020 goals and vision for CA and encourage all to take the challenge!

Key Points

- The rest of the course provides information, tools, and resources that can be used to achieve RCRA CA progress, meet RCRA CA goals, and ensure the RCRA CA Vision is achieved.
- We will return to the "Get to YES!" principles as we progress.

References

- None.