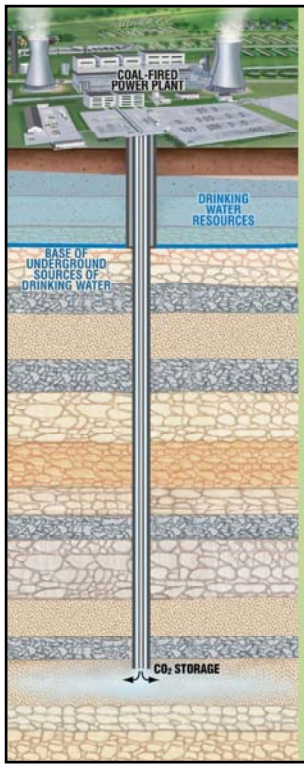
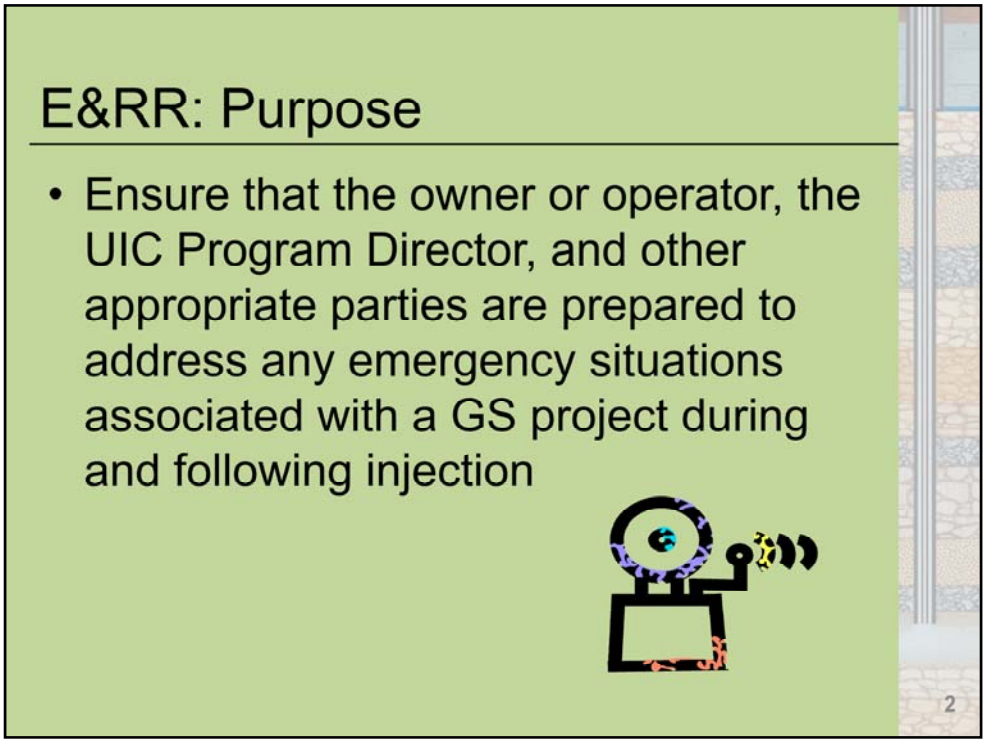
United States
Environmental Protection
Agency

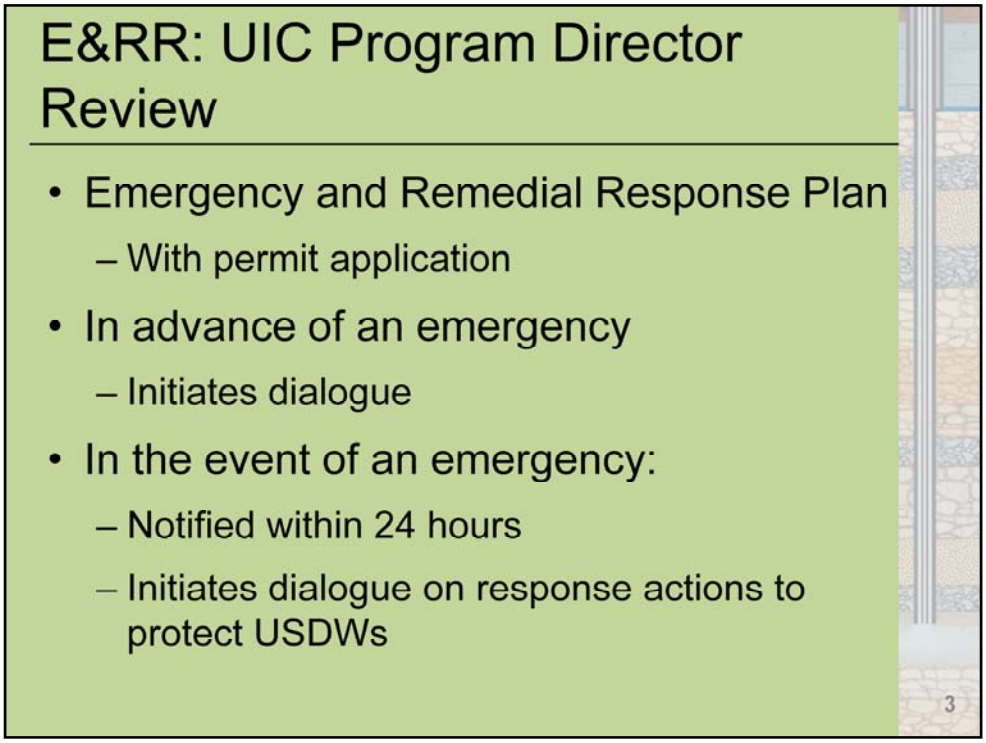


Underground Injection Control Geologic Sequestration Rule Training Workshop: Emergency and Remedial Response (E&RR)

(40 CFR 146.94)



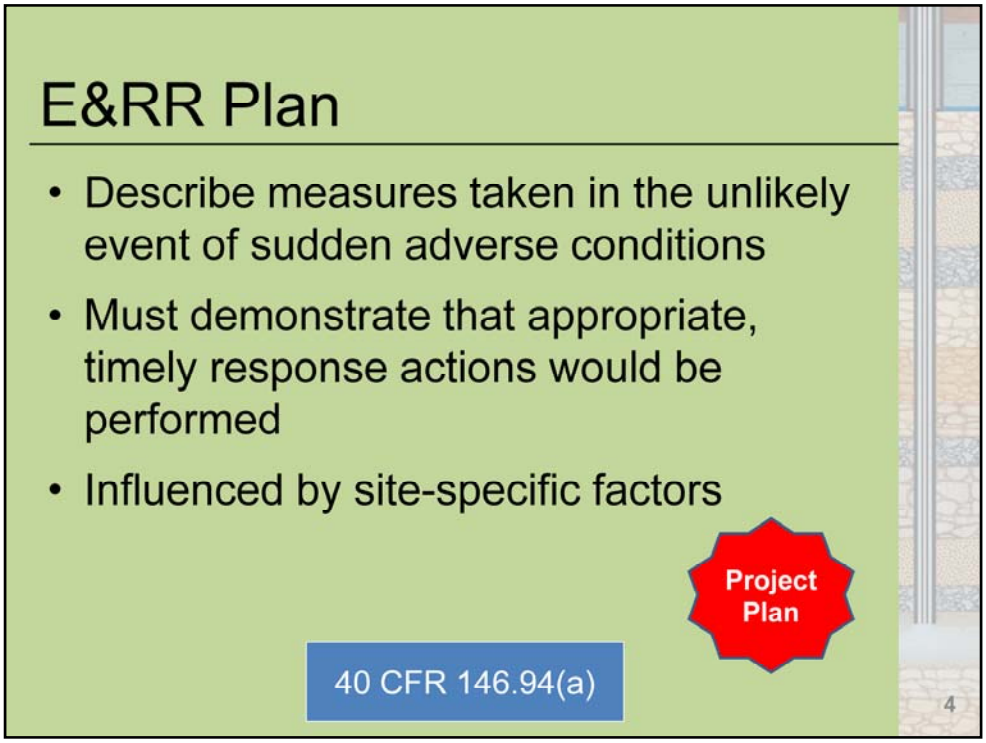
The purpose of the emergency and remedial response requirements of the GS Rule are to ensure that the owner or operator, the UIC Program Director, and other appropriate parties are prepared to address any emergency situation associated with a GS project during and following injection (i.e., during the PISC period).



The UIC Program Director will review the Emergency and Remedial Response Plan submitted with the permit application.

Prior to the occurrence of any emergency event, the UIC Program Director should initiate a dialogue with the owner or operator concerning emergency procedures to be implemented.

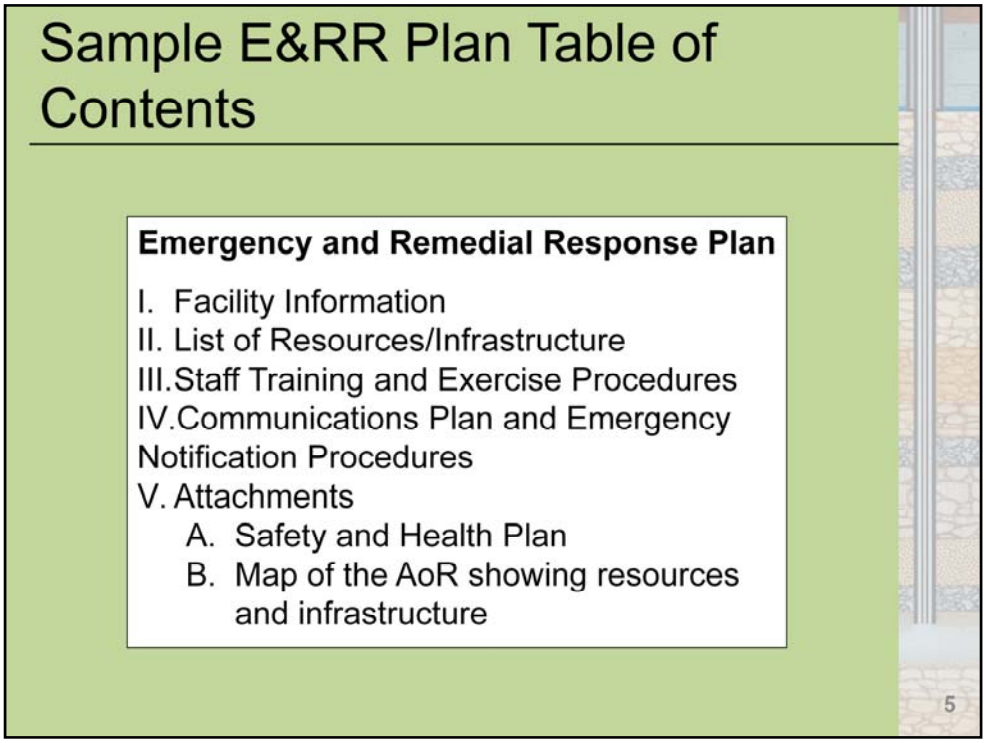
The UIC Program Director must be notified of any emergency within 24 hours. The UIC Program Director will want to discuss any emergency event with the owner or operator and work with that person and others to ensure that response actions address the event and that USDWs are protected.



The owner or operator must submit an Emergency and Remedial Response Plan with the permit application that describes the measures that would be taken in the event of sudden adverse conditions, such as a loss of mechanical integrity or movement of injection or formation fluids resulting in potential endangerment to a USDW.

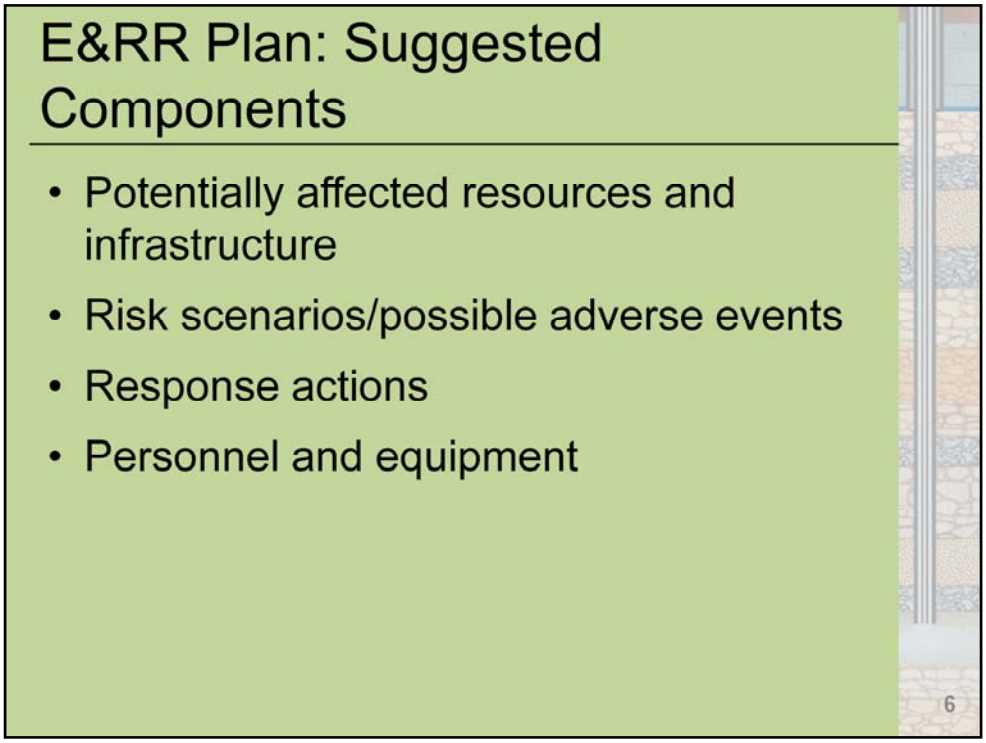
Situations requiring emergency response may occur during the construction, operation, or PISC periods. The Plan can ensure that, in the event of an emergency, a process is in place to facilitate and expedite the necessary and appropriate response.

The details of the Emergency and Remedial Response Plan may be influenced by a variety of site-specific factors including: regional geology, USDW depth, injection depth, proposed operating conditions, properties of the carbon dioxide stream, and activities in the AoR (e.g., the presence of population centers, specific land uses, presence/location of PWS).



This is a sample table of contents for an Emergency and Remedial Response Plan that the UIC Program Director may receive. It incorporates all the elements of the plan that should be reviewed.

This is adapted from the template in Appendix E of the Project plan development guidance.



The GS Rule does not identify the specific elements of the Emergency and Remedial Response Plan. However, the Plan Development Guidance describes a process that an owner or operator may undertake in developing an Emergency and Remedial Response Plan.

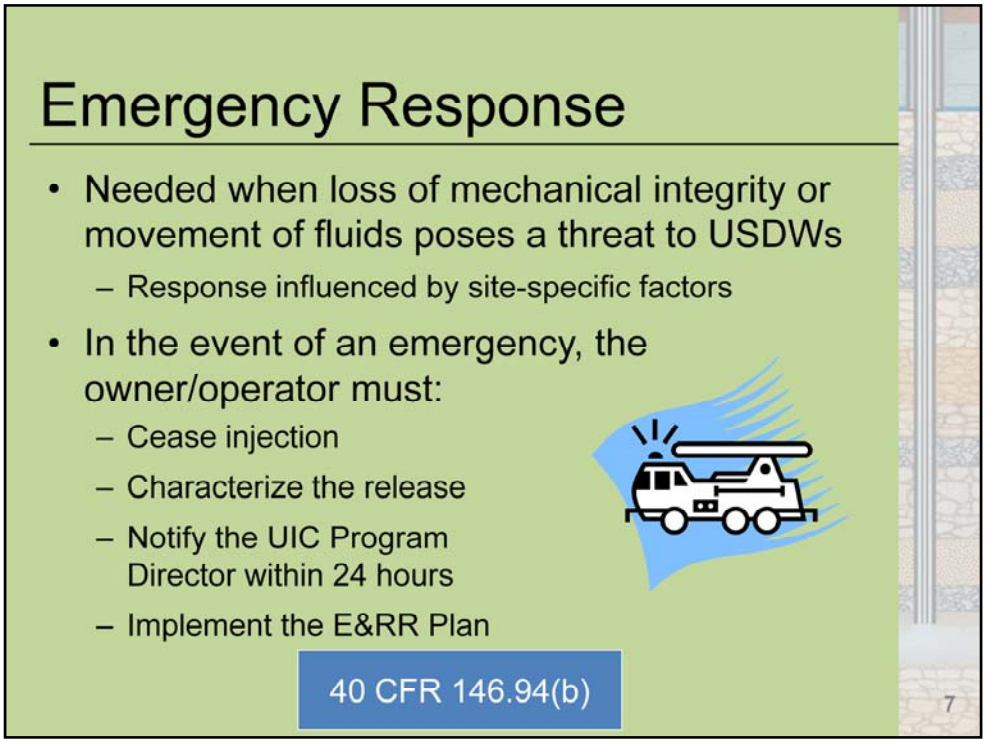
•Identify and list resources/infrastructure that potentially may be impacted, such as the injection well, any public water systems, private drinking water wells, aquifers and USDWs, and surface water bodies.

•For each identified resource or infrastructure element, the plan should identify any potential adverse events that may occur (e.g., equipment failure, fluid movement, water supply contamination, or the potential for unintended carbon dioxide migration).

•The plan might also describe response actions to address the identified risk scenarios, e.g., remedial cementing of the well or treatment of ground water or drinking water supplies. High-impact risk scenarios may warrant special consideration in the Emergency and Remedial Response Plan.

•The personnel and equipment needed to implement the response actions should also be identified. These personnel may include first responders, GS project facility staff, or environmental response contractors.

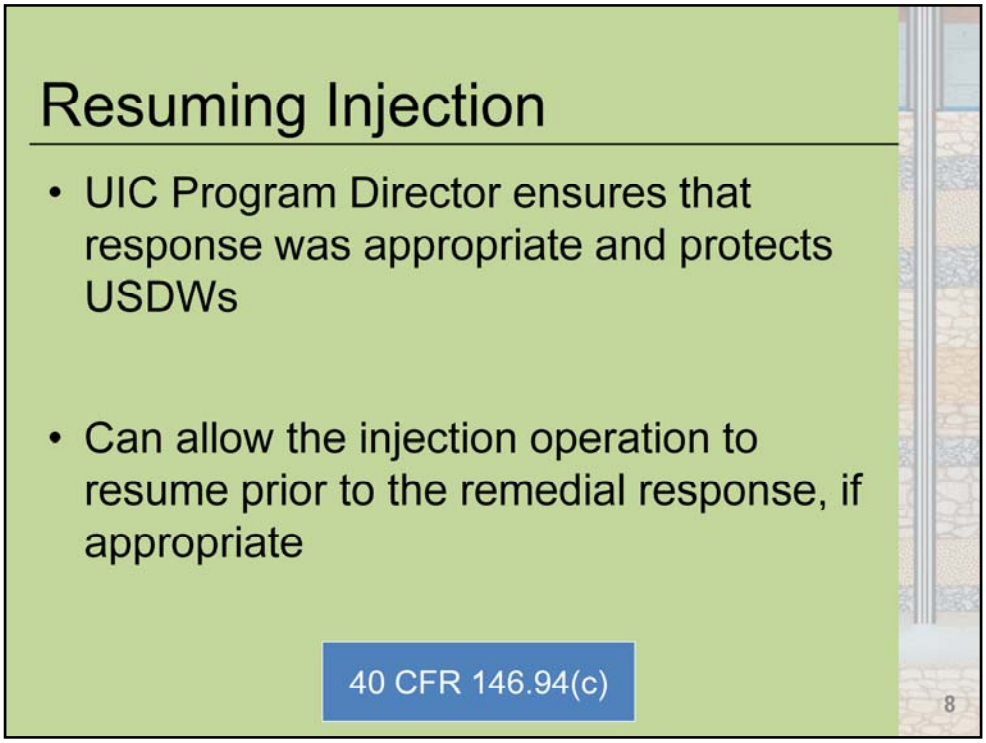
EPA recommends that the Emergency and Remedial Response Plan also include: facility emergency contacts, people who should be notified of an adverse event (i.e., PWS supervisor, permitting authority, and the local media), how they should be notified, the location of the well and a map of the area, schematics and diagrams of the facility and well, and a communications plan and emergency notification procedures.



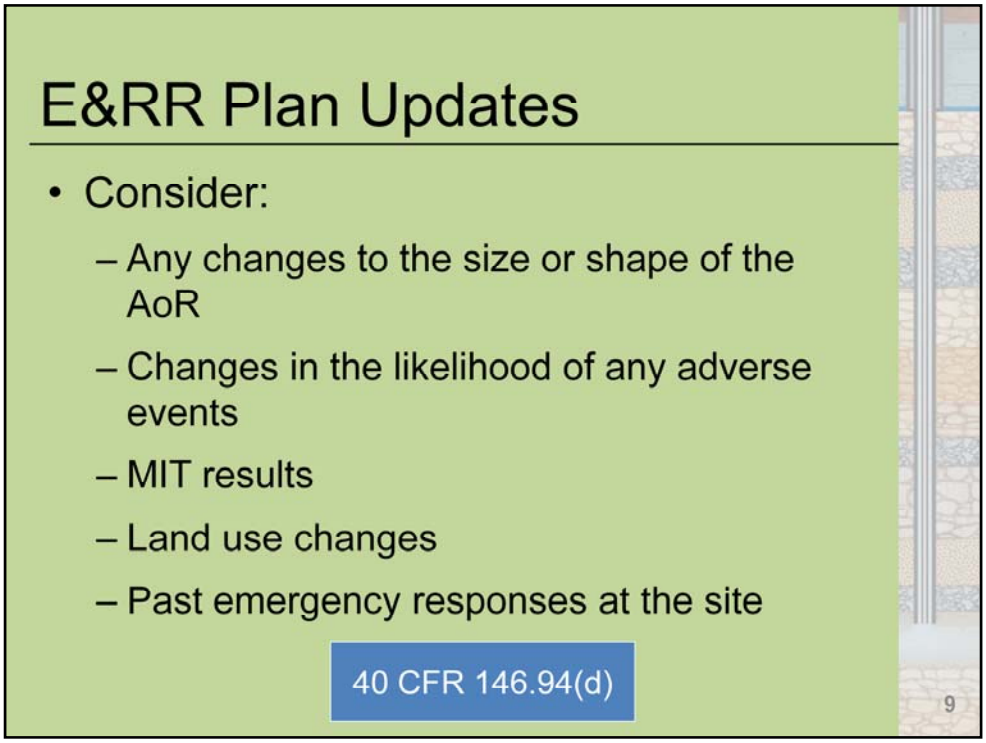
An emergency response from the owner or operator is warranted when a loss of mechanical integrity or movement of fluids poses a threat to USDWs. Situations requiring emergency response may occur during the construction, operation, or PISC periods. The associated response to an emergency must account for site-specific factors including geology, injection depth, operating conditions, and other activities in AoR.

In the event of an emergency, the owner or operator must undertake all required actions, including cessation of injection, characterization of the release, notification of the UIC Program Director within 24 hours, and implementation of the E&RR Plan.

The portion of the GS rule ensures that the UIC Program Director begins a dialogue with the owner or operator prior to the initiation of an emergency event to determine how emergency measures will be implemented and to discuss any other site-specific emergency or remedial response needs.



In the event of a need to implement the Plan, the UIC Program Director should ensure the owner's or operator's response to the emergency was appropriately conducted and that USDWs are protected from endangerment. Following the emergency response, the UIC Program Director has the discretion to allow injection operation to resume prior to the subsequent remedial response if the owner or operator demonstrates, and the UIC Program Director confirms, that USDWs will not be endangered.



The GS rule requires the owner or operator to periodically review the emergency and remedial response plan in the context of the most recent AoR reevaluation and monitoring and operational data. The plan should be updated if needed to ensure USDW protection.

Considerations for determining the need to update the emergency and remedial response plan include:

1. Whether the most recent AoR modeling or monitoring data indicate any changes to the prediction of plume and pressure front movement or the size of the AoR;
2. Whether any of the considered emergency scenarios are more likely to occur than originally considered (e.g., if ground water chemistry is changing);
3. Whether MIT results indicate increased concerns for well failures;
4. If recent (or planned) land use changes brought new resources or infrastructure near or into the AoR; or
5. If there has been a need to implement emergency procedures at the site, any lessons learned might be incorporated into an amended Emergency and Remedial Response Plan.

Some Class VI Program E&RR Resources

- For more information on emergency and remedial response, refer to:
  - Draft UIC Class VI Primacy Application and Implementation Manual
  - Draft UIC Class VI Project Plan Development Guidance
  - EPA's Class VI Web site: http://water.epa.gov/type/groundwater/uic/class6/gsclass6wells.cfm

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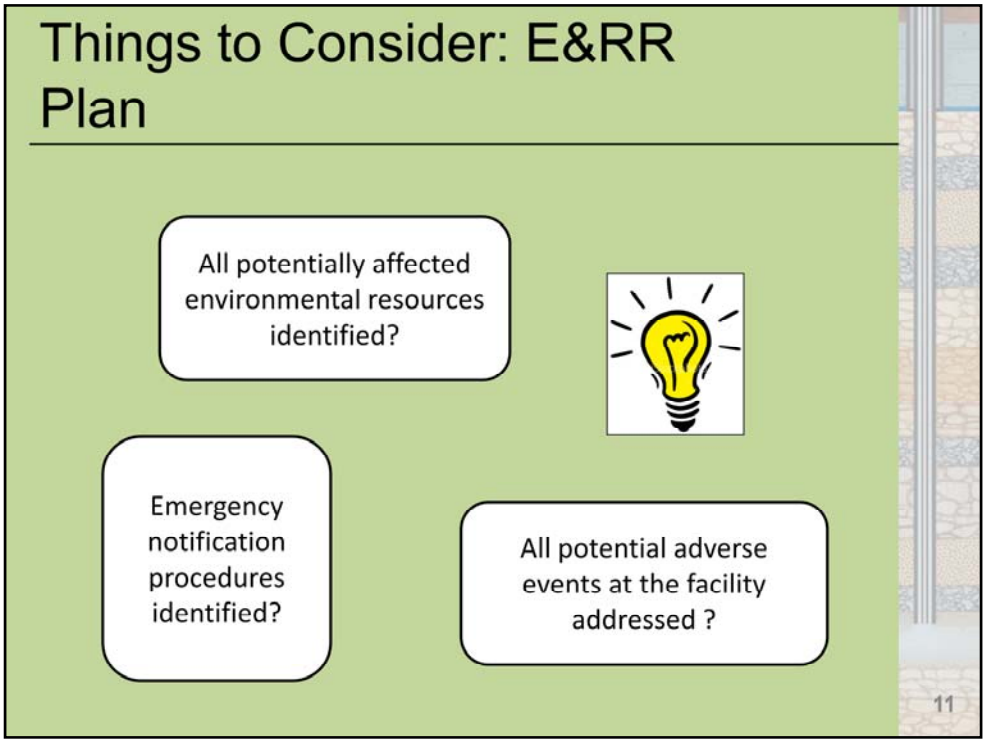
Some Class VI Program emergency and remedial response resources that are currently available are:

•The Draft UIC Program Class VI Primacy Application and Implementation Manual.

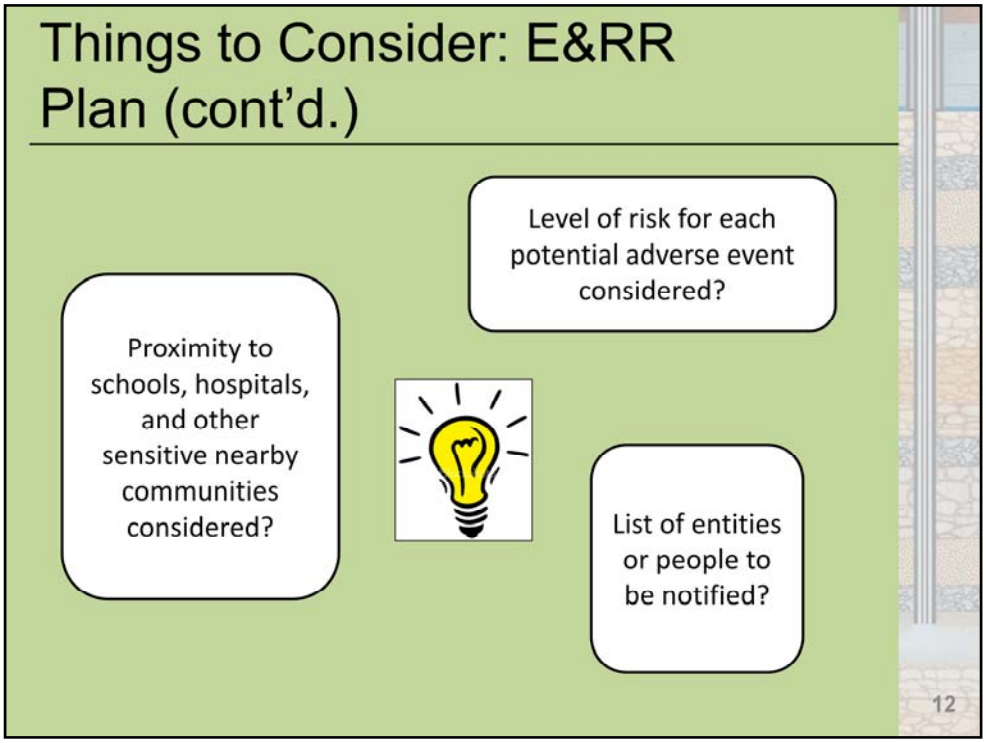
•The Draft UIC Program Class VI Project Plan Development Guidance.

•And EPA's Class VI website: http://water.epa.gov/type/groundwater/uic/class6/gsclass6wells.cfm.



Questions that the UIC Program Director will want to consider while reviewing the Emergency and Remedial Response Plan include:

1. Are all potentially affected environmental resources (e.g., ground water, surface water bodies, PWS, the biosphere) or existing infrastructure (e.g., the well, buildings, other nearby structures) identified?
2. Are emergency notification procedures and communication plans identified?
3. Are all potential adverse events at the facility addressed in the Emergency and Remedial Response Plan and are adequate response procedures and equipment identified? Are all activities within the AoR, including land use and the presence of population centers, addressed?



Additional questions that the UIC Program Director will want to consider while reviewing the Emergency and Remedial Response Plan include:

1. Does the Plan consider the proximity of wells to schools, hospitals, and other sensitive nearby communities?
2. Does the Plan consider the level of risk for each potential adverse event at the site?
3. Is there a list of entities or people that will be notified in an adverse event (e.g., local water systems, land owners, pipeline operators, Regional Response Teams)?