

**ESSB 6001 Stakeholder Committee
September 18, 2007 Meeting
Decision Matrix**

Geologic Sequestration:

Specific regulations for geologic sequestration will be in Ch 173-218 WAC, Underground Injection Control (UIC) Program. This will be a new section focusing on geologic sequestration standards that are added to the existing rule. The revision may not change the regulatory program for other UIC wells. Carbon dioxide injection wells will be permitted under the State Waste Discharge Permit Program of Ch 173-216 WAC. The permit will include all site specific requirements including the protection of ground water quality under WAC 173-200 WAC, Water Quality Standards for Ground Waters of the State of Washington.

Links to existing rules:

Ch 173-218 WAC, Underground Injection Control Program: <http://www.ecy.wa.gov/biblio/wac173218.html>

Ch 173-216 WAC, State Waste Discharge Permit Program: <http://www.ecy.wa.gov/biblio/wac173216.html>

Ch 173-200 WAC, Water Quality Standards for Ground Waters of the State of Washington:
<http://www.ecy.wa.gov/biblio/wac173200.html>

Issue	What concerns are there (e.g. with current law)?	What approaches should be considered?	What is the reflected opinion (recommendation) of the committee?	What complicating factors (or minority opinions) are there?
1) What should the regulations require for geologic characterization and site selection?				
How to address surface structures?	<ul style="list-style-type: none"> - deminus standard - Some access to monitor a projected plume. 	<ul style="list-style-type: none"> - Two tiered process - Refer to model reg. - application to identify all structures (vertical and horizontal storage units) and provide a map - provide guidance to applicant on their area of review (define) and a timeframe or mass of CO2. 	<ul style="list-style-type: none"> - demonstrate sufficient access to construct, operate, characterize and monitor the site. 	
How to address existing wells (open	<ul style="list-style-type: none"> - Wells represent a potential public health threat. 	<ul style="list-style-type: none"> - Spreadsheet of all the wells constructed. - Identify all the open and closed 	<ul style="list-style-type: none"> - Site specific method to address well issues. 	<ul style="list-style-type: none"> - investigation of unrecorded wells

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and closed)?	- Some wells could intersect target sequestration sites	wells.		
What should be the minimum drilling investigation?		- site characterization plan		
What should be the minimum geophysical investigation?		- site characterization plan		
What are requirements for presenting all available geologic info? (Faulting? seismic info? Caprock? etc)		- Site characterization plan (drilling, hydrologic testing, geophysical surveys, lab tests, mechanical properties, maximum working pressure, migration monitoring, evolution of CO2 plume) to establish capacity and injectivity and acceptable risk over the lifetime of the project. - Refer to solid waste rules for reference.		- Determining measurable and enforceable criteria.
What should be required to define the target formation and extent of storage area?	- groundwater quality - CO2 release to the atmosphere - public health risk			
How much characterization and monitoring should be required for usable				

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(shallower) aquifers in area?				
What should be required for a leak monitoring aquifer?				
What should be the performance standard for site selection?				
Required reports?				
2) What should the regulations require for well construction standards and casing integrity tests?				
What are the casing and cementing requirements? (Injection wells? and Monitoring wells?)	<ul style="list-style-type: none"> - prevent communication between aquifers - appropriate materials to prevent corrosion issues 	<ul style="list-style-type: none"> - find similar rules from IOGCC - Alberta 		
What well integrity tests should be required? (What tests? How often? How to define success?)		<ul style="list-style-type: none"> - Create a reporting standard with the opportunity to reduce the testing intervals based upon performance. - Tests = cement bond log, corrosion log, mechanical integrity - CO2 resistant cement (results from field experience) 		<ul style="list-style-type: none"> - CO2 resistant cement does not have long history of performance
Required reports?				

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3) What should the regulations require for monitoring and leak detection?				
How to conduct monitoring? (direct vs indirect, or combination)		<ul style="list-style-type: none"> - Components- surface monitoring techniques, aquifer monitoring wells - PH measuring - Monitor at time intervals - Assess natural background and determine deviation (is it within acceptable range?) -May depend of site characterization study. - Monitor what is happening outside the containment zone. - Might consider FutureGen monitoring recommendations. 		Does leakage (language) in SB 6001 refer to atmosphere or groundwater?
What is considered an acceptable leakage level?				
Required reports?				
4) What should the regulation require for closure and post closure?				
How should the regulation define the start of the post closure period?	<ul style="list-style-type: none"> - Should closure be when injection stops? - What should be involved in closure of a site? - Should a number of years define the post 	<ul style="list-style-type: none"> - Consider other states - Consider post closure monitoring based on percentage mineralized or percentage CO2 trap-age. - Standards should be based on acceptable risk profile. 		

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	closure of a site? - Will we know rate of migration? - Who is responsible for long term liability (legislature?) - Who is responsible for monitoring long term closure? - What happens to the Cos if site does not effectively sequester it?	- End of post closure period could be defined as site not stabilizing as predicted.		
What should be required for injection well closure & monitoring well closure?				
How should the length of the post closure period be determined? (Defined length of post closure period? or Performance standard to end post closure based on diminished risks? What is the performance standard?)				
Required reports?				

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5) Should financial assurance be required?				
Who has liability? What is covered by financial assurance?				
What form of financial instrument is required? (bond? trust fund? letter of credit? other?)	- Legislature needs to address this problem.	<ul style="list-style-type: none"> - Consider requiring a bank statement guaranteeing financial stability that would cover the cost of closure and restoration of a site. - Reference solid waste rules. - EFSEC financial guarantees may provide guidance. - Consider time bonds/ financial responsibility/indemnification as it ties to individual assets such as wells. 		- initial vote indicated mixed reaction and not enough information (such as length of time)
How long a period should be covered?		-FutureGen Alliance plan is six years.		
What are the terms to release funds?				

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6) What are the appropriate mitigation requirements for projects that result in unexpected environmental impacts?				
What notification and reports should be required?	<ul style="list-style-type: none"> - Do we have authority to take action if necessary? - Who will project manager work with to determine mitigation plan? Who is designated authority? 	<ul style="list-style-type: none"> - Consider EFSEC mitigation model 		<ul style="list-style-type: none"> - Mitigation issue may not be applicable to ESSB 6001.
What corrective measures should be required?		<ul style="list-style-type: none"> - Stop injecting 		
Who is in charge? Who must approve the actions?		<ul style="list-style-type: none"> - Consider working with the company on a mitigation plan. Take Action after plan is agreed upon. 	<ul style="list-style-type: none"> - General agreement that DOE should take action on mitigation plan if necessary. 	