

# Instructions for Completing the Utah Underground Injection Control Inventory Information Form for Subsurface Environmental Remediation (SER) Injection Wells

Owners or operators of all Class V injection wells, existing and new, must submit inventory information according to Section R317-7-6.4(C) of the Utah Administrative Rules for the Underground Injection Control Program. Required information includes: facility name and location; name and address of legal contact; ownership of facility; nature and type of injection wells; and operating status of injection wells. The Utah UIC Inventory Information Form is designed to assist owners or operators to comply with this requirement, to collect sufficient information regarding the injection activity such that authorization-by-rule status can be assessed, and to coordinate UIC Program regulatory action with other agencies having regulatory authority over the subject facility. Inventory information must be submitted prior to injection for new wells.

**This submission does not relieve the applicant of any liability for ground water cleanup or any claim for resource damage if ground water contamination is traced to the injection wells shown on this form.**

## Facility Location:

**Facility Physical Address:** Enter street address of facility or other description of physical location of facility that would enable someone to drive to the location of the facility. You may provide a photocopy of a road map (no greater than 11" x 17", preferably 8 ½" x 11") with the facility location indicated if a street address is not available.

**Facility Geographic Location:** Enter Township, Range, Section, Quarter Section, and Quarter/Quarter Section. Enter latitude and longitude in degrees, minutes, seconds **OR** enter Universal Transverse Mercator (UTM) Easting and Northing. For assistance in determining geographic location, go to <http://nrwr1.nr.state.ut.us/cgi-bin/stview.exe?Startup> ) You may provide a photocopy of a USGS 7 ½ minute topographic quadrangle map, including the name of the map, with the facility location indicated.

## Facility Contact:

At least one of the contacts listed must be the legal representative of the owner of the Class V injection well(s) for which the UIC Inventory Information is being submitted. The owner/operator or the legal representative must be the signatory for the form. Provide additional contacts capable of providing reliable information regarding the operation of the facility.

## Land Ownership at Facility:

Self explanatory.

## Facility Description:

Enter primary and secondary North American Industry Classification System (NAICS) code numbers used in census & other government reports that best describe the primary business activities occurring at the facility. Go to the U.S. Census Bureau NAICS web site for assistance in determining the correct NAICS Code: <http://www.census.gov/eos/www/naics/>

The NAICS has replaced the U.S. Standard Industrial Classification (SIC) system, however, conversion tables are available at the U.S. Census Bureau NAICS Concordance web site located at: <http://www.census.gov/eos/www/naics/concordances/concordances.html>

Include a description of the business activities performed at the facility. Include the NAICS code description. You may wish to include additional narrative for clarity.

## Remediation Activity Involving Injection Wells:

Descriptions of a few of the commonly employed subsurface environmental remediation technologies involving injection wells are given below.

**Air Sparging** - Air sparging involves the injection of air or oxygen through a contaminated aquifer. Injected air traverses horizontally and vertically in channels through the soil column, creating an underground stripper that removes volatile and semivolatile organic contaminants by volatilization. The injected air helps to flush the contaminants into the unsaturated zone. SVE usually is implemented in conjunction with air sparging to remove the generated vapor-phase contamination from the vadose zone. Oxygen added to the contaminated groundwater and vadose-zone soils also can enhance biodegradation of contaminants below and above the water table.

**Bioventing / Biosparging** - Bioventing is a common form of in situ bioremediation. Oxygen is delivered to contaminated unsaturated soils by forced air movement (either extraction or injection of air) to increase oxygen concentrations and stimulate biodegradation.

**In-Situ Bioremediation** - Bioremediation uses microorganisms to degrade organic contaminants in soil, sludge, and solids either excavated or in situ. The microorganisms break down contaminants by using them as a food source or co-metabolizing them with a food source. Aerobic processes require an oxygen source, and the end products typically are carbon dioxide and water. Anaerobic processes are conducted in the absence of oxygen, and the end products can include methane, hydrogen gas, sulfide, elemental sulfur, and dinitrogen gas. In situ techniques stimulate and create a favorable environment for microorganisms to grow and use contaminants as a food and energy source. Generally, this means providing some combination of oxygen, nutrients, and moisture, and controlling the temperature and pH. Sometimes, microorganisms that have been adapted for degradation of specific contaminants are applied to enhance the process.

**In-Situ Chemical Oxidation** - Chemical oxidation typically involves reduction/oxidation (redox) reactions that chemically convert hazardous contaminants to nonhazardous or less toxic compounds that are more stable, less mobile, or inert. Redox reactions involve the transfer of electrons from one compound to another. Specifically, one reactant is oxidized (loses electrons) and one is reduced (gains electrons). The oxidizing agents most commonly used for treatment of hazardous contaminants in soil are ozone, hydrogen peroxide, hypochlorites, chlorine, chlorine dioxide, potassium permanganate, and Fentons reagent (hydrogen peroxide and iron). Cyanide oxidation and dechlorination are examples of chemical treatment. This method may be applied in situ or ex situ, to soils, sludges, sediments, and other solids, and may also be applied for the in situ treatment of groundwater.

**In-Situ Flushing** - For in situ soil flushing, large volumes of water, at times supplemented with surfactants, co-solvents, or treatment compounds, are applied to the soil or injected into the groundwater to raise the water table into the contaminated soil zone. Injected water and treatment agents are isolated within the underlying aquifer and recovered together with flushed contaminants.

Co-solvent flushing involves injecting a solvent mixture (e.g., water plus a miscible organic solvent such as alcohol) into either vadose zone, saturated zone, or both to extract organic contaminants. Co-solvent flushing can be applied to soils to dissolve either the source of contamination or the contaminant plume emanating from it. The co-solvent mixture is normally injected upgradient of the contaminated area, and the solvent with dissolved contaminants is extracted downgradient and treated above ground.

Recovered ground water and flushing fluids with the desorbed contaminants may need treatment to meet appropriate discharge standards prior to recycle or release to local, publicly owned wastewater treatment works or receiving streams. To the maximum extent practical, recovered fluids should be reused in the flushing process. The separation of surfactants from recovered flushing fluid, for reuse in the process, is a major factor in the cost of soil flushing. Treatment of the recovered fluids results in process sludges and residual solids, such as spent carbon and spent ion exchange resin, which must be appropriately treated before disposal. Air emissions of volatile contaminants from recovered flushing fluids should be collected and treated, as appropriate, to meet applicable regulatory standards. Residual flushing additives in the soil may be a concern and should be evaluated on a site-specific basis.

**In-Situ Thermally Enhanced Recovery** - Thermally enhanced recovery is an in situ treatment process that uses heat to increase the volatilization rate of organics and facilitate extraction. Volatilized contaminants are typically removed from the vadose zone using soil vapor extraction. Specific types of thermally enhanced recovery techniques include Contained Recovery of Oily Waste (CROWTM), radio frequency heating, conductive heating, steam heating, in situ steam stripping, hot air injection, dynamic underground stripping, in situ thermal desorption, and electrical resistance heating. Thermally enhanced recovery is usually applied to contaminated soil but may also be applied to groundwater.

**In Well Air Stripping** - Air is injected into a double screened well, lifting the water in the well and forcing it out the upper screen. Simultaneously, additional water is drawn in the lower screen. Once in the well, some of the VOCs in the contaminated ground water are transferred from the dissolved phase to the vapor phase by air bubbles. The contaminated air rises in the well to the water surface where vapors are drawn off and treated by a soil vapor extraction system.

### **Injection Well Operating Status**

Self explanatory.

### **Injection Well Construction and Subsurface Details**

On the page provided or on a separate sheet, submit a plan view (not to exceed 11" x 17") of the facility property showing the location of the injection well(s). Also, on the page provided or on a separate sheet, submit a vertical cross-section (not to exceed 11" x 17") showing the details of the injection well(s) and the details of the relevant subsurface hydrogeology. Include such details as unique injection well ID number; construction type; if pre-fab construction, indicate type; construction dimensions; depth of well if vertical construction; screened interval if vertical construction; depth of engineered bottom if horizontal construction; depth to ground water; ground water class (see Utah Administrative Rules R317-6-3 for ground water class definition - <http://www.rules.utah.gov/publicat/code/r317/r317-006.htm> ; hydrogeologically distinct horizons, etc.

### **Injectate Characterization**

In the space provided or on an attached sheet, provide a narrative describing the fluid to be injected. If remediation agents are added, provide Material Safety Data Sheets (MSDS) for each agent. Claims of Confidential Business Information (CBI) will not be considered acceptable reason for not submitting sufficient information regarding the chemical composition of remedial agents. CBI may be sent directly to the UIC Program for review and filing in DWQ's CBI files.

### **Comments**

Include additional contact information and/or any other relevant information not already addressed in the other sections of this form.

### **Signature of Owner / Operator**

In keeping with the requirement of Section R317-7-6.4(C) of the Utah Administrative Rules for the Underground Injection Control Program that the owner or operator must submit inventory information, the UIC Inventory Information Form **must** be signed by the **owner or operator (or his/her legal representative)** of the injection well(s) for which the inventory information is being submitted.