disclosed except in accordance with procedures set forth in 40 CFR part 2.

In addition to one complete version of the comment that includes any information claimed as CBI, a copy of the comment that does not contain the information claimed as CBI must be submitted for inclusion in the public docket and EPA's electronic public docket. If you submit the copy that does not contain CBI on disk or CD ROM, mark the outside of the disk or CD ROM clearly that it does not contain CBI. Information not marked as CBI will be included in the public docket and EPA's electronic public docket without prior notice. If you have any questions about CBI or the procedures for claiming CBI, please consult the person identified in the **FOR FURTHER INFORMATION CONTACT** section.

C. How Can I Get or View Copies of Related Information?

EPA has established an official public docket for this action under Docket ID No. ORD–2004–0004. The official public docket consists of any public comments received and other information related to this action. Although a part of the official docket, the public docket does not include Confidential Business Information (CBI) or other information whose disclosure is restricted by statute. The official public docket is the collection of materials that is available for public viewing at the Office of Environmental Information (OEI) Docket in the Headquarters EPA Docket Center, (EPA/DC) EPA West Building, Room B102, 1301 Constitution Avenue, NW., Washington, DC 20460. The EPA Docket Center Public Reading Room is open from 8:30 a.m. to 4:30 p.m., Monday through Friday, excluding legal holidays. The telephone number for the Public Reading Room is (202) 566–1744, and the telephone number for the OEI Docket is (202) 566–1752; facsimile: (202) 566–1753; or e-mail: *ORD.Docket@epa.gov*.

An electronic version of the public docket is available through EDOCKET. You may use EDOCKET at *http://www.epa.gov/edocket/* to submit or view public comments, access the index listing of the contents of the official public docket, and to access those documents in the public docket that are available electronically. Once in the system, select ''search,'' then key in the appropriate docket identification number.

Certain types of information will not be placed in the EDOCKET. Information claimed as CBI and other information whose disclosure is restricted by statute, which is not included in the official public docket, will not be available for public viewing in EPA's electronic public docket. EPA's policy is that copyrighted material will not be placed in EPA's electronic public docket but will be available only in printed, paper form in the official public docket. To the extent feasible, publicly available docket materials will be made available in EPA's electronic public docket. When a document is selected from the index list in EDOCKET, the system will identify whether the document is available for viewing in EPA's electronic public docket. Publicly available docket materials that are not available electronically may be viewed at the docket facility identified above.

For public commenters, it is important to note that EPA's policy is that public comments, whether submitted electronically or in paper, will be made available for public viewing in EPA's electronic public docket as EPA receives them and without change, unless the comment contains copyrighted material, CBI, or other information whose disclosure is restricted by statute. When EPA identifies a comment containing copyrighted material, EPA will provide a reference to that material in the version of the comment that is placed in EPA's electronic public docket. The entire printed comment, including the copyrighted material, will be available in the public docket.

Public comments submitted on computer disks that are mailed or delivered to the docket will be transferred to EPA's electronic public docket. Public comments that are mailed or delivered to the Docket will be scanned and placed in EPA's electronic public docket. Where practical, physical objects will be photographed, and the photograph will be placed in EPA's electronic public docket along with a brief description written by the docket staff.

Dated: March 19, 2004.

Paul Gilman,

EPA Science Advisor, Office of the Science Advisor.

[FR Doc. 04–6695 Filed 3–24–04; 8:45 am]

BILLING CODE 6560–50–P

ENVIRONMENTAL PROTECTION AGENCY

[FRL–7640–1]

Underground Injection Control Program Hazardous Waste Disposal Injection Restrictions Petition for Exemption—Class I Hazardous Waste Injection Environmental Disposal Systems, Inc., Romulus, MI

AGENCY: Environmental Protection Agency (EPA).

ACTION: Notice of issuance of exemption from land disposal restrictions.

SUMMARY: EPA is giving the public notice that the Agency has granted an exemption under the Resource Conservation and Recovery Act, as amended by the 1984 Hazardous and Solid Waste Amendments, (RCRA) and its implementing regulations from the land disposal restrictions (LDR) on underground injection for wells No. 1–12 and 2–12 drilled by Environmental Disposal Systems, Inc. (EDS) in Romulus, Michigan. As required by 40 CFR part 148, subpart C, EDS has demonstrated that, to a reasonable degree of certainty, there will be no migration of hazardous constituents from the injection zone for as long as the waste remains hazardous. Among other things, the EPA reviewed the petition, including information on the geology of the injection zone, the confining zone, and the formations between the confining zone and the lowermost underground source of drinking water (USDW), the conceptual model of the geology, simulations of the results of the proposed injection of hazardous wastes into the injection zone, and the mechanical integrity of each well; evaluated the conclusions and data; determined that conclusions are based on valid interpretations of measured data and show that the model used to simulate waste migration is conservative; and found that EDS's petition meets the requirements of 40 CFR part 148, subpart C. This decision constitutes a final Agency action. There is no further administrative process to appeal this decision.

DATES: This action is effective as of March 16, 2004.

FOR FURTHER INFORMATION CONTACT: Harlan Gerrish, Lead Petition Reviewer, EPA, Region 5, Water Division (WU–16J), 77 W. Jackson Blvd., Chicago, Illinois 60604,telephone (312) 886–2939,e-mail address *gerrish.harlan@epa.gov*. Copies of the petition and all pertinent information relating thereto are on file and are part of the Administrative Record. It is

recommended that you contact the lead reviewer prior to reviewing the Administrative Record.

SUPPLEMENTARY INFORMATION:

Introduction

As discussed below, EPA has decided to grant EDS an exemption from the RCRA land disposal restrictions for deep injection of hazardous wastes through two wells in Romulus, Michigan because it has determined that EDS's petition for the exemption meets the requirements for an exemption set forth in 40 CFR part 148, subpart C, and accordingly that the injection will be protective of human health and the environment. This notice discusses the requirements for obtaining such an exemption, and explains how the EDS petition meets those requirements and demonstrates that the proposed injection will be protective of human health and the environment. This decision also discusses the Agency's consideration of public comments and events and changes that have occurred since the Agency published its notice of intent to grant the petition in December of 2002, and sets forth the conditions on the exemption.

Background

RCRA provides for the prohibition of land disposal of certain hazardous wastes by a number of methods, among them underground injection by deep wells. RCRA also provides for exceptions from these prohibitions when methods of land disposal are determined to be protective of human health and the environment for as long as the waste remains hazardous. (*See* RCRA sections 3004(d)(1), (e)(1), (f)(2), and (g)(5), 42 U.S.C. 6924, (d)(1), (e)(1), (f)(2), and (g)(5)). Under RCRA section 3004(g)(5), a method of land disposal may not be determined to be protective of human health and the environment (except with respect to a hazardous waste which has complied with the pretreatment regulations promulgated under subsection (m)) unless, upon application by an interested person, it has been demonstrated to a reasonable degree of certainty, that there will be no migration of hazardous constituents from the disposal unit or injection zone for as long as the wastes remain hazardous.

The EPA previously determined that underground injection of hazardous waste could meet the RCRA ''protectiveness'' standard provided that the EPA could review and approve injection facilities on a case-by-case basis. Accordingly, the EPA promulgated UIC regulations in 1988 establishing criteria and procedures for no migration petitions to demonstrate compliance with this standard, 40 CFR 148.20–148.24. As discussed below, the regulations allow a petitioner to make this demonstration by showing, among other things, that conditions at the site and the nature of the waste are such that reliable predictions can be made that injected fluids will not migrate within 10,000 years vertically upward out of the injection zone or laterally within the injection zone to a point of discharge or interface with a USDW. The United States Court of Appeals for the District of Columbia Circuit upheld the regulations in *Natural Resources Defense Council, Inc.* v. *EPA*, 907 F.2d 1146 (D.C. Cir. 1990).

EDS submitted a petition on January 21, 2000, as amended on October 3, 6, 27, and 31, 2000; January 12, April 24, and October 16, 2001; and January 31, August 22, September 25, and October 23, 2002, requesting an exemption from the LDR for injection of all land ban-restricted hazardous wastes into Well No. 1–12 and Well No. 2–12, located on Citrin Drive in Romulus, Michigan. EDS's petition is based, among other things, on a showing under 40 CFR 148.20(a)(i) that the hydrogeological and geochemical conditions at the site and the physiochemical nature of the waste stream(s) are such that reliable predictions can be made that fluid movement conditions are such that the injected fluids will not migrate within 10,000 years (A) vertically upward out of the injection zone; or (B) laterally within the injection zone to a point of discharge or interface with a USDW.

The EPA issued a notice of intent to grant this petition on November 19, 2002, publishing this notice in the **Federal Register** (67 FR 77981, December 20, 2002) (Notice of Intent). The EPA accepted public comments on this Notice of Intent from December 6, 2002, until October 6, 2003, holding two public hearings (on January 8, 2003 and on April 21, 2003).

Exemption Determination

After reviewing the petition and additional submissions of information, and considering public comments, the EPA has determined that EDS has met the requirements of 40 CFR part 148, subpart C. The EPA finds EDS has demonstrated that, to a reasonable degree of certainty, there will be no migration of hazardous constituents from the injection zone for as long as the waste remains hazardous, by showing that the hydrogeological and geochemical conditions at the site and the physiochemical nature of the waste stream(s) are such that reliable predictions can be made that fluid movement conditions are such that the injected fluids will not migrate within 10,000 years (A) vertically upward out of the injection zone; or (B) laterally within the injection zone to a point of discharge or interface with a USDW and meets other applicable requirements of 40 CFR part 148, subpart C. Accordingly, the EPA has determined that EDS's proposed injection is protective of human health and the environment.

No Migration Standard

A petition submitted under 40 CFR 148.20(a)(1)(i) must show that the hydrogeological and geochemical conditions at the site and the physiochemical nature of the waste stream(s) are such that reliable predictions can be made that fluid movement conditions are such that the injected fluids will not migrate within 10,000 years (A) vertically upward out of the injection zone; or (B) laterally within the injection zone to a point of discharge or interface with a USDW.

A determination under 40 CFR 148.20(a)(1)(i) is based on the interpretation of data and the use of conservative assumptions to characterize the injection zone and to predict waste movement. The plume modeling detailed in the petition document is not intended to predict the actual plume behavior for 10,000 years, but to ''bound'' the area of potential plume migration as discussed in the preamble to the 40 CFR part 148 regulations (*see* 53 FR 28117, at 28126–28127, July 26, 1988). As discussed in the preamble, the EPA believes that the 10,000 year demonstration strikes an appropriate balance between the need to demonstrate ''no migration with a reasonable degree of certainty'' and the limits of the technological means available to make such a demonstration. The EPA believes that a site which could demonstrate no migration throughout a 10,000 year time period would provide containment for a substantially longer time frame, and allow for geochemical transformations or attenuation which would render the waste non-hazardous or immobile. As set forth in the preamble to the part 148 regulations and noted in the Notice of Intent:

> The EPA's standard does not imply that leakage will occur at some time after 10,000 years. It requires a demonstration that leakage will not occur within that time frame.

(53 FR 28117, at 28126, July 26, 1988; 67 FR 77981, at 77982, December 20, 2002).

Considerable weight should be accorded to an executive department's

construction of a statutory scheme it is entrusted to administer. *Chevron U.S.A. Inc.* v. *Natural Resources Defense Council, Inc.*, 467 U.S. 837, 844 (1984). (*Chevron*) If the Agency's choice represents a reasonable accommodation of conflicting policies that were committed to the agency's care by the statute, it should not be disturbed unless it appears from the statute or its legislative history that the accommodation is not one that Congress would have sanctioned. (*See Chevron*, at 845, citing *United States* v. *Shimer*, 367 U.S. 374, 382, 383 (1961)).

The EPA interprets the ''reasonable degree of certainty'' standard to require that the petitioner provide:

> Reasonably trustworthy information and data such that the totality of the facts and circumstances within the Agency's knowledge be sufficient, in light of its scientific and technical expertise, to warrant a firm belief that no migration of hazardous constituents from the injection zone will occur in 10,000 years.

(*Kay* v. *EPA* No. 6:90 CV 582, slip op. at 5 (E.D. Tex. Aug 3, 1993). EPA does not interpret the standard to require proof beyond a reasonable doubt, or to require that facts be proven to be extremely likely. The regulations at 40 CFR 148.20(a)(1), which govern this demonstration, require a showing that reliable predictions can be made based on conditions at the site.

As discussed below, EPA staff with appropriate technical expertise reviewed the EDS petition and determined that the requirements of the no migration standard were satisfied. Information to be submitted in support of a no migration petition is detailed in 40 CFR 148.20–148.22. Additional information required for a Class I hazardous waste injection well permit is detailed in 40 CFR 146.66 and 146.70. A geological review of a no migration petition includes evaluation of local and area geology, seismic, and hydrogeologic conditions. Data evaluated in the geologic review process included, among other things, open hole and cased hole logs of the injection wells and other area wells, such as temperature, neutron, electrical, and radioactive tracer logs; confining and injection zone core data; geological cross sections based on area wells; well location, structure, and net formation thickness maps; geological reports from consultants; regional hydrogeological reports; USDW base maps; injection zone water samples; drilling and completion reports, scout tickets, plugging and abandonment reports, and state completion reports for area wells; well injection data; seismicity reports; and USDW ground water sample data.

During drilling and construction, EDS collected numerous samples, conducted in situ tests, and completed analyses. These activities were conducted by experienced service companies and consultants who used standard methods. EDS repeated many procedures and conducted different tests that returned complementary results. Results were compared to demonstrate that any new testing performed by the petitioner was accurate and reproducible. EDS petitioned to inject all restricted waste identified under 40 CFR part 261, subparts C and D. While no specific waste sources have been identified yet, the EPA reviewed the waste analysis plan, which complies with 40 CFR 146.68(a).

Model Validation and Verification

In the context of the no migration demonstration, validation is a demonstration by the petitioner that the mathematical simulator for the model is an appropriate surrogate for the actual geological reservoir into which waste will be injected. This means that the simulators must be capable of accurately calculating the effects of injection. Verification is a demonstration that the mathematical equations which the simulator uses to emulate the geological factors which govern the movement of wastes and distribution of pressure increase in the injection zone give accurate results when the parameter values upon which the calculation is based are representative of the characteristics of the injection zone.

EDS used mathematical simulators which are based on standard analysis of radial, laminar flow of a single fluid phase which has a constant viscosity and constant, small compressibility from a well which is perpendicular to the geological formations and is open through the entire thickness of a bounded, near flat-lying reservoir of uniform thickness and permeability to calculate pressurization due to injection. The solutions have been thoroughly tested and long accepted as accurate means of estimating the pressurization which will occur in geologic reservoirs similar to that which exists at the EDS site. The equations used to estimate the distances of vertical and horizontal movement of the waste plume and its attenuation are similarly accepted. To meet the requirements of 40 CFR 148.21(a)(3), EDS provided information which allowed the EPA to validate and verify the simulators. The EPA consulted with the Lawrence Berkeley National Laboratory (LBNL)to confirm the validation and verification of the simulators. EDS demonstrated that reliable predictions can be made by using a mathematical simulator to generate a pressure history which closely matched pressure changes measured in one of the wells while water was injected into the second well. Through EPA Regional staff, LBNL requested that EDS benchmark its solution against a popular numerical simulator which uses a different approach for calculating plume spread. The distance of migration calculated using this simulator was somewhat greater than the distance calculated using EDS's analytic method. To ensure that the results are conservative, the distances which were calculated using the analytic method were increased by an appropriate amount.

Quality Assurance and Quality Control

As required by 40 CFR 148.21(a)(4), EDS has demonstrated that adequate quality assurance and quality control plans were followed in preparing the petition. The EPA approved a quality assurance project plan for the construction and testing of the wells and preparation of the demonstration on November 1, 2001. Some changes were made subsequently to accommodate changes in plans. These were reviewed and given informal approval as necessary. EDS followed an appropriate protocol for locating records of penetrations in the area of review (AOR), for collecting and analyzing geologic and hydrogeologic data, for characterizing waste, and for conducting all tasks associated with the modeling demonstration.

Conservative Assumptions

The demonstration is based on direct measurements of the geological properties of the injection zone made during the construction and subsequent testing of the wells at the EDS facility on Citrin Drive or on values measured at similar locations where conditions can be expected to be near equivalents. The measurements are used to create a conceptual model of the geological framework into which waste would be injected. Many properties were determined by direct measurements. In-place geophysical measurements and tests of core material recovered from the injection and confining zones during well construction provided independent information about the thickness, porosity and permeability of the rocks making up these zones. The permeabilities for the receptive intervals of the Eau Claire and Mt. Simon formations, as wholes were calculated by analyzing the pressure changes occurring during injection tests. The formation fluid properties were

determined through analysis of samples of the fluid removed from the well. However, the model encompasses regions which are larger than can be reached by sampling techniques employed along and between the well bores. As required by 40 CFR 148.21(a)(5), the demonstration allows for uncertainty by using values which are more conservative than those which the petitioner believes are most appropriate. Many instances of the use of conservative values are described below.

Sensitivity Analysis

As required by 40 CFR 148.21(a)(6), the demonstration includes a sensitivity analysis. This analysis showed the effects of variations in the values characterizing the various parameters and confirmed that where there is uncertainty, conservative values were used.

Regional Geology

Geological characteristics common to southeastern Michigan include: sedimentary formations overlying Precambrian igneous and metamorphic rocks found at a depth of about 4,500 feet below the surface; simple structure in the sedimentary formations, including no known transmissive faults or fractures, with a low rate of dip toward the center of the Michigan Basin to the northwest; and deep reservoir zones in a formation containing sandstones, shales, and carbonate rocks overlain by mostly dense carbonate rock which also includes several sequences of more and less permeable zones. The formations into which the waste will be injected do not contain salt dome formations, salt formations or underground mines or caves. Southeastern Michigan lies in a stable continental area where there is little risk of new faulting, and any seismic events experienced in Michigan have been minor. The well siting meets the requirements of 40 CFR 146.62.

Injection Zone

The injection zone must have reservoir strata with sufficient permeability, porosity, thickness, and areal extent to allow the injected fluid to be distributed through a large volume of rock so that there is no long term increase in pressure in the injection zone. Above the reservoir zone, the injection zone must have strata which have low vertical permeability and are continuous across the area within which the reservoir strata will be affected by injection. These are called arresting strata and make up the arrestment interval. They prevent upward movement of wastes from the injection zone to USDWs or the surface.

The injection zone for the EDS facility is between 3,369 and 4,550 feet below the surface. It consists of 1,099 feet of reservoir and overlying arresting strata, and includes upper Precambrian rocks at the base and the Mt. Simon, Eau Claire, Franconia-Dresbach, Trempealeau, Glenwood, and lower Black River Formations. EDS has subdivided the injection zone into an injection interval and an arrestment interval. The Mt. Simon, Eau Claire, and Franconia-Dresbach Formations at depths from 3,937 to 4,468 feet below the surface will actually contain the injected wastes. They make up the injection interval. The Trempealeau, Glenwood, and Black River Formations between 3,369 and 3,937 feet below the surface are the strata within the injection zone which will confine fluid movement above the injection interval. They make up the arrestment interval. These formations are tabular and each extends far beyond the vicinity of the EDS facility. The Mt. Simon and Eau Claire Formations reach the surface in Wisconsin and thin to the east so that the porous zones at the EDS site may pinch out and may not be hydraulically connected to porous zones in the Mt. Simon Formation beyond Lake Erie. Approaching Chicago, where the Mt. Simon is much shallower, the salinity of the water in the Mt. Simon decreases, and west and north of Chicago the Mt. Simon is a USDW. These changes occur hundreds of miles from the EDS facility. As a result, the effects of injection by EDS will be negligible.

Waste will be injected directly into the injection interval from the open-hole portion of the waste disposal wells. The Mt. Simon and Eau Claire Formations are composed of sandstones interbedded with siltstone, limestone, dolomite, and shale. These formations contain a number of zones which appear capable of accepting injected waste. The porosity of strata which seems to accept injected liquids tends to be greater than 12%. The open-hole geophysical logs identified a total of 255 feet of section with porosity greater than 12%. The portion of this injection zone which will receive injected wastes, the active injection zone, is found almost entirely in the Mt. Simon Sandstone.

The arresting interval is the portion of the injection zone above the injection interval, and contains dense carbonates and shale units with low permeability and porous carbonates and sandstones which are pressure bleed-off units. EDS calculated an average permeability for the arresting interval by calculating the harmonic average of vertical permeability measurements from the core samples having less than 12% porosity. That analysis concluded that the effective vertical permeability of the arresting interval is less than 0.005 millidarcies (md).

Fracture logging of the three wells drilled by EDS indicated several sub-vertical fractures in the arresting interval. These fractures have limited height and appear to be filled by mineral deposits. Based on the information, the logging company's analysts concluded that these fractures did not compromise the integrity of the arresting interval. Because there are no known transmissive fractures or faults in the arresting interval, it is suitable for long term waste retention.

Confining Zone

In addition to the arresting strata within the injection zone, the injection zone must be overlain by a second series of strata which are sufficient to prevent upward fluid movement. These strata are known as the confining zone. Like the arresting interval, the confining zone must be (1) laterally continuous; (2) free of transecting, transmissive faults or fractures over an area sufficient to prevent fluid movement; and (3) of sufficient thickness, lithologic, and stress characteristics to prevent vertical propagation of fractures. The immediate confining zone above the injection zone at EDS is made up of the upper Black River Limestone, the Trenton Formation, and the Utica and Cincinnatian Shales which are found between 2,364 and 3,369 feet. This confining zone is 1,000 feet in thickness, and the top is at an elevation almost 2,000 feet below the lowermost USDW. No fractures were detected in the well bores and no transmissive faults or fractures are otherwise known to exist in the confining zone within the AOR. The confining zone will resist vertical migration of fluids because of its low natural permeability.

Bleed-Off Zone

The confining zone must be separated from the lowermost USDW by at least one sequence of permeable and less permeable strata that will provide added layers of protection by either providing additional confinement (low permeability units) or allowing pressure bleed-off (high permeability units). Overlying the confining zone, the Clinton Formation is made up of shales and dolomite having low porosity and permeability. The White Niagaran between 2,133 and 2,227 feet is a dolomite which the well site geologist described as ''a new disposal formation'' in a letter mailed to the EPA on

December 27, 2001. The Salina Formation contains thick beds of dense, plastic anhydrite and salt separated by dolomite, some of which is porous and permeable, and shale between 1,300 and 2,100 feet. The anhydrite and salt offer very effective barriers to fracturing and flow because they deform plastically under the weight of the overlying formations to reseal any void space. In addition, the Sylvania Sandstone between the depths of 400 and 550 feet is a thick, porous, and permeable formation which has been used extensively as an injection zone in the area. It is capable of accepting large amounts of fluid without developing hydrostatic pressures which would be high enough to either fracture it or cause formation water to flow through an open conduit into the USDWs. The layers are continuous for hundreds of square miles. They provide the added layers of protection required by the regulations.

Geochemical Conditions and Waste Streams

The petitioner must adequately characterize the injection and confining zone fluids and rock types to determine the waste stream's compatibility with these zones. EDS's petition sought permission to inject listed or hazardous wastes identified under 40 CFR part 261, subparts C and D. Because each waste code contained in 40 CFR part 261 identifies a specific waste with specific chemical and physical properties, the EPA already has extensive data on the chemical and physical properties of listed and characteristic wastes for which EDS requested exemption from the LDR.

The injection zone is composed mainly of quartz sandstone, with lesser amounts of shale, siltstone, and dolomite. These rock types are known to be resistant to most chemical attack. These Mt. Simon rock types are found in all wells which inject into the Mt. Simon. Periodic measurements in other wells injecting corrosive wastes into the Mt. Simon do not show changes in the size and shape of the well bores. Because these rocks generally are very resistant to chemical degradation, EDS anticipates little, if any, compatibility problems. To alleviate any problems that may arise from reactions between the native formation fluids and the injected wastes, EDS may inject brine or fresh water to serve as a buffer between the formation water and the injectate before it begins to inject wastes and between batches of waste containing constituents which may react with each other. The water buffers will prevent the formation of solids due to reactions in the near well-bore region, and will dilute the mixtures when they do come into contact as a result of mixing due to dispersion so that the possibility of reactions will be reduced. The confining zone is composed of silty shale and shaley dolomite. The injected fluid should have little effect on the dolomitic layers because dolomite does not react with dilute acids at the temperatures which will exist in the injection zone. The shale layers are very stable and will be essentially unaffected by contact with the injectate.

Conceptual Model

The model includes an assumption that chemical reactions between the formation and the injectate will not have a significant effect on the receptiveness of the injection zone to injection.

The permeability for the receptive intervals of the Eau Claire and Mt. Simon formations, as a whole, has been calculated by analyzing the pressure changes occurring during injection tests using fresh water. A two-layer model was required to closely match the pressures actually recorded. The properties of the two layers are actually a summation of the effects of numerous layers, some with higher permeability and some with lower. The simulation matched the pressure record by allowing one half of the injected liquid to flow into each of the two zones. The zone with higher permeability can be described as 33 feet in thickness with an average permeability of 400 md. The zone with lower permeability can be described as 190 feet thick with an average permeability of 63.43 md. The average porosity of the 33-foot zone is 11% so the porosity-thickness product is 363 porosity-feet.

Results of Simulation

Two simulation time periods were considered in the demonstration: A 20-year operational period and a 10,000-year post-operational period. The EDS demonstration also assumes that the injection rate will be continuous at 166 gallons per minute (gpm) for the first 19 years and 11 months of the operational period, and would then increase to 270 gpm for the final month. These rates are, respectively, the maximum allowable long-term average rate and the maximum allowable instantaneous injection rate. These high rates maximize both the lateral extent of the waste plume and pressurization in the injection zone during the operational phase.

The demonstration of no migration of hazardous wastes out of the injection zone is based on physical containment of the wastes by multiple barriers. Detailed knowledge of the chemical makeup of the injectate was not required because only the final physical characteristics of the waste plume such as density and viscosity are factors in modeling. The demonstration assumes that the injectate will be a single chemical which does not react to form solids, is not attracted to the mineral grains of the injection zone, and has the highest coefficient of diffusion of any molecule. The only factors tending to reduce concentration are dispersive and diffusive mixing. The waste is assumed to be toxic at a concentration of one part in one trillion. Fewer than 10 chemicals which might be injected are toxic at that level. Concentrations of these few chemicals will be limited to ensure that their concentrations are reduced to health-based limits at the same point as the concentration of the theoretical constituent. The location of this concentration is considered to be at the plume edge. The EDS lateral waste plume demonstrations included assumptions that the plume was made up of the least dense and, alternatively, of the most dense liquids which can be injected. These alternative scenarios bound the lateral movement of the waste due to buoyancy. By gathering conservative assumptions and applying them as discussed, EDS demonstrated that the concentrations of the most mobile constituents will not migrate out of the injection zone in concentrations which would be hazardous if the migrating constituents are the most toxic which might be injected.

A. Vertical Migration

The starting point for calculating upward vertical movement from the injection zone is at 3,937 feet, the top of the injection interval. This is shallower than the termination of the corrosion-resistant steel well casing through which the waste is injected into the injection interval. To simplify computation of vertical migration and make the assumptions more conservative, the increase in pore pressure of 1,178 pounds per square inch (psi), which was predicted to occur only at the end of the operational period as a result of increasing the injection rate to 270 gpm during the final month of injection, was assumed to exist for twice the length of the entire operational period. Analytical solutions used to predict vertical distance of waste migration showed that the edge of the waste plume will advance through 10.1 feet of the arresting strata. Therefore, at the end of the operational period, the waste front will be located at a depth of 3,927 feet below the surface.

At the start of the post-operational period, pressure in the injection zone will decrease and cease to cause movement. Molecular diffusion, which is random motion of individual molecules through the watery fluid which permeates even dense, essentially non-porous rock, becomes the primary mechanism causing upward vertical migration. EDS used an integrating method, taking into account lithologic differences for each foot of movement, to calculate vertical diffusion distance above the level reached by injectate during the operational period. The diffusion rate of cesium was used to maximize the predicted distance which waste constituents might migrate upward as a result of diffusion. The no migration demonstration assumed a source which remained at 100% concentration at the farthest extent of pressure-driven migration for 10,000 years. The distance which waste in hazardous concentration migrates is the distance at which concentration has been reduced to one one-trillionth (1:1,000,000,000,000) of the starting concentration. For constituents which are still toxic at concentrations of one in a trillion, the EPA will impose limits on starting concentrations in the injectate to ensure that no constituent will migrate beyond the resulting distance in hazardous concentrations. The EPA plans to modify the EDS UIC permits to incorporate these limits. These are very conservative assumptions. The true concentrations will be small fractions of 100% and diffusion rates for most hazardous molecules are very low. Diffusion results in movement over significant distances only because the time over which it operates is very long. For example, the distance of travel during the operational period includes both pressure-driven and diffusive transport; however, this value is within a foot of that calculated for pressure-driven transport alone. By using conservative assumptions such as this, the demonstration defines limits beyond which waste constituents, in hazardous concentrations, will not migrate.

The maximum vertical movement of the waste front during the post-operational period is 227 feet from the assumed starting point at 3,925 feet upward to 3,698 feet, 329 feet below the top of the injection zone. Therefore, the waste will be contained within the vertical limits of the permitted injection zone throughout the post-operational period. However, the top of the injection zone itself is inclined so that its depth decreases by about 1,050 feet at the farthest extent of the updip plume. Continuing in the same direction, the inclination reverses and the injection zone formations do not come to the surface.

B. Lateral Migration

The extent of migration within each zone depends on the product of porosity and thickness. As discussed above, the calculation of lateral migration assumed that one half of the waste is injected into a single 33-foot zone which has a porosity of 11%. This flow split was determined by matching simulation results with actual test results. The product of the thickness and the average permeability of a zone relative to other available zones determines the fraction of flow which the zone will accept. For spreading to extend farther in any zone, including portions of the 33-foot zone, other than in the 33-foot zone as a whole, the porosity would have to be less than the average porosity of the 33-foot zone, or the permeability would have to be higher. Sandstones with porosity less than 10% rarely have sufficient permeability to allow significant flow while permeability in ancient, well-lithified, sandstones is rarely as great as 400 md. Therefore, it is unlikely that such a zone exists within the injection interval, and assuming injection at one half of the maximum rate into this portion of the injection zone leads to conservative results.

Lateral migration of the waste plume during the operational period is driven almost exclusively by injection pressure. The rates of movement due to buoyancy and diffusion are negligible in comparison. If we assume 100% displacement of formation waters from a cylinder of rock 33 feet thick with an effective porosity of 11%, so that the liquid within the cylinder would be 100% waste and the liquid outside the cylinder would be 100% formation water, the plume edge would be 3,199 feet from a single well at the end of the 20-year simulation period.

This distance is increased as a result of a failure to displace 100% of native formation waters from the cylinder surrounding the wells. The effect of this failure and of diversion of waste from straight-line movement as a result of diversion around sand grains is called dispersion. The effects of dispersion can be calculated. EDS's demonstration used a reasonably conservative estimate of 300 feet for longitudinal dispersivity and 25% of that value, 75 feet, for transverse dispersivity.

In addition to considering the effects of injection by EDS, the demonstration also calculates the effects of injection at the proposed location of the permitted Sunoco Partners Marketing and Terminals, LLC (SPMT) injection well by displacing the plume 2,870 feet to the southwest. This assumption causes increases in the final distances of migration for most directions, with resulting decreases being small. This is generally a conservative assumption because the SPMT well may not be constructed. At the end of the projected 20-year operational period, the total distance from the center of the plume to the southwest edge of the plume, determined at the 10^{-12} concentration ratio (initial concentration/final concentration), is 19,677 feet. Therefore, the plume could extend more than 3½ miles southwest from the EDS wells at the end of the projected 20-year operational period. This distance is within the AOR. In all other directions, the distance would be less.

The simulation of plume-flow distance and direction during the post-operational period considered buoyancy and the natural flow within the Mt. Simon and Eau Claire Formations in addition to the movement which occurs during the operation of the wells. Buoyancy flow occurs because the strata into which waste will be injected dip slightly northwest into the Michigan Basin and the specific gravity of the injected waste will be different from that of the native water now filling the pores in the injection zone. Buoyancy resulting from either lighter waste being injected into a more dense native brine or a more dense waste being injected into a less dense natural formation water results in a substantial movement of the waste front. Because of the conservative assumptions concerning the specific gravity of the injected waste, the amount of movement due to the effects of buoyancy exceeds the movement which will actually occur. Movement of a waste plume caused by buoyancy differences, regional groundwater flow, or injection from a nearby well is calculated based on the effect on a volume of fluid near the center of the plume. This volume is called the centroid, and it is originally found near the wells. While this volume may move about nearly intact, the edges of the plume travel greater distances and the plume becomes diluted.

The direction of buoyancy flow is 42 degrees west of north (northwest) for a heavier waste and 166 degrees east of north (south southeast) for a lighter waste. The dip to the south southeast is 1.14 degrees, and the dip to the northwest is about 0.68 degrees. To be conservative, the greater angle of dip was used to calculate the distances in both directions. EDS assumed that 100% of the waste to be injected will be a brine with a specific gravity of 1.22

(the heaviest fluid which might be injected) when calculating the distance of flow down into the Basin. When calculating the distance of movement up-dip it assumed 100% of the waste will be methanol (the lightest fluid which might be injected) with a specific gravity of 0.88. Because the difference between the specific gravities of the native brine (1.153) and methanol is greater than the difference between that of a heavy waste, 1.22, and the native brine, the distance of movement due to buoyancy will be greater up-dip (to the south southeast). If we assume that the entire plume has the density of methanol, buoyancy might cause the centroid of the plume to move up dip a distance of 14,792 feet to the south southeast. If we assume that the plume is as dense as a heavy brine, buoyancy might cause the centroid of the plume to move 6,550 feet to the northwest.

Regional pressure gradients are very small. Calculations based on pressure measurements made at well #2–12 and at several other wells indicated that the rate of flow due to regional pressure gradients could be as high as 0.4 ft/year, possibly in a northeasterly direction. In 10,000 years, the effect of regional flow could result in an additional 4,000 feet of drift of the plume centroid plus associated dispersion. Because EPA wishes to use conservative assumptions, the 4,000 feet of possible movement due to regional flow was added to the total distance of the movement regardless of which direction it was calculated. The net up-dip movement of the plume centroid is calculated by adding the effects of each force individually as vectors. Vectors are directed line segments. A distance and direction of movement caused by each force is calculated. The result of each calculation is a vector. Then the vectors can be added, tail to head. The location of the final head represents the location of the centroid at the end of the process. Because the forces are acting simultaneously, rather than consecutively, the centroid does not follow the path of the vectors, but the end result is the same. In this case, vectors representing each distance and its direction were added, resulting in a total 20,672 feet of movement to the south southeast.

From that point, an analytical method was used to account for dispersive spread and to project plume movement to the health-based limits. For this calculation, the distance the center of the plume is displaced by regional flow (4,000 feet), the distance it is displaced by buoyancy (14,792 feet), and the distance it might be displaced by the proposed SPMT injection (2,870 feet), each acting alone, are added, for a total distance of 21,662 feet, and the dispersion is based on this distance. Dispersion will move the health-based limit 27,539 feet beyond the end of the undispersed plume edge. At this distance, all hazardous constituents will be below the health-based levels or detection limits. To calculate the total distance of movement in the up-dip direction, one should add the original radius of the plume (3,199 feet), the vector-summed distances which the centroid is displaced by regional flow, buoyancy, and injection through the SPMT well (20,672 feet), the distance added by dispersion (27,539 feet), and an additional 1,580 feet which SWIFT modeling indicates should be added to the results obtained using the analytical method. Based on these calculations, the maximum predicted lateral migration of waste at the EDS site is 52,990 feet (≈ 10 miles) in the up-dip, or south southeast, direction. The petition describes a similar process, resulting in a total distance of 36,158 feet, for movement in the down-dip direction.

The no migration demonstration addressed vertical and lateral waste movement as required in 40 CFR 148.20(a)(1)(i). The maximum vertical movement of the waste at the end of 10,000 years was conservatively estimated at 239 feet above the top of the injection interval located at 3,937 feet. At the site of the injection wells, the waste will remain 3,298 feet below the lowermost USDW, which is located at depths of less than 400 feet. The maximum predicted lateral waste plume movement within the injection interval was approximately 10 miles in the up-dip or south-southeasterly direction. The maximum predicted lateral waste plume movement in the down-dip or northwesterly direction was 6.85 miles from the injection wells. The nearest point of discharge to a USDW is over two hundred miles away. EDS's demonstration has shown that the hydrogeological and geochemical conditions at the site and the physiochemical nature of the waste stream(s) are such that reliable predictions can be made that fluid movement conditions are such that the injected fluids will not migrate within 10,000 years (A) vertically upward out of the injection zone; or (B) laterally within the injection zone to a point of discharge or interface with a USDW.

Well Construction and Integrity

The EDS wells were constructed using four strings of steel casing for each well. As the wells were drilled, increasingly smaller diameter casings were placed in the well and cemented to the surface. The first cemented casings are 20 inches (in well #1–12) and 16 inches (in well #2–12) in diameter and were set at 119 feet and 177 feet, respectively, to stabilize the well bores through the unconsolidated glacial drift. The second strings of casing are 13⅜ inches in diameter and were set at 396 and 598 feet, respectively, to prevent loss of drilling fluid into cavernous zones in the shallow bedrock. The third strings of casing were designed to add another layer of protection through the USDWs, and to establish a separation of the annulus behind the long string casing from the USDWs. These casings are 9⅝ inches in diameter and were set at 824 and 1,444 feet, respectively. The final casing was set from the surface to within the top of the formations which will be used as the waste reservoir. These casings are 7 inches in diameter and were set at 4,080 and 3,983 feet, respectively. The space around each of the casings was sealed with cement from the base of the casing to the surface. Cementing eliminates potential avenues for either the injected fluid or fluid from other, shallower zones to flow outside the casings and into USDWs.

EDS will inject the waste through a tubing set on a packer just above the end of the casing and isolated from the casing by a fluid-filled annulus, which will be continuously monitored for pressure change. The monitoring system is designed to trigger alarms and shut off injection before the injection pressure exceeds the maximum permitted levels, or if the difference between the injection and annulus pressures falls below the minimum permitted level.

Thus, the integrity of the construction will be monitored constantly by measuring the pressure within the annulus between the casings and tubing, and tracking the amounts of liquid added to or removed from the annulus system. Even a small leak should be detected. More rigorous annual testing ensures that even very small leaks are discovered. The pressure in the annulus will be maintained at a higher level than the pressures in either the formations outside the casing or within the injection tubing. Therefore, even if a leak in the tubing occurs, the waste will not leak into the annulus. Instead, annulus fluid will leak into the injection tubing through which waste would be injected and be carried downward into the waste disposal reservoir. If there is a casing leak, annulus fluid, not waste, will leak into the formations surrounding the well.

As described above, the construction provides for a replaceable tubing and a

system to detect when replacement of the tubing is necessary. The tubing prevents the waste from contacting all except the lowermost few tens of feet of casing, which are made of a corrosion resistant alloy. The three casing strings and layers of cement through the fresh water-bearing formations provide extra protection from contamination.

The UIC program regulates injection pressure, injection rate, waste properties, and the concentration of hazardous constituents to ensure, among other things, that the actual conditions under which injection occurs are less likely to cause increased migration of hazardous constituents than those proposed and simulated. The injection pressure is important because injection pressure drives fluid movement through both the reservoir rock and the overlying confining rock. Because the confining rock is usually less than one one-thousandth as permeable as reservoir rock, the distance of vertical movement through the confining rock is less than one one-thousandth as great as the horizontal movement through the reservoir rock. If excessive, the injection pressure can fracture the reservoir rock and, at higher pressures, the confining rock. EDS conducted tests during well construction to measure the resistance of the rock of the injection and confining zones to fracturing. These tests showed that injecting at pressures below 903 psi measured at the surface will not create fractures in the injection zone. The EPA plans to modify EDS's UIC permits to limit the injection pressure at the surface to 903 psi. The current permits limit injection pressure to 521 psi.

The mechanical integrity of the wells has been demonstrated several times, most recently on November 13, 2003. Well No. 1–12 recorded a pressure drop from 1,081.06 to 1,077.48 psi, a total of 3.6 psi, in one hour and Well No. 2–12 recorded a pressure change from 1,045.39 to 1,025.43 psi, a total of 19.95 psi in one hour. The failure criterion for the test is a pressure change greater than 3% in one hour. For these wells, a 3% change in an original pressures of 1,050 psi would be 31.5 psi. Therefore, EDS has demonstrated that there are no leaks in the casing, tubing, or packer in either well. The reason for pressure drop in this case is that the pressure in the annulus had been maintained at about 250 psi. Increasing the pressure to the test level causes the fiberglass tubing to slowly contract. As the tubing contracts, the annulus space is enlarged and pressure decreases. The radioactive tracer surveys required under 40 CFR 148.20(a)(2)(4) were conducted on June 20, 2003. EPA found no evidence to indicate upward movement of the radioactive tracer.

Absence of Known Transmissive Faults

As discussed below, the AOR around the EDS wells has a radius of more than six miles centered at the point midway between the two wells at the Citrin Drive site. The regulations at 40 CFR 148.20(b) require a showing that the strata which will confine fluid movement above the injection interval are free of known transmissive faults or fractures. There are no known transmissive faults in the Glenwood, Trempealeau, and Franconia Formations, the strata within the injection zone that will confine fluid movement within the AOR. During construction of the wells, a geophysical tool which produces images of the walls of the well bore was used to search for fractures. The few fractures which were detected appear to be sealed with mineral deposits. Moreover, the interference test conducted on June 12–15, 2002, indicates that there are no transmissive fractures cutting the injection interval within a distance of 800 feet of either well. That test, which evaluates an area outlined by two contiguous squares of equal size centered on the wells, supported the conclusion, based on log review, that there are no transmissive fractures cutting the well bores.

Seismic Activity

An analysis of seismic risk occurring at the EDS facility is presented in section III.D of the no migration petition. The potential for seismic activity which might affect the injection wells was also considered by the EPA prior to approving EDS's UIC permits in accordance with 40 CFR 146.62(b)(1). Michigan is an area of low seismic risk. The EPA reviewed information from the National Earthquake Information Center (NEIC) in Boulder, Colorado regarding earthquakes in the area of the injection wells. The NEIC reported that the nearest earthquake was 41 kilometers, about 25 miles, away and occurred in 1980. Two other earthquakes have occurred within 100 km, about 61 miles, of the wells. Moreover, the steel casings of deep injection and production wells are more flexible and resilient than the rock through which they pass. As a result, they are not damaged as a result of earthquakes unless actually sheared as a result of movement along a fault which they penetrate. Because Midwestern earthquakes are widely scattered, with none reported in the immediate vicinity of the EDS location, there is almost no possibility of damage as a result of seismic activity.

As discussed above, no faults cutting the well bores were identified. Thus, there is a reasonable degree of certainty that the wells' casings will not be sheared. The EPA additionally notes that the well will be continuously monitored throughout the operational life under the UIC permit. Among other things, annual mechanical integrity tests are required to demonstrate the mechanical integrity of the casing, tubing and packer. Other mechanical integrity tests are used at five-year intervals to demonstrate there is no significant fluid movement into a USDW through vertical channels adjacent to the injection well bore.

Where critically oriented faults exist near injection wells, pore pressure increases may induce seismic activity. Injection-induced earthquakes cease as soon as the pore pressure declines below a critical level. Because the Mt. Simon in this area is porous and permeable, the pressure drop would occur within a few days. Therefore, if the EDS wells were to induce any earthquakes, such earthquakes could be stopped simply by stopping injection.

In regard to ground water contamination, EDS has met the no migration standard of 40 CFR 148.20(a)(1)(i). The no migration demonstration shows that there will be little upward migration of hazardous materials if there are no conduits for flow. There are many layers of rock in the salt-bearing formation between the injection zone and the USDWs which deform under pressure to fill all voids. Any conduit which is not artificially protected from closure in such a zone will be closed by this deformation. This minimizes the potential for any conduit to penetrate the Salina Group, located between 766 feet and 2,002 feet below ground surface.

Area of Review (AOR)

Under 40 CFR 146.63, the AOR of Class I hazardous waste wells is minimally a two-mile radius around the well bore or a larger area specified by the EPA based on the calculated zone of endangering influence of the well. The zone of endangering influence is the area within which the pressure induced in the injection interval as a result of injection can raise a column of formation fluid or injected fluid sufficiently to cause contamination of a USDW. 40 CFR 148.20(a)(2) requires a petition to demonstrate that the injection well's AOR complies with the substantive requirements of 40 CFR 146.63. The petitioner used refined parameter values and more conservative

assumptions agreed upon with EPA reviewers to determine a new and larger AOR radius under 40 CFR 146.63. The petitioner considered the measured pressure in the injection zone, a pressure in the lowermost USDW consistent with the level of Lake Erie, and the density of the brine found in the injection zone to find that an additional pressure of 89.6 psi in the injection zone is sufficient to cause flow.

Analytical models were also used to simulate the maximum pressure buildup in the injection interval. When calculated using reasonably conservative values for geological parameters representative of actual conditions, the zone of endangering influence for the EDS injection wells has a radius of 23,275 feet, or 4.4 miles from the center of the line between the two wells. However, because this did not represent a worst-case scenario, EDS used more conservative values and calculated an enlarged zone of endangering influence which, at the end of the twenty-year operational period, reaches 32,280 feet, or 6.1 miles, from the center of the line connecting the two wells. EDS showed that there are no USDWs in the injection zone within this distance. The EPA determined that this 6.1 mile area was sufficiently conservative because most of the values used to calculate this distance are less favorable than those which actually exist. Nor are there any natural or man-made features which might allow increased vertical movement out of the injection zone. Considering injection at a single point is appropriate because the distance between the wells is small in relation to the radius of the AOR and the sparsity of wells which reach the confining zone in the region. Although the density of the brine is greater than the density of many potential wastes which might be injected, it is appropriate to use the brine density because injected waste will not reach the limits of the AOR during the operational period.

Wells in the Area of Review

Under 40 CFR 148.20(a)(2)(ii), a petitioner must locate, identify, and ascertain the condition of all wells within the injection well's AOR that penetrate the injection zone or the confining zone. EDS conducted a well search over the larger zone of endangering influence consistent with the requirements of 40 CFR 148.20(a)(2)(ii) and 146.64, and identified two wells penetrating the confining zone and/or injection zone. As discussed below, both of these wells have been properly plugged, completed and/or abandoned, so no corrective action is required under 40 CFR 148.20(a)(iii) and 146.64.

The McClure Oil Co. Fritsch *et al.* #1 is located about 4.5 miles south of the EDS site. That well was drilled to a depth of 2,885 feet in 1955 and then plugged with heavy mud with a bridge which is firmly fixed in place 1,750 feet from the surface to provide a seal within the well bore. The plugging was approved on July 21, 1955, by the Michigan Department of Conservation. This well has been properly abandoned, and there is no potential for fluids to move through the well to the USDWs. Moreover, the maximum depth of this well is almost 800 feet above the reach of the predicted upward migration of waste from the EDS well.

The second well, well #1–20, was drilled by EDS in 1993 at a site which was to be used for the facility under review. This well, which was properly completed pursuant to an EPA UIC permit, penetrates the entire injection zone. The lower portion of the well has been plugged using a cast iron bridge plug above the injection zone with 50 feet of cement on top of the bridge plug. This meets Region 5's standards for plugging wells within the AOR, and will prevent the well's casing from serving as a conduit for the movement of fluids from the injection zone. Moreover, on January 12, 1999, EDS entered into a Stipulation and Consent Agreement with the Michigan Department of Environmental Quality (MDEQ). This agreement authorizes EDS #1–20 to remain inactive and not be considered abandoned, so long as all applicable requirements are met, until 30 days after EDS's receipt of all MDEQ approvals for the Citrin Drive facility. The agreement requires EDS to permanently plug and abandon the well within that 30-day period. When the well is abandoned, the EPA UIC permit for well #1–20 requires that the well must be properly plugged and abandoned under a plan approved by the EPA. Well #1–20 is properly completed, is not abandoned, and will be permanently plugged and abandoned pursuant to the UIC requirements.

Injection Well Proposed for Construction

It is possible that SPMT will drill at least one injection well for the injection of non-hazardous salt brine about 2,800 feet northeast of the nearer EDS well. Both the EPA and the MDEQ have issued permits for the construction of this proposed well. Any injection wells which SPMT drills will be constructed to standards approved by Region 5 for the protection of USDWs and the construction will be overseen by Region 5's contract inspectors.

Operation of the EDS Wells

The EPA also considered EDS's operation of two wells at Citrin Drive. Because the EDS wells are closed in at the surface when not operating and no liquid can enter from the bottom of the well bore, wastes will not be pushed into an idle well. As required by 40 CFR 146.68, the EDS UIC permits require continuous monitoring of the injection rate and injection pressure. In addition, the operator must maintain a positive pressure differential within the tubing-casing annulus in respect to the injection tubing pressure and this annulus pressure must be continuously monitored. The UIC permits also require automatic alarms designed to sound before pressures, flow rates, or other parameters exceed permitted values. The continuous monitoring of the injection wells occurs whether or not the well is operating. EDS is currently in compliance with its permits and all applicable requirements of the UIC program.

Because no wells penetrating the confining zone or injection zone are improperly plugged, completed, or abandoned, a corrective action plan is not required under 40 CFR 146.64 and 148.20(a)(2)(iii).

Consideration of MDEQ Permit for an Extraction Well

The only changes in circumstance that have occurred since the EPA issued its Notice of Intent that might affect the determination are the issuance by the State of Michigan of an extraction well permit to SPMT on May 29, 2003, allowing SPMT to extract brine from several formations, including the Mt. Simon Formation, within ½ mile of the EDS wells subject to certain conditions; and the subsequent State litigation and direction on that permit. The EPA has reviewed and considered that permit and comments on that permit, and has decided that issuance of such a permit should not bar granting of the exemption. Based on the evidence in the record, the EPA finds that neither the permit nor the drilling of such a well will affect EDS's demonstration. It is the operation of an extraction well drilled into the injection zone within the plume of hazardous waste that would be problematic. Based on the current record, EPA can make a reliable prediction that the proposed extraction well, if ever drilled, would not be drilled and operated in formations that form the injection zone of the EDS injection wells. The State permit, as qualified by the State circuit court, requires an investigation and evaluation of the brine recovery capacity of the

Lockport Dolomite and further approval before an extraction well can be drilled to the depth of the confining or injection zone. An extraction well drilled and operated in the shallower Lockport Dolomite would not impact EDS's demonstration. The EPA, however, has decided to retain the condition proposed in its Notice of Intent that would terminate the exemption if an extraction well is both drilled and operated within the injection zone in the area of review. Under current conditions, EDS's demonstration meets the criteria at 40 CFR 148.20.

SPMT's description of its proposed use of the brine extracted from the Mt. Simon has been sketchy. By letter dated March 28, 2003, SPMT indicates that SPMT can support a multi-year 1 million barrel cavern expansion effort utilizing only a single injection well with a target rate below 200 gpm and that in subsequent years, SPMT can operate the expanded cavern system with brine injection and production rates below 200 gpm and that the rates can be achieved at injection pressures below the fracture point of the formation. The May 29, 2003 State permit requires SPMT to obtain approval of a plan to test the Lockport Formation for brine production between the approximate depths of 2,120 and 2,140 feet prior to commencing to drill the well. Under the permit, the plan must specify the methods, materials, and procedures used to test the Lockport Formation; identify criteria for determining whether to continue the test at various key points; and establish the criteria for determining if the Lockport Formation is suitable for commercial brine production. In the November 19, 2003 proceedings before the Circuit Court of Ingham County on the May 29, 2003 State permit, the court made it clear that SPMT has to complete its testing and obtain the court's approval before it can drill below the Lockport Formation. Moreover, the State's November 20, 2003 approval of SPMT's plan to test the Niagara Group (the Lockport Formation) for brine concludes that if the step-rate injectivity test shows the well capable of receiving brine at a rate of at least 175 gallons per minute, SPMT will complete the well in the Niagara Group interval and utilize it for both brine supply and injection, and will not drill to or utilize the Munising Group or Mt. Simon formation for these purposes. The plan submitted to the State on behalf of SPMT for evaluating the Niagran indicates that brine production is possible from the White Niagran, and references the Michigan Mineral Resource supply well production of 135 gpm from 3 porosity stringers which have a maximum of 28% porosity. On May 16, 2003, EDS sent EPA the results of an analysis of the native Mt. Simon Formation water which indicates that the Mt. Simon has a salt saturation level of approximately 60% and the White Niagaran would be a better choice for balancing in salt caverns utilized for liquid petroleum gas (LPG) storage.

Furthermore, injection by EDS would make SPMT's brine extraction proposal impractical. The May 29, 2003 State permit also provides that if SPMT's extraction well is completed in one or more Cambrian geologic horizons below 3,900 feet and EDS begins hazardous waste disposal at its Citrin Drive facility, SPMT must immediately begin a program of testing the produced brine for specific chemical components present in the EDS wastes or a marker compound approved by MDEQ for injection with the EDS wastes, conduct testing every 15 days, and manage all produced brine as a hazardous waste until results of the required testing demonstrate to MDEQ's satisfaction that it is not hazardous waste. EPA has a reasonable degree of certainty that SPMT will not extract if EDS injects hazardous waste. It is SPMT's extraction that will draw up injected wastes; SPMT noted in its October 6, 2003 comments that injected hazardous waste would render the brine unsuitable for production; and extraction after EDS injects will require SPMT to comply with expensive requirements under its State permit. If SPMT has to treat their extracted brine as hazardous they will have to pay increased costs for handling the brine pursuant to hazardous waste requirements. In addition, if the brine actually is hazardous, SPMT would not be able to place it back on the land without an exemption from or treatment to LDR levels, much less use it for cavern expansion. Since EDS will be injecting listed hazardous waste, the presence of any of the waste in the extracted brine would render the brine subject to regulation as a hazardous waste under the contained in principle (unless SPMT were to obtain a contained out determination). As such, it would have to be treated to LDR levels and, even after such treatment, would remain a listed hazardous waste. This raises the question of whether SPMT would be able to use the material for the intended commercial purposes—essentially a question of whether any use would be viewed as legitimate or sham recycling. Hence, in addition to the increased costs to SPMT, the extraction of brine from the Mount Simon formation following injection of hazardous waste by EDS would engender significant regulatory complexities, which might bar SPMT's intended use of the brine. Indeed, in proceedings before the Circuit Court of Ingham County on June 16, 2003, the State indicated that SPMT would be prohibited from pumping out because they would, in fact, be creating a situation where there was hazardous waste, that they would be a hazardous waste generator at that point in time, so they would probably be the entity that would be required to shut down. While SPMT noted that the permit does not explicitly say that they have to shut down, it admitted that it does not want to become a party that is in the business of generating hazardous waste, and that the permit says that would be the effect. (Transcript of 6/16/03 proceedings at pp. 17–18) Moreover, if SPMT ever does extract, the Agency might consider taking appropriate action to address such extraction.

The State permit, as qualified by the State circuit court, requires an investigation and evaluation of the brine recovery capacity of the Lockport Dolomite and further approval before an extraction well can be drilled to the depth of the confining or injection zone. The State's approval of SPMT's plan to evaluate the brine capacity of the Lockport formation specifies that if the step-rate injectivity test shows the well capable of receiving brine at a rate of at least 175 gallons per minute, SPMT cannot drill into the Mt. Simon, and the plan suggests that the Lockport has the capacity for brine production. Under the terms of the State permit and as admitted by SPMT, injection by EDS will make extraction from the injection zone impracticable for SPMT. An extraction well drilled and operated in the shallower Lockport Dolomite would not impact EDS's demonstration. The EPA, however, has decided to retain and clarify the condition proposed in its Notice of Intent to terminate the exemption if an extraction well is drilled within the AOR into the injection zone, penetrated by well #2–12 at a depth of 3,369 feet, and is used for extraction from any strata within the injection zone. Under current conditions, EDS's demonstration meets the criteria at 40 CFR 148.20.

Comments

The EPA received several hundred comments on this petition. The EPA offered an extended public comment period between December 6, 2002, and May 16, 2003, holding two public hearings; and took additional public comment until October 6, 2003, on the

May 29, 2003 extraction well permit issued by MDEQ to SPMT. The EPA also considered some comments that previously had been submitted during the public comment period for the SPMT injection wells in relation to the EDS wells. The EPA has also taken into consideration more recent State court limitations and other developments on the May 29, 2003 State extraction well permit.

Comments submitted raised concerns about hazardous waste management in Romulus; the potential for harm from waste injection; the land ban process; local ordinances; modeling and simulation; the EPA's review of the no migration demonstration; the geological basis for the modeling; geological concerns; the method of simulation; the results of simulation; the well search within the AOR; the quality assurance project plan; the results of the EPA's review; the extent of the effects of injection by EDS; seismic events; other injection well operations; well construction; waste disposal operations; alternative waste management options; the State of Michigan's role; EDS and its funding; the EPA's decision making process; politics; community concerns; Canadian waste; civil rights; Michigan waste management capacity; the effects of EDS's operations on business and property; public opinion; environmental justice; and the State permit to SPMT for an extraction well. A number of comments pertained to issues outside the scope of the determination on the exemption, and the EPA stressed that this is a determination on an exemption from the RCRA LDR for deep well injection under 40 CFR part 148, subpart C. The granting of an exemption from the LDR for EDS's injection does not preclude other permits, licenses, approvals or requirements that might govern activities at the site or in the area. It is limited to granting an exemption from the LDR for restricted waste for this method of land disposal. Moreover, the regulations require specific showings and do not consider such factors as community acceptance, politics, violations history, if any, and above-ground transportation. Some of the comments related to issues such as the State construction permit and civil rights which belong in a different forum. The EPA has prepared a response to comments, which can be viewed at the following URL: *www.epa.gov/region5/water/uic/pubpdf/eds_rtc.pdf.* In its response, the EPA discusses underground injection, the geology of the site, its search for transmissive faults, the construction of the wells consistent with 40 CFR part 146 requirements, its review of wells in the area, its inquiry into other underground injection well sites and releases near those locations, its decision-making process and the factors it considered, the modeling, the use of buffers, the EPA's authorities under the Statutes, the land disposal prohibition with its exemptions, the quality assurance project plan, and the permit issued by MDEQ to SPMT for an extraction well in the area.

After considering comments, the State extraction well permit and its litigation, and current conditions, the EPA has determined that its reasons for granting the exemption as set forth in the Notice of Intent remain valid. Accordingly, the exemption is issued with specific conditions listed in this notice. As discussed above, EPA has prepared a response to comments, which can be viewed on its website.

EPA Review

The injection zone for the EDS disposal operation consists of 1,099 feet of reservoir and overlying arresting strata including the upper Precambrian rocks at the base and the Mt. Simon, Eau Claire, Franconia-Dresbach, Trempealeau, Glenwood, and lower Black River Formations from 3,369 to 4,468 feet below the surface where penetrated by EDS's well No. 2–12. As required by 40 CFR 148.20(b), EDS has delineated an arrestment zone within the injection zone consisting of the Trempealeau, Glenwood, and Black River Formations between 3,369 and 3,937 feet below the surface which will confine fluid movement above the injection interval. EDS has presented evidence that these strata are free of known transmissive faults or fractures, and the EPA's investigations found no evidence of known transmissive faults or fractures affecting these strata. EDS has shown that there is a confining zone overlying the injection zone. As required by 40 CFR 148.20(a)(2)(i), EDS calculated an AOR extending 32,280 feet from the center of a line connecting the two wells based on measurements of hydrogeological properties at the site and meeting the substantive requirements of 40 CFR 146.63. As required by 40 CFR 148.20(a)(2)(ii), EDS has located, identified, and ascertained the conditions of all wells within the injection wells' AOR that penetrate the injection zone or the confining zone by use of a protocol acceptable to the Director and meeting the substantive requirements of 40 CFR 146.64. As required by 40 CFR 148.20(a)(2)(iii), EDS has submitted the results of pressure and radioactive tracer tests performed within one year prior to submission of the petition demonstrating the mechanical integrity of the well's long string casing, injection tube, annular seal, and bottom hole cement.

After reviewing the petition and other information in the record, and considering public comments, the EPA determined that EDS has shown that the hydrogeological and geochemical conditions at the site and the physiochemical nature of the waste streams are such that reliable predictions can be made that fluid movement conditions are such that the injected fluids will not migrate within 10,000 years: (A) vertically upward out of the injection zone; or (B) laterally within the injection zone to a point of discharge or interface with a USDW pursuant to 40 CFR 148.20(a)(1)(i); and has met the other applicable requirements of 40 CFR part 148, subpart C.

Changes to Conditions of the Exemption

In response to public comments noting that the State and UIC permits do not allow injection of wastes with the codes D001 and D003, the EPA is removing wastes carrying the hazardous waste codes D001 and D003 from the list of wastes approved for possible injection by EDS. This makes the limitations under the petition decision identical to those of the permits. Accordingly, this exemption allows injection of wastes bearing the following RCRA waste codes:

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The method of calculating the average injection rate has been changed as described in condition #3 below. The Notice of Intent proposed a 7,275,780 gallon limit on the volume of wastes injected in any month. Condition 3 imposes a limit of a lifetime average of 166 gallons per minute. This condition was changed because the petitioner commented that the demonstration was based on an assumption that the injection rate through the first 20 years of the life of the wells will not exceed 166 gallons per minute, and requested that the condition be made consistent with the no migration demonstration.

Additionally, the example of a circumstance under condition 7 in which EDS would be required to submit a new demonstration of no migration has been modified for clarity and elevated to become condition #9, in light of the May 29, 2003, extraction well permit MDEQ issued to SPMT.

Conditions

This exemption is issued subject to the following conditions: (1) The permitted injection zone must be comprised of the Precambrian, Mt. Simon and Eau Claire, Franconia-Dresbach, Trempealeau, and Glenwood Formations from 3,369 to 4,550 feet below the surface; (2) Injection shall occur only into that part of the Franconia-Dresbach, Eau Claire, Mt. Simon, and Precambrian Formations which is more than 3,900 feet and less than 4,550 feet, true vertical depths, below the surface; (3) The volume of wastes injected through both wells at the site must not exceed an average of 166 gallons per minute. This average rate will be calculated at the end of each month based on the cumulative injected volume, the total number of months elapsed since initiation of injection through either well, and the number of minutes in an average month (30.44 days/month × 1440 minutes/day); (4) Maximum concentrations of chemical contaminants which are hazardous at less than one part in a trillion (1:1,000,000,000,000) shall have limits for maximum concentration at the well head set through the permits; (5) The injection pressure at the well head shall be limited to fracture opening pressure at the casing shoe. Tests during construction of well #2–12 determined that the fracture opening pressure while injecting waste of the highest density to

be allowed is 903 psi (gauge) at the well head; (6) The petitioner shall fully comply with all requirements set forth in Underground Injection Control Permits #MI–163–1W–C007 and #MI–163–1W–C008 issued by the EPA; (7) This exemption is granted only while the underlying assumptions are valid; (8) The exemption will become invalid 20 years after injection commences. EDS must halt operations at that time unless Region 5 has approved a new, valid demonstration of no migration from the injection zone. (9) In the event that a brine extraction well is drilled within the AOR into the injection zone, penetrated by well #2–12 at a depth of 3,369 feet, and is used for extraction from any strata within the injection zone, the exemption will terminate. In order to resume injection, EDS must prepare a new demonstration of no migration including consideration of the extraction activity, and a new exemption must be issued by the EPA. Operation must be in full compliance with all conditions of its permits and other conditions relating to the exemption found in 40 CFR 148.23 and 148.24.

Dated: March 16, 2004.

Jo Lynn Traub,

Director, Water Division.

[FR Doc. 04–6697 Filed 3–24–04; 8:45 am]

BILLING CODE 6560–50–P

FEDERAL COMMUNICATIONS COMMISSION

Notice of Public Information Collection(s) Being Reviewed by the Federal Communications Commission for Extension Under Delegated Authority

March 16, 2004.

SUMMARY: The Federal Communications Commission, as part of its continuing effort to reduce paperwork burden invites the general public and other Federal agencies to take this opportunity to comment on the following information collection(s), as required by the Paperwork Reduction Act (PRA) of 1995, Public Law 104–13. An agency may not conduct or sponsor a collection of information unless it displays a currently valid control number. No person shall be subject to any penalty for failing to comply with a collection of information subject to the Paperwork Reduction Act (PRA) that does not display a valid control number. Comments are requested concerning (a) whether the proposed collection of information is necessary for the proper performance of the functions of the Commission, including whether the information shall have practical utility; (b) the accuracy of the Commission's burden estimate; (c) ways to enhance the quality, utility and clarity of the information collected; and (d) ways to minimize the burden of the collection of information on the respondents, including the use of automated collection techniques or other forms of information technology.

DATES: Written Paperwork Reduction (PRA) comments should be submitted on or before May 24, 2004. If you anticipate that you will be submitting comments, but find it difficult to do so within the period of time allowed by this notice, you should advise the contact listed below as soon as possible.

ADDRESSES: Direct all Paperwork Reduction Act (PRA) comments to Judith B. Herman, Federal Communications Commission, Room 1–C804, 445 12th Street, SW., Washington, DC 20554 or via the Internet to *Judith-B.Herman@fcc.gov*.

FOR FURTHER INFORMATION CONTACT: For additional information or copies of the information collection(s), contact Judith B. Herman at 202–418–0214 or via the Internet at *Judith-B.Herman@fcc.gov*.

SUPPLEMENTARY INFORMATION:

OMB Control Number: 3060–0977.

Title: Procedures for Reviewing Requests for Relief From State and Local Regulations Pursuant to Section 332(c)(7)(B)(v) of the Communications Act of 1934.

Form No.: N/A.

Type of Review: Extension of a currently approved collection.

Respondents: Business or other for-profit, not-for-profit institutions, and State, local or tribal government.

Number of Respondents: 10.

Estimated Time per Response: .50 hours.

Frequency of Response: Third party disclosure requirement.

Total Annual Burden: 5 hours.

Total Annual Cost: N/A.

Needs and Uses: On November 17, 2000, the FCC released a Report and Order in WT Docket No. 97–192 regarding its review of requests for relief from impermissible State and local regulation of personal wireless service facilities based on the environmental effects of radio-frequency emissions. The Report and Order amends Note 1 to paragraph (a) of 47 CFR 1.1206 of the Commission's rules so that the expanded service requirements set forth in that note apply to petitions filed pursuant 47 U.S.C. 332(c)(7)(B)(v). The service requirement instructs petitioners to serve a copy of such petitions on those State and local governments that are subject of the petitions, as well as those State and local governments otherwise specifically identified in the petitions whose actions petitioners argue are inconsistent with Federal law.

Federal Communications Commission.

Marlene H. Dortch,

Secretary.

[FR Doc. 04–6721 Filed 3–24–04; 8:45 am]

BILLING CODE 6712–01–P

FEDERAL ELECTION COMMISSION

Sunshine Act Meeting

DATE AND TIME: Tuesday, March 30, 2004 at 10 a.m.

PLACE: 999 E Street, NW., Washington, DC.

STATUS: This meeting will be closed to the public.

ITEMS TO BE DISCUSSED:

Compliance matters pursuant to 2 U.S.C. 437g.

Audits conducted pursuant to 2 U.S.C. 437g, 438(b), and Title 26, U.S.C.

Matters concerning participation in civil actions or proceedings or arbitration.

Internal personnel rules and procedures or matters affecting a particular employee.

DATE AND TIME: Thursday, April 1, 2004 at 10 a.m.

PLACE: 999 E Street, NW., Washington, DC, (Ninth Floor).

STATUS: This meeting will be open to the public.

ITEMS TO BE DISCUSSED:

Correction and Approval of Minutes.

Legislative Recommendations 2004.

Draft Advisory Opinion 2004–07: Viacom/MTV by counsel, Elizabeth Kingsley.

Draft Advisory Opinion 2004–08: American Sugar Cane League by counsel, Paul G. Borron, III.

Draft Advisory Opinion 2004–09: Green-Rainbow Party by Grace Ross and David Ebony Allen Barkley, Co-Chairs.

Notice of Proposed Rulemaking on Inaugural Committees.

Notice of Proposed Rulemaking on Contributions and Donations by Minors.

Routine Administrative Matters.

PERSON TO CONTACT FOR INFORMATION: Robert W. Biersack, Acting Press Officer, Telephone: (202) 694–1220.

Mary W. Dove,

Secretary of the Commission.

[FR Doc. 04–6866 Filed 3–23–04; 3:01 pm]

BILLING CODE 6715–01–M