SOUTHWEST RESEARCH AND INFORMATION CENTER
P.O. Box 4524 Albuquerque, NM 87196 505-262-1862 FAX: 505-262-1864 www.sric.org

May 20, 2013

Trais Kliphuis
New Mexico Environment Department
2095 Rodeo Park Drive, Building 1
Santa Fe, NM 87505

RE: WIPP Class 3 Permit Modification Requests – Panel Closure System, Repository Reconfiguration, and VOC Monitoring Program Revisions

Dear Trais,

Southwest Research and Information Center (SRIC) provides the following comments on the package of Class 3 permit modification requests that was submitted by the permittees on March 18, 2013, according to their public notice. The three requests are:
1: Modification to the WIPP Panel Closure;
2: Repository Reconfiguration of Panels 9 and 10
3: Revise Volatile Organic Compound (VOC) Target Analyte List and Other Changes to the VOC Monitoring Program

SRIC appreciates that the permittees provided a draft of the proposed requests and that representatives of the permittees as well as NMED met with SRIC and other citizen group representatives on December 18, 2012. SRIC continues to believe that such pre-submittal meetings are useful and supports continuing that "standard" practice in the future. SRIC also notes that there were some changes made in the modification request after the pre-submittal meeting, although some changes suggested by SRIC were not incorporated into the request.

Request for Public Hearings and Negotiations

For the reasons that follow, SRIC requests public hearings on each of the three class 3 modification requests. Further, and prior to any notice of public hearing, pursuant to 20.4.1.901. A.4 NMAC and NMED practice regarding past class 3 modifications and permit renewal hearings, SRIC requests that NMED, the Permittees, SRIC, and other parties conduct negotiations to attempt to resolve issues, including whether negotiations and hearings should be combined or separated on different schedules. SRIC believes that other parties and NMED would agree with some of the concerns and objections raised in the following comments and that a draft permit could be developed prior to the public hearing(s) that would contain many provisions for which there is general agreement. Such a draft permit could simplify the hearings and reduce the resources required of NMED, SRIC, the permittees, and other parties.

1. Modification to the WIPP Panel Closure

As NMED and the Permittees are aware, the Panel Closure System (PCS) is required by the WIPP Permit and the Environmental Protection Agency (EPA) Certification for WIPP. SRIC believes that complete information about the PCS should be provided for the Class 3 modification and for the EPA forthcoming rulemaking regarding PCS.

Consequently, SRIC is disappointed that the Class 3 modification request is incomplete. SRIC requests that NMED issue a Notice of Deficiency so that additional information is provided prior to the issuance of a draft permit and notice of public hearing and so that additional public comment can occur.

Matters that require additional information include the following:

A. Performance of bulkheads in comparison with explosion-isolation wall(s).

In panels 1, 2, and 5, the 12-foot explosion-isolation wall has been emplaced and is called the "existing concrete block wall" in the modification request. For panels 3, 4, 6, and subsequent panels, the Permittees propose to use a bulkhead, instead of the 12-foot explosion-isolation wall. But the request provides no detailed technical analysis of the performance of the existing explosion-isolation walls in three panels and no detailed technical analysis of the performance of the bulkheads in panels 3 and 4. Such an analysis should be provided, including the amounts of volatile organic compounds (VOCs) measured in each of those panels in comparison with the amounts of VOCs contained in wastes in each panel. The analysis should include quantitative data as well as qualitative and engineering analysis of the comparative performance of the explosion-isolation walls and bulkheads.

A comparative analysis also should be provided regarding the projected performance of two explosion-isolation walls in each panel, as compared with one explosion-isolation wall and the proposed bulkhead in panels 1, 2, and 5, and no explosion-isolation wall and the proposed bulkheads in panels 3, 4, 6, and subsequent panels.

Those analyses have not been provided and are necessary for an adequate analysis of the performance of the proposed PCS.

SRIC requests that in a response to a Notice of Deficiency or other method that the permittees provide their model(s) and the results, including sensitivity analysis, and comparative analysis of the performance of explosion-isolation walls and bulkheads in each of the configurations that they could be installed in the panels.

B. Performance of run-of-mine salt.

The modification request provides the following rationale for proposing 100 feet of run-of-mine salt.

> A minimum length of 100 feet for the run-of-mine salt was selected based on engineering judgment that a backfill length that is 7 to 10 times the panel entry height would provide adequate flow resistance. The panel entry height is nominally 13 feet; therefore, 7 to 10 times this height corresponds to approximately 90 to 130 feet. A nominal distance of 100 feet was chosen to meet this guideline. at 2.

However, the references on page 11 include no documentation of that "engineering judgment," including whether more than 100 feet of salt would be more protective. The references in proposed Appendix G1 also apparently do not include such documentation. SRIC requests that in response to a Notice of Deficiency or other method that the permittees provide their documentation of such engineering judgment, including which engineers provided it, based on what experience in WIPP and other salt mines, what other lengths were considered, what other materials were considered. The Permittees also should provide information regarding whether other engineers were consulted and what judgment they provided.

The modification request further describes that run-of-mine salt does not provide a complete seal between the closed panel and WIPP drifts that would continue to be used for operations. Indeed, the request states that a gap will exist between the roof and the salt.

> Initially, numerical modeling predicts that the settling rate of the emplaced run-of-mine salt will exceed the salt convergence rate of the drift. This will result in the formation of a gap between the roof of the drift and the run-of-mine salt. This gap is expected to form within the first two years of installation. Subsequently, closure of the gap and compression and consolidation of the run-of-mine salt occurs. Id.

The references on page 11 do not include a description of or the results of any modeling. The proposed Appendix G1 states that model FLAC3D was used. The references to that Appendix include:

> Itasca Consulting Group, Inc., 2006, *FLAC3D User's Guide*, Itasca Consulting Group, Inc., Minneapolis, Minnesota.

But that document is not included in the request and is not found on the WIPP website. Nor is any documentation provided of the full modeling results.

Moreover, the modeling is used, rather than actual analysis of run-of-mine salt, because many of the parameters are highly uncertain. For example, average void fraction of run-of-mine salt, fractional density changes with time, consolidation rates of emplaced salt and the insitu rock, VOC concentrations and movement through the ROM salt including through the air gap that will be formed but is assumed to close in 23 years are all parameters that the permittees apparently do not have actual values or even a range of values. Of course, the quantity of VOCs expected at any time also is highly uncertain.

Any modeling should include the range of plausible values for each parameter and sensitivity analysis. In addition, the worst possible scenario(s) also should be analyzed, including a roof collapse.

SRIC requests that in a response to a Notice of Deficiency or other method that the permittees provide their model(s) and the results. The Permittees should also provide information as to why the gap would only be along the roof and could not also be along the sides or the floor. The Permittees should provide documentation regarding what measures have been considered to emplace salt in such a way so as to minimize the gap(s). The Permittees also should provide information regarding their consideration of whether other materials could be added that would

reduce the gap(s) or the amount of VOC emissions. The permittees also should provide all actual data on run-of-mine salt and provide the results of use of adequate model(s) with a range of parameter values, including VOC concentrations. The permittees also should provide analyses of the worst possible scenarios and their impacts and mitigation alternatives.

C. Maintenance of bulkheads and Explosion-Isolation walls.
The request states:

> Some minimal maintenance of the outer accessible bulkhead will be required to ensure that it provides the necessary air flow resistance during the time period that the gap is closing. This minimal maintenance may consist of reinforcing and replacement of components (i.e., flexible flashing) or it may consist of installation of a new bulkhead in front of the previous bulkhead. The inner barrier (i.e., either the in-bye bulkhead or block wall) which is not accessible after construction of the WPC, is not credited with any air flow resistance because the effective life of the inner barrier is less than the duration of the gap. Refer to the revised Permit Attachment G1 in Appendix B of this modification for a more thorough discussion of the WPC and associated gap formation and closure. Id.

Attachment G1 lists various references, some of which may relate to maintenance. But none of the documents are provided, nor does the request include detailed information about the maintenance required for bulkheads, explosion-isolation walls or other possible materials for panel closure.

SRIC requests that in a response to a Notice of Deficiency or other method that the permittees provide all references and detailed information about maintenance of existing bulkheads and explosion-isolation walls and projected maintenance requirements, along with maintenance requirements for other possible materials, for the duration of the PCS in their model(s) and the results.

D. Estimated cost savings of the proposed PCS.
The request states:

> As part of the redesign process, comparable cost estimates were prepared by the Permittees for Option D (October 7, 2002 Permit Modification Request: Closure Plan Amendment). The cost for Option D was estimated to be approximately three times the cost for the explosion-isolation wall. The construction cost for the two explosion-isolation walls installed into Panel 5 in 2011 was $1.44 million. at 6.

The request includes no documentation for those costs. In addition, the request includes no cost estimates for:

1) run-of-mine salt and bulkhead in panels 1, 2, and 5 that have explosion-isolation walls,
2) two bulkheads and run-of-mine salt in panels 3 and 4,
3) two bulkheads and run-of-mine salt in panels 6-8,
4) two bulkheads and run-of-mine salt in panels 9 and 10,

5) a second explosion-isolation wall in panels 1, 2, and 5, and
6) two explosion-isolation walls in remaining panels.

SRIC requests that in a response to a Notice of Deficiency or other method that the permittees provide detailed cost and schedule information for at least the six options described above and for any other viable alternatives.

E. Changes in some PCS performance standards.
The modification request states:

> These changes do not reduce the ability of the Permittees to provide continued protection of human health and the environment. at 1.

However, the request includes several proposed changes in the panel closure design requirements in Permit Attachment G, Section G-1e(1). Those changes include the requirements that the PCS "shall limit the migration of VOCs to the compliance point," "shall perform under a postulated methane explosion," and "shall address the most severe ground conditions." Each of those changes reduces the stringency and protectiveness of the PCS performance standards.

For example,

> The PCS cannot, of and by itself, achieve compliance with VOC standards since the PCS will not be able to mitigate VOC migration from the active panel at any point in time. at 7.

> The requirement was changed to require the PCS to address the expected ground conditions instead of the most severe ground conditions expected since the WPC does not interact with the DRZ as the Option D design does and the numerical modeling predicts that the DRZ would consolidate along with the run-of-mine salt. at 8.

The request admits that the proposed PCS would not limit VOC migration to the same levels as those of the existing PCS. Further, the requirement to meet "expected ground conditions" is considerably less stringent than meeting "the most severe ground conditions." Thus, the reasonable conclusion is that the PCS would provide less protection of human health and the environment. The permittees have not provided a rationale for that lower level of protection, so those changes should not be approved. Moreover, the permittees have not included a detailed description of the worst possible release scenario(s) and how the proposed PCS system would perform in such circumstances.

SRIC requests that in a response to a Notice of Deficiency or other method that the permittees provide detailed information regarding what are considered the worst possible release scenario(s) and how the proposed PCS and alternative PCSs would perform for each scenario. All models and results must be provided, along with the assumptions and uncertainties, and sensitivity analysis.

F. Revisions in VOC monitoring.
The request would eliminate the requirement in Section 4.6.1.2 that "Permittees shall also submit at that time an annual certification by a registered professional engineer certifying the stability of any explosion-isolation walls." That requirement is necessary until the PCS is installed in any panels that includes such walls. Thus, the deletion should not be allowed until such certification is no longer possible.

G. Revisions to Table G-1.
The request would change operations start, operations end, and closure start dates for panels 6-10. The reasons for the changes are not provided. Some of the change dates do not coincide with the changes proposed for Table G-1 in the repository reconfiguration request.

SRIC requests that in a response to a Notice of Deficiency or other method that the permittees provide the basis for the proposed changes, the assumptions used to estimate the schedule, and the range of dates that the activities might occur under other plausible schedules.

2. Modification for repository reconfiguration of panels 9 and 10.
The permittees decided some time ago that they would propose the repository reconfiguration so that they would not use panels 9 and 10, but would instead propose two new panels. EPA also must approve repository reconfiguration. Thus, SRIC is disappointed that the Class 3 modification request is incomplete. SRIC requests that NMED issue a Notice of Deficiency so that additional information is provided prior to the issuance of a draft permit and notice of public hearing and so that additional public comment can occur.

Matters that require additional information include the following:
A. The need for the modification.
Regulatory requirements provide that the request explain why the modification is needed. 40 CFR §270.42(c)(1)(iii).

The request acknowledges the requirement and states that the modification is needed for two reasons:

> 1. Based on geomechanical considerations, it has been determined that locating new disposal Panels 9A and 10A south of the existing panels is geotechnically more advantageous than the location previously proposed for Panels 9 and 10, as discussed below.
> 2. Changes to the ventilation and underground traffic descriptions are required to support the panel reconfiguration to provide adequate separation of traffic and ventilation air during waste management activities. at 2.

However, another reason that the modification is needed is because the permittees have managed the facility during the past 14+ years in a way as to not provide enough actual capacity for 6.2 million cubic feet (175,564 cubic meters) of defense transuranic waste. That maximum capacity is set by the WIPP Land Withdrawal Act. (LWA, PL 102-579, Section 7(a)(3)). However, that limit is not a mandate to emplace that amount of waste, rather it is an absolute ceiling on the volume of waste.

The original WIPP design was for the waste to be emplaced in 8 panels of seven rooms each. However, in the first five panels, a total of 75,775 cubic meters of contact-handled (CH) waste and 411 cubic meters of remote-handled (RH) waste have been emplaced. If panels 6, 7, and 8 were filled to the permitted capacity, the total amount of waste emplaced would be 132,025 cubic meters of CH waste and 2,245 cubic meters of RH waste. Those amounts are less than 80 percent of the CH limit and less than one-third of the RH limit. See Chart 1.

Thus, the need for additional panels that are not currently permitted is to allow the permittees to emplace a larger amount of waste than could be be in 8 panels. But this issue is not included in the modification request, which is incomplete.

B. The capacity of Panels 9 and 10.
The capacities of Panels 9 and 10 have never been included in the WIPP Permit. The capacities of the 8 permitted panels are provided in the permit, along with the actual capacities of each panel when it is closed. Table 4.1.1. The permittees have never proposed a capacity limit for Panels 9 and 10. Those panels would have a significantly different configuration that Panels 1-8. Panels 9 and 10 also could have a significantly different capacity than the other 8 panels. The permittees should have included in the request the capacity of panels 9 and 10 and a description and analysis of how that capacity was determined.

SRIC requests that in a response to a Notice of Deficiency or other method that the permittees provide the estimated capacity for CH and RH waste in panels 9 and 10 and the basis for those calculations.

If the capacity of Panels 9 and 10 is less than the proposed Panels 9A and 10A, that additional capacity is another need for the request, even though it is not discussed.

C. A complete geotechnical description of the proposed locations of Panels 9A and 10A.
The request states that one reason for the modification is the "geomechanical considerations" that make the reconfiguration "geotechnically more advantageous." But a detailed description about the geotechnical aspects of the locations proposed two panels is not provided.

For example, results of borehole and probe holes surrounding Panels 4 and 5 are not provided. Further, moving panels closer to the southern boundary would result in waste emplacement closer to existing oil wells on the southern boundary of WIPP. Figure 1. That figure is as of September 1, 2007 and additional wells have been drilled in the vicinity of the WIPP site during the past 5+ years. The permittees should provide a current description and map of existing wells. Extending the panels further south will bring waste rooms closer to those wells. The permittees should provide an analysis of the impacts of drilling or other activities during the proposed almost 20 years of the continuing operation.

SRIC requests that in a response to a Notice of Deficiency or other method that the permittees provide the geophysical analyses and reports for the area surrounding Panels 4 and 5, including any features that could impact the performance of the two proposed panels. Further, the permittees should provide the location of oil and gas wells and other activities in proximity to

Panels 9A and 10A and analysis of how those activities could impact the performance of the panels.

D. The timing of approval of Panels 9A and 10A.
The request states:

> Current anticipated schedules indicate that Panel 9A would be needed for operations in September 2020. Mining the access drifts (tunnels) south of S-3650 is planned to begin in calendar year 2016. Mining must be integrated with the schedule to perform final closure of Panels 1 through 6 and waste operations in Panels 7 and 8. Therefore, submittal of this modification at this time provides the Permittees sufficient time to process this change through the Class 3 process and, once approved, alter the underground long-term mining plan to assure the smooth integration of mining and waste emplacement activities and to provide the resources and manpower to complete the mining and outfitting in an efficient and timely manner. at 4.

The proposed revised Table G-1shows that Panel 8 would operate until May 2021. That date is after the current permit expires in December 2020. According to that proposed table, operations in Panel 10A would not start until May 2024, which is more than three years after the current permit term. Thus, the request does not provide an adequate bais for approval of the two new panels at this time.

Moreover, all of those panel operational dates should be considered unreliable based on past and current schedules. For example, proposed Table G-1 shows the operations end date for the current Panel 6 will be extended by 13 months, until February 2014. The proposed end date for Panel 7 would be extended by 2 years and 8 months, until September 2017. Such revised, and extended, dates for operations of panels have been a continuing reality with WIPP. For example, in the "Monster Mod" (Section 311) permit approved on November 23, 2005, Panel 6 operations were expected to end in February 2011. Table I-1. The proposed Table G-1 has that date extended by three years. In that 2005 permit modification, Panel 8 operations were to end by January 2014, at which time Panel 9 operations were to have started. Id. However, in the proposed Table G-1, Panel 8 operations would end in May 2021, or more than 7 years later than in the 2005 modification.

SRIC requests that in a response to a Notice of Deficiency or other method that the permittees provide the basis for the proposed changes to Table G-1, the assumptions used to estimate the schedule, and the range of dates that the activities might occur under other plausible schedules.

The request states that approval would allow the permittees to:

> ...alter the underground long-term mining plan to assure the smooth integration of mining and waste emplacement activities and to provide the resources and manpower to complete the mining and outfitting in an efficient and timely manner. at 4.

The request includes no details about how the integration would work or any description of how changes in the schedule would impact "mining and emplacement activities." Nor does the request include any details about the "resources and manpower" needed. Nor does the request include any details about the "efficient and timely" mining and outfitting of Panels 9 and 10 or 9A and 10A.

SRIC requests that in a response to a Notice of Deficiency or other method that the permittees provide the long-term mining plan and associated information regarding emplacement activities and the assumptions used in the plan, the range of dates that the activities might occur under other plausible schedules, and the details of mining and outfitting Panels 9 and 10 and Panels 9A and 10A.

SRIC considers that it is unlikely that Panel 9A would be needed until well after the second WIPP permit renewal application, so that there is no need to act now. At a minimum, the technical basis for the proposed dates should be provided. Thus, the request to "authorize disposal" in Panels 9A and 10A is premature, at best.

Clearly, this modification request does not need to be considered at the same time as the PCS request. The EPA process will follow the PCS rulemaking. SRIC requests that the panel reconfiguration modification request be considered subsequent to the PCS process, which would better allow SRIC and other members of the public to participate in the separate processes.

3. Modification to Revise Volatile Organic Compound (VOC) Target Analyte List and Other Changes to the VOC Monitoring Program.

As the permittees and NMED are aware, revising the VOC target analyte list was included in the permit renewal application and approval. Dramatically changing sampling and chemical analysis for VOCs was the subject of a class 2 modification, submitted by permittees on December 12, 2012, and approved by NMED on March 13, 2013.

Consequently, SRIC is disappointed that the Class 3 modification request proposes so many additional changes to VOC monitoring and that the request is incomplete. SRIC objects to so many additional changes in the piecemeal way that the permittees have submitted them. SRIC also objects to having to fully consider another class 3 request along with the other two that are part of this package. Consequently, adequate time has not been provided for full analysis of the request. Additional public comment time is needed, either by extending the comment period on this request for another 60 days, or providing additional public comment after the permittees' responses to a Notice of Deficiency is available to the public.

SRIC provides initial comments and requests to assist NMED's issuance of a Notice of Deficiency so that additional information is provided prior to the issuance of a draft permit and notice of public hearing and so that additional public comment can occur.

Matters that require additional information include the following:

A. The need for the modification.

Regulatory requirements provide that the request explain why the modification is needed. 40 CFR §270.42(c)(1)(iii). The request provides two overall reasons that the requested changes are needed:

> This change is the result of the EPA evaluation of risk associated with the inhalation of VOCs and changes in the risk factors associated with these VOCs. Second, the Permittees have identified numerous improvements to the VOC monitoring program based on technological advances in VOC monitoring and experience with the program over the last 13 years of operation. at 4.

The first reason is not new, nor does it require a modification now. The EPA IRIS database has not been updated for the target analytes in the past two years. Thus, that reason does not provide a basis to update the target analytes that was not present when the Permit was renewed in 2010 and to do so at this time.

The second reason has not been demonstrated by data regarding actual VOC exposures. No such complete exposure data are provided in the request. Instead, the effect of the proposed changes is to reduce the levels of protection to human health and the environment.

Such reduced levels of protection have not been justified. In fact, levels of VOCs emissions, especially carbon tetrachloride, have been higher than were expected at the time of the WIPP permit. Thus, the source term and modeling were inadequate to accurately estimate the actual emission levels in the underground. As a result, underground workers have received higher exposures than estimated. Yet the data regarding such actual exposures have not been included in the request. Table 10 of the request includes data of maximum VOC detection values in Panels 3, 4, and 6 for the first six months of 2012, and detection values for Panel 5 for the last six months of 2011. Further, no data are provided as to VOC levels from closed Panel 4, related to the operations of the Granulated Activated Carbon system, including highest levels behind ventilation barriers, where workers apparently received higher levels of exposure than at Station A.

SRIC requests that in a response to a Notice of Deficiency or other method that the permittees provide the actual data of maximum VOC detection values in Panels 3, 4, 5, and 6 from the time of initiation of monitoring in each panel until at least December 31, 2012. The detection levels should be compared with maximum exposure levels of underground workers and maximum exposure levels to surface workers. Those actual exposure levels also must be compared to modeling results.

B. Actual data of health effects from disposal rooms and panels.
The request includes no information about health effects to underground workers or surface workers from the exposures received. Such data are necessary to assist in the evaluation of the effectiveness of the existing VOC monitoring program. The projected health effects to workers from the proposed changed program should be provided and compared with the existing program.

SRIC requests that in a response to a Notice of Deficiency or other method that the permittees provide an evaluation of the effectiveness of the existing VOC monitoring program and a comparison with the projected health effects to underground and surface workers from the proposed revised program.

C. Comparison of actual worker activities to the hypothetical workers in modeling.
The request states:

> Two additional exposure scenarios that hypothetically occur within the WIPP site boundary are also evaluated in this appendix. One additional scenario is that of a worker who works on site 1,920 hours/year (EF = 1,920 hours/year), for 10 years (ED = 10 years, AT = 613,200 hours) on the surface near the exhaust shaft. The 1920 hours are the hours for an employee after removing vacations and holidays. This is conservative since workers spend approximately ten percent of their time off site at training, travel, and meetings. The ten year exposure duration represents normal turnover in employees. at 20.

No data are provided as to the actual time workers spend in comparison to those estimates. No data are provided as to the actual turnover rate in employees. Such actual data should be provided and compared with the hypothetical workers to determine how well the exposure scenarios correspond to actual worker experience and where they are conservative.

SRIC requests that in a response to a Notice of Deficiency or other method that the permittees provide the actual data regarding worker experience, including amount of time that underground and surface worker have exposures and actual turnover rates. Other parameters and scenarios involved in modeling should be compared with actual worker data and sensitivity analysis should be included.

D. The use of the 10^{-5} risk level.
In the request, the permittees presume that the 10^{-5} risk level is appropriate. But the request does not demonstrate that level is adequately protective of public health and the environment.

Scientific and health data clearly show that a risk level of 10^{-6} is more protective of public health and is a reasonable and achievable risk level. Given the multiple carcinogens that are used at the generator sites and are in WIPP wastes, a risk level of 10^{-6} should be used.

There is substantial support for this risk level in federal agency practice. For example, in both cancer and non-cancer assessments, the EPA has defined 1 in 1,000,000 excess risk as a *de minimis* risk level (Caldwell et al. 1998; Clean Air Act Amendments 1990; Fiori and Meyerhoff 2002; U.S. EPA 1991; Castorina and Woodruff 2003).[1]

---

[1] See, Caldwell J, Woodruff T, Morello-Frosch R, Axelrad D. 1998. *Application of hazard identification information for pollutants modeled in EPA's Cumulative Exposure Project*, Toxicol Ind Health 14(3):429–454. Castorina R, Woodruff TJ., *Assessment of potential risk levels associated with U.S. Environmental Protection Agency reference values*, Environ Health Perspect. 2003 Aug;111(10):1318-25; Fiori JM, Meyerhoff RD. 2002. *Extending the threshold of regulation concept: de minimis limits for carcinogens and mutagens*. Regul Toxicol Pharmacol 35(2 pt 1):209–216.

For non-cancer risks such as birth defects, respiratory disease, and organ toxicity, EPA presumes that there is a threshold below which there is a negligible risk of adverse health effects from a lifetime of environmental exposure. The risk estimate is called the oral reference doses (RfDs) and inhalation reference concentrations (RfCs) (U.S. EPA. 1999. Integrated Risk Information Service (IRIS) Glossary of IRIS Terms. Available: http://www.epa.gov/iris/gloss8.htm).

For cancer assessments, it is generally accepted that there is no known "safe" level, or threshold level of exposure to the vast majority of cancer-causing agents. That is, the only "safe" exposure is no exposure. The approach the EPA uses to quantify the risk associated with a given level of exposure is to develop a dose-response curve, where the default assumption is that the slope of the curve is linear unless substantial data can demonstrate otherwise.

Unfortunately, SRIC also notes that EPA's standard assessment approach often underestimates risk to children and other susceptible populations. Children's health and risks associated with in utero, perinatal, or childhood exposures have been identified as critical public health issues. Simply adjusting for differences in dose between children and adults based largely on body weight or size is not adequate for protecting children from environmental cancer risks. Exposures to hazardous agents during early life stages may lead to long-term and even permanent damage, such as possibly increasing risks for later developing cancers. It is for these reasons that EPA issued its *Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens*, which outlines the specific susceptibilities and preferable approaches for preventing exposure to carcinogens during early life (U.S. EPA. *Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens*, U.S. Environmental Protection Agency, Washington, DC, EPA/630/R-03/003F, 2005).

Further, synergistic effects of exposure to multiple compounds simultaneously are not known. The lack of data on such synergistic effects further supports the need for conservativism in risk levels.

At a minimum, SRIC requests that in a response to a Notice of Deficiency or other method that the permittees provide their health-based basis for use of the 10^{-5} risk level. In addition, the permittees should provide an analysis of what the values would be used in Table 4.4.1, Table 4.6.2.3, and Table 4.6.3.2 if a 10^{-6} risk level were used.

E. The updated source term.
The request states:

> In order to calculate the source term, the average concentration of each VOC had to be weighted for each WMCG and then summed. A new weighting factor for each WMCG was determined using the scaled contact-handled (**CH**) TRU waste inventory used in the 2004 Compliance Recertification Application [footnoted omitted]. Updated weighting factors are shown in Table 1. at 6.

That waste inventory is years out of date. WIPP is required to provide annual inventories, the latest of which (2012) should be used.

SRIC requests that in a response to a Notice of Deficiency or other method that the permittees provide a revised Table 1, based on the most current waste inventory. Other calculations and proposed related revisions to other tables should also be provided.

F. The proposed change in non-adjacent room sampling.
The request states:

> Only samples in closed rooms adjacent to active TRU waste disposal rooms can trigger actions related to mitigating VOC emissions in accordance with the requirements in Permit Part 4. Additional samples in rooms that are closed and non-adjacent may be useful to understanding VOC emissions; however, they need not be mandatory. at 27.

The purpose of VOC sampling and monitoring is protection of public health and the environment. As such, sampling and data "useful to understanding VOC emissions" is directly relevant and necessary to the overall monitoring program. As previously noted, VOC emissions have been higher than expected in the underground air sampling, posing risks to underground and surface workers. Data that helps understand those VOC emissions is necessary and should not be eliminated based on the permittees inadequate justification.

SRIC requests that in a response to a Notice of Deficiency or other method that the permittees provide specific justification for how VOC emissions from non-adjacent rooms will be determined if sampling in such rooms is eliminated and how elimination of such sampling improves understanding of VOC emissions.

G. The proposed changed sampling and analysis methods.
The request states:

> Experience has shown that during a typical work day at the WIPP facility, the VOC concentrations at Station VOC-A will be affected by ventilation changes throughout the repository. These changes may be the result of moving bulkheads, realigning flow rates, power failures, or simply propping doors open to ventilate areas to allow work to proceed. Twenty-four hour samples at Station VOC-A are less likely to be affected by these changes than shorter-duration samples. Hence, the Permittees believe the 24-hour samples may remove some of the variability that is observed in the VOC results and result in more representative predictors of chronic exposure. at 29.

The proposed change to 24-hour samples is another example of being less protective for workers by not including exposures on a typical work schedule, which is how exposures actually occur. The permittees have provided no information about the exposure levels detected in the six-hour sampling compared with 24-hour sampling data. Such data should be provided along with an analysis to show that the 24-hour sampling provides more conservative results of actual worker exposures.

SRIC requests that in a response to a Notice of Deficiency or other method that the permittees provide actual data of six-hour and 24-hour sampling in the WIPP underground, including

comparison of the range of exposure amounts. The permittees should provide justification as to why the 24-hour sampling always provides more conservative results than six-hour sampling.

Clearly, this modification request does not need to be considered at the same time as the PCS request. SRIC requests that the VOC target analyte list and monitoring program modification request be considered subsequent to the PCS process, which would better allow SRIC and other members of the public to participate in the separate processes.

Thank you very much for your careful consideration of, and your response to, these and all other comments.

Sincerely,

Don Hancock

cc: John Kieling

WIPP PERMITTED VS. ACTUAL CAPACITY					Chart 1			
(in cubic meters)								
	CH-Permitted	Actual	% Used	RH-Permitted	Actual	% Used		
Panel 1	18,000	10,500	58.33%	0				
Panel 2	18,000	17,998	99.99%	0				
Panel 3	18,750	17,092	91.16%	0				
Panel 4	18,750	14,258	76.04%	356	176	49.44%		
Panel 5	18,750	15,927	84.94%	445	235	52.81%		
Panel 6	18,750			534				
Panel 7	18,750			650				
Panel 8	18,750			650				
Panel 9*	*18,750*			*650*				
Panel 10*	*18,750*			*650*				
Totals	186,000	75,775	40.74%	3,935	411	10.44%		
Panels 1-5	92,250	75,775	82.14%	801	411	51.31%		
Panels 1-8**	148,500	132,025	88.91%	2,635	2,245	85.20%		
Legal Capacity	168,485		78.36%	7,079		31.71%		
Panels 9-10***		169,525	100.62%		3,545	50.08%		
Notes: *Panels 9 and 10 expected capacities. ** If Panels 6-8 are filled to capacity.								
***Total capacity if Panels 9 and 10 filled to expected capacities.								
"CH" is Contact-Handled waste; "RH" is Remote-Handled								
"Permitted" refers to the limits in the New Mexico WIPP permit								
Compiled by: Don Hancock, Southwest Research and Information Center; 505/262-1862; sricdon@earthlink.net								

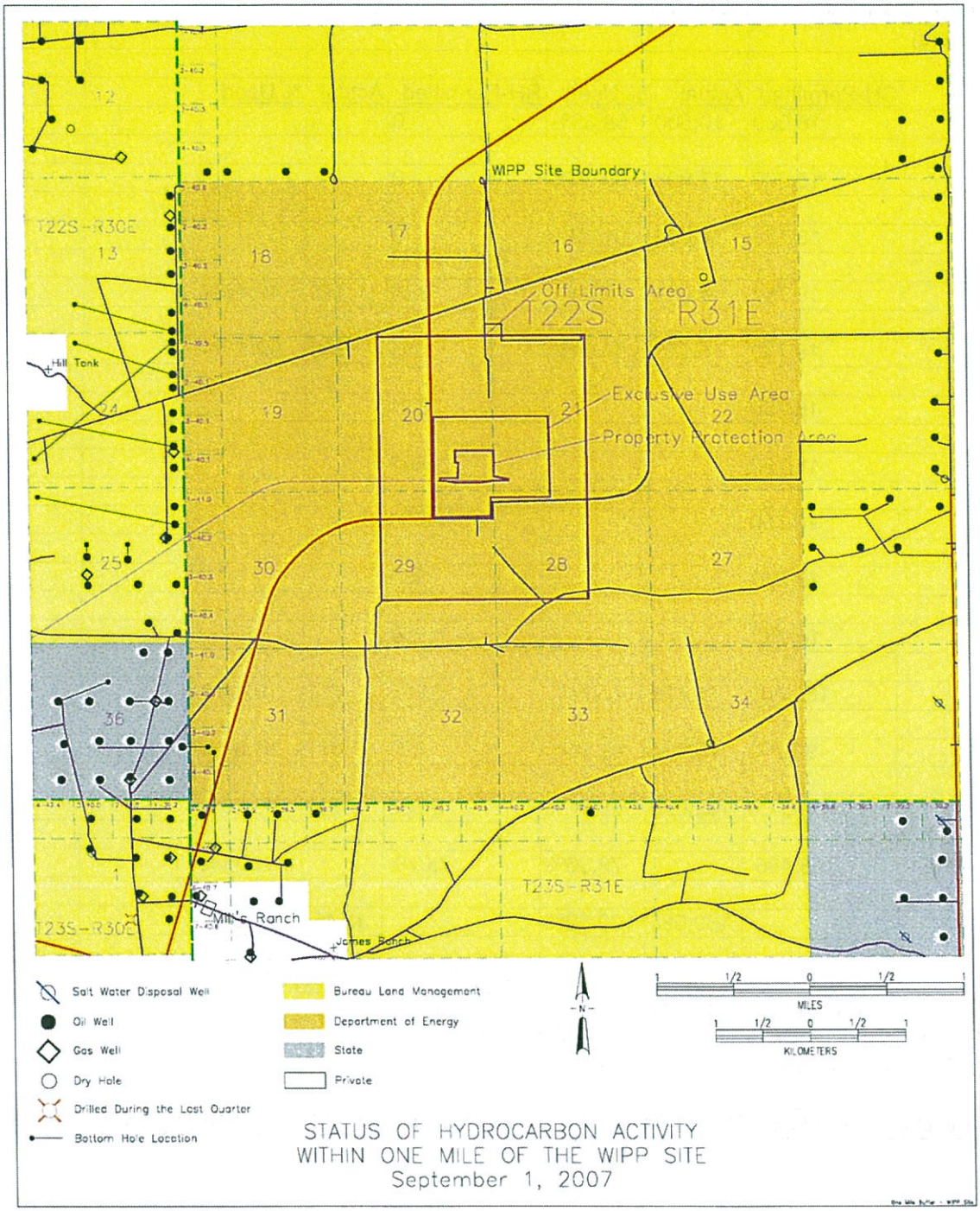

FIGURE 3
Oil and Gas Wells Within One Mile of the WIPP Site