Attachment N		
Section	**Change**	**Explanation of Change**
Section Title	~~**CONFIRMATORY**~~ **VOLATILE ORGANIC COMPOUND MONITORING PLAN**	Change reflects addition of room-based VOC monitoring.
Table of Contents	Numerous Changes	Change reflects addition of room-based VOC monitoring.
List of Tables	Numerous Changes	Change reflects addition of room-based VOC monitoring.
List of Figures	Numerous Changes	Change reflects addition of room-based VOC monitoring.
Acronyms & Abbreviations	Numerous Changes	Delete units which are no longer used. Delete units add new acronyms for VOC.
N-1 Introduction	~~**CONFIRMATORY**~~ **VOLATILE ORGANIC COMPOUND MONITORING PLAN** This Permit Attachment describes the ~~confirmatory~~ monitoring plan for volatile organic compound (**VOC**) emissions from mixed waste that may be entrained in the exhaust air from the U.S. Department of Energy (**DOE**) Waste Isolation Pilot Plant (**WIPP**) Underground Hazardous Waste Disposal Units (**HWDUs**) during the disposal phase at the facility. The purpose of ~~the confirmatory~~ VOC monitoring is to assure compliance with ~~confirm that the concentrations of VOCs in the emissions from the Underground HWDUs do not exceed~~ the VOC ~~room-based~~ limits specified in Permit Module IV. This VOC monitoring plan consists of two components as follows: (1) Confirmatory VOC Monitoring which assesses compliance with the environmental performance standards in Table IV.F.2.c; and (2) Disposal Room VOC Monitoring which assesses compliance with the disposal room performance standards in Table IV.D.1. Implementation of this plan ensures compliance with the disposal room performance standards as directed by Section 311 of Public Law (P.L.)108-137 and Section 310 of Public Law 108-447. This plan ...	Change reflects addition of room-based VOC monitoring, and clarifies the distinction between the confirmatory and room-based VOC monitoring programs. Change provides the statuatory basis for the addition to the VOC program.
N-1a	... As defined for this Permit, an Underground HWDU is a single excavated panel consisting of seven rooms and two access drifts designated for disposal of contact-handled (**CH**) and remote-handled (**RH**) transuranic (**TRU**) mixed waste. ... This plan addresses the follwoing elements:	Change reflects addition of room-based VOC monitoring, and addition of RH TRU mixed waste. Part of this includes the establishment of action levels that replace the actions that are mandated in the HWFP to close rooms should the average concentration in containers in a disposal room exceed the room based limits based on HSGSA results.

	1. Rationale for the design of the monitoring program, based on: • Possible pathways from WIPP during the active life of the facility • Demonstrating compliance with the disposal room performance standards by monitoring VOCs in underground disposal rooms • ... 2. Descriptions of the ... • ... • Action levels for remedial action if limits are approached The results of baseline VOC monitoring at WIPP were used, in part, to define the VOC monitoring program ~~confirmatory monitoring program that will be established for the Disposal Phase, during which full-scale waste emplacement activities will occur~~. ... The technical basis for Disposal Room VOC Monitoring is discussed in detail in the Technical Evaluation Report for Room-Based VOC Monitoring (WRES, 2003).	This change also references the technical report that presented room-based VOC monitoring data for Panel 1.
N-1b	N-1b Objectives of the ~~Confirmatory~~ Volatile Organic Compound Monitoring Plan The CH and RH TRU mixed waste disposed in the WIPP Underground HWDUs contain VOCs which could be released from ~~open and closed panels located at~~ WIPP during the disposal phase of the project. This plan describes how~~.~~: ~~-~~• VOCs released from waste panels will be monitored to confirm that the annual average concentration of VOCs in the air emissions from the Underground HWDUs do not exceed the VOC concentrations of concern (**COC**) identified in Permit Module IV, Table IV.F.2.c~~listed in Table N-2~~ Appropriate remedial action specified in Permit Condition IV.F.2.d.will be taken if limits are reached. • VOCs released from waste containers in disposal rooms will be monitored to confirm that the concentration of VOCs in the air of closed and active rooms in active panels do not exceed the disposal room performance standards in Permit Module IV, Table IV.D.1. Remedial action, as specified in Permit Condition IV.F.2.g will be taken if the Action Levels in Permit Module IV, Table IV.F.2.g are reached.~~.~~	Change reflects addition of room-based VOC monitoring, and addition of RH TRU mixed waste. Table N-2 is deleted. This table is redundant to the table in Module IV. Cross referencing to Module IV is used instead of repeating the table.
N-2	The target VOCs for ~~this sampling plan~~ confirmatory monitoring (Station VOC-A and VOC-B) and	Change clarifies the distinction between confirmatory VOC monitoring (i.e,

	room-based monitoring will be as ~~follows:~~ presented in Table N-1. These target VOCs were selected becuase together ... air emissions. ~~Physical and chemical data for these target VOCs for confirmatory are monitoring are presented in Table N-1.~~	stations VOC-A and VOC-B), and the room-based VOC monitoring. Adds Table N-1 as the list of target analytes and methods
N-3	... ~~Available s~~Sampling equipment includes the WIPP VOC canister samplers for both the Confirmatory and Disposal Room Monitoring Programs.~~-~~	Change clarifies the distinction between confirmatory VOC monitoring (i.e, stations VOC-A and VOC-B), and the room-based VOC monitoring.
N-3a	Air samples will be collected in the underground to quantify airborne VOC concentrations as described in the following sections.	Change states the overall purpose of VOC monitoring.
N-3a(1)	N-3a(1) Sampling Locations for Confirmatory VOC Monitoring	Change divides Section N-3a into two parts to clarify the distinction between confirmatory VOC monitoring (i.e, stations VOC-A and VOC-B), and the room-based VOC monitoring.
N-3a(2)	N-3a(2) Sampling Locations for Disposal Room VOC Monitoring For the purposes of compliance with the Section 311 of Public Law 108-137 and Section 310 of Public Law 108-447, the VOC monitoring of airborne VOCs in underground disposal rooms in which waste has been emplaced will be performed as follows: • A sample head will be installed inside the active disposal room behind the exhaust drift bulkhead in the active disposal room. (Figure N-3 and N-4) • TRU mixed waste will be emplaced in the active disposal room. • When the active disposal room is filled, another sample head will be installed to the inlet of the filled active disposal room. (Figure N-3 and N-4) • The exhaust drift bulkhead will be removed and re-installed in the next disposal room so disposal activities may proceed. • A ventilation barrier will be installed where the bulkhead was located in the active disposal room's exhaust drift. Another ventilation barrier will be installed in the active disposal	Change explains the legal driver for room-based VOC monitoring, and provides HWFP conditions with regard to the sample locations for room-based VOC monitoring, as sequenced with room filling.

	room's air inlet drift, thereby closing that active disposal room. • Monitoring of VOCs will continue in the now closed disposal room. Monitoring of VOCs will occur in the active disposal room and all closed disposal rooms In which waste has been emplaced until commencement of panel closure activities (i.e., completion of installation of ventilation barriers in Room 1). This sequence for installing sample locations will proceed in the remaining disposal rooms until the inlet air ventilation barrier is installed in disposal room one. An inlet sampler will not be installed in disposal room one because disposal room sampling proceeds to the next panel.	
N-3b	The nine VOCs that have been identified for confirmatory and room-based monitoring are listed in Table N-1. The analysis will focus on routine detection and quantification of these compounds in collected samples. ~~Other compounds may also be present in the samples.~~ As part of the analytical evaluations, the presence of other compounds will be investigated. ~~The analytical method will allow semiquantative evaluation of these compounds as tentatively identifiaced compounds.~~ The analytical laboratory will be directed to classify these compounds as Tentatively Identified Compounds (TICs). For the confirmatory VOC monitoring program, TICs detected in 25% or more of the samples in a running year will be reported to NMED and added to the target analyte list, unless the Permittees can justify the exclusion from the taget analyte list. TICs detected in the confirmatory and room-based monitoring programs will be placed in the WIPP Operating Record and reported to NMED in the Annual Mine Ventilation Report in accordance with Section IV.F.2.b of Module IV of the HWFP.	Change to clarify the distinction between the confirmatory and room-based VOC monitoring programs. Also, the change sets forth the TIC provisions of the monitoring programs. The TIC approach in the HWFP is retained. That is TICs are reported in accordance with the Method Requirements. The Permittees will stipulate that TICs will become new target analyte only if they persist in the monitoring results. Persist is defined in the revised text as occurring in 25 percent of the confirmatory samples in any running year. Confirmatory samples are used because it is possible to remove background VOC from these samples while it is not possible to identify and remove background VOCs from room monitors.
N-3c	The ~~present WIPP~~ VOC monitoring program ...in place The method ~~that will be~~ used for VOC sampling is based on the concept of pressurized sample collection contained in the U.S. Environmental Protection Agency (**EPA**) Compendium Method ~~TO-14A (EPA, 1997)~~ TO-15 (EPA, 1999). The ~~TO-14A~~ TO-15 sampling concept uses 6-liter SUMMA® passivated (or equivalent) stainless-steel canisters to collect integrated air samples at each sample location. Laboratory analytical procedures have been developed based on the concepts contained in ~~both~~	Change provides for the use of a newer generation analytical method for trace VOC analysis (i.e., Method TO-15), and the addition of Method 8260B for analysis of samples that may be greater than the low part per million level. Also the change explains that the tubing, like the sample cannisters, is passivated. The term “or equivalent” was inadvertently deleted.

	~~TO-14A~~ TO-15,8260b, and the draft *EPA Contract Laboratory Program - Statement of Work* (**CLP-SOW**) *for Volatile Organics Analysis of Ambient Air in Canisters* (EPA, 1994). Section N-5 contains additional QA/QC information for this project. The ~~TO-14A~~ TO-15 method is an EPA-recognized sampling concept for VOC sampling and speciation. ... This sampling technique is viable for use while analyzing the sample using other EPA methods such as 8260b. The air is pumped into an initially evacuated SUMMA® passivated (or equivalent) canister by the sampler. . . ~~The passivation process forms a pure chrome-nickel oxide on the interior surfaces of the canisters.~~ The treatment of tubing and canisters used for VOC sampling effectively seals the inner walls and prevents compounds from being retained on the surfaces of the equipment. By the end of ... work shift.	
N-3c	~~Alternative sampling methods will be considered for deployment. One option will be to use subatmospheric samplers rather than pressurized sampling systems for stations VOC-A and VOC-B. WIPP personnel will continue to follow the development of emerging FTIR technology, and other potentially applicable technologies for assessing VOCs in the WIPP environment. Real-time monitoring with an FTIR system may be a feasible future option for the VOC Confirmatory Monitoring Program. If the Permittees determine that an alternate sampling technique is appropriate, the Permittees will submit a request for a Permit modification to the Secretary for review and approval. The Permit modification request will include a revised confirmatory VOC monitoring plan.~~ Disposal room VOC monitoring system will employ the same canister sampling method as used in the confirmatory VOC monitoring. Passivated or equivalent sampling lines will be installed in the disposal rooms as described in Section N-3a(2). The independent lines will run from the sample inlet point to the individual sampler located in the access drift to the disposal panel. The air will pass through dual particulate filters to prevent sample and equipment contamination.	Change clarifies the distinction between the confirmatory and room-based VOC monitoring program by stating that the sample sampling techniques and apparatus will be used under both programs.
N-3d	~~The Permittees will conduct sampling prior to waste emplacement to troubleshoot the monitoring and analytical systems.~~	The deleted text applied to the confirmatory VOC Monitoring Programs no longer relevant, because waste emplacement has begun.
N-3d(1)	N-3d(1) Sampling Schedule for Confirmatory VOC Monitoring Confirmatory VOC sampling at Stations VOC-A and VOC-B ~~will begin~~began with initial waste	Section N-3d is subdivided to distinguish the operating parameters for both the confirmatory and room-based monitoring programs.

	emplacement in Panel 1. ...	This change is also being made because WIPP is already receiving waste
N-3d(2)	N-3d(2) Sampling Schedule for Disposal Room VOC Monitoring The disposal room sampling will occur once every two weeks, unless the need to increase the frequency to weekly occurs in accordance with Permit Module IV.F.2.g.	Change clarifies the distinction between the confirmatory and room-based VOC monitoring programs.
N-3e	N-3e(1) Data Evaluation and Reporting for Confirmatory VOC Monitoring When the Permittees ... COCs. The COCs for each of the nine target VOCs are presented in Permit Module IV, Table IV.F.2.c ~~Table N-2~~.The values are presented in terms of micrograms per cubic meter (ug/m^3) and ppbv. ... The Underground HWDU VOC emission concentration for each target VOC that is calculated for each sampling event will be compared directly to its COC listed in Permit Module IV, Table IV.F.2.c. ~~Table N-2.~~ ... As specified in Permit Module IV, the Permittees shall notify the Secretary in writing, within five (5) working days of obtaining validated analytical results, whenever the concentrations of any target VOC listed in exceeds the concentration of concern specified in Permit Module IV, Table IV.F.2.c . ~~Table N-2~~... ... As specified in Permit Module IV, the Permittees shall notify the Secretary in writing, within five (5) wording days of obtaining validated analytical results, whenever the running annual average concentration (calculated after each sampling event) for any target VOC exceeds the concentration of concern specified in Permit Module IV, Table IV.F.2.c. ~~Table N-2.~~ ...	Section N-3e is subdivided to distinguish the operating parameters for both the confirmatory and room-based monitoring programs. Change clarifies the distinction between the confirmatory and room-based VOC monitoring programs as regards reporting.
N-3e(2)	N-3e(2) Data Evaluation and Reporting for Disposal Room VOC Monitoring	Change clarifies the distinction between the confirmatory and room-based VOC monitoring programs, by explaining the data evaluation and reporting provisions of the room-based program.

	When the Permittees receive laboratory analytical data from an air sampling event, the data will be validated as specified in Section N-5a, within three (3) working days of receiving the laboratory analytical data. After obtaining validated data from an air sampling event, the data will be evaluated to determine whether the VOC concentrations in the air of any closed room or in any immediately adjacent closed room exceeded the Action Levels for Disposal Room Monitoring specified in Permit Module IV, Table IV.F.2.g. The Permittees shall notify the Secretary in writing, within five (5) working days of obtaining validated analytical results, whenever the concentration of any VOC specified in Permit Module IV, Table IV.D.1. exceeds the action levels specified in Permit Module IV, Table IV.F.2.g. The Permittees shall submit to the Secretary an annual report along with the confirmatory monitoring data as specified in Permit Condition IV.F.2.f.	
N-4a	The sampling equipment that will be used includes the following: 6-liter (L) stainless-steel SUMMA® canisters (or equivalent), ~~and~~ VOC canister samplers, treated stainless steel tubing, and a dual filter housing. A discussion of each of these items is presented below.	Text describes the sampling equipment that is proposed for use for WIPP repository monitoring.
N-4a(1)	Six-liter, stainless-steel canisters with SUMMA® passivated (or equivalent) interior surfaces will be used to collect and store all ambient air and gas samples for VOC analyses collected as part of the monitoring processes. These canisters will be cleaned and certified prior to their use, in a manner similar to that described by Compendium Method ~~TO-14A~~ TO-15 and the draft EPA CLP-SOW for Analysis of Ambient Air in Canisters (EPA, 1994). The canisters will be certified clean to below the required reporting limits for the VOC analytical method for the target VOCs ~~(see Table N-4)~~. The vacuum ... cycle.	Change provides for the use of a newer generation analytical method for trace VOC analysis (i.e., Method TO-15).
N-4a(2)	~~Two such systems, located~~ Such units will be used at monitoring Stations VOC-A and VOC-B, ~~will be operational at the time waste disposal operations begin in Panel 1~~ and at sampling locations for room-based measurements. The sampling ~~system~~ units consist~~s~~ of ~~a~~ sample pumps, flow controllers, sample inlets, ~~two~~ inlet filters in series to remove particulate matter, vacuum/pressure gauges, electronic timers, inlet purge vents, ~~two~~ sampling ports, and sufficient collection canisters so that any delays attributed to laboratory turnaround time and canister cleaning and certification will not result in canister shortages.	Change necessary to reflect addition of samplers for room-based monitoring. Change provides for the use of a newer generation analytical method for trace VOC analysis (i.e., Method TO-15)

	A conceptual diagram ... analysis. The cleaning and certification procedure is derived from concepts contained in the EPA Compendium Method ~~TO-14A (EPA, 1997)~~ TO-15 (EPA, 1999).	
N-4a(3)	N-4a(3) Sample Tubing Treated stainless steel tubing is used as a sample path from the desired sample point, to the sample collection unit. This tubing is treated to prevent the inner walls from absorbing contaminants as they are pulled from the sample point to the sample collection unit.	Text added to describe sample tubing for room-based monitoring.
N-4b	Prior to collecting disposal room samples, the sample line is purged to ensure that the air collected is not air that has been stagnant in the tubing. This is important in regard to the disposal room sample particularly because of the long lengths of tubing associated with these samples. The confirmatory samples do not require this action due to the short lengths of tubing required at these locations.	Text added to describe room sample collection process.
N-4c	All sample containers will be marked with identification at the time of collection of the sample. A Request-for-Analysis Form ~~(Figure N-3)~~ will be completed to identify the sample canister number(s), sample type and type of analysis requested. An important component ... alteration. To satisfy this requirement, evidence of collection, shipment, laboratory receipt, and custody will be documented with a completed Chain-of-Custody Form ~~(Figure N-4)~~. Chain-of-custody procedures ... shipment. ...	Revision removes obsolete figures.
N-4d	Periodic maintenance ... sampler malfunction. At a minimum, canister samplers will be certified for cleanliness initially and annually thereafter upon initial use, after any parts that are included in the sample flow path are replaced, or any time analytical results indicate potential contamination. All sample canisters will be certified prior to each usage.	Change clarifies provisions for sampler certification.
N-4e	Analytical procedures used in the analysis of VOC samples from canisters are based on concepts contained in Compendium Method ~~TO-14A (EPA, 1997)~~ TO-15 (EPA, 1999) and in the draft CLP-SOW for Analysis of Ambient Air (EPA, 1994). ~~The technical approach for canister sample analysis is summarized below.~~ Analysis of samples will be performed by a certified laboratory. Methods will be specified in procurement documents and will be selected to be consistent with EPA recommended procedures in	Change provides for the use of a newer generation analytical method for trace VOC analysis (i.e., Method TO-15). Also, change removes the outdated QA requirements from the permit, and replaces them with the specific lab QA requirements explicit in the analytical methods EPA TO-15 and EPA 8260B. This change comports with the way laboratory analytical QA is handled under the groundwater monitoring program. NMED will be provided copies of the lab SOPs.

	SW-846 (EPA, 1996). Additional detail on analytical techniques and methods will be given in laboratory SOPs. The Permittees will establish the criteria for laboratory selection, including the stipulation that the laboratory follow the procedures specified in SW 846 and that the laboratory follow EPA protocols. The selected laboratory shall demonstrate, through laboratory SOPs, that it will follow appropriate EPA SW 846 requirements and the requirements specified by the EPA protocols. The laboratory shall also provide documentation to the Permittees describing the sensitivity of laboratory instrumentation. This documentation will be retained in the facility operating record and will be available for review upon request by NMED. The SOPs for the laboratory currently under contract will be maintained in the operating record by the Permittees. The Permittees will provide NMED with an initial set of applicable laboratory SOPs for information purposes, and provide NMED with any updated SOPs on an annual basis. Data validation will be performed by the Permittees. Copies of the data validation report will be kept on file in the operating record for review upon request by NMED.	
N-4e(1)	~~N-4e(1) Sample Preparation~~ ~~Because canisters will be pressurized during the sampling procedure, laboratory pressurization will not normally be necessary for analyses. Canister pressures will be verified by the laboratory when they are received to confirm that significant losses did not take place during shipping and storage.~~	Change removes the outdated QA requirements from the permit, and replaces them with the specific lab QA requirements explicit in the analytical methods EPA TO-15 and EPA 8260B. This is consistent with the groundwater detection program. Laboratory specific documents controlling the analytical process will be maintained by the Permittees in the operating record and provided to NMED as stated in revised Permit Attachment N-4e.
N-4e(2)	~~N-4e(2) Analytical System Requirements~~ ~~The GC/MS analytical system will consist of three major components: the sample introduction system, the analyte separation system (**GC**), and the analyte detector system (**MS**).~~ ~~● Sample Introduction System for Canisters: This system may include a drying tube to remove moisture from the gas stream. One or more cryogenic traps may be used to focus and desorb trapped material. Transfer lines within the introduction unit will be heated as necessary so that volatile compounds are not actively adsorbed. Valves and solenoids will be heated and of a low dead volume type. The introduction system will have an in-line mass flow controller. The introduction unit will be capable of introducing internal standards directly into the~~	Change removes the outdated QA requirements from the permit, and replaces them with the specific lab QA requirements explicit in the analytical methods EPA TO-15 and EPA 8260B. This is consistent with the groundwater detection program. Laboratory specific documents controlling the analytical process will be maintained by the Permittees in the operating record and provided to NMED as stated in revised Permit Attachment N-4e.

	~~sample flow path.~~ ~~• Analyte Separation: Analyte separation will be achieved by GC. The GC will be capable of subambient temperature programming.~~	
N-4e(2)	~~• Detection System: Analyte detection will be accomplished by MS. The MS must be capable of scanning from 35 to 300 mass-to-charge ratio in one second or less, using 70 electron-volt electron energy in the electron impact ionization mode, and produce a mass spectrum which meets all the instrument performance acceptance criteria when 50 nanograms of 4-bromofluorobenzene (BFB) is analyzed. The MS must have a data system capable of continuous acquisition and storage on machine readable media storing all raw data, and a computer algorithm for analyte quantitation and forward library searching. All raw and processed GC/MS data must be stored on magnetic tape or disk and maintained as Lifetime Records (i.e., for the life of the confirmatory VOC monitoring program plus six years).~~	Change removes the outdated QA requirements from the permit, and replaces them with the specific lab QA requirements explicit in the analytical methods EPA TO-15 and EPA 8260B. This is consistent with the groundwater detection program. Laboratory specific documents controlling the analytical process will be maintained by the Permittees in the operating record and provided to NMED as stated in revised Permit Attachment N-4e.
N-4e(3)	~~N-4e(3) Standard Preparation~~ ~~Primary analytical standards will be prepared by the laboratory from commercially available, certified calibration gases. Alternatively, primary standards may be generated internally by the laboratory. Primary standards of analytes that are gases at standard temperature and pressure may be prepared internally in a static gas dilution bottle. For analytes that are liquid or solid at standard temperature and pressure, a mixture may be made and loaded directly into a standard preparation cylinder. These internally generated standards will be checked against EPA audit cylinders or other reference materials to verify the accuracy of their concentrations.~~ ~~Primary standards will be prepared for the nine target compounds as well as the internal standards. Secondary standards used for instrument calibration will be prepared from dilution of the primary standards.~~	Change removes the outdated QA requirements from the permit, and replaces them with the specific lab QA requirements explicit in the analytical methods EPA TO-15 and EPA 8260B. This is consistent with the groundwater detection program. Laboratory specific documents controlling the analytical process will be maintained by the Permittees in the operating record and provided to NMED as stated in revised Permit Attachment N-4e.
N-4e(4)	~~N-4e(4) Calibration Procedures~~ ~~Prior to the analysis of a standard curve, the GC/MS system must undergo a mass calibration check. This check is performed by introducing 50 nanograms of BFB into the capillary column through the preconcentrator. The requirements (criteria) for relative ion abundances for BFB, listed in Table N-3N-2, must be met before analyses may proceed. BFB requirements must be met for each 12 hours of operation.~~ ~~Quantitative standards for the nine target analytes will be analyzed at five concentrations. These concentrations should define the linear range of the instrument for these nine compounds; however, if~~	Change removes the outdated QA requirements from the permit, and replaces them with the specific lab QA requirements explicit in the analytical methods EPA TO-15 and EPA 8260B. This is consistent with the groundwater detection program. Laboratory specific documents controlling the analytical process will be maintained by the Permittees in the operating record and provided to NMED as stated in revised Permit Attachment N-4e.

	~~some nonlinearity exists, concentrations may be determined by curve fitting or physically plotting the data. One standard concentration shall be at or near a concentration corresponding to the required MRL for each target compound. Relative response factors will be generated for each target compound. These response factors must meet the requirements listed in Section N-5a(3). As discussed above, if low concentration standards do not meet the linearity requirement, a curve-fitting routine may be used. The method used to quantify the data must be reported with the analytical results. In addition, a single point calibration check will be performed for each 12 hours of analytical system operation.~~	
N-4e(5)	~~N-4e(5) Library Searches~~ ~~In every sample analyzed, a forward search of the NIST library of mass spectra for tentatively identified compounds must be performed for all chromatographic peaks greater than 10 percent of the nearest internal standard.~~	Change removes the outdated QA requirements from the permit, and replaces them with the specific lab QA requirements explicit in the analytical methods EPA TO-15 and EPA 8260B. This is consistent with the groundwater detection program. Laboratory specific documents controlling the analytical process will be maintained by the Permittees in the operating record and provided to NMED as stated in revised Permit Attachment N-4e.
N-4e(6)	~~N-4e(6) Data Reporting~~ ~~The laboratory will provide a data package that identifies and describes the sample analyzed, the analysis date, the analytical results, the QC check results and description of any unusual conditions encountered.~~ ~~Sample target analyte concentrations will be quantified using the average relative response factor of the initial calibration standards and will be reported in ppbv. Non-target sample contaminants identified by NIST library searches will be reported as tentatively identified compounds, and concentration calculations will be based on the response of the nearest internal standard. The relative response factor used for quantitation, as well as copies of spectra with the library search results (purity and/or fit), will be submitted with the results. A table listing the run sequence with the corresponding internal standard area counts will be reported with the analytical results. A narrative describing any problems with sample analyses will be included. Any nonconformances must be included with the reporting of the data.~~	Change removes the outdated QA requirements from the permit, and replaces them with the specific lab QA requirements explicit in the analytical methods EPA TO-15 and EPA 8260B. This is consistent with the groundwater detection program. Laboratory specific documents controlling the analytical process will be maintained by the Permittees in the operating record and provided to NMED as stated in revised Permit Attachment N-4e.
N-4f	~~N-4f Laboratory Selection~~ ~~Sample will be analyzed at the WIPP on-site analytical laboratory and/or at a suitable contract analytical laboratory. Upon selection of an off-site contract laboratory, the Permittees will ensure that procured services conform to specified requirements. These measures generally will include one or more of the following: (1) evaluation of the supplier's capability to provide services in accordance with~~	Change removes the outdated QA requirements from the permit, and replaces them with the specific lab QA requirements explicit in the analytical methods EPA TO-15 and EPA 8260B. This is consistent with the groundwater detection program. Laboratory specific documents controlling the analytical process will be maintained by the Permittees in the operating record and provided to NMED

	~~requirements, including a history of providing similar services; (2) evaluation of objective evidence of conformance, such as laboratory document submittals; and (3) examination of delivered services.~~ ~~If the WIPP on-site analytical laboratory is utilized to conduct the sample analyses, then duplicate samples from each sampling station (Stations VOC-A and VOC-B) will be collected at an overall frequency of 10 percent. The duplicate samples will be analyzed by an independent off-site analytical laboratory (see Section N-5a).~~	as stated in revised Permit Attachment N-4e.
N-4g	~~N-4g Laboratory Procedures~~ ~~Specific laboratories that perform analyses and sampler certification activities for the Confirmatory VOC Monitoring Program are required to develop and maintain the following SOPs as appropriate:~~ ~~● Canister cleaning and certification~~ ~~● Sampler cleaning and certification~~ ~~● Analyses of VOCs in SUMMA® canisters~~ ~~● Data QA and reporting~~ ~~Analytical laboratories are required to maintain an internal program QA manual, and to develop and prepare a Quality Assurance Project Plan (QAPjP) covering cleaning and certification of canisters and laboratory analysis of canister samples.~~	Change removes the outdated QA requirements from the permit, and replaces them with the specific lab QA requirements explicit in the analytical methods EPA TO-15 and EPA 8260B. This is consistent with the groundwater detection program. Laboratory specific documents controlling the analytical process will be maintained by the Permittees in the operating record and provided to NMED as stated in revised Permit Attachment N-4e.
N-5	The QA activities for the ~~confirmatory~~ VOC monitoring program will be conducted in accordance with the document *EPA Requirements for Quality Assurance Project Plans for Environmental Data Operations* (EPA, 1994), and the *Interim Guidelines and Specifications for Preparing Quality Assurance Project Plans* (EPA, 1983). ~~The QA criteria for the confirmatory VOC monitoring program are listed in Table N-4.~~ This section addresses the methods to be used to evaluate the components of the measurement system and how this evaluation will be used to assess data quality. The QA limits for the sampling procedures and laboratory analysis shall be in accordance with the limits set forth in the specific EPA Method referenced in standard operating procedures employed by either the Permittees or the laboratory. The Permittees standard operating procedures will be in the facility Operating Record and available for review by NMED at anytime. The laboratory standard operating procedures will also be in the facility Operating Record and will be supplied to the NMED as indicated in Section N-4e of this Attachment. ~~These data quality objectives are based on control criteria proposed by the EPA as presented in the CLP-SOW for the Volatile Organics Analysis of Ambient Air in Canisters (EPA, 1994).~~	Change removes the outdated QA requirements from the permit, and replaces them with the specific lab QA requirements explicit in the analytical methods EPA TO-15 and EPA 8260B. This is consistent with the groundwater detection program. Laboratory specific documents controlling the analytical process will be maintained by the Permittees in the operating record and provided to NMED as stated in revised Permit Attachment N-4e.

N-5a	~~N-5a Quality Assurance Objectives for the Measurement of Precision, Accuracy, Sensitivity, and Completeness.~~ ~~QA objectives for this plan will be defined in terms of the following data quality parameters.~~ ~~**Precision.** For the duration of this program, precision will be defined and evaluated by the RPD values calculated between field duplicate samples and between laboratory duplicate samples.~~ $RPD = \left(\frac{(AB)}{(A+B)/2} \right) * 100$ ~~where: A = Original sample result~~ ~~B = Duplicate sample result~~ ~~**Accuracy.** Analytical accuracy will be defined and evaluated through the use of analytical standards. Because recovery standards cannot reliably be added to the sampling stream, overall system accuracy will be based on analytical instrument performance evaluation criteria. These criteria will include performance verification for instrument calibrations, laboratory control samples, sample surrogate recoveries, and sample internal standard areas. These criteria will constitute the verification of accuracy for target analyte quantitation (i.e., quantitative accuracy). Evaluation of standard ion abundance criteria for BFB will be used to evaluate the accuracy of the analytical system in the identification of targeted analytes, as well as the evaluation of unknown contaminants (i.e., qualitative accuracy).~~	Change removes the outdated QA requirements from the permit, and replaces them with the specific lab QA requirements explicit in the analytical methods EPA TO-15 and EPA 8260B. This is consistent with the groundwater detection program. Laboratory specific documents controlling the analytical process will be maintained by the Permittees in the operating record and provided to NMED as stated in revised Permit Attachment N-4e.
N-5a	~~**Sensitivity.** Sensitivity will be defined by the required MRLs for the program. Attainment of required MRLs will be verified by the performance of statistical method detection limit (**MDL**) studies in accordance with 40 Code of Federal Regulations 136. The MDL represents the minimum concentration that can be measured and reported with 99 percent confidence that the analyte concentration is greater than zero. An MDL study will be performed by the program analytical laboratory prior to sampling and analysis, and annually thereafter.~~ ~~**Completeness.** Completeness will be defined as the percentage of the ratio of the number of valid sample results received (i.e., those which meet data quality objectives) versus the total number of samples collected. Completeness may be affected, for example, by sample loss or destruction during shipping, by laboratory sample handling errors, or by rejection of analytical data during data validation.~~	Change removes the outdated QA requirements from the permit, and replaces them with the specific lab QA requirements explicit in the analytical methods EPA TO-15 and EPA 8260B. This is consistent with the groundwater detection program. Laboratory specific documents controlling the analytical process will be maintained by the Permittees in the operating record and provided to NMED as stated in revised Permit Attachment N-4e.
N-5a(1)	~~N-5a(1) Evaluation of Laboratory Precision~~ ~~Laboratory sample duplicates and blank spike/blank spike duplicates (BS/BSD) will be used to~~	Change removes the outdated QA requirements from the permit, and replaces them with the specific lab QA requirements explicit in the analytical methods

	~~evaluate laboratory precision. QA objectives for laboratory precision are listed in Table N-4, and are based on precision criteria proposed by the EPA for canister sampling programs (EPA, 1994). These values will be appropriate for the evaluation of samples with little or no matrix effects. Because of the potentially high level of salt-type aerosols in the WIPP underground environment, the analytical precision achieved for WIPP samples may vary with respect to the EPA criteria. RPDs for BS/BSD analyses will be tracked through the use of control charts. RPDs obtained for laboratory sample duplicates will be compared to those obtained for BS/BSDs to ascertain any sample matrix effects on analytical precision. BS/BSDs and laboratory sample duplicates will be analyzed at a frequency of 10 percent, or one per analytical lot, whichever is more frequent.~~	EPA TO-15 and EPA 8260B. This is consistent with the groundwater detection program. Laboratory specific documents controlling the analytical process will be maintained by the Permittees in the operating record and provided to NMED as stated in revised Permit Attachment N-4e.
N-5a(2)	~~N-5a(2) Evaluation of Field Precision~~ ~~Field duplicate samples will be collected at a frequency of 5 percent for both all monitoring locations. The data quality objective for field precision is 35 percent for each set of duplicate samples.~~	Change removes the outdated QA requirements from the permit, and replaces them with the specific lab QA requirements explicit in the analytical methods EPA TO-15 and EPA 8260B. This is consistent with the groundwater detection program. Laboratory specific documents controlling the analytical process will be maintained by the Permittees in the operating record and provided to NMED as stated in revised Permit Attachment N-4e.
N-5a(3)	~~N-5a(3) Evaluation of Laboratory Accuracy~~ ~~**Quantitative Accuracy.** Quantitative analytical accuracy will be evaluated through performance criteria on the basis of (1) relative response factors generated during instrument calibration, (2) analysis of laboratory control samples (**LCS**), and (3) recovery of internal standard compounds. The criteria for the initial calibration (5-point calibration) is < 30 percent relative standard deviation for target analytes. After the successful completion of the 5-point calibration, it is sufficient to analyze only a midpoint standard for every 12 hours of operation. The midpoint standard will pass a 30 percent difference acceptance criterion for each target compound before sample analysis may begin.~~	Change removes the outdated QA requirements from the permit, and replaces them with the specific lab QA requirements explicit in the analytical methods EPA TO-15 and EPA 8260B. This is consistent with the groundwater detection program. Laboratory specific documents controlling the analytical process will be maintained by the Permittees in the operating record and provided to NMED as stated in revised Permit Attachment N-4e.
N-5a(3)	~~A blank spike or LCS is an internal QC sample generated by the analytical laboratory by spiking a standard air matrix (humid zero air) with a known amount of a certified reference gas. The reference gas will contain the target VOCs at known concentrations. Percent recoveries for the target VOCs will be calculated for each LCS relative to the reference concentrations. Objectives for percent recovery are listed in Table, and are based on accuracy criteria proposed by the EPA for canister sampling programs (EPA, 1994). LCSs will be analyzed at a frequency of 10 percent, or one per analytical lot, whichever is more frequent.~~ ~~**Qualitative Accuracy.** Qualitative accuracy in the identification of target VOCs will be evaluated by~~	Change removes the outdated QA requirements from the permit, and replaces them with the specific lab QA requirements explicit in the analytical methods EPA TO-15 and EPA 8260B. This is consistent with the groundwater detection program. Laboratory specific documents controlling the analytical process will be maintained by the Permittees in the operating record and provided to NMED as stated in revised Permit Attachment N-4e.

	~~the relative ion abundance criteria established for the internal standard compound BFB. For each 12 hours of sample analysis, a 50-nanogram injection of BFB must be made, and the requirements listed in Table N-3 will be met before the instrument may be used to analyze samples.~~ ~~The MDL for each of the nine target compounds will be evaluated by the analytical laboratories before sampling begins. The initial and annual MDL evaluation will be performed in accordance with 40 Code of Federal Regulations 136 and with EPA/530-SW-90-021, as revised and retitled, "Quality Assurance and Quality Control" (Chapter 1 of SW-846) (1996).~~	
N-5a(5)	~~N-5a(5) Completeness~~ ~~The expected completeness for this program is greater than or equal to 90 percent. Data completeness will be tracked monthly.~~	Change removes the outdated QA requirements from the permit, and replaces them with the specific lab QA requirements explicit in the analytical methods EPA TO-15 and EPA 8260B. This is consistent with the groundwater detection program. Laboratory specific documents controlling the analytical process will be maintained by the Permittees in the operating record and provided to NMED as stated in revised Permit Attachment N-4e.
N-5b	~~N-5b Sample Handling and Custody Procedures~~ ~~Sample packaging, shipping, and custody procedures are addressed in Section N-4C.~~	Change removes the outdated QA requirements from the permit, and replaces them with the specific lab QA requirements explicit in the analytical methods EPA TO-15 and EPA 8260B. This is consistent with the groundwater detection program. Laboratory specific documents controlling the analytical process will be maintained by the Permittees in the operating record and provided to NMED as stated in revised Permit Attachment N-4e.
N-5c	~~N-5c Calibration Procedures and Frequency~~ ~~Calibration procedures and frequencies for analytical instrumentation are listed in Section N-4e(4).~~	Change removes the outdated QA requirements from the permit, and replaces them with the specific lab QA requirements explicit in the analytical methods EPA TO-15 and EPA 8260B. This is consistent with the groundwater detection program. Laboratory specific documents controlling the analytical process will be maintained by the Permittees in the operating record and provided to NMED as stated in revised Permit Attachment N-4e..
N-5d	~~N-5d Analytical Procedures~~ ~~The analytical procedures for the Confirmatory VOC Monitoring Program, which are based on the draft *CLP-SOW for Volatile Organics Analysis of Ambient Air in Canisters* (EPA, 1994) and EPA Method TO-14A (EPA, 1997), are outlined in Section N-4e.~~	Change removes the outdated QA requirements from the permit, and replaces them with the specific lab QA requirements explicit in the analytical methods EPA TO-15 and EPA 8260B. This is consistent with the groundwater detection program. Laboratory specific documents controlling the analytical process will be maintained by the Permittees in the operating record and provided to NMED

		as stated in revised Permit Attachment N-4e.
N-5e	N-5~~e~~a A dedicated logbook .. Sampling conditions. Data validation... laboratory supervisor. Data will be reported ... Module IV. ~~Acceptable data for this monitoring program will meet stated precision and accuracy criteria. The QA objectives for precision, accuracy, and completeness as shown in Table N-3 can be achieved when established methods of analyses are used as proposed in this plan and standard sample matrices are being assessed. However, because of the potential for the samples to contain high levels of salt-type aerosols, the degree to which the QA objectives for the program can be achieved is presently uncertain. The program data will be evaluated and QA objectives modified as necessary based on the results of the QC testing program. If the Permittees determine that alternate QA objectives are required, the Permittees will submit a request for a Permit modification to the Secretary for approval.~~	Change removes the outdated QA requirements from the permit, and replaces them with the specific lab QA requirements explicit in the analytical methods EPA TO-15 and EPA 8260B. This is consistent with the groundwater detection program. Laboratory specific documents controlling the analytical process will be maintained by the Permittees in the operating record and provided to NMED as stated in revised Permit Attachment N-4e.
N-5f	N-5~~f~~b	Change renumbers section. No changes in text.
N-5g	N-5~~g~~c	Change renumbers section. No changes in text.
N-5h	N-5~~h~~d If the required completeness of valid data (~~90~~95 percent) is not maintained, corrective action may be required. Corrective action ... test equipment. ~~Laboratory corrective actions may be required to maintain data quality. The laboratory continuing calibration criteria indicate the relative response factor for the midpoint standard will be less than 30 percent different from the mean relative response factor for the initial calibration. Differences greater than 30 percent will require recalibration of the instrument before samples can be analyzed. If the internal standard areas in a sample change by more than 40 percent, the sample will be reanalyzed. If the 40 percent criterion is not achieved during the reanalysis, the instrument will undergo a~~	Change renumbers section and removes the outdated QA requirements from the permit, and replaces them with the specific lab QA requirements explicit in the analytical methods EPA TO-15 and EPA 8260B.

	~~performance check and the midpoint standard reanalyzed to verify proper operation. Deviations larger than 40 percent are an indication of potential instrument malfunction.~~ ~~The laboratory results for samples, duplicate analyses, LCSs, and blanks should routinely be within the QC limits. If results exceed control limits, the reason for the nonconformances and appropriate corrective action must be identified and implemented.~~	
N-5i	N-5~~i~~e The ~~Confirmatory~~ VOC Monitoring Program will require administration of record files (both laboratory and field data collection files). The records ... WIPP requirements. Unless otherwise specified, monitoring program records will be retained as ~~permanent~~ lifetime records. Temporary and permanent storage of QA records will occur in facilities that prevent damage from temperature, fire, moisture, pressure, excessive light, and electromagnetic fields. Access to stored ~~Confirmatory~~ VOC Monitoring Program QA Records will be controlled and documented to prevent unauthorized use or alteration of completed records. ...	Change renumbers section and clarifies that records will be maintained over the lifetime of the facility.
N-6	~~U.S. Environmental Protection Agency. 1997. *Compendium Method TO-14A: Determination of Volatile Organic Compounds (VOCs) In Ambient Air Using Specially Prepared Canisters With Subsequent Analysis By Gas Chromatography*, EPA 625/R-96/010b. Center for Environmental Research Information, Office of Research and Development, Cincinnati, OH, January 1997.~~ U.S. Environmental Protection Agency. 1999. *Compendium Method TO-15: Determination of Volatile Organic Compounds (VOCs) In Air Collected in Specially Prepared Canisters and Analyzed By Gas Chromatography/Mas Spectrometry*, EPA 625/R-96/010b. Center for Environmental Research Information, Office of Research and Development, Cincinnati, OH, January 1999. Washington Regulatory and Environmental Services. 2003. *Technical Evaluation Report for WIPP Room-Based VOC Monitoring*	Change provides for the use of a newer generation analytical method for trace VOC analysis (i.e., Method TO-15) and makes reference to a technical report that included demonstration information on room-based VOC monitoring in Panel 1.
Table N-1	Table N-1 Target Analytes and Methods for Confirmatory VOC (Station VOC-A and VOC-B) Monitoring and Room-Based Monitoring Target Analyte	A new Table N-1 is provided with a listing of the target analytes and the methods to be used.

	EPA Standard Analytical Method EPA TO-15[a] EPA SW-846[b] EPA SW-8260B[b] Carbon tetrachloride Chlorobenzene Chloroform 1,1-Dichloroethylene 1,2-Dichloroethane Methylene chloride 1,1,2,2-Tetrachloroethane Toluene 1,1,1-Trichloroethane U.S. Environmental Protection Agency, 1999, Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air – Second Edition, http://www.epa.gov/ttn/amtic/airtox.html [b] U.S. Environmental Protection Agency, SW-846 Test Methods for Evaluation Solid Wastes, Chemical and Physical Methods, http://www.epa.gov/epaoswer/hazwaste/test/main.htm	Change reflects addition of room-based VOC monitoring, as well as the addition of Methods EPA T0-15 and 8260B.
Tables	All Previous Tables have been removed.	Change eliminates tables that were repeats of tables in Module IV. Change also removes outdated QA tables, as specific lab QA requirements explicit in the analytical methods EPA TO-15 and EPA 8260B are now used.
Figure 1	Figure 1 has been revised	Figure updated to show mining progress through 4/29/05
Figure 2	Figure 2 has been revised	
Figure 3	Figure 3 has been deleted	
Figure 4	Figure 4 has been deleted	
Figure 5	New Figure added	Figure depicts typical disposal room monitoring points.