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Revision 0

PERFORMANCE DEMONSTRATION PROGRAM PLAN
for the
WIPP EXPERIMENTAL-WASTE CHARACTERIZATION PROGRAM

Waste Isolation Pilot Plant
Carlsbad, New Mexico

February 1991

PERFORMANCE DEMONSTRATION PROGRAM PLAN
for the
WIPP EXPERIMENTAL-WASTE
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PART I. GAS ANALYSIS

1.0 SCOPE AND FREQUENCY

The Performance Demonstration Program is designed to ensure that compliance with the Quality Assurance Objectives (QAOs), identified in the Quality Assurance Program Plan for the Waste Isolation Pilot Plant (WIPP) Experimental-Waste Characterization Program (QAPP), is achieved. This Program Plan is intended for use by the WIPP Project Office (WPO) to assess the laboratory support provided for the characterization of WIPP TRU waste by the storage/generator sites. It is not intended to support any analytical requirements that are outside the scope of the QAPP. Phase 0 of the Performance Demonstration Program encompasses the analysis of headspace gas samples for inorganic and organic components.

The WPO will ensure the implementation of this plan by designating an independent organization to coordinate and provide technical oversight for the program (Program Coordinator). Initial program support, regarding the technical oversight and coordination functions, shall be provided by the USEPA-Office of Radiation Programs (ORP). This plan identifies the criteria that will be used for the evaluation of laboratory performance, the responsibilities of the Program Coordinator, and the responsibilities of the participating laboratories.

Laboratory performance will be demonstrated by the successful analysis of blind audit samples according to the criteria set within the text of this Program Plan. Blind audit samples will be used as an independent means to assess laboratory performance regarding compliance with the QAPP QAOs. The concentration of analytes in these audit samples will encompass the range of concentrations anticipated in waste samples. No laboratory may provide analytical support for the characterization of WIPP waste until they have achieved acceptable performance in this program.

Acceptable performance must be demonstrated by all participating laboratories prior to the initial analysis of WIPP waste samples and on a continuing, semi-annual basis. The criteria for acceptable performance is given in Section 5 of this Program Plan. The performance demonstration samples must be analyzed using the methods the laboratory anticipates using for the analysis of waste characterization samples. These methods must have been developed and approved within the specifications of the QAPP (see the *WIPP Waste Characterization Program Sampling and Analysis Guidance Manual*). Only those methods used in the performance demonstration program will be considered acceptable to support the analysis of waste samples. The data generated as a result of the performance demonstration will indicate the appropriateness of the method used as well as the performance of the laboratory.

The laboratories participating in the testing program will include:

	Volatile Organics	Gases	
		GC	Gas Mass Spec.
RFP/EG&G	X		X
INEL/EG&G	X		
INEL/ANL-W		X	
ANL-EAST	X		X
WIPP/Westinghouse	X		X
[Independent designate]*	X	X	X

*Laboratory designated by the Program Coordinator.

The contact persons responsible for receipt of performance demonstration samples and communications between the Program Coordinator and the individual laboratories are provided in Table 2 and Attachment 1.

2.0 PROGRAM COORDINATION

The USEPA-ORP shall provide initial independent technical oversight and coordination of an inter-laboratory demonstration program to qualify participating analytical laboratories. Ensuring the administration and coordination of the semi-annual continuance of the Performance Demonstration Program will be the responsibility of the WPO. A WPO-designated independent organization shall function as the Performance Demonstration Program Coordinator and technical advisor to WPO. For the inter-laboratory performance demonstration the Program Coordinator will:

a. Ensure the preparation and distribution of the blind audit samples.
b. Receive, review, and compile the analytical data.
c. Report performance data as specified within this document.

3.0 PREPARATION OF SINGLE BLIND SAMPLES

Table 1 lists suggested concentration ranges for the single blind performance samples. The listed concentration maxima are for guidance purposes only. Final analyte concentrations in the single blind audit samples are left to the discretion of the Program Coordinator. The Program Coordinator shall ensure delivery of the Performance Demonstration samples (6 liter cylinders for VOCs and 1 liter

cylinders for the gases) to each of the laboratories participating in the inter-laboratory Performance Demonstration Program. DOE-WPO will give the Program Coordinator a four-week written advance notice as to when the Performance Demonstration samples should be sent to the participating laboratories. The Program Coordinator will then give two weeks advance notification of the blind audit sample shipping date to all participating laboratories. The performance audit cylinders should be sent to the attention of those individuals listed in Table 2 for VOC and/or gas analyses as appropriate. Eventually, the Performance Demonstration Program should be implemented on a scheduled semi-annual basis.

4.0 ANALYTICAL AND DATA REPORTING REQUIREMENTS

Each performance demonstration sample shall be analyzed in quadruplicate as an aid in determining precision. A summary of all analytes listed in Tables 4 and 5 that are detected (even if levels are below the MDL), and for all replicate analyses, will be sent by the participating laboratories to the Performance Demonstration Program Coordinator postmarked no later than 28 days after validated time of sample receipt (VTSR). Results for all blanks run in association with the performance demonstration samples must be submitted with the summary. Concentrations must be reported in ppmv for VOCs and in % volume for the gases using sample reporting criteria specified in the QAPP.

5.0 EVALUATION OF PERFORMANCE DATA

The Program Coordinator shall review the results, compile them into a master summary, and deliver this summary to DOE-WPO within two weeks post-receipt of the last laboratory data set or within seven weeks of the last VTSR, whichever occurs first. The report summary shall include the reference analyte values, acceptance ranges per analyte, and the pass/fail status (based on score) of the individual laboratories.

DOE-WPO, in conjunction with the Program Coordinator, will evaluate individual laboratory performance and approve individual laboratories for participation in the WIPP waste characterization program. Depending on the results of the Performance Demonstration, the site Project Manager shall have the responsibility of ensuring that appropriate corrective action measures are taken. The monthly QA reports (Section 14.0 of the QAPP for the WIPP Experimental-Waste Characterization Program) must assess the impact of corrective action measures taken.

Individual laboratory master summaries shall be distributed, as appropriate, to each of the DOE Operations Offices involved, each of the participating laboratories, and to all individuals listed in Table 2. DOE-WPO shall also provide written notification to the DOE-OPS Offices regarding the adequacy and approval status of their participating laboratories. A backup set of blind audit canisters

will be available two weeks after laboratories are notified of their status. Laboratories that do not pass on the initial set of blind audit canisters may request to have these sent to their facility. Requests must be submitted in writing to DOE-WPO and be accompanied by a report stating the corrective action measures taken.

The acceptance criteria for the laboratories will be based on the requirements of this Program Plan.

5.1 Analysis of Volatile Organic Compounds (VOCs) (Table 4 Analytes): VOC analysis performance will be evaluated in four areas:

a. Performance on Blanks
b. Accuracy of Quantitation
c. Precision of Quantitation
d. Qualitative Identification (TICs).

5.1.1 Performance on Blanks

5.1.1.1 Purpose: Analytical results for blanks are used to determine the presence of contamination problems and to quantify those problems if any exist.

5.1.1.2 Criteria: The criteria for blank performance is that none of the target compounds should be present in the blank analyses at levels exceeding 50% of the PRQL.

5.1.1.3 Method: The method for the evaluation of acceptable blank performance is explained here. The analytical results for all reported blanks are reviewed. The data for all detected compounds will be compiled and the percent of their concentrations relative to the PRQL for that compound, calculated as follows:

$$RBT_A = \frac{CB_A}{PRQL_A} \times 100$$

where

RBT_A = amount of compound A calculated in blank as percent of the PRQL

CB_A = concentration of compound A in blank (ppmv)

$PRQL_A$ = required quantitation limit for compound A (ppmv).

5.1.1.4 Actions: Actions will be taken depending on the blank results. If all of the participating laboratories report a specific analyte to be present in the blank at levels exceeding 50% of the PRQL, the blank will be considered contaminated and the analyte data will be judged unusable and deleted from consideration in the performance criteria for that particular performance demonstration.

5.1.1.4.1 For any compound for which the RBT_A exceeds 50%, the laboratory will be judged to have exceeded an action limit for compound A. Data for that compound will be reported but appropriately identified as unacceptable by the Program Coordinator. The impact of exceeding an action level on overall laboratory performance is given in Section 5.1.5. In accordance with Section 5.0, the site Project Manager shall have responsibility to ensure that appropriate corrective action measures are taken when necessary.

5.1.2 Accuracy of Quantitation

5.1.2.1 Purpose: Analytical results for blind spikes of known concentration will be used to determine the accuracy with which a laboratory can quantitate the target compounds.

5.1.2.2 Criteria: The results reported for the target compounds should not deviate from the reference values by more than 30%.

5.1.2.3 Method: The reported analytical data are used to calculate the relative percent accuracy (RPA) for each of the target compounds as follows:

$$RPA_A = \frac{ACS_A}{TC_A} \times 100$$

where

RPA_A = relative percent accuracy expressed as percent recovery of compound A in the blind sample

ACS_A = average concentration of compound A from quadruplicate determinations of the blind sample (ppmv)

TC_A = reference value of compound A in blind sample (ppmv).

5.1.2.4 Actions: Actions will be taken depending on the recovery of the target analytes. If all of the reporting laboratories report a specific analyte that falls outside the criteria of

5.1.2.2, then that data will be judged as inappropriate for use in the determination of performance for that round of performance demonstration.

5.1.2.4.1 For any compound for which the RPA_A is outside the range of 70 to 130% recovery (exceeds the reference value by more than ±30%) in any of the three blind spikes, the laboratory will be judged unable to quantitate for compound A. Data for that compound will be reported but appropriately identified as unacceptable by the Program Coordinator. The impact of exceeding an action level on overall laboratory performance is given in Section 5.1.5. In accordance with Section 5.0, the site Project Manager shall have responsibility to ensure that appropriate corrective action measures are taken when necessary.

5.1.3 Precision of Replicate Determinations

5.1.3.1 Purpose: Analytical results for quadruplicate analyses of blind spikes of known concentration will be used to estimate the precision with which a laboratory can quantitate the target compounds.

5.1.3.2 Criteria: The results reported for the target compounds of quadruplicate determinations from the same canister should not exhibit a standard deviation greater than 25%.

5.1.3.3 Method: The method defined below will be used to evaluate laboratory precision. The analytical results for the quadruplicate determinations from each canister are used to calculate the relative percent standard deviation for each of the target compounds as follows:

$$\%RSD_A = \frac{s}{AC_A} \times 100$$

where

$\%RSD_A$ = relative standard deviation of the quadruplicate determinations from a single canister (percent)

s = standard deviation of the quadruplicate determinations from a single canister.

AC_A = average concentration of compound A in quadruplicate determinations from a single canister (ppmv).

5.1.3.4 Actions: Actions will be taken depending on the performance results for the precision of replicate determinations. If all the reporting laboratories report a specific analyte

outside the criteria limits specified in 5.1.3.2, the data for that specific analyte will be judged as inappropriate for use in the evaluation of performance for that performance demonstration.

5.1.3.4.1 For any compound for which the $\%RSD_A$ exceeds 25%, the laboratory will be judged unable to quantitate reproducibly for that compound. Data for that compound will be reported but appropriately identified as unacceptable by the Program Coordinator. The impact of exceeding an action level on overall laboratory performance is given in Section 5.1.5. In accordance with Section 5.0, the site Project Manager shall have responsibility to ensure that appropriate corrective action measures are taken when necessary.

5.1.4 Precision of Quantitation of Duplicates

5.1.4.1 Purpose: Analytical results for duplicate blind spikes of known concentration will be used to determine the precision with which a laboratory can quantitate the target compounds.

5.1.4.2 Criteria: The difference between the results reported for the target compounds for duplicate determinations from different canisters should not exceed 25% of the average of the duplicate results.

5.1.4.3 Method: The method described below will be used to evaluate the field duplicate precision. The analytical results for all reported data are used to calculate the relative percent differences for each of the target compounds as follows:

$$RPD_A = \frac{|ACS_A - ACD_A|}{[\frac{ACS_A + ACD_A}{2}]} \times 100$$

where

RPD_A = relative percent difference between the averages of quadruplicate determinations of two duplicate canisters

ACS_A = average concentration of compound A in quadruplicate determinations from duplicate canister 1 (ppmv)

ACD_A = average concentration of compound A in quadruplicate determinations from duplicate canister 2 (ppmv).

5.1.4.4 Actions: Actions will be taken depending on the magnitude of the RPD between field duplicates. If all the participating laboratories report data for a specific analyte that falls outside the RPD criteria specified in 5.1.4.2, that data will be judged to be inappropriate for use in the evaluation of performance for that particular performance demonstration.

5.1.4.4.1 For any compound for which the RPD_A exceeds 25%, the laboratory will be judged unable to quantitate reproducibly for that compound. Data for that compound will be reported but appropriately identified as unacceptable by the Program Coordinator. The impact of exceeding an action level on overall laboratory performance is given in Section 5.1.5. In accordance with Section 5.0, the site Project Manager shall have responsibility to ensure that appropriate corrective action measures are taken when necessary.

5.1.5 Overall Performance

5.1.5.1 Purpose: Individual laboratory performance on the set of blind audit samples will be used to assess general problems that may affect the laboratory's ability to analyze the compounds of interest. This conclusion could result in a holding period during which the laboratory would not analyze WIPP waste characterization samples until the causes of the problems are identified, corrective action taken, and the efficacy of the corrective action demonstrated.

5.1.5.2 Criteria: The criteria used for the evaluation of laboratory overall performance are specified below. Performance will be demonstrated by achieving these criteria:

a. Laboratories must pass all performance criteria for each critical target compound (CTC) to be considered as qualified to perform VOC analysis on WIPP waste characterization samples.

b. Laboratories must also pass 75% of the accumulated performance criteria for those target compounds (TC) not identified as critical to be considered qualified to perform VOC analysis on WIPP waste characterization samples.

5.1.5.3 Methods: Methods for evaluating target compound overall performance are discussed below. Target compounds have been divided into two groups, CTCs and TCs. Table 4 lists the TCs, and those which have been classed as CTCs are identified. CTCs are those compounds which have been identified in documentation and/or studies of TRU waste as:

a. Critical to performance demonstration for the WIPP, or

b. Of special significance with respect to hazardous waste characterization or supporting ultimate granting of the no-migration variance from the land disposal ban.

TCs are those compounds identified as potentially present in the WIPP Experimental Waste in sufficient quantities to be of quantitative interest but not identified as critical.

5.1.5.3.1 The results reported for analysis of CTCs in the performance demonstration samples must meet all of the criteria identified in Sections 5.1.2.2, 5.1.3.2, and 5.1.4.2 of this Program Plan.

5.1.5.3.2 The reported analyses of TCs in the performance demonstration samples will be evaluated on a point scoring system. Results will be scored as follows:

a. For TCs present in the duplicate canisters, the laboratory will receive five points for each evaluated RPA, RSD, and RPD that meet the criteria of 5.1.2.2, 5.1.3.2, and 5.1.4.2, respectively. (Possible 25 points per compound.)

b. For TCs present in a single canister, the laboratory will receive five points for each evaluated RPA and RSD that meet the criteria of 5.1.2.2 and 5.1.3.2, respectively. (Possible 10 points per compound.)

c. For each compound which is known to be present in any canister but which is neither a CTC nor TC, the laboratory will receive five points for correctly identifying the compound as a Tentatively Identified Compound (TIC). (Possible 5 points per compound.)

d. Each laboratory will start with 61 points for each blank canister (5 points for each CTC, and one point for each TC). From this total the laboratory will lose five points for each CTC and one point for each TC for which the laboratory fails to meet the blank criteria of 5.1.1.2.

e. Each laboratory will lose one point for each false positive (i.e., identification of a CTC or TC, at or greater than the PRQL) in a canister in which the compound is known to be absent. This criteria does not apply to the blank canister which is evaluated as in (d), above.

5.1.5.3.3 Example calculation

Laboratory A receives five canisters grouped as follows:

Canister 1 is a blank.

Canisters 2 and 3 are duplicates containing 6 CTCs and 5 TCs at the same concentrations in each canister.

Canister 4 contains 5 CTCs and 7 TCs at different concentrations than canisters 2 and 3 and 1 possible TIC.

Canister 5 contains 1 CTC and 3 TCs.

The Laboratory can score a maximum of 291 points, broken down as follows:

Canister 1 = 61 points

Canisters 2 and 3 = 125 points (5 times 25)

Canister 4 = 75 points (10 times 7 plus 1 times 5)

Canister 5 = 30 points (10 times 3)

Laboratory Score = 100 * (LP/291).

where LP is the total points scored by the laboratory.

5.1.5.4 Actions: The site Project Manager shall have the responsibility of ensuring that appropriate corrective action measures are implemented when a laboratory exceeds an action limit. The following are considered minimum mandatory measures that must be implemented when action limits are exceeded.

5.1.5.4.1 If a laboratory fails to meet any combination of three of the criteria specified in 5.1.3.2, 5.1.4.2 or 5.1.5.2 for any of the CTCs, the laboratory will be judged to have exceeded an action level. The laboratory shall cease analytical operations for the analysis of WIPP waste characterization samples. The laboratory may not begin analytical operations regarding the analysis of WIPP waste characterization samples until the laboratory has addressed the following actions:

a. Investigated the cause(s) of the failure and taken corrective action, and
b. Demonstrated adequate performance on another set of blind performance samples.

5.1.5.4.2 If a laboratory obtains a score less than 75% of the total possible points, the laboratory will be judged to have exceeded a control level. For those laboratories that are presently qualified from a previous WIPP Performance Demonstration, the laboratory will be placed on probation. Probationary status will be removed if the laboratory scores greater than 75% on the next Performance Demonstration sample set. Laboratories that score less than 75% on the

initial Performance Demonstration sample set or score less than 75% on two consecutive sample sets (after initially qualifying) shall cease analytical operations for the analysis of WIPP waste characterization samples. The laboratory may not begin analytical operations in support of this program until the laboratory has:

a. Investigated the cause of the failure(s) and taken corrective action,

b. Generated sufficient data to demonstrate that the same problems will not recur, and

c. Demonstrated adequate performance, i.e., a score equal to or greater than 75% on another set of blind performance samples.

5.2 Analysis of Gases (Table 5 Analytes): Gas analysis performance will be evaluated in three areas:

a. Performance on blanks
b. Accuracy of quantitation
c. Precision of quantitation.

5.2.1 Performance on Blanks

5.2.1.1 Purpose: Analytical results for blanks are used to determine the presence of contamination problems if any exist.

5.2.1.2 Criteria: None of the target analytes should be present in the blank at levels exceeding the program required detection limit (PRDL).

5.2.1.3 Method: The analytical results for all reported blanks are reviewed. Data for all detected analytes will be used to calculate the percent of their concentrations relative to the PRDL for that compound as follows:

$$RBT_A = \frac{CB_A}{PRDL_A} \times 100$$

where

RBT_A = amount of analyte A calculated in the blank as percent of the PRDL

CB_A = concentration of analyte A in the blank (vol%)

$PRDL_A$ = required detection limit for analyte A (vol%).

5.2.1.4 Actions: Actions will be taken depending on the blank results and are discussed below.

5.2.1.4.1 If all of the participating laboratories report a specific analyte to be present in the blank at levels exceeding 70% of the PRDL, the blank will be considered contaminated and the analyte data will be judged unusable and deleted as part of the performance criteria for that performance demonstration.

5.2.1.4.2 For any analyte for which the RBT_A exceeds 70%, the laboratory will be judged unable to quantitate for analyte A at the required PRDL. Data for that analyte will be reported but appropriately identified as unacceptable by the Program Coordinator. The impact of exceeding an action level on overall laboratory performance is given in Section 5.2.5. In accordance with Section 5.0, the site Project Manager shall have responsibility to ensure that appropriate corrective action measures are taken when necessary.

5.2.2 Accuracy of Quantitation

5.2.2.1 Purpose: Analytical results for blind spikes of known concentration will be used to determine the accuracy with which a laboratory can quantitate the target analytes.

5.2.2.2 Criteria: The results reported for the target analytes should not deviate from the reference values by more than 10% (50% for NO_x).

5.2.2.3 Method: The analytical results for all reported data are used to calculate the recovery for each of the target analytes as follows:

$$RPA_A = \frac{ACS_A}{TC_A} \times 100$$

where

RPA_A = relative percent accuracy expressed as percent recovery of compound A in the blind sample

ACS_A = average concentration of analyte A from quadruplicate determinations of the blind sample (vol%)

TC_A = reference concentration of compound A in the blind sample (vol%).

5.2.2.4 Actions

5.2.2.4.1 For analytes for which the RPA_A is outside the range of 90 to 110% recovery (exceeds the reference by more than ±10%) in the blind spikes, the laboratory will be judged as unable to quantitate for analyte A. Data for that analyte will be reported but appropriately identified as unacceptable by the Program Coordinator. The impact of exceeding an action level on overall laboratory performance is given in Section 5.2.5. In accordance with Section 5.0, the site Project Manager shall have responsibility to ensure that appropriate corrective action measures are taken when necessary.

5.2.3 Precision of Replicate Determinations

5.2.3.1 Purpose: Analytical results for quadruplicate analyses of blind spikes of known concentration will be used to determine the precision with which a laboratory can quantitate the target analytes.

5.2.3.2 Criteria: The results reported for the target analytes of quadruplicate determinations from the same canister should not exhibit a standard deviation of greater than 10% (20% for NO_x).

5.2.3.3 Method: The analytical results for the quadruplicate determinations from each canister are used to calculate the relative standard deviation for each of the target analytes as follows:

$$\% \ RSD_A = \frac{s}{AC_A} \ x \ 100$$

where

$\%RSD_A$ = percent relative standard deviation of the quadruplicate determinations with a single canister

AC_A = average concentration of analyte A from quadruplicate determinations of a single canister (vol%)

s = standard deviation of the quadruplicate determinations of analyte A from a single canister

5.2.3.4 Actions

5.2.3.4.1 For any sample for which the $\%RSD_A$ exceeds 10% (20% for NO_x) for any analyte, the laboratory will be judged unable to quantitate reproducibly for that compound. Data for that analyte will be reported but appropriately identified as unacceptable by the Program Coordinator. The impact of exceeding an action level on overall laboratory performance is given in Section 5.2.5. In accordance with Section 5.0, the site Project Manager shall have responsibility to ensure that appropriate corrective action measures are taken when necessary.

5.2.4 Precision of Quantitation of Duplicates

5.2.4.1 Purpose: Analytical results for duplicate blind spikes of known concentration will be used to determine the precision with which a laboratory can quantitate the analytes.

5.2.4.2 Criteria: The difference between the results reported for target analytes for duplicate determinations from different canisters should not exceed 10% of the average of the duplicate results (20% for NO_x).

5.2.4.3 Method: The analytical results for all reported data are used to calculate the relative percent difference for each of the target analytes as follows:

$$RPD_A = \frac{|ACS_A - ACD_A|}{\frac{(ACS_A + ACD_A)}{2}} \times 100$$

where

RPD_A = relative percent difference between the average of quadruplicate determinations of two duplicate canisters

ACS_A = average concentration of analyte A in quadruplicate determinations from duplicate canister 1 (vol%)

ACD_A = average concentration of analyte A in quadruplicate determinations from duplicate canister 2 (vol%).

5.2.4.4 Actions: For any duplicate set for which the RPD_A exceeds 10% (20% for NO_x) for any analyte, the laboratory will be judged unable to quantitate for that compound. Data for that analyte will be reported but appropriately identified as unacceptable by the Program Coordi-

nator. The impact of exceeding an action level on overall laboratory performance is givein in Section 5.2.5. In accordance with Section 5.0, the site Project Manager shall have responsibility to ensure that appropriate corrective action measures are taken when necessary.

5.2.5 Overall Performance

5.2.5.1 Purpose: Laboratory performance on the entire set of blind audit samples will be used to assess any problems exist that may affect the laboratory's ability to analyze the analytes of interest. This conclusion could result in a holding period during which the laboratory would not analyze WIPP Test Program samples until the causes of the problems are identified, corrective action taken, and the efficacy of the corrective action demonstrated.

5.2.5.2 Criteria: The criteria used for the evaluation of overall laboratory performance are specified below. Performance shall be demonstrated by achieving these criteria:

a. Laboratories must pass all performance criteria for each critical target analyte gas (CTAG) to be considered qualified to perform gas analysis on WIPP waste characterization samples.

b. Laboratories must pass 75% of the accumulated performance criteria for those target analyte gases (TAGs) not identified as critical to be considered qualified to perform gas analysis on WIPP waste characterization samples.

5.2.5.3 Methods for evaluating target compound overall scoring are discussed below. Target compounds have been divided into two groups, CTAGs and TAGs. Table 5 lists the target compounds and those which have been classed as CTAGs are identified. CTAGs are those compounds which have been identified in documentation and/or studies of TRU waste as being of concern regarding flammability. Target compounds listed in Table 5 are those compounds which will:

a. Provide information regarding gas generation processes occurring in the waste, and

b. Are potentially present in WIPP experimental waste in sufficient quantities to be of quantitative interest.

5.2.5.3.1 The results reported for the analysis of CTAGs for the performance demonstration samples must meet all of the criteria identified in sections 5.2.2.2, 5.2.3.2, and 5.2.4.2 of this Program Plan.

5.2.5.3.2 The reported analyses of target compounds in the performance samples will be evaluated on a point scoring system. Results will be scored as follows:

a. For target analytes present in the duplicate canisters, the laboratory will receive five points for each evaluated RPA, RSD, and RPD that meet the criteria of 5.2.2.2, 5.2.3.2, and 5.2.4.2, respectively. (Possible 25 points per analyte)

b. For target analytes present in a single canister, the laboratory will receive five points for each evaluated RPA and RSD that meet the criteria of 5.2.2.2 and 5.2.3.2, respectively. (Possible 10 points per analyte)

c. Each laboratory will start with 50 points for each blank canister (5 points for each target analyte). From this total the laboratory will lose five points for each target analyte which fails to meet the blank criteria of 5.2.1.2.

d. Each laboratory will lose two points for each false positive (i.e., identification of a target analyte in a canister in which the compound is known to be absent). This criterion does not apply to the blank canister which is evaluated as in (c), above.

5.2.5.3.3 The calculation of the performance evaluation sample analysis score will be by the following equation:

$$\text{Laboratory Score} = 100 * (LP/TP)$$

where LP is the total points scored by the laboratory and TP is the total points possible for the performance sample set.

5.2.5.4 Actions: The site Project Manager shall have the responsibility of ensuring that appropriate corrective action measures are implemented when a laboratory exceeds an action limit. The following are considered minimum mandatory measures that must be implemented when action limits are exceeded.

5.2.5.4.1 If a laboratory obtains a score less than 75% of total possible points, the laboratory will be judged to have exceeded a control level. For those laboratories that are presently qualified from a previous WIPP Performance Demonstration, the laboratory will be placed on probation. Probationary status will be removed if the laboratory scores greater than 75% on the next Performance Demonstration sample set. Laboratories that score less than 75% on the initial Performance Demonstration sample set or score less than 75% on two consecutive sample sets (after

initially qualifying) shall cease analytical operations for samples from the WIPP Test Program. The laboratory may not begin analytical operations for samples from the WIPP Test Program until the laboratory has:

a. Investigated the cause of the failure(s) and taken corrective action,

b. Demonstrated adequate performance, i.e., a score equal to or greater than 75% on a set of blind performance samples.

Table 1. Blind Audit Sample Concentration Ranges

Canister Type	Concentrations of Target Analytes	Notes
Low Concentration VOC	< 20 ppmv	1
High Concentration VOC	< 1000 ppmv	1
Special VOC	< 1000 ppmv	1, 2
Low Concentration Gases	< 1.5% v/v	3
High Concentration Gases	< 3% v/v	4
Special Gases	< 1.5% v/v	2, 4
Blanks	< 50% PRQLs/PRDLs	5

Notes:

1. May contain VOCs not on target list.
2. May contain interferents or targets with known analytical problems.
3. Limit does not apply to N_2 which may be present up to normal air concentrations.
4. Limit does not apply to N_2 or O_2, which may be present up to normal air concentrations, or to CO_2, which may be up to 10%.
5. Pure dilution gas for gases; pure dilution gas or zero air for VOCs. "PRDLs" are the program required detection limits for gases. "PRQLs" are the program required quantitation limits for VOCs.

Table 2. Performance Demonstration Contacts *

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Office phone: (708) 972-4367 Fax: (708) 972-5287
(FTS) 972-4367 (FTS) 972-5287

Chuan F. Wu, WIPP/Westinghouse-WID
Westinghouse Electric Corp.
P.O. Box 2078
Carlsbad, New Mexico 88221
Office phone: (505) 887-8384 Fax: (505) 885-4562

[Program Coordinator designate laboratory(ies)]

* See Attachment 1 for shipping addresses.

ATTACHMENT 1

Laboratories scheduled to receive performance evaluation canister sets for both organic and inorganic target compounds:

James Schoen/T690L (303) 966-7421
EG&G Rocky Flats, Inc.
Receiving - Building 130
Rocky Flats Plant for USDOE
Golden, CO 80402

Lilia Barbosa (708) 972-7174
Building 205, Room L190
Argonne National Laboratory
9700 S. Cass Avenue
Argonne, IL 60439

Chuan F. Wu (505) 887-8384
WIPP/Westinghouse-WID
JAL Highway, 30 mi. SE of Carlsbad
Carlsbad, NM 88221-2078

Laboratories scheduled to receive sets of performance evaluation canisters for organic target compounds:

Joseph Bennett, CFA 633 (208) 526-2730
EG&G Idaho, Inc.
CFA 601 - Warehouse
Scoville, ID 83415

Harry Kimball • (913) 557-3881
USEPA Region 7
Environmental Services Division Laboratory
25 Funston Road
Kansas City, KS 66115

Laboratories scheduled to receive sets of performance evaluation canisters for inorganic target compounds:

Robert Villarreal, INEL/ANL-W (208) 533-7311
Argonne National Laboratory-West, Idaho Site
Building 752
Scoville, ID 83415

Bruce Kalowich • (313) 668-8582
Motor Vehicle Emission Laboratory/OAR
USEPA
2565 Plymouth Road
Ann Arbor, MI 48105

• Program Coordinator, designate laboratory

Table 3. Administrative Contacts

Mark Duff, USDOE (EM-342)
Office of Waste Operations
Office of Environmental Restoration and Waste Management
12800 Middlebrook Road, 4/F
Germantown, MD 20874
Office phone: (301) 427-1675 Fax: (301) 427-1650
(FTS) 427-1675 (FTS) 427-1650

Paul Hagen, USDOE/ASG
Rocky Flats Area Office
P.O. Box 928
Golden, CO 80402-0928
Office phone: (303) 966-4281 Fax: (303) 966-2256
(FTS) 345-4281 (FTS) 345-2256

Janine (Jessup) Arvizu, EG&G Idaho, Inc.
P.O. Box 1625
Idaho Falls, ID 83415-4123
or
INEL, Department of Energy
EG&G Idaho, Inc.
CFA Building 601
Scoville, ID 83415
Office phone: (208) 526-4541 Fax: (208) 526-2304
(FTS) 583-4541 (FTS) 583-2304

Michael J. Connolly, EG&G Idaho, Inc.
P.O. Box 1625
Idaho Falls, ID 83415-3940
Office phone: (208) 526-0238 Fax: (208) 526-6802
(FTS) 583-0238 (FTS) 583-6802

Peter Lindahl, Argonne National Lab (East)
Argonne National Laboratory, Bldg 200, 8181
9700 South Cass Ave.
Argonne, IL 60439
Office phone: (708) 972-3490 Fax: (708) 972-4470
(FTS) 972-3490 (FTS) 972-4470

Bill Scott, EG&G Idaho, Inc.
P.O. Box 1625
Idaho Falls, ID 83415
Office phone: (208) 526-8189 Fax: (208) 262-0524
(FTS) 583-8189 (FTS) 583-0524

Table 4. VOC Headspace Target Compound List (TCL) and Program Required Quantitation Limits (PRQLs)

Volatiles	CAS Number	PRQL (ppmv)
1. Acetone*	67-64-1	100
2. Benzene	71-43-2	1
3. Bromoform	75-25-2	1
4. 1-Butanol	71-36-3	100
5. 2-Butanone	78-93-3	100
6. Carbon Tetrachloride*	56-23-5	1
7. Chlorobenzene	108-90-7	1
8. Chloroform	67-66-3	1
9. Cyclohexane	110-82-7	1
10. 1,1-Dichloroethane*	75-35-3	1
11. 1,2-Dichloroethane	107-06-2	1
12. 1,1-Dichloroethene	75-35-4	1
13. cis-1,2-Dichloroethene	156-59-2	1
14. Ethyl Benzene	100-41-4	1
15. Ethyl Ether	60-29-7	1
16. Methanol	67-56-1	100
17. Methylene Chloride*	75-09-2	1
18. 4-Methyl-2-pentanone	108-10-1	100
19. 1,1,2,2-Tetrachloroethane*	79-34-5	1
20. Tetrachloroethene	127-18-4	1
21. Toluene	108-88-3	1
22. 1,1,1-Trichloroethane*	71-55-6	1
23. Trichloroethene*	79-01-6	1
24. 1,1,2-Trichloro-1,2,2-trifluoroethane	76-13-1	1
25. 1,3,5-Trimethylbenzene	108-67-8	1
26. 1,2,4-Trimethylbenzene	95-63-6	1
27. m-Xylene	108-38-3	1
28. o-Xylene*	95-47-6	1
29. p-Xylene	106-42-3	1

* Critical Target Compounds (CTCs)

Table 5. Gas Target Compound List (TCL) and Program Required Detection Limits (PRDLs)

Gases	CAS Number	PRDL (vol%)
1. Nitrogen (N_2)	7727-37-9	1.0
2. Oxygen (O_2)	7782-44-7	0.1
3. Hydrogen (H_2) •	1333-74-0	0.1
4. Methane (CH_4) •	74-82-8	0.1
5. Ethane (C_2H_6)	74-84-0	0.1
6. Propane (C_3H_8)	74-98-6	0.1
7. Nitrogen Oxides (NO_x) (NO) (NO_2)	 10102-43-9 10102-44-0	0.07
8. Carbon Monoxide (CO)	630-08-0	0.01
9. Carbon Dioxide (CO_2)	124-38-9	0.1
10. Argon (Ar)	7440-37-1	0.1

• Critical Target Analyte Gases (CTAGs)