RESPONSE TO EG&G COMMENTS

ON

PILOT TEST PLAN FOR SOIL VAPOR EXTRACTION TECHNOLOGY SUBSURFACE IM/IRA

ROCKY FLATS PLANT

903 PAD, MOUND, AND EAST TRENCHES AREAS

OPERABLE UNIT NO.2

U.S. Department of Energy
Rocky Flats Plant
Golden, Colorado

FEBRUARY 1993

U/NU
REVIEWED FOR CLASSIFICATION/UCNI
BY C. T. Ostdick
DATE 2-8-93

List of commentors:

1. Jim Koffer
2. Craig Cowdery
3. Gary Anderson
4. Alex Danzberger
5. Scott Grace
6. Michael Harris
7. Dan Helper
8. Phil Ralphs
9. Dennis Schybbe
10. Paul Singh

Responses to Comments by:
Jim Koffer

EG&G ROCKY FLATS
ENVIRONMENTAL MANAGEMENT DEPARTMENT

DOCUMENT REVIEW SHEET

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TITLE Draft Pilot Test Plan For *In Situ* Volatilization Technology, Subsurface IM/IRA-OU2, dated 11 September 1992

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SECTION OR PARAGRAPH	COMMENT	DISPOSITION	Concur (initial)
Section 2.2, Paragraph 1, Page 2-7	What about reducing vapor pressure?	The paragraph has been modified to discuss SVE mechanisms.	
Section 2.3, Page 2-4	Data Quality, What about pressures and volume rates?	All process measurements that will be taken are listed in Section 7.	
Section 4.1.1, Page 4-3	Construction requirements: screens or slots, horizontal or vertical?	Document has been modified to use the terms "well screen" and "screened interval."	
Section 4.2, Page 4-7	In regard to pump/motors, what about electrical controls, level controls, and length of cords.	Discussion regarding specifications of electrical systems and components have been augmented. In addition, specification for a control/power distribution panel have been added to the Plan.	
Section 4.4, Paragraph 1, Sentence 2, Page 4-10	Use butterfly valves only, ball valves are expensive and fluctuations are high.	Design has been revised to include the use of butterfly valves.	

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SECTION OR PARAGRAPH	COMMENT	DISPOSITION	Concur (initial)
Section 4.5, Page 4-11	Piping requirements: specify type of material or choices.	The piping specifications have been modified to include choices of possible materials of construction.	
Section 4.8.3, Paragraph 2, Page 4-13	Are there any standard EG&G procedures that should be referenced?	Appendix F will include a listing of potentially applicable RFP SOP's. These SOP's are also referenced throughout the document as appropriate.	
Section 5.1, Page 5.1	Use existing road.	Test Plan has been modified to include use of the existing gravel road used for the South Walnut Creek Basin surface water treatment facility.	
Section 5.4 Page 5-4	With regard to power source, specify expected size of power source.	125 kW.	

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Responses to Comments by:
Craig Cowdery

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SECTION OR PARAGRAPH	COMMENT	DISPOSITION	Concur (initial)
Introduction, Page 1-1, Paragraph 2	Should the Pilot test be conducted at T-3 rather than T-4?	Based on Phase II RI data, T-3 appears to be a better site to conduct the Pilot test. However, a final decision regarding the test site will be made after SVS data are available. The SVE bid package, will be revised to reflect the final SVE test site.	
Section 1.1, Page 1-4, Paragraph 2	Need to mention that alternative Pilot test sites may be used.	The text in Subsection 1.1 has been revised as suggested.	
Section 1.2, Page 1-5, Paragraph 2	Note limitations of Observational/Streamlined Approach.	Text revised to note that it is not possible to offer complete design flexibility due to time constraints and resource limitations.	
Section 2.1.3.1, Page 2-2	T-4 does not appear to be a good place to conduct vapor extraction, not even as an alternative site.	The final decision for the East Pilot Test site will be made after the SVS data is evaluated.	
Section 2.3, Page 2-10	DQO section needs to be "beefed up."	The DQO section has been revised.	
Section 3.2.4, Page 3-6	Equation does not account for surface leakage, multiple pressure monitoring would be better.	The text will be revised as suggested.	

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SECTION OR PARAGRAPH	COMMENT	DISPOSITION	Concur (initial)
Section 4.1, Page 4-2, Paragraph 2, Line 5	In regard to surface casing, is this a cement plug?	The description of the grouting procedure has been clarified.	
Section 4.1.3, Page 4-4	We need some general requirements concerning pump accessibility and possible controls.	Well head design has been revised to enhance pump and water level instrumentation accessibility.	
Section 4.1.3, Page 4-4, Last line on page.	Need a larger borehole than 8' for pumps and controls, also in 4.1.4.	All wells included in the Pilot unit have been sized to allow ample accessibility to ground water pumps and level instrumentation.	
Section 4.2, Page 4-6, Paragraph 1, Line 4	Add something about fire risks.	All electrical components and instrumentation have been specified for Class I, Division II operation.	
Section 4.2, Page 4-7, Line 1-2	Who will provide the information?	The Test Plan has been revised to note that subcontractor will provide pump specifications.	
Section 4.2, Page 4-7, Above 4.3	Need to discuss the delays that final sizing could cause. Can we do the sizing now?	Extraction pumps have been specified in the Test Plan, based on an expected water flow rate of 6 gpm.	
Section 4.3, Page 4-7, Top Line	Ensure slot size is correct based on sand pack.	Sand pack has been specified to have a nominal size that prevents sand from entering the well.	
Section 4.3.2, Page 4-9, Construction Req.	Borehole diameter should be 6 to 8 inches.	See comments above pertaining to Section 4.1.3, Page 4-4.	
Section 4.4, Page 4-10, Paragraph 1, Line 4	Do not use a ball valve, butterfly valve only.	Design has been revised to include the use of butterfly values.	
Section 4.4, Page 4-10, Paragraph 1, Line 5	Why use an orifice plate.	Measuring the pressure drop across an orifice plate is an accurate method of determining velocity.	
Section 4.6, Page 4-11, Line 1-2	Only winterize water lines and places that contain extracted moisture.	Statement revised to read as follows: "All non-buried piping and associated fittings outside of the equipment trailer will be winterized."	
Section 4.8.2, Page 4-12, Paragraph 2-3	Will separate borings be drilled for initial soil sampling?	No. As indicated, samples will only be taken from boreholes, advanced for vapor extraction/injection vents and PM probes.	

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SECTION OR PARAGRAPH	COMMENT	DISPOSITION	Concur (initial)
Section 5.2, Page 5-1, Paragraph 2	No money for gravel in line 2 or office in line 5.	The scope of pilot system has been reduced. Existing road for SWCB surface treatment facility will be used. Office work space will be provide in the process trailer. Size of gravel area has been reduced.	
Section 5.2, Page 5-2, Top paragraph on page.	No money for additional gravel.		
Section 5.3, Page 5-3	Storage tank requirements list should include a site glass.	Need for site glass will be investigated.	
Section 5.4, Page 5-4, Line 5	Evaluate gasoline or diesel to our air permits.	Portable power source has been specified using diesel fuel.	
Section 5.4, Page 5-5	Discuss instruments/controls/hookups. Are controls going to be centralized?	Instrument readings for on vapor treatment process are centralized on a control panel in the office space. Well head instruments are read locally.	
Figure 6-1, Page 6-2	Is gravel area large enough for turnaround?	Gravel area has been sized for turnaround.	
Section 6.2.2, Page 6-3	We need overall information and design for voltage current and phase.	Electrical and instrumentation specifications have been augmented.	
Section 6.2.5, Page 6-4	Information provided when and to whom.	Test Plan has been modified to note that subcontractor will submit information to EG&G.	
Section 6.4.2, Page 6-10, Design specs	Need to make sure that pump P-1 can overcome the head at the junction with the groundwater pump.	Subcontractor will evaluate the pressure at the piping junction to properly specify pumps.	
Section 6.5, Page 6-11, Last line before 6.6	10" H_2O change to 2" H_2O.	Test Plan has been revised to read "The pressure drop (clean) will not exceed 10 inches H_2O (at 300 SCFM).	
Section 6.6, page 6-11, System specs	Is minimum GAC 1,800 pounds or 500 pounds? Check IRAP.	Size of GAC not specified in IM/IRAP. 1,800 pounds GAC (each unit) has been specified in test plan to ensure ample absorption capacity for pilot tests at all three sites. At 30% loading, each GAC should recover ≈ 360 pounds of VOCs.	
Section 6.7.1, Page 6-12	Why is the alpha monitor provided by EG&G?	Complexity of monitor has been reduced. Document revised to require subcontractor to provide the alpha monitor.	
Section 6.7.1, Page 6-13	Is it possible that we will need to bring the discharge line back out through the stack?	Sampling system modified to route discharge line back to exhaust stack.	

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Section 6.7.4, Page 6-16, Paragraph 1	Line 2 states six pressure indicators. Dwg 11 shows eight.	Differences between text and drawings have been reconciled.	
Table 7-1, Page 7-4	Operating time should be based on a steady state condition.	The Test Plan will be revised to ensure that steady state is achieved prior to measurement of process variables. A critical parameter (i.e., well head pressure) will be selected as an indicator of steady state conditions. Example: Three consecutive measurements of the critical parameters, which are ±10% of each other would be indicative of steady state conditions.	
Table 7-2, Page 7-5	Explain measurement methods of flow, RH	Dedicated process sensors will be used for measuring flow and relative humidity Vapor Extraction System.	
Table 7-3, Page 7-6	Radiation measurements 2/hour, hydrocarbon measurements HC 2/hour.	Statements have been added to reflect field adjustment.	
Section 8.2.2, Page 8-4, Paragraph 2	Delete cost estimate for cost per volume of air.	This data evaluation will be deleted.	
Drawing 1-11	Remove Roy F. Weston from title block.	Roy F. Weston, Inc. has been removed from all drawing title blocks.	
Drawing 3	Why a pad for alluvial vent?	The well is a requirement of EG&G Standard Procedures for well installation. Pad provides proper water runoff and protection from vehicle damage.	
Drawing 3	Need to add a port so that a pressure gauge can be added.	Pressure measurements (and sampling) will be at a location downstream of the elbow. See Drawing 9.	
Drawing 3	90° elbow replaced with a "T" as a sampling port.	The elbow has been replaced by a "T" for ease of access to well.	
Drawing 5	Borehole too narrow.	All wells included in the pilot unit have been sized to allow ample accessibility to ground water pumps and level instrumentation.	
Drawing 7	Why does alluvial probe have a tip?	It may be required to drive probe into ground.	
Drawing 9	Verify cylindrical tank usage.	Drawing has been modified to reflect that storage tank may not be cylindrical.	

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Drawing 9	Modify piping to storage tank to have a globe valve and check valve in series.	See comment for Section 6.4.2 page 6-10.	
Drawing 1-11	Add site information to title box OU2.	Site information has been added to all drawings.	
Drawing 10	Number system needs fixing B-Basin? Drawing 11: B = blower F = fan or filter	Drawing 10 has been revised.	
Drawing 11	Why are there no flow meters in-line from extraction manifold?	Measurements will be made with a hand-held/portable instrument.	
Drawing 11	On make-up air line, what is the instrument labelled RH1?	A relative humidity sensor. New document clarifies instrument identification.	
Drawing 11	Label T-1 and other major units.	Document revised to label major units.	
Drawing 11	Is pump P-1 designed to overcome the heads of the other pump?	Subcontractor will evaluated junction pressures to properly size pumps.	
Drawing 11	Groundwater wells P-2 and P-3 need level controls and ball valves.	Level controls and ball valves have been added.	
Drawing 11	Alarm beacon, need separate alarms for each line C (lights).	Alarm beacon is to provide visual indicator when any of the alarm conditions exist. Control panel display will indicate alarm condition.	
Drawing 11	What are the instruments above B-1 that are labelled K1C and HOA?	KIC will indicate the time of blower shut down. HOC should be HS which is a manual switch for blower shut down. This has been corrected.	
Drawing 11	Are safety valve VRV-1 and VRV-2 shown properly?	Safety valves are shown correctly.	
Appendix C, Page 2 of 7	Is there a safety factor in calculations?	Equation has been used directly from Crane's Handbook.	
Appendix C	Sizing of piping. We need to size pumps.	Pumps have been sized for expected flow rate service.	

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Gary Anderson

EG&G ROCKY FLATS
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SECTION OR PARAGRAPH	COMMENT	DISPOSITION	Concur (initial)
Table of Contents	Include a list of acronyms used in the Test Plan.	An acronym list has been prepared and included in the document.	
Section 1.2, Page 1-6, Last Line	Concerning "control features", should include "...further described in Section X.Y."	Reference is made to Section 6 of the Pilot Test Plan.	
Section 2.1.3.1, Page 2-2, Third Sentence	This doesn't make sense.	The sentence has been rewritten to be more clear.	
Section 2.2, Page 2-7, Last Sentence on page	Deemphasize negatives associated with excavation.	Sentence modified to read "Remedies that minimize the disturbance of vegetation and soils are preferable to those requiring excavation."	
Figure 2-2, Page 2-8	Figure should be consistent with Drawing #11.	Figure 2-2 "schematic diagram of typical single well vent system" has been deleted from the document.	
Section 2.3, Page 2-10, Second Paragraph	"The level of concern..." does not make sense.	The "Data Quality Objectives" section has been rewritten.	

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Section 2.3, Page 2-10, After • Data types	What about soil samples before and after?	The Test Plan has been revised to include soil sampling before and after pilot testing.	
Section 2.3, Page 2-10, • Data Quality, d) Required detection	Limit of 1 ppm is vapor phase or soils?	Detection limits listed in text refer to analysis of soil vapor.	
Section 3.2.6, Page 3-10, Third Paragraph, Third Line	Clarify use of displacement blowers to be used to achieve the head pressure.	Text will be revised to clarify.	
Section 3.2.6, Page 3-10, Third Paragraph, Last Sentence.	Explain.	High moisture content will reduce the surface area of carbon available for the collection of VOC's.	
Section 4.1, Page 4-2, Second Paragraph, Line Four through Seven	About surface casting - won't this create annular seal to T.D.?	Paragraph has been rewritten to clarify grouting procedures.	
Section 4.1.1, Page 4-3, Construction/Performance Requirements	Change "treatment" to "screened."	Global change to reflect the term "screened interval."	
Section 4.1.2, Page 4-4, Specification on Top of Page.	More design calculations are needed for Injection Blower.	Document has been modified to include calculations and design basis for Injection Blower in Appendix E.	
Section 4.1.4, Page 4-6	No design data found for injection system	Document has been modified to include calculations and design basis for Injection Blower in Appendix E.	
Section 6.3.3, Page 6-7	Power requirements: 10 BHP listed differs from the 18 hp listed on the performance curves on sheet 5/5, Appendix C.	The typographical error has been corrected. 18 HP is correct.	
Section 6.3.4, Page 6-8	Don't see calculations for Blower B-3.	Document has been modified to include calculations for Blower B-3 in Appendix E.	
Drawings 5, 6	Place seal for power cable at top of 90° elbow.	Seal for power cable will be shown.	
Drawing 6	Large 90° elbow shown as "to vapor header" should be changed to "from air injection header."	On extraction and injection wells where dewatering occurs elbow will be replaced with "Ts." The typographical errors noted in the comment have been corrected.	
Drawing 9	AV1 is (negative pressure).	Document will be revised to label AV1.	

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SECTION OR PARAGRAPH	COMMENT	DISPOSITION	Concur (initial)
Drawing 11	Tank T-1 should be labeled.	P&ID has been revised to include labels for all major components.	
Drawing 11	Filters F-1, F-2 should be labelled	P&ID has been revised to include labels for all major components.	
Drawing 11	Intake for positive displacement blower should have a screen or filter.	A filter has been added at the input to the air injection pump.	
Drawing 11	Sandstone extraction vents and injection vents are not shown.	Drawing has been revised to include additional vents.	
Drawing 11	Tank T-2, why is inlet on bottom?	Drawing has been modified to show inlet at the top of T-2.	
Drawing 11	Tank T-2, no pumpout system.	Drawing has been modified to reflect pumpout system to a tank truck.	

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Responses to Comments by:
Alex Danzberger

EG&G ROCKY FLATS
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Comment No. 1, General	Format appears as highbred. Is this a Field Treatability Study, and if so, what treatment goals apply? The language on Page 1-4 is not clear. References should be provided for "discussions" with the regulators.	The objective of the pilot test is to collect information on SVE technology that can be used in FS evaluations and subsequent design of full-scale systems (if SVE is selected in ROD). Operating data collected during pilot testing will be used to define criteria for post-pilot operation (i.e., mass of VOCs recovered per unit cost, areal influence, etc.). A VOC mass removal rate of 1 pound/day is presented in the Test Plan as a preliminary threshold for success for operation of the pilot-scale SVE system.	
Comment No. 2, General	SVE is being applied in the East Trenches Area where heavy metals (HMs) and radionuclides (Rads) are present in addition to VOAs. Other RFP areas are contaminated with VOAs only and would be beneficiaries of this demonstration. Also, SVE could be pretreatment for solidification of soils which contain Rads, Hms. These areas would also be beneficiaries. The utility of the present demonstration should be noted also in this context.	The Subsurface IM/IRA Pilot Test Program includes investigation of SVE at three sites with different hydrogeological settings. The IM/IRAP also notes that information collected during the Pilot Test Program will be used to examine the feasibility of the application of SVE site wide.	

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SECTION OR PARAGRAPH	COMMENT	DISPOSITION	Concur (initial)
Comment No. 3, General	There is no reference to management of GAC which is generated by this treatment process. GAC will be contaminated with VOCs, and should be handled as a RCRA waste.	There are three options for handling spent GAC: storage, disposal, and on-site regeneration. EG&G is currently investigating the feasibility of onsite GAC regeneration. The Test Plan will be revised to address the management of spent GAC when more information is available on the potential for onsite regeneration.	
Comment No. 4, General	Handling of pumped groundwater together with KO drum condensate by OU2 IM/IRA appears assumed. Free product, especially oils, could upset this treatment system; the stream should by QCd in some way.	There is no intention of sending free product (LNAPL or DNAPL) to any water treatment facility. A phase separator will be installed if free product is encountered (see Subsurface IM/IRA Observational/Streamlined Approach Tables 4-1 and 4-3). However, the following procedure to check for the presence of free product in the ground-water storage tank will be added to the Test Plan. "Prior to transfer of collected ground water to an onsite treatment facility the tank contents will be inspected for the presence of free product as follows: Step 1 – Turn of influent to storage tank and let contents of tank stand undisturbed for 5 minutes to ensure a phase separation. Step 2 – Inspect surface of water for presence of LNAPL (sample with bailer if necessary). Step 3 – Inspect for DNAPL, by slowly lowering a conductivity sensor to the bottom of the tank. The ground-water transfer procedure will allow lowering the water level in the tank to only 6 inches. *This will prevent any* thin layer of DNAPL on the bottom of the tank that may have been undetected by the sensor from being transferred to the treatment facility."	

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Comment No. 5, General	There appears to be no provision for double containment of storage tankage and transfer piping.	The Test Plan has been revised to note that secondary containment will be provided for the ground-water storage tank.	
Comment No. 6, General	The text contains a great deal of detail which could be handled as an Appendix for greater ease of reading.	The following detailed information has been included in the Appendices of the Test Plan: SVE engineering drawings, soil boring logs, quality assurance procedures, and design basis calculations.	
Comment No. 7, Page 7-19	Replacement of lead carbon at 50% utilization is wasteful, not necessary when using the lead polish arrangement and generates excessive waste. This matter should be reconsidered.	The lead GAC unit will be replaced when it is fully loaded (i.e., effluent is 95% of influent), and it will be replaced by either: • The polishing GAC unit if it is estimated that 50% or more of its capacity has been used, or • A new GAC unit if the used capacity of the polishing unit is estimated to be less than 50%.	

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Responses to Comments by:
Scott Grace

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Introduction, Page 1-1, Paragraph 2	Test location is to remain flexible.	Section 1 of the Test Plan has been revised to include alternate Pilot test sites that may be substituted for the Primary test sites proposed in the Subsurface IM/IRAP. Reference is made to future SVS data that will guide test site selection decisions.	
Section 2.1, Page 2-1	Augment the hydrogeological description.	Section 2 has been revised as suggested.	
Introduction, Page 1-1, Paragraph 2	Consider changing test site to T-3.	Based on Phase II RI data, T-3 appears to be a better site to conduct the pilot test. However, EG&G will wait for SVS data prior to making a final decision.	
Section 7.1, Page 7-1	Must build flexibility into the "success threshold criteria." Also, need criteria to allow operation after pilot test is complete, but mobile unit is not yet needed at another pilot test site.	Section 7.1 (2nd paragraph) presents a revised pilot test program with respect to success criteria and continued post-pilot operation.	

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General Comment	Reference EPA treatability study guidance for SVE.	Reference is made in Section 1 (2nd paragraph).	
Section 7.4.8, Page 7-19	Must have either: 1) storage for spent GAC, or 2) onsite GAC regeneration	EG&G will investigate the potential for onsite regeneration of spent GAC. The Pilot Test Plan will be revised to include management of spent GAC.	
Section 3.2.8, Page 3-12, Third Paragraph	Is there sufficient capacity at SWCB surface water treatment facility to accommodate groundwater collected during the pilot test at East Trenches Area?	The expected groundwater recovery rate is 5 gpm. During the "wet season" the average surface water influent flow to the SWCB treatment facility is 12 to 18 gpm (Peak = 22 gpm). Thus, there is ample spare treatment capacity since the facility has been designed to operate at 60 gpm.	

	PHONE	DATE	DEPT.
REVIEWER (PRINT): Scott Grace (U.S. DOE) SIGNATURE OF REVIEWER: _____ REVIEW TYPE: __INDEPENDENT __QA __PEER REVIEW __OTHER	_____	_____	____

Responses to Comments by:
Michael Harris

EG&G ROCKY FLATS

ENVIRONMENTAL MANAGEMENT DEPARTMENT

DOCUMENT REVIEW SHEET

PLEASE REVIEW THE ATTACHED PROCEDURE, NO. _____ REV. _____ DRAFT ___

TITLE Draft Pilot Test Plan For *In Situ* Volatilization Technology, Subsurface IM/IRA-OU2, dated 11 September 1992

COMPLETE THE FOLLOWING AND RETURN THIS SHEET TO: _____ BY ___/___/___

_____ NO COMMENT

_____ COMMENTS ARE RECOMMENDATIONS TO BE CONSIDERED BY THE RESPONSIBLE MANAGER

_____ COMMENTS SHOWN BELOW ARE TO BE DISPOSITIONED BEFORE THE DOCUMENT IS SUBMITTED FOR APPROVAL

SECTION OR PARAGRAPH	COMMENT	DISPOSITION	Concur (initial)
Section 3.2.2, Paragraph 2, Page 3-3	Explain why TCE could potentially occur in some location as a free phase solvent or DNAPL.	The presence of free phase TCE is inferred from nearby ground water chemistry. Monitoring well No. 3687 is located approximately 40 feet north of and hydraulically down-gradient of Trench T-4. A sample of water collected in May 1988 from this well contained 221.8 mg/l of TCE which represents 20 percent of the TCE solubility limit. The high concentration detected in 1988 and in subsequent sampling events, coupled with the proximity of this well to Trench T-4 suggests the likelihood of free phase TCE in and around Trench T-4.	
Section 3.2.8, Page 3-11 to Page 3-13	Will the groundwater require any treatment? If yes, provide a description of the treatment process.	The groundwater will be treated. A discussion on alternative groundwater treatment facilities has been added to Section 3.	
Section 4.4, Paragraph 1, Page 4-10	Specify the slope angle of the manifolds from the extraction vents?	The slope of the manifolds from the extraction vents has been specified to equal 1%.	
Section 5.3, Page 5.3	Will the groundwater storage tank require secondary containment (e.g., liner, berm etc.)?	Yes. A requirement for secondary containment has been added to the Plan.	

NOTE: Comments listed on this Review Sheet were transcribed by WESTON from comments handwritten directly in a copy of the Draft Pilot Test Plan dated 11 September 1992.

REVIEWER (PRINT): Michael Harris	PHONE	DATE	DEPT.
SIGNATURE OF REVIEWER:			
REVIEW TYPE: __INDEPENDENT __QA __PEER REVIEW __OTHER			

CONTROLLED DOCUMENT REVIEW CONTINUATION SHEET

PROCEDURE NO. _____ REV. _____

SECTION OR PARAGRAPH	COMMENT	DISPOSITION	Concur (initial)
Section 7.1, Paragraph 2, Page 7-1	1. How will the VOC recovery rate be determined? 2. Will it be determined by weighing the GAC?	The VOC mass recovery rate will be calculated from the flow rate of the extracted air and the concentration of VOCs in the air stream.	
Section 7.2.2.1, Table 7-2	Why is it necessary to take relative humidity measurements at the dilution air inlet, demister inlet, and stack?	Relative humidity measurements will be necessary to obtain the "corrected" air flow rate. A measurement error up to 5% may be introduced, if relative humidity is not factored into the air flow rate calculations.	
Section 7.2.2.2, Paragraph 2, Page 7-6	Explain specifically how the optimal AV1 operating procedure will be determined?	VOC recovery rate will be measured at different vent pressures to yield the "optimum" operating configuration at which the recovery rate is maximized.	
Section 7.2.2.3, Paragraph 1, Page 7-6	How will the rise in the groundwater table be measured?	Groundwater table will be monitored by means of level measurement instrumentation installed in the extraction and injection wells.	
Section 7.2.2.3, Table 7-3	Duplicate runs of the alluvium vapor extraction vent (AV1) will be needed.	Duplicate runs are not included in the baseline pilot-testing protocol to keep the program streamlined. However, under the observational/streamlined approach, the Project Manager may decide to perform duplicate runs, after an evaluation of initial test results.	
Drawing No. 11	Is it required to install valves after the HEPA filters?	A valve will have to be installed after each of the HEPA filters to allow replacement of filter media without interrupting the continuous operation of the SVE system.	
Drawing No. 11	It is not clear where the radiation monitoring system is positioned within the treatment train?	Drawing 11 has been revised to clarify the measurements that will be taken at various locations on the SVE system.	

	PHONE	DATE	DEPT.
REVIEWER (PRINT): Michael Harris SIGNATURE OF REVIEWER: _____ REVIEW TYPE: __INDEPENDENT __QA __PEER REVIEW __OTHER	_____	_____	____

Responses to Comments by:
Dan Helper

ENGINEERING SUPPORT REQUEST

FE/FPM Internal Document	Date:	Revision Number:
Project Title: Pilot TEST PLAN IN SITU Volatilization SIM/IRA	Auth/EJO No.: Charge No.: 989011	
Project Engineer JIM KOFFER	User Contact: Phone:	
Project Administrator:	Facilities Project Manager:	

X	PROJECT/SERVICES	NEED DATE (ACTIVITY DUE)	ESTIMATED DOLLARS FOR TASK	ACTUAL COMPLETION DATE
	Study			
	Conceptual Design Report (CDR)			
	Schedule 44 - Construction Project Data Sheet			
	Action Description Memorandum (ADM)			
	Design Criteria (DC)			
	Design Build Criteria			
	Part IV Cost Estimate			
	Scope & Estimate (S&E), Including Environ. Checklist			
	Specification			
	Title I Services (TI)			
	Title II Services (TII)			
	As-Built Drawings (AB)			
	Change Scope			
	Stop Work			
	Additional Technical Data for HS&E			
X	Other (Specify) PACKAGE REVIEW			

Special Instructions:
Not to exceed 10 hrs, comments due by 10/16/92

Attached Documents:		Status Entered: (Initials/Date)	
Accepted (Project Engineer):	Date: 10/12/92	Completed (Project Engineer):	Date: 10/13/92
Contract Accepted (Design Manager):	Date: 10/12/92	Request Completed (Design Manager):	Date:
Contract Accepted (Project Administrator):	Date:	Request Completed (Project Administrator):	Date:

Distribution: Original and two copies. (after signing by PA and Design Manager).

White: Return to PA fpr project file
Yellow: Facilities Engineering
Green: Engineering Control Systems

RF-47188 (Rev. 9/91) Supersedes Previous Issues

DOCUMENT COMMENTS/RESOLUTIONS

Tracking NO. ____

Date ____

Project Title: OU 2 IRA Auth No.: 989011

Document Title/No.: Pilot TEST PLAN IN SITU VOLATILIZATION TECHNOLOGY Rev.: DRAFT Date: 9/11/92

Review Type: 30% ____ 60% ____ 90% ____ Other ____

Review's Name: DAN HEPLER

Phone No./Organization: 2276, FLUID PROCESS ENGINEERING

Item No.	Reference Page/Para.	Comments Show Actual Proposed Rewording, If Possible	Disposition: Accept	Disposition: Reject	Disposition: Other	Proposed Resolution (Include Responsible Party) for other or Technical Justification for Rejection	Date Closed
1	General Comment	It is the policy at RF that all activities and work that impact or affect Safety or quality shall be controlled by written instruction appropriate to the type of work performed.				1 Pilot Test Program activities will be guided by the Procedures presented in the Test Plan and RFP SOPs. RFP SOPs that are applicable to the Test Program have been referenced in the Test Plan.	
2	CCCP overview	The CCCP system shall be used to Safely modify the configuration of ALL Rocky Flats Facilities.				2 Response to be supplied by Craig Cowdery.	

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SCM 2000C (NES)

DOCUMENT COMMENTS/RESOLUTIONS

Tracking No. ____

Date ____

Project Title: OU 2 IRA Auth No. 989011

Document Title/No.: Pilot Test Plan In Situ Volatilization Technology Rev. DRAFT Date 9/11/92

Review's Name: DAN HEPLER

Phone No./Organization: 2276, Fluid Process Engineering

Review Type: 30% ____ 60% ____ 100% ____ Other ____

Item No.	Reference Page/Para.	Comments Show Actual Proposed Rewording, If Possible	Disposition: Accept	Disposition: Reject	Disposition: Other	Proposed Resolution (Include Responsible Party) for other or Technical Justification for Rejection	Date Closed
3	General Comment	To ensure compliance with RFP policies and DOE requirements, it is paramount that a consistent program be used to control and monitor the design, construction and installation of all activities. If this product is a Line Item Project, then FAC-1, FAC 5 and FAC 6 apply as does the CCCP/COEM.			3	A consistent program to control and monitor program activities will be used throughout Pilot testing. This program may be modified per Observational / Streamlined Approach methodology as information is collected in the early stages of Pilot testing. Response to be provided by Craig Cowdery.	

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SCM 2000C INES

DOCUMENT COMMENTS/RESOLUTIONS

Tracking NO. ____

Date ____

Project Title OU 2 IRA Auth No. 989011

Document Title/No. Pilot Test Plan In Situ Volatilization Technology Rev. DRAFT Date 9/11/92

Review's Name DAN HEBLER

Phone No./Organization 2276, Fluid Process Engineering

Review Type 30% ____ 60% ____ 90% ____ Other ____

Item No.	Reference Page/Para.	Comments Show Actual Proposed Rewording, If Possible	Disposition: Accept	Disposition: Reject	Disposition: Other	Proposed Resolution (Include Responsible Party) for other or Technical Justification for Rejection	Date Closed
3	cont'd	IF it is a general Plant Project then FAC-2 applies as does CCAP/COEM. It is Engineering position that this performance Specification without a design basis as required by EG&G Policy does not follow Safety First and Best Management practices and is an "at Risk" endeavor.				• Section 3 of the Test Plan Summarizes the "Basis of Design" and Appendix E, "Design Calculations" Provides the supporting calculations.	

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SCM 2400C (R5)

DOCUMENT COMMENTS/RESOLUTIONS

Tracking No. ____

Date ____

Project Title: OU 2 IRA Auth No. 989011

Document Title/No.: PILOT TEST PLAN IN SITU VOLATILIZATION TECHNOLOGY Rev. DRAFT Date 9/11/92

Review Type: 30% ____ 60% ____ 90% ____ Other ____

Review's Name: DAN HEPLER

Phone No./Organization: 2276, FLUID PROCESS ENGINEERING

Item No.	Reference Page/Para.	Comments Show Actual Proposed Rewording, If Possible	Disposition: Accept	Disposition: Reject	Disposition: Other	Proposed Resolution (Include Responsible Party) for other or Technical Justification for Rejection	Date Closed
4	Specific Comments Para. 6.2	"all applicable OSHA standard/requirements should not be the responsibility of the Fabricator but needs to be identified by the "design basis." "as well as State or local building codes or electric codes. Need specifics for out of State bidders.				4 • Inclusion of standards and codes in the design basis is appropriate for a detailed design package. This Test Plan, however, provides a performance specification rather than a detailed design. • Reference is made to "state and local standards and codes." The actual standards and codes will be provided to all prospective bidders.	

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SCM 2010C (10/5)

DOCUMENT COMMENTS/RESOLUTIONS

Tracking No. ____

Date ____

Project Title: OU 2 IRA Audit No. 989011

Document Title/No.: Pilot TEST PLAN IN SITU VOLATILIZATION TECHNOLOGY Rev. DRAFT Date 9/11/92

Review Type: 30% ____ 60% ____ 90% ____ Other ____

Review's Name: DAN HEPLER

Phone No./Organization: 2276, FLUID PROCESS ENGINEERING

Item No.	Reference Page/Para.	Comments Show Actual Proposed Rewording, If Possible	Disposition: Accept	Disposition: Reject	Disposition: Other	Proposed Resolution (Include Responsible Party) for other or Technical Justification for Rejection	Date Closed
5	6.2.2	The type of fuel used by the Portable power source ~~should~~ should be ~~deed~~ identified along with unit storage requirements.				5 • The Portable Power Source has been specified to be a diesel generator. Fuel storage requirements will be specified in the Test Plan.	
6	6.2.4	The design should not be based on an "expected" number actual mean data should be used. Does this mean the Portable power source will have to run off shifts?				6 • The current Test Program includes Pilot testing the SVE unit at 3 sites within OU2 (i.e., 903 Pad [IHSS 112], Mound [IHSS 113], and East Trenches [IHSS 111.1]). These 3 tests will be done sequentially. Thus, the Power Source will be dedicated to each test.	

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SCH 200C (R5)

DOCUMENT COMMENTS/RESOLUTIONS

Tracking No. ____

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Project Title: OU 2 IRA Auth No. 989011

Document Title/No.: Pilot Test Plan In Situ Volatilization Technology Rev. DRAFT Date 9/11/92

Review's Name: DAN HEPLER

Phone No./Organization: 2276, Fluid Process Engineering

Review Type: 30% ____ 60% ____ 90% ____ Other ____

Item No.	Reference Page/Para.	Comments Show Actual Proposed Rewording. If Possible	Disposition: Accept	Disposition: Reject	Disposition: Other	Proposed Resolution (Include Responsible Party) for other or Technical Justification for Rejection	Date Closed
7	[redacted]	[redacted] prior [redacted]			7	• The Test Plan will be modified to note that a submittal of deviations will be submitted to Ecia for approval prior to component purchase / system fabrication.	
8	[redacted]	Submittal have absolutely nothing relevant to "Design" only Fabrication. Request energy balances (Heat trace) piping + Electrical codes used, welding brazing + soldering			8	• The submittal list will be augmented to include detailed design backup (i.e., calculations, codes, etc.)	

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SCM 2000C REV

DOCUMENT COMMENTS/RESOLUTIONS

Tracking No. ____

Date ____

Project Title: OU 2 IRA Auth No. 989011

Document Title/No.: Pilot Test Plan In Situ Volatilization Technology Rev. DRAFT Date 9/11/92

Review Type: 30% ____ 60% ____ 90% ____ Other ____

Review's Name: DAN HEPLER

Phone No./Organization: 2276, Fluid Process Engineering

Item No.	Reference Page/Para.	Comments Show Actual Proposed Rewording. If Possible	Disposition: Accept	Disposition: Reject	Disposition: Other	Proposed Resolution (Include Responsible Party) for other or Technical Justification for Rejection	Date Closed
(8)	6.2.6 cont'd	Codes, Inspection codes, material specs, valves specs etc. you have asked for nothing and required even less. [redacted] "shakedown" procedure. give guidance on what "shakedown" means. I think you want an S.O. Test.				• The Plan has been revised to request a System operations Test Checklist to be submitted to EPA by the Subcontractor.	

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SCM 2000C (RES)

DOCUMENT COMMENTS/RESOLUTIONS

Tracking No. ____

Date ____

Project Title: OU 2 IRA Auth No. 989011

Document Title/No.: Pilot Test Plan In Situ Volatilization Technology Rev. DRAFT Date 9/11/92

Review's Name: DAN HEPLER

Phone No./Organization: 2276, Fluid Process Engineering

Review Type: 30% ____ 60% ____ 90% ____ Other ____

Item No.	Reference Page/Para.	Comments Show Actual Proposed Rewording. If Possible	Disposition: Accept	Disposition: Reject	Disposition: Other	Proposed Resolution (Include Responsible Party) for other or Technical Justification for Rejection	Date Closed
9	[redacted] 6.3.3 6.3.4	[redacted] Equipment at 6000 ft Any deviation.... will be noted. when + where Reword last bullet - All Electrical Component will "be"? Class 1 Division 1 is for use in and explosive atmosphere			9	SVE equipment has been specified to be derated for operation at 6000 feet above mean sea level. • Deviations will be submitted in writing to Ecte prior to purchase and continued fabrication. Alternative specifications must be approved by Ecte prior to making substitutions. • Editorial change made as suggested. • All electrical equipment has been specified for NEC CI, DII operation.	

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SCM 2000C 08/5

DOCUMENT COMMENTS/RESOLUTIONS

Tracking NO. ____

Date ____

Project Title OU 2 IRA Auth No. 989011

Document Title/No. Pilot TEST PLAN IN SITU VOLATILIZATION TECHNOLOGY Rev. DRAFT Date 9/11/92

Review Type 30% ____ 60% ____ 90% ____ Other ____

Review's Name DAN HEPLER

Phone No./Organization 2276, FLUID PROCESS ENGINEERING

Item No.	Reference Page/Para.	Comments Show Actual Proposed Rewording. If Possible	Disposition Accept	Reject	Other	Proposed Resolution (Include Responsible Party) for other or Technical Justification for Rejection	Date Closed
9	6.3.2 6.3.3 6.3.4	Class 1 Division 2 appears to be a better choice. How can you require Class 1 Div 1 Electrical and disregard ~~[illegible]~~ Coded Vessels + piping?				See previous response.	

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SCM 2000C (ES)

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Review's Name: DAN HEPLER

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Review Type: 30% ____ 60% ____ 90% ____ Other ____

Item No.	Reference Page/Para.	Comments Show Actual Proposed Rewording. If Possible	Disposition: Accept	Disposition: Reject	Disposition: Other	Proposed Resolution (Include Responsible Party) for other or Technical Justification for Rejection	Date Closed
10	6.4	The Knockdown Drum and demister is a "pressure vessel" an should be treated accordingly. Code of construction should be identified and request design calculations. Request material compatability study/chart			10	Knock out Drum is ASME Boiler and Pressure Vessel Code, Section VIII, Division 1 has been specified.	
11	6.5	ARE Both Hepa filters normally in service, this			11	• No. A Parallel configuration is employed so that one filter can be serviced while the	

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SCM 2000C 10/5

DOCUMENT COMMENTS/RESOLUTIONS

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Document Title/No. Pilot Test Plan In Situ Volatilization Technology Rev. DRAFT Date 9/11/92

Review Type 30% ____ 60% ____ 90% ____ Other ____

Review's Name DAN HEPLER

Phone No./Organization 2276, Fluid Process Engineering

Item No.	Reference Page/Para.	Comments Show Actual Proposed Rewording, If Possible	Disposition: Accept	Disposition: Reject	Disposition: Other	Proposed Resolution (Include Responsible Party) for other or Technical Justification for Rejection	Date Closed
11	6.5 cont'd	paragraph infers they are not. How are they sized, need face area, flow rate and pressure drop when change is required.				(cont) Second filter is in service. Filters sized for anticipated range of flow rates (up to 500 scfm). A filter should be changed when "ΔP" increases by 1-2 inches of Hg (over ΔP for new filter at approximately the same flow rate). Filter changing will be addressed in more detail in the subcontractor-supplied O&M manual.	
12	6.6	The GAC bins are also a Tank/pressure Vessel, Identify Code of Construction, Calc's requirement, material compatibility.				12 GAC units... the ASME Boiler and Pressure Vessel Code, Section VIII, Division I has been specified.	

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SCM 2000 CIES

DOCUMENT COMMENTS/RESOLUTIONS

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Date ____

Project Title: OU 2 IRA Auth No. 989011

Document Title/No.: Pilot Test Plan In Situ Volatilization Technology Rev. DRAFT Date 9/11/92

Review's Name: DAN HEPLER

Phone No./Organization: 2276, Fluid Process Engineering

Review Type: 30% ____ 60% ____ 90% ____ Other ____

Item No.	Reference Page/Para.	Comments Show Actual Proposed Rewording, If Possible	Disposition: Accept	Disposition: Reject	Disposition: Other	Proposed Resolution (Include Responsible Party) for other or Technical Justification for Rejection	Date Closed
12	6.6 Cont'd	Identify wind & weather conditions for STACK design				(Cont) Stack (and process trailer) must withstand wind velocities as high as 100 mph.	
13	6.7	Containment Requirements for groundwater Storage Tank overflow.?			13	Since the pilot test phase is a temporary effort (i.e., less than 90 days), secondary containment is not required for the groundwater storage tank.	
14	6.7.1	There are strict Plant Policies on Piping and Tanks containing Radioactive substance. You should use them.			14	The levels of radionuclides expected in the ground water are very low relative to what has been handled in the Plant. The Plant tank and piping specifications/Policies would not be applicable.	

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SCM 2000 C (ES)

DOCUMENT COMMENTS/RESOLUTIONS

Tracking No. ____

Date ____

Project Title: OU 2 IRA Auth No.: 989011

Document Title/No.: Pilot Test Plan In Situ Volatilization Technology Rev. DRAFT Date: 9/11/92

Review's Name: DAN HEPLER

Phone No./Organization: 2276, Fluid Process Engineering

Review Type: 30% ____ 60% ____ 90% ____ Other ____

Item No.	Reference Page/Para.	Comments Show Actual Proposed Rewording. If Possible	Disposition: Accept	Disposition: Reject	Disposition: Other	Proposed Resolution (Include Responsible Party) for Other or Technical Justification for Rejection	Date Closed
15	6.7.1	Tank T-2, is it supplied by the Trailer unit vendor. Need unload/spill prevention capabilities.			15	• Tank T-2 will be supplied by the Site Preparation Subcontractor. The Test Plan has been revised to include spill control measures.	
16	6.7.1	Detector accuracy? Calibratable? Hepa filter "ALARA" shielding?			16	• Since the monitoring technique involves filtering the exhaust gas, followed by measurement of the filter media for α activity, it is not appropriate to specify a detection limit (e.g., pCi/m³). Instead a Detection Efficiency (20%) is specified (Lab Analysis = 100%)	
17	6.7.1	Why an Isolation Valve on the monitor piping?					

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SCM 2400C (NES)

DOCUMENT COMMENTS/RESOLUTIONS

Tracking NO. ____

Date ____

Project Title: OU 2 IRA Auth No. 989011

Document Title/No.: PILOT TEST PLAN IN SITU VOLATILIZATION TECHNOLOGY Rev. DRAFT Date 9/11/92

Review's Name: DAN HEPLER

Phone No./Organization: 2276, FLUID PROCESS ENGINEERING

Review Type: 30% ____ 60% ____ 90% ____ Other ____

Item No.	Reference Page/Para.	Comments Show Actual Proposed Rewording, If Possible	Disposition: Accept	Disposition: Reject	Disposition: Other	Proposed Resolution (Include Responsible Party) for other or Technical Justification for Rejection	Date Closed
19	6.7.4 (cont'd)	Cause a release to the environment?				(cont) atmospheric air being introduced into the treatment train.	
20	6.7.7	Is this unit in an Enclosed Trailer? If so, based upon grab air samples, what monitors the Trailer Atmosphere to guard against leaks. Is this the reason for NEC Class 1 Division 1?				20 Yes. Leaks are not expected because the SVE system is designed to operate under vacuum. Class I, Division II equipment ratings are specified.	

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SCM 2000C (1/85)

DOCUMENT COMMENTS/RESOLUTIONS

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Document Title/No.: Pilot TEST PLAN IN SITU VOLATILIZATION TECHNOLOGY Rev. DRAFT Date 9/11/92

Review Type: 30% ____ 60% ____ 90% ____ Other ____

Review's Name: DAN HEPLER

Phone No./Organization: 2276, FLUID PROCESS ENGINEERING

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21	General Comment	This "temporary" unit has a requested design Life of 5 years, based upon this potential Longevity, a more stringent "Performance Spec" would be prudent.				(21) A statement will be added to the Test Plan Performance specifications regarding the expected operational life of the unit.	
22	General Comment	No request was made for materials of construction to be compatable				(22) Materials compatability with respect to heat tracing will be noted in the Test Plan.	

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SCM 2000C 10/5

DOCUMENT COMMENTS/RESOLUTIONS

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Review's Name: DAN HEPLER

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22	General Comment (Cont'd)	with heat protection IE some plastic pipes are not for use with H.T.					
23	General Comment	The chemical Resistance section (6.21) is weak, what about corrosion allowances, Cathodic protection etc.				(23) All chemicals expected are listed in the Performance Specifications. Exact materials of construction will be specified in the detailed design. SVE Process train is trailer mounted, no need for cathodic protection (Also, tank T-2 is temporary).	
24.	General Comment	Tank T-2 appears to be a ground mounted unit.			(24)	Yes. T-2 is a 10,000-gallon "Frac" Tank. Options for	

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SCH 2/DOC RES

DOCUMENT COMMENTS/RESOLUTIONS

Project Title: OU 2 IRA Auth No. 989011

Document Title/No.: Pilot TEST PLAN IN SITU VOLATILIZATION TECHNOLOGY Rev. DRAFT Date 9/11/92

Review's Name: DAN HEPLER

Phone No./Organization: 2276, FLUID PROCESS ENGINEERING

Review Type: 30% ____ 60% ____ 90% ____ Other ____

Tracking No. ____

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24	G.C. cont'd	Is this true, how should it set, how is it moved, how is it anchored?				transport include ① Tow ② Flatbed transport /crane dismount. This is a detailed design issue.	
25	G.C.	No discussion of Trailer design other than D.O.T. No seismic or wind loads for Trailer modification (They will be needed) Is a used trailer acceptable, does				(25) Wind loading specification added (i.e. Tie downs to withstand 100 mph, minimum) for trailer. The use of a previously used trailer should not be a problem. This would have to be approved by EG&G, however.	

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SCM 2000 HES

DOCUMENT COMMENTS/RESOLUTIONS

Tracking No. ____

Date ____

Project Title: OU2 IRA Auth No. 989011

Document Title/No.: Pilot TEST PLAN IN SITU Volatilization Technology Rev. Draft Date 9/11/92

Review Type: 30% ____ 60% ____ 90% ____ Other ____

Review's Name: DAN HEPLER

Phone No./Organization: 2276, FLUID Process Engineering.

Item No.	Reference Page/Para.	Comments Show Actual Proposed Rewording. If Possible	Disposition: Accept	Disposition: Reject	Disposition: Other	Proposed Resolution (Include Responsible Party) for other or Technical Justification for Rejection	Date Closed
		Its prior use matter?					
26	G.C.	Regardless of Funding (Duffy money?) where is your authorization to Deviate from DOE Order 6430.1A Requirements?				(26) Response to be provided by Craig Condery.	
27	Final comment.	As a performance spec, the document is ~~not~~ inadequate				(27) The document is currently in a draft form. The Performance specification	

SCH 2000C INES

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Document Title/No.: PILOT TEST PLAN IN SITU VOLATILIZATION TECHNOLOGY Rev. DRAFT Date 9/11/92

Review's Name: DAN HEPLER

Phone No./Organization: 2276, FLUID PROCESS ENGINEERING

Review Type: 30% ____ 60% ____ 90% ____ Other ____

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27	F.C cont'd	for procurement. and should be submitted for Engineering Review and rewrite. These Twenty seven comments are issued against section 6 only. Other sections although review for understanding were not commented upon,				(cont) will be strengthened as the Plan evolves into a final document for procurement.	

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SCM 2000C (R/S)

Responses to Comments by:
Phil Ralphs

EG&G ROCKY FLATS
ENVIRONMENTAL MANAGEMENT DEPARTMENT

DOCUMENT REVIEW SHEET

PLEASE REVIEW THE ATTACHED PROCEDURE, NO. _____ REV. _____ DRAFT ___

TITLE Draft Pilot Test Plan For *In Situ* Volatilization Technology, Subsurface IM/IRA-OU2, dated 11 September 1992

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SECTION OR PARAGRAPH	COMMENT	DISPOSITION	Concur (initial)
General – Format	The general format of the work plan should adhere to that specified in EG&G/EM procedure 3-21000-ADM-05.03. Since this is not an RFI/RI work plan, the recommended Table of Contents is not applicable. However, the basic format including Title Page, page headers, and signature approval block, is applicable.	The format of the document will be revised to conform to the specifications contained in the specifications contained in the referenced EG&G procedures.	
General – Document No.	A document number needs to be assigned to this work plan. A suggested document number is 21000-WP-OU02.07.	The suggested EG&G Document No. has been added to the cover and title pages of the Test Plan.	
General – Organization & Responsibilities	The organization and functional responsibilities for this project need to be a defined in the work plan. An organization chart needs to be developed that identifies the lines of communications and interfaces between the EG&G Project Manager, other EG&G Rocky Flats organizations and divisions providing support to this project, and all subcontractors. The responsibilities for performing the various tasks addressed in the work plan need to be defined.	An organization chart will be prepared at the time that project subcontractors are identified.	

NOTE: Comments listed on this Review Sheet were transcribed by WESTON from comments handwritten directly in a copy of the Draft Pilot Test Plan dated 11 September 1992.

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SECTION OR PARAGRAPH	COMMENT	DISPOSITION	Concur (initial)
General – Organization & Responsibilities (Continued)	For example, responsibilities for design, construction, operation, vent and pressure monitor installation, soil and air sampling, and system inspection need to be defined. (NOTE: System inspection should be done by someone independent of system installation and operation.)		
General – EG&G Procedures	EG&G procedures that are applicable to work activities need to be identified and referenced. Examples include, but are not limited to, drilling for vent and PM installation, soil sampling, management of waste materials, and equipment decontamination.	Appendix F has been added to list all applicable EG&G SOPs. Reference to the SOPs are also made throughout the text.	
General – Section 6.0	This section addresses specifications for the vapor extraction unit. There are several power, equipment, and performance requirements and detailed design information that have not been specified in the test plan. Some indication of when and how these specifications will be provided needs to be added to the text (e.g., subsequent revisions to the test plan or detailed design drawings). It is also important, form a project planning perspective to indicate who is responsible for establishing these additional specifications and to who will they be provided.	The performance specifications have been augmented. Detailed design information will be provided by the appropriate subcontractor submittals that are required by the Test Plan.	
General – Quality Control	There is no discussion in the test plan that addresses the preparation/collection and analysis of quality control samples. QC samples must be incorporated into both the sampling and analysis plans for both soil samples and air samples.	A Quality Assurance Addendum (QAA) has been added to the Test Plan (Appendix D). QC requirements are address in the QAA.	
General – Sample Identification and Handling	The Test Plan does not address sample identification nor does it address requirements for sample containers, preservatives, handling, shipping, and storage. This discussion must address custody of samples in the field, from the field to the laboratory (both field and off-site analytical), and at the laboratory. Custody of the samples must be verifiable. The EG&G EM operating procedures that address these requirements, as well as the QAPjP. EG&G procedures and the QAPjP must be reviewed to determine if they are, they	Addressed in the QAA (attached).	

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SECTION OR PARAGRAPH	COMMENT	DISPOSITION	Concur (initial)
General – Sample Identification and Handling (Continued)	should be referenced. This is an example of how the test plan needs to identify and referenced applicable procedures (see previous comment). If existing procedures do not adequately address sample identification and handling requirements, the test plan must address these.	Addressed in QAA.	
General – Records	The test plan needs to identify the records that will be generated as a result of implementing the activities described in this plan. Records include this test plan, design specifications and drawings, procedures, operation manual(s), field data and sampling records, logbooks, analytical data, data reports, etc.	References to records are made throughout the document. A section will be added to the Test Plan that provides a summary of required project records.	
General – Data Validation and Verification	There is no discussion in the test plan concerning data validation and verification. As a requirement of the QAPjP, which is applicable to all RPF environmental restoration program activities (including treatability/feasibility studies and interim remedial actions), environmental analytical data must be verified and validated, or justification offered for exempting data from verification and validation requirements.	Addressed in QAA.	
Section 1.1, page 1-4	The paragraph at the top of this page makes reference to an agreement (presumably between DOE, EPA and CDH) to pursue an IM/IRA that addressed suspected VOC contamination in the subsurface at OU2, and that the IM/IRA should be used to aid the selection and design of final remedial action s at OU2. Such an agreement should be documented and referenced. The reference should be added.	The agreement was verbal and was a result of a series of review meetings. A written reference is not available.	
Section 1.4	This section, including the section heading, presently refers to the test plans a report. It is not a report, it is a plan. Please revise the text appropriately.	The text has been changed to reference the "Plan."	

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SECTION OR PARAGRAPH	COMMENT	DISPOSITION	Concur (initial)
Section 1.4, 2nd Paragraph	Section 1.2 states that the performance specifications and pilot test procedures have been developed to allow flexibility to take into account a wide range of conditions from site to site. Why then would the general design considerations need to be reevaluated if a different location is selected for implementation as indicated in this paragraph? Are the specifications and procedures flexible or not?	Section 1-4 has been modified with all references to future modification of the Test Plan deleted.	
Section 2.1.3.2, 1st Paragraph	What is the location of Well 3687 in relation to T-4? Section 2.1.3.1 states that is "just north of T-4," while this paragraph states that it is "approximately 40 feet northwest of the eastern end of T-4."	The location of well 3687 is shown in Figure 2-1. Both descriptions are correct, however, describing the location as 40 feet northwest of the eastern end of T-4 is more precise.	
Section 2.1.3.2, 2nd Paragraph, last sentence	What is a "parched well cemented zone?" Is this something related to a cased well or is it more like a perched water table or is in a well completed in a parched water table?	The statement has been revised to read "...perched within cemented zones within the sandstone..."	
Section 2.3 – General	DQOs are established to ensure that data collected are sufficient and of adequate quality for their intended use. DQOs should be developed following the 3-stage process described in EPA guidance for developing DQOs, which is summarized in Appendix A of QAPjP. These 3 stages include (1) identifying decision types, (2) Identify data uses/needs, and (3) designing a data collection and analysis program. While the discussion in Section 2.3 includes parts of the DQO process, it does not appear to follow the process in a logical of complete manner. For example, the most important consideration in determining DQOs is to establish the objective of a data generating activity. Also, even though it isn't stated as such in the test plan, the "data quality elements" identified on pages 2-10 and 2-11 are the components of Stage 2 of the DQO process.	DQOs have been re-worked per EPA development guidance.	

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SECTION OR PARAGRAPH	COMMENT	DISPOSITION	Concur (initial)
Section 2.3, 1st paragraph	According to Section 7, the objective of the test plan is to determine if the recovery rate of the vapor extraction unit equals or exceeds 0.5 lbs/day. This is a different objective than to determine is the SVE can effectively treat contamination at Trench T-4. Soil characterization data, which is totally ignored in this discussion of DQOs, is directly applicable to the objective state in Section 7, but has very little relevance to the objective stated here. The specific objective of the test plan needs to be clearly stated.	As mentioned in the IM/IRAP and Test Plan, the primary objective is to collect information on SVE technology that can be used in FS and design efforts. Initially (i.e., Pilot Test Phase) we are interested in SVE performance in terms of VOC mass recovery. Post-pilot operation, if deemed beneficial, will examine soil remediation more closely (i.e., before and after soil characterization).	
Section 2.3, 2nd paragraph	What is the "data quality level of concern" and how is this determined? Levels of concern typically specify contaminant concentrations that are associated with action levels, which help define detection limits. Are these what is being referred to? If so, please clarify. Also, please state what the levels of concern are for the contaminants of concern.	The level of concern refers to the acceptable concentrations of contaminants that can remain in the soil. This has not been determined yet for OU2. Analytical detection limits identified in the GRRASP will be used and are considered sufficiently low to quantify contaminant removal and possibly demonstrate compliance with cleanup levels once they are developed. This section has been significantly revised in response to this comment and others.	
Section 2.3, 3rd paragraph	While we agree that most data quality controls are applicable to laboratory analyses, there are methods to determine and control sample variability (replicate samples), container contamination (trip blanks for VOCs), and sample collection and preparation (duplicate samples). These must be incorporated into the sampling and analysis process to control sample quality (see previous general comment regarding quality control).	The revised text will specify performance with GRRASP (1990) and Rocky Flats Plant Site-Wide QAPP (1991).	
Section 2.3, page 2-10, 2nd paragraph	We are still confused with the use of the level of concern. The analytical level (which is specified in the test plan and should be used to define detection limits and select the appropriate sampling and analytical methods) should be based on the level of concern. For example, if the level of concern is based on an ARAR, an analytical method with a detection limit less that the ARAR value and procedures that provide data of a known quality should be used. Whereas, if the level of concern is based on a reduction in contaminant levels, the analytical methods should be capable of detecting	See response to previous comment on Section 2-3, paragraph 2.	

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SECTION OR PARAGRAPH	COMMENT	DISPOSITION	Concur (initial)
Section 2.3, page 2-10, 2nd paragraph (Continued)	the contaminant at concentrations less than those investigators anticipate finding and the quality of the data does not need to be as rigorous because the objective is to detect a reduction in contamination as opposed to defining precisely what the level of contamination is.	See response to previous comment on Section 2-3, paragraph 2.	
Section 2.3, page 2-10, 2nd paragraph	For physical parameters, the sensitivity of the measurement process to changes in physical characteristics should based on the level of concern.	A new table (Table 2-2) has been prepared that identifies data needs and how they will be fulfilled. It is responsive to this comment.	
Section 2.3, page 2-10, 2nd paragraph	What is "best engineering judgement," and how will such a comparison be documented? Also, please explain, in the test plan, what data is being compared to which objectives.	The reference to best engineering judgement was meant to imply a somewhat subjective evaluation of system performance based on gross trends (i.e., less than or greater than 1.0 lb/day recovery rate).	
Section 2.3, • Data Types	Soil samples will be collected and analyzed for chemical and physical parameters as part of this test plan. These are also data types. The specific type of data to be generated should also be identified here (e.g., VOC concentration in soil and air samples, amount of soil vapor extracted, soil descriptions).	The revised text will include a discussion on DQO's for all media.	
Section 2.3, • Sampling and Analysis Approach	Please specify what the rationale is for the number of samples to be collected for start-up tests and sustained operations.	Maximum number of measurements.	
Section 2.3, • Sampling and Analysis Approach	The sampling and analytical options for soil and air samples should be discussed here. The discussion in this DQO section should provide the rationale for the sampling and analysis described in Section 7.	Turnaround time.	
Section 2.3, • DQO Parameters	The DQO parameter discussion doesn't make sense, nor is it complete. DQOs should be addressed for all measurement data, not just for air samples. Measurement data will consist of soil screening results for organic vapors, soil descriptions, soils sample analytical results for VOCs and radionuclides,	Table 2-2 (new) identifies data quality and quantity needs and defines the PARCC parameter specifications.	

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SECTION OR PARAGRAPH	COMMENT	DISPOSITION	Concur (initial)
Section 2.3, • DQO Parameters (Continued)	static pressure, flow rate, temperature, relative humidity, radiation, organic contaminant concentration, subsurface static pressure, and organic contaminant concentration in air samples.		
Section 2.3, • DQO Parameters	What does "20% field replicates" mean for precision? The relative percent difference between the sample and a replicate analysis can be used to calculated precision. Is this what is meant? Accuracy is a quantitative measure that is based on the % recovery of the analytical instrument. Representativeness is a qualitative measure of how well the sample represents the actual conditions, and is controlled by adhering to approved sampling and analytical programs and procedures.	20% referred to the frequency of collecting replicates, not the RFD. This text has been removed and a table (Table 2-2) created that specifies the PARCC parameter data quality requirements.	
Section 3.1, 3rd paragraph	The Soil Vapor Survey Work Plan for the 903 Pad, Mound, and East Trenches Area (OU2) needs to be referenced, since it is the work plan that describes the soil gas survey referred to in this paragraph.	The SVS Workplan will be referenced in Sections 1 and 3.	
Section 4.1	This section should refer to Section 4.8 for the drilling procedures used to install the extraction vents.	The suggested reference will be made.	
Section 4.2, last paragraph	The method for determining the water yield from the sandstone vents needs to be included, or referenced if it is addressed by an existing procedure.	The method for predicting water yield from sandstone vents is discussed in Section 3.2.8 and Appendix C.	
Section 4.8	Existing EM operating procedures need to be referenced if applicable. If they are not applicable, new procedures must be developed, reviewed, and approved prior to implementing the drilling and sampling described here.	References to number of RFP SOPs have been added to the Test Plan.	
Section 6.1, 2nd paragraph	This paragraph implies that the vapor extraction unit already exists. If this is true, why does the general specifications include "will be designed, constructed and installed" statements? If the unit does not exist, please revise this paragraph.	The statement will be revised to read "It should be noted that the performance specifications call for an SVE unit to be sized to accommodate expected conditions..."	

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SECTION OR PARAGRAPH	COMMENT	DISPOSITION	Concur (initial)
Section 6.2.3	Please reference the specific OSHA requirements for noise levels that the unit will need to comply with.	OSHA requirements 29 CFR 1910.95 have been referenced.	
Section 6.2.5	How will deviations be documented and reported? EG&G/EM has a procedure for controlling nonconformances. This procedure should be used to document, report, and disposition deviations from performance specifications. The procedure, 3-21000-ADM-15.01, should be used and referenced.	The suggested procedure will be review for applicability to the test program in question.	
Section 7.2.1	The means of documenting the results of the system shakedown inspection should be specified. An inspection checklist is strongly suggested.	An S.O. test checklist is required by the subcontractor and has been stated as such in Section 7.	
Section 7.4.6, first bullet	The specific RFP standard waste management operating procedures that will be adhered to for disposal of spent filters needs to be referenced.	Comment is acknowledged.	
Section 7.4.6, second bullet	Please specify what instrument will be used to monitor alpha radiation levels, and include or reference an appropriate procedure.	Identification of a specific instrument was deliberately omitted. The intent was to provide a performance specification and allow bidders to propose specific equipment.	
Section 8.1.1	Where are the data collection sheets that will be used to record data? Please reference the document that contains these data sheets. Who checks and tabulates data? Please clarify.	These sheets will be developed in the field. Data tables will be checked by the EG&G project manager.	

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Responses to Comments by:
Dennis Schybbe

EG&G ROCKY FLATS
ENVIRONMENTAL MANAGEMENT DEPARTMENT

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Section 2.1.2.1, Page 2-2	Cross section is based on only two soil borings. More data is available (general RFP).	A very large body of geologic information is available for RFP and OU2. However, the Test Plan describes the conditions expected at the test site, which encompasses a relatively small area. For this reason, only that information specific to the test site was referenced in the Test Plan. Other hydrogeologic information was also used in selection of the test site and in developing the conceptual model presented in the referenced section.	
Section 2.1.2.1, Page 2-2	Provide reference for cross section/soil boring location (Figure 2-1?).	Figure 2-1 has been modified as suggested.	
Section 2.1.3.2, Page 2-4	Provide figure showing the locations of soil borings/wells and cross sections.	Figure 2-1 has been modified as suggested.	
Section 2.1.3.2, Paragraph 2, Sentence 1, Page 2-4	The TCE concentration is "high" with respect to what.	The TCE concentration is high relative to the solubility limit. TCE concentrations greater than 20% of the solubility limit suggest potential presence of a free phase.	

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Section 2.1.3.2, Paragraph 3, Sentence 2, Page 2-4	What is the concentration level of methylene chloride and acetone in the sample blank?	These data are not immediately available. However, these compounds are common laboratory contaminants and may be present in laboratory blanks. The reported values were presented in the Draft Test Plan for completeness, however, acetone and methylene chloride are not expected to constitute a significant portion (if any) of the total contaminant mass recovered during the pilot test.	
Table 2-1, Page 2-5	1. Is 1,1-Dichloroethane the same as 1,1-Dichloroethene? 2. Is 1,2-Dichloroethane the same as 1,2-Dichloroethene? 3. If 1,2-Dichloroethane is the same as 1,2-Dichloroethene, why is there no concentration listed for the former, in data on 11/10/88 sample?	The compounds noted in the comment are in fact different. Note difference between "ethane" and "ethene."	
Table 2-1, Page 2-5	How is it possible to report values below the detection limit? Is the value the detection limit?	Analytical techniques can generate reliable concentration estimates for contaminants present below the detection limit method but greater than the instrument detection limit. These estimates are qualified with a 'J'.	

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Responses to Comments by:
Paul Singh

EG&G ROCKY FLATS
ENVIRONMENTAL MANAGEMENT DEPARTMENT

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Section 2.1.2.2, Page 2-2	Do we have groundwater data that indicates T-4 is a source of VOCs?	The presence of free phase TCE is inferred from nearby ground water chemistry data. Monitoring well No. 3687 is located approximately 40 feet north of and hydraulically down-gradient of Trench T-4. A sample of water collected in May 1988 from this well contained 221.8 mg/l of TCE which represents 20 percent of the TCE solubility limit. The high concentrations detected in 1988 and in subsequent sampling events, coupled with the proximity of this well to Trench T-4 suggests the likelihood of free phase TCE in and around Trench T-4.	
Section 2.3, Page 2-11	Data quantity 460 samples. What is the schedule in Section 9.1 based on (days, hr/sample).	The schedule presented in Table 9 is based on a worst-case scenario of 3 months for conducting the SVE pilot test at the East Trenches Area.	
Section 3.2.6, Paragraph 1, Line 5, Page 3-10	(Q/H), does H refer to horizontal or vertical plane?	'H' refers to the horizontal plane.	
Section 4.4, Paragraph 1, Last line, Page 4-10	In regards to term "sloped back," specify slope (i.e., = 1/4"/ft).	The slope of the manifolds from the extraction vents has been specified to equal 1%.	

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SECTION OR PARAGRAPH	COMMENT	DISPOSITION	Concur (initial)
Section 5.3, Page 5-3	Add to list of terms on storage tank, "Activated Carbon on the Atmospheric Breather Vent"	An activated carbon canister has been included in the specifications for the groundwater storage tank.	
Section 6.3.3, Page 6-7	Specifications of Blower B-2. The temperature differential across Blower B-2 of 150 °F seems high.	The temperature differential of 150°F is specified as a maximum. The actual temperature rise across the blower should be lower than 150°F for most operating configurations.	
Section 6.7.6, Page 6-17	Explain the need for RH measurements after the dilution valve.	Relative humidity measurements will be necessary to correct the "observed" air flow rate for moisture content. If relative humidity is not addressed in the calculations, flow rate estimation error of as high as 5% may result.	
Table 7-1, Page 7-4	In Test 1, operation time of 1 hour may need to be extended to allow the system to reach steady state.	The Test Plan will be revised to ensure that steady state is achieved prior to measurement of process variables. A critical parameter (i.e., well head pressure) will be selected as an indicator of steady state conditions. Example: Three consecutive measurements of the critical parameters, which are ±10% of each other would be indicative of steady state conditions.	
Table 7-2, Page 7-5	Are RH measurements at the demister inlet and stack outlet calculated?	Relative humidity measurements at the demister inlet and exhaust stack will be performed using a relative humidity meter which provides a "direct" measure of relative humidity. Use of this instrument will eliminate the need to perform additional calculations.	
Section 7.2.2.2, Paragraph 2, Last Sentence, Page 7-6	With reference to the maximum removal rate, will rate decrease from Test 1 to Test 3?	All others factors being equal, mass removal rate should stay relatively constant over the short term if venting is performed near a significant source of solvent. However, the mass removal rate can be expected to decrease over a period of time if the area in which the vent is located has limited quantities of source material (e.g., TCE).	
Section 7.2.2.3, Line 3, Page 7-6	In regards to groundwater table of 30" how will the water level be measured?	Groundwater table will be monitored by means of level measurement instrumentation installed in the extraction and injection wells.	

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SECTION OR PARAGRAPH	COMMENT	DISPOSITION	Concur (initial)
Table 7-3, Page 7-7	AVI vent pressures: Unable to calculate experimental error because runs are not repeated.	Duplicate runs are not included in the baseline pilot-testing protocol to keep the program streamlined. However, under the "observational approach" the Project Manager may include duplicate runs, after an evaluation of initial test results.	
Section 7.4.2, Line 4, Page 7-15	Is velocity pressure measured across an orifice?	No. Measurement across an orifice plate gives a pressure drop or pressure difference. Velocity pressure is the difference between total pressure and static pressure. Total pressure is measured with a pitot tube while static pressure is measured at a pressure tap in the pipe.	
Section 7.4.3, Line 2, Page 7-17	Temperature probe, will this be a thermocouple?	Measurements (including temperature) at well head will be made with hand-held/portable instruments. Measurements on the vapor treatment process train will be made with dedicated sensors.	
Section 7.4.8, Paragraph 2 Line 9, Page 7-19.	GAC-2 can use 50% of capacity before breakthrough of GAC-1.	This may occur, however, the 50% guideline provides a sufficient margin of safety to prevent VOC emissions to atmosphere prior to changeout of the lead GAC unit.	
Drawing 11	Identify instruments RH1 (make up air) and AI,RH (from extraction manifold and before GAC-1).	Drawing 11 has been revised to clarify the instrumentation that will be used in the SVE system.	

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