PNM PUBLIC SERVICE COMPANY OF NEW MEXICO
ALVARADO SQUARE ALBUQUERQUE, NEW MEXICO 87158

January 17, 1992

Hand Delivered

Mr. Joe Kennedy
New Mexico Environment Department
Hazardous and Radioactive Materials Bureau (HRMB)
525 Camino de Los Marquez
Santa Fe, NM 87502

Dear Mr. Kennedy:

Subject: Revised Proposal For Groundwater Assessment Program in Response to Corrective Action Directive Issued September 18, 1991, Person Generating Station, NMT360010342

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Jack D. Maddox
Director, Resources and Nuclear Services

This letter and its enclosures comprise our revised proposal for a groundwater assessment program to be initiated in response to a Corrective Action Directive (CAD) issued under RCRA Permit NMT360010342, for the Person Generating Station.

Public Service Company of New Mexico incorporated comments received from the HRMB on our initial proposal submitted November 21, 1991. We look

forward to receiving approval for initiation of the program by January 24, 1992.

If you have any questions, please contact me at 848-2998.

Sincerely,

Ron D. Johnson
Sr. Environmental Scientist

RDJ:krl
Enclosure

REVISED GROUNDWATER ASSESSMENT PLAN
CORRECTIVE ACTION DIRECTIVE NMT360010342
ISSUED FOR
PNM PERSON GENERATING STATION

PREPARED FOR
PUBLIC SERVICE COMPANY OF NEW MEXICO

PREPARED BY
METRIC CORPORATION

SUBMITTED TO
NEW MEXICO ENVIRONMENTAL IMPROVEMENT DIVISION

JANUARY 1992

T A B L E O F C O N T E N T S

ATTACHMENT A

Technical Schedule for Corrective Action Program
Public Service Company of New Mexico
Person Generating Station

PHASE ONE-GROUNDWATER QUALITY ASSESSMENT

Item	Days to Completion	Action
1	60	PNM adopts HRMB's sampling and analysis plan shown as Attachment D.
2	60	HRMB receives PNM's proposal for a groundwater assessment program that will assess the rate and extent of hazardous constituent migration, both on and offsite in the uppermost aquifer. An approvable groundwater assessment plan must include:

A. A characterization of the uppermost aquifer which must at a minimum include:

1) Flow nets (if a vertical gradient is identified). Flow nets are defined here as stratigraphic cross sections showing vertical flow lines. Each flow net diagram should include the location and name of each well, the location of all well screens, the stratigraphy of the subsurface, the groundwater elevations and the date of water elevation measurements.

2) Cross-sections depicting the stratigraphy of the uppermost aquifer. If an aquitard is identified below the saturated zone, cross sections must be constructed both down dip and cross dip with respect to the aquitard.

Item	Days to Completion	Action

3) The hydraulic conductivities of each potential migration flow path in the uppermost aquifer, not previously determined, based upon site specific pump tests. Potential confining units must be characterized.

4) Groundwater potentiometric contour maps.

5) Narrative description of the hydrogeologic conditions and potential contaminant pathways.

B. The assessment monitoring system described in Attachments B and C, or a proposed modification of this system.

C. The investigatory approach that will be used to fully characterize the horizontal and vertical rate and extent of contaminant migration and each investigatory phase involved. The horizontal extent of the plume shall be that boundary at which all historically identified contaminants are below the Maximum Concentration Limits (**MCLs**) for those contaminants. The vertical extent of the plume shall be that boundary at which all historically identified contaminants are below the Method Detection Limits (**MDL**) for those contaminants.

MCL is defined as the maximum concentration of contaminants allowed in groundwater by the New Mexico Water Quality Control Commission (**WQCC**) or the US EPA, whichever is the lesser. The MCLs for the contaminants found at PNM Person Station are as follows:

1,1,1-Trichloroethane (**TCA**):	.06 mg/l	(WQCC)
1,1-Dichloroethylene (**DCE**):	.005 mg/l	(WQCC)
Tetrachloroethylene (**PCE**):	.005 mg/l	(EPA)

MDL is defined as the estimated concentration at which the signal generated by a known constituent is three standard deviations above the signal generated by a blank, and represents the 99% confidence level that the constituent does exist in the sample.

Item	Days to Completion	Action

D. The number, location, and depth of the wells that will initially be installed.

E. The strategy to be used in subsequent investigatory phases.

F. The chosen method of well drilling, construction and completion. A schematic and narrative description of the proposed well construction must include:

1) Borehole diameter, casing diameter and casing material proposed.

2) Well screen slot size.

3) Filter pack material particle size range.

4) Annular seal(s) and location(s) and composition(s) of annular seal(s).

5) Type of grout used above the saturated zone.

6) Riser pipe protection and security (secondary casing, bumper guards, etc.).

7) The proposed depth and length of well screens. All RCRA monitoring wells designed to monitor a specific flow zone must be screened over an equivalent length such that the same vertical section of the flow zone is monitored. Wells must be screened for no more than 5 feet above the ground water surface elevation. If a discrete flow zone is present, the screen must be positioned to monitor this zone. No more than one flow zone should be monitored per well.

8) The proposed method of well development. Compressed air jetting will not be approved. Wells will be developed by a combination of bailing, surging, and pumping.

Well construction methods are presented in Exhibits 3 through 6.

Item	Days to Completion	Action

G. The Provision that cores will be obtained using a Central Mine Equipment continuous sampler. Continuous samples are proposed to be collected from the upper flow zone auger drilled wells. Cutting samples collected at 5 feet intervals are proposed for the rotary drilled second and third flow zone wells.

H. The data analysis procedures that will be used to interpret the analytical data. The analytical data will be interpreted with vertical flow nets and water quality contour mapping.

I. Documentation of the appropriateness of any other investigatory techniques (e.g., soil gas studies, use of temporary driven-point wells) to be used in addition to the use of permanent, RCRA-type monitoring wells, and a discussion of how they will be utilized.

J. A description of the parameters which will be included in data collection and the proposed schedule for sampling. This must include the provision that all wells in the assessment program will be initially sampled for Appendix IX volatiles (Method 8240) parameters. Any hazardous contaminants identified above the MDL must be included as parameters in all subsequent sampling events. Within the assessment program, quarterly monitoring must be conducted and quarterly reports submitted to HRMB. These must include chemical analytical data and water surface elevation data to HRMB on pc-compatible computer disk in a data format acceptable to both PNM and HRMB. Isothermic contour maps for each contaminant will be included in the quarterly reports. Quarterly reports must be submitted to HRMB within 90 days of the sampling event.

K. Permanent RCRA monitoring wells just ahead of the horizontal boundary of the contaminant plume(s) and within the plume(s) at or near the site(s) of highest contamination based on evaluation of data from system installed as per Phase One, Item 2.B above. The horizontal and vertical boundaries of the plume shall be as defined in Phase One, Item

em	Days to Completion	Action
(2 cont)		2.C. above.
		L. A schedule of implementation which sets specific dates for the completion of each phase of the assessment program.
		M. The use of HRMB's revised sampling and analysis plan (Phase One, Item 1 of this schedule,).
		N. A discussion of the procedures which will be used to determine the rate of constituent migration.
		O. Health and Safety Plan. PNM shall follow practices consistent with those standards set forth in OSWER Directive 9902.3 ("RCRA Corrective Action Plan"), page 9.
3	90	PNM receives HRMB's comments on its ground water assessment plan proposal.
4	120	PNM incorporates HRMB's comments and resubmits the groundwater assessment plan of its CAP proposal to HRMB.
	125	After access for offsite wells has been obtained, the schedule in Phase One, Item 2.L is triggered. Quarterly sampling of assessment wells will continue while assessment program is in effect.
6	237	The installation of the groundwater assessment program is complete as per Phase One, Item 2.B. Phase One, Item 10 will direct the drilling of more wells if HRMB determines that more wells must be drilled to further delineate the plume.
7	267	PNM submits cutting/core logs to HRMB.
8	297	PNM submits an Assessment Summary Report of results of the groundwater assessment program. This report must include at a minimum:
		A. the as-built, well-specific construction schematics of its permanent RCRA monitoring wells, a topographic map pursuant to the requirements of HWMR-6, Part V, Part 40 CFR §270.14(b)(19) and including the extent and location of all known solid waste management units with the location of each well identified using the New Mexico State Coordinate System.

AER 1 CMT Approved 7/23/93

Item	Days to Completion	Action

B. cross-sections constructed using data from its assessment program if HRMB determines that the logs from Phase One, Item 7 above identify distinct strata. Complete cross-sections must indicate definable stratigraphic units which differ according to:

1) Particle size distribution and overall texture as determined by procedure contained in Oklahoma Geological Survey, 1964, The Composite Interpretive method of Logging Drill Cuttings.
2) dry color descriptions based on the Rock- Color Chart as specified by Geological Society of America.
3) zones of moisture or saturation where drilling method allows.

C. borehole drill logs. Drill logs must include:

1) hole number or code.
2) dates drilling began and finished.
3) driller's name and company affiliation.
4) drill logger's name. (All borehole cuttings from all wells must be logged by the same person to minimize subjective error.)
5) drill hole location.
6) drill rig type.
7) bit/auger size.
8) 1,2 and 3 from Phase One, Item 8.B. above.

D. The assessment program results characterizing the uppermost aquifer and the rate and extent of hazardous constituent migration.

9 297 PNM will submit a report which will be 1) a discussion of Potential Corrective Measure Technologies listing all approaches to remediation which will be considered for the site; and 2) a proposal for a groundwater pumping and treatment system capable of capturing the plume identified in Phase One, 8.D. above. The discussion on Potential Corrective Measure Technologies should address the following:

1. What will be the residual concentration of each constituent after treatment using this technology? Either 1) Cite one case study using this technology where the proposed level of cleanup was achieved or

Item	Days to Completion	Action
		2) see Phase One, Item 9.3, below.
		2. At what rate can the cited level of cleanup be attained? Either cite one case study where this rate was achieved or see Phase One, Item 9.3, below. The groundwater remediation system must be sized such that all groundwater within the vertical and horizontal extent of the contaminant plume(s) identified in Phase One, Item 8.D., above, has been remediated to or below the protection standard for all hazardous contaminants in the contaminant plume(s) within a period of not more than twenty (20) years from the date of the CAP, PHASE TWO implementation.
		3. In lieu of case citations for Phase One, Items 9.1 and 9.2, above, PNM may propose bench-scale tests of the proposed technologies as a basis for determining what cleanup levels and rates of cleanup will be achievable.
10.	342	PNM receives comments from HRMB addressing the submitted Assessment Summary Report (PHASE ONE, Item 8) and Potential Corrective Measures Technologies Report (PHASE ONE, Item 9). HRMB will negotiate with PNM as to the location and number of wells to be drilled to further delineate the plume. If such wells are necessary, HRMB will issue a schedule for drilling.

PHASE TWO

The PHASE TWO technical schedule will be triggered on that date that HRMB certifies that Phase ONE above has been completed.

Item	Days to Completion	Action
1.	60	PNM will submit a proposal for PHASE TWO of its Corrective Action Program (CAP). PHASE TWO will be based on the results of PHASE ONE. An approvable proposal must address:

A. Corrective Action Objectives

1. Groundwater Protection Standards. Groundwater shall be considered to have been remediated when the concentration of all hazardous constituents in eastern property boundary and offsite wells is equal to or less than the lesser of the following:

   a. For any constituent listed in Table 1 of HWMR-6, Part V, 40 CFR section 264.94, the concentration given in that table if the background level of the constituent is below that given in Table 1; or

   b. The health-based allowable constituent concentration calculated as per the Superfund Public Health Evaluation Manual (OSWER Directive 9285.4-1); or

   c. An maximum concentration limit as defined in Phase I, Item 2.C.

B. Corrective Measures Proposal.

PNM will select one or more of the corrective action technologies in Phase One, Item 9, above, for implementation in its corrective action program. PNM's Phase Two, Item 1 report will detail all pertinent findings and substantiate PNM's choice of cleanup technologies.

1. In the event the remediation approach has been selected based on data available from a case history (PHASE ONE, Items 9.1. and 9.2, above), PNM will:

Item	Days to Completion	Action

a. present these findings and conclusions, including the following data from the case study: Aquifer hydraulic conductivity, average depth from ground surface to groundwater potentiometric surface within plume boundary, approximate vertical and horizontal extent of contamination, initial (pre-cleanup) maximum contaminant concentrations for all treatment parameters, time elapsed since implementation of cleanup, current or final constituent concentrations in the plume and the current plume vertical and horizontal dimensions, and the initial and current projected date of cleanup completion.

b. present a map, to approximate scale, showing plume configurations and specific proposed locations of remediation devices.

c. present engineering specifics of all remediation devices.

2. If the remediation approach has been selected based on laboratory bench-scale testing (PHASE ONE, Item 9.3), PNM shall present all data and conclusions including:

a. a narrative description of each type of test run.

b. all raw data with each report signed and dated by the supervising scientist.

c. a presentation of each equation used, with all variables defined, and a narrative description of the use of each equation.

d. a clear presentation of each set of calculations for each trial, with all units (e.g., cm, kg, ppm) indicated for each variable.

e. all calculations clearly performed.

f. a narrative description of the results

Item	Days to Completion	Action

for each trial of each type of test, i.e., if 7 trials are run for a given test type, a narrative description of the outcome of each of the seven trials.

The results shall be presented in PNM's Phase TWO, Item 6 report. The report must include a table of contents which is specific with respect to each test type, trial within each test type, raw data pages, equation explanation pages, trial test narratives and test conclusions.

3. The final remediation technology(ies) chosen must be selected based on level and rate of cleanup, reliability, implementability and personnel safety. HRMB will review the proposed technology(ies) based on the criteria presented in OSWER Directive 9902.3 (RCRA Corrective Action Plan), Task IX, pages 18-20.

4. If the remediation technology(ies) selected may generate a hazardous waste, the Proposal must include:

   a. Testing criteria for waste evaluation, and a schedule for periodic remediation-waste analysis if necessary; and

   b. Specific contingency provisions for appropriate waste disposal including the name(s) of the likely disposal facility(ies) and EPA identification number(s).

5. The Corrective Measure Proposal must include a schedule of implementation with clearly defined milestones to be achieved within a specified number of days from HRMB's acceptance of the Proposal.

6. The Corrective Measure Proposal must include design specifications for all equipment to be used.

7. The Corrective Measure Proposal must include a Health and Safety Plan. PNM shall follow

Item	Days to Completion	Action
		practices consistent with those standards set forth in OSWER Directive 9902.3 ("RCRA Corrective Action Plan"), page 9.
2.	90	PNM receives HRMB's comments on its PHASE TWO proposal.
3.	120	PNM incorporates HRMB's comments and resubmits its Phase Two proposal to HRMB.
4.	125	Assuming the Phase Two proposal is approved, PNM begins installation of CAP equipment.
5.	215	Installation of CAP equipment is complete.
6.	275	A Post-Corrective Measures Implementation Report is submitted to NMED by PNM. The report shall include: A. as-built diagrams of all groundwater treatment wells or injection wells. Include on a map at 1"=200' scale, the surveyed locations of the RCRA unit and solid waste management unit (SWMU) boundaries, all treatment wells, assessment monitoring wells, injection wells, groundwater flow barriers, groundwater treatment devices, and wastewater holding impoundments, with all survey points identified using the New Mexico State coordinate system. B. PNM's evaluatation of the effectiveness of its remediation technology.
7.		If the groundwater treatment technology includes an above-ground, through-put approach (e.g., "pump and treat"), PNM shall submit an updated evaluation of its remediation technology on a monthly basis. Samples of groundwater shall be collected both before and after treatment and analyzed for all contaminants which have been historically identified in PNM's groundwater. PNM will proceed to quarterly evaluations after 8 consecutive monthly sampling events occur in which the contaminants are shown to have been have been treated to or below the groundwater protection standards. PNM will proceed to semi-annual evaluations after 4 consecutive quarterly sampling events occur in which the contaminants are shown to have been have been treated to or below the groundwater protection standards. PNM will continue to test its remediation system as described above on a semi-

Item	Days to Completion	Action

annual basis throughout the remainder of the corrective action program.

A.) Quarterly reports must be submitted to HRMB summarizing the results of the previous quarter's remediation effectiveness testing. All pages must be consecutively numbered. The reports must include all laboratory data sheets; data summaries by well location for the concentrations of each contaminant listed above in this item (Phase Two, Item 7), in the pre- and post-treatment groundwater samples; a narrative summary discussing the effectiveness of treatment of each groundwater treatment device in the previous quarter; and a table of contents locating all sections of the quarterly report.

B.) After semi-annual remediation effectiveness testing has been established, PNM shall submit remediation effectiveness reports annually. This report shall contain all data contained in Phase Two, Item 7.a. above, for PNM's semi-annual testing. PNM shall continue to submit annual reports on or before January 1 of each year until remediation is complete as defined in Phase Two, Item 1A, above, where the ground water protection standard, identified in Phase Two, Item 1A has been achieved.

ATTACHMENT B

GROUNDWATER ASSESSMENT PROGRAM OVERVIEW

PNM shall include as part of its groundwater assessment program the following:

1) Sample all off-site wells screened in the uppermost aquifer which are down and sidegradient and within a one mile radius of the waste tank unit. Sampling will target PCE, DCE, TCA.

2) Designate PSMW-7 as the upgradient well. The upgradient well is to be used to determine background concentrations of ground water moving through PNM property.

3) Install RCRA monitor wells shown in Attachment C. These wells will be screened from 5 feet above to 15 feet below the water table surface. A phased approach will be taken in delineating the horizontal and vertical extent of the plume. The first phase upper flow zone wells will be installed as wells PSMW-9, 10, 11, 13 and 14 and will be located as shown in Attachment C. If MCL values are exceeded at any upper flow zone well drilled as part of Phase One, a subsequent upper flow zone will be drilled 200-300 feet downgradient of that well as part of the second phase of drilling. Upper flow zone wells will continue to be drilled in the second phase of drilling and sampling down gradient of each upper flow zone well exceeding the MCL until the horizontal extent of the upper flow zone plume, as prescribed in the Technical Schedule, Phase One, Item 2C, has been defined.

   The same approach will be used in determining the vertical extent of contamination. At any offsite or property boundary well where MCLs have been exceeded in the upper flow zone, a second phase well screened from 25-35 feet below the water table will be installed. If the Method Detection Limit (MDL) is exceeded at the 25-35 foot level, a third well will be drilled and screened from 45-55 feet below the water table. Wells will continue to be drilled and screened at increasing depth intervals of 20 feet (with 10 feet long screens) until ground water below the MDL is found.

   Install RCRA monitor well PSMW-15B at location shown in Attachment C. This well will be screened at 25-35 feet below the water table surface. This well will be used to sample the ground water from the lower flow zone as

well as determine the gradient and direction of flow of the lower flow zone. The gradient and direction of flow will be established by utilizing water level measurements from PSMW-3B, PSMW-8B and PSMW-15B.

5) Install well cluster PSMW-12A, B 300 feet downgradient and in the flow path (as defined by Item 4 above) of the waste tank. Note that location of well cluster PSMW-12A, B shown on Attachment C is arbitrary. Actual location will depend on characterization of the lower flow-zone flow path. A well cluster is defined here as a group of wells at the same location, each with its own borehole, and each screened at a different depth. The cluster will include two wells screened at depths approximately 5 feet above to 15 feet below water table surface and 25-35 feet below the water table surface. Water level measurements in these wells will also be used to determine if there is vertical flow. Wells in the cluster will be designed and constructed as RCRA monitor wells.

   If PSMW-15B or PSMW-12B show contamination above MDLs steps to assess the lower flow zone plume will proceed as follows:

   a) Utilize any down gradient lower flow zone wells that may already exist for mapping concentrations of contaminants.

   b) If no down gradient, lower flow zone wells exist, drill three wells 200-300 feet down gradient from the contaminated well(s), spaced at 200-300 feet apart, and screened at 25-35 feet below the water table surface. One well should be 200-300 feet directly down gradient, and the other two wells should be 200-300 feet side gradient on either side of that well.

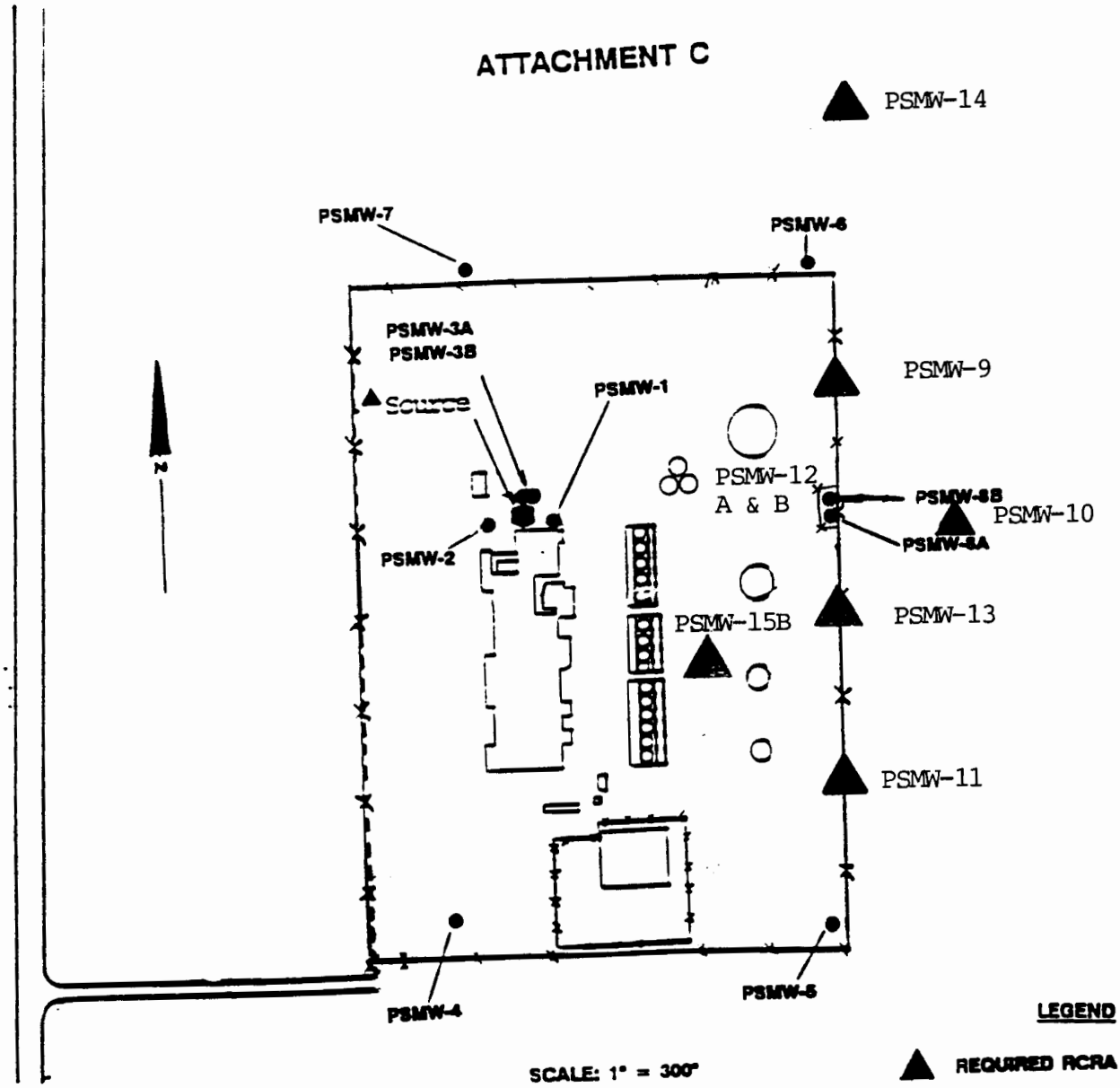
      Continue to drill lower flow zone wells, utilizing the approach in item 4 above, until the horizontal (below MCL) and vertical (below MDL) extent of the lower flow zone plume is defined.

6) During the well installation and sampling phase, PNM will provide weekly written status reports to HRMB summarizing work completed during previous week and the work schedules for the upcoming week. Reports will be transmitted by facsimile machine with original follow-up by mail.

7) Quick turnaround laboratory analysis for PCE, TCA and DCE will be used to determine proper second phase well placements. Full SW-846 Method 8240 analysis will also be performed on each well in duplicate (approximately one week between sampling) for analysis per requirements of the groundwater assessment plan.

Location of above wells will be subject to HRMB approval.

ATTACHMENT C



REQUIRED NEW MONITOR WELL AND PIEZOMETER LOCATIONS

FIGURE

WELL INSTALLATION SCHEDULE

	WEEKS																
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Order Materials and Schedule Rigs	X	X	X	X													
Drill 5 leading edge upper flow zone wells (Auger Rig)					X	X	X	X	X								
Drill upper flow zone well of nest (Auger Rig)										X							
Drill second flow zone well (Rotary)							X										
Drill second and third flow zone wells of nest (if required) (Rotary)								X	X								
Drill 2 second flow zone leading edge wells (if required) (Rotary)										X	X						
Sample leading edge upper flow zone wells (2 times each) (8240)										X	X						
Sample upper flow zone well of nest (2 times) (8240)											X	X					
Sample second and third flow zone wells (2 times) (8240)										X	X						
Sample second flow zone leading edge wells (2 times) (8240)											X	X					
Laboratory analyses										X	X	X	X	X	X	X	

ATTACHMENT D

PERSON GENERATING STATION
HAZARDOUS WASTE PROGRAM
SAMPLING AND ANALYSIS PLAN
(NMT 360010342)

The purpose of this Sampling and Analsis Plan (S&A plan) is to ensure that groundwater samples are representative of the groundwater in the aquifer and to ensure that the samples are collected, analyzed, and reported in a consistent and appropriate manner. This S&A plan is based on the latest edition of RCRA Groundwater Monitoring Technical Enforcement Guidance Document (TEGD), September, 1986.

The Permittee must refer to TEGD methodologies for groundwater monitoring where appropriate and when questions of correct procedure arise.

I. Water Elevation and Total Depth Measurements:

Before purging, the depth to the bottom of the well and the depth to water must be measured and recorded unless the well has a dedicated installed pump. For monitor wells with dedicated pumps, total depth measurements must be made every five years or when the pump is pulled, whichever is more frequent, unless more frequent measurements are directed by the Director.

All measurements must be made from a visibly marked, surveyed point on the well casing rim. The surveyed point must have an elevation measured to the 0.01 foot with respect to sea level by a licensed surveyor.

The surveyed elevations of the reference points for the monitoring wells must be listed in a table developed by the Permittee and recorded in the log book.

The materials of construction for the measuring devices must be recorded in the field log book.

A. Total Depth Measurements

All total depth measurements must be recorded to the nearest 0.25 foot.

To measure the total depth of the well a weighted tape must be lowered into the well casing until the bottom is felt. The slack in the tape must be taken out while the tape remains on the bottom of the well. The total depth must be recorded in the log book by observing the tape

measurement at the surveyed point on the well casing rim. The total depth measurement must be adjusted to reflect the length of the weight which is attached to the end of the tape.

B. Water Elevation Measurements

All water elevation measurements must be taken before sampling any well and must be taken within a twenty-four (24) hour period or less. All water elevation measurements must be accurate to the nearest 0.01 foot and recorded to the nearest 0.01 foot.

The depth to water must be measured as the distance from the surveyed point on the well casing rim to the wetted interface on the measuring device. The depth to water measurement must be subtracted from the elevation of the surveyed point in order to determine the water elevation measurement.

If a plastic or polytetrafluoroethylene (PTFE) measuring tape or electric sounder is used, then this device must be checked periodically, at least once a year, with a steel tape in order to determine whether the synthetic tape has stretched. If the synthetic tape has stretched more than 0.01 foot then the tape must be calibrated with the steel tape.

Measurements must be taken three times to accurately determine water level elevation. The field person must note which of the three measurements appears to be the correct measurement.

The Permittee must note in the field logbook whether any wells that are being pumped could potentially impact the water elevations measured at the RCRA wells.

C. Decontamination of the Measuring Device

The level of decontamination for the measuring device depends on the situation. Less stringent decontamination procedures can be used if the wells have not evidenced contamination in the past, and more stringent decontamination should be used if the wells have evidenced contamination in the past. The tape must be cleaned before and between sampling points as follows.

The lower portion of the measuring device which comes in contact with the water must be washed with deionized water rinse.

Decontamination procedures for the tape are less

stringent than for sampling equipment because the tape does not come into contact with the sample and the wells will be purged after the tape is used.

II. Detection of Immiscible Layers

For newly developed wells, the Permittee must use the guidelines in the TEGD for determining the presence, measuring the thickness, and collecting a sample of any light or dense immiscible layers (TEGD, Section 4.2.2.). These procedures must be accomplished prior to purging the well.

A. Light Immiscible Layers

The Permittee must test for light immiscible layers when a new well is developed if the Permittee believes that a light immiscible layer may be present. In addition, the Permittee must test for light phase immiscible layers if requested by the Director to do so.

If the Permittee determines that any immiscible light phase is present, TEGD guidelines for measuring the thickness and sampling the phase must be adopted. A clear bailer constructed of inert material with a bottom filling, bottom emptying device can be used to determine an immiscible light phase.

The Permittee may use an alternative method if the Director approves the method.

B. Dense Immiscible Layers

The Permittee must test for dense phase immiscibles when a new well is developed if the Permittee believes that a dense immiscible layer may be present. In addition, the Permittee must test for dense phase immiscible layers if requested by the Director to do so.

Dense phase immiscible layers can be detected by lowering an interface probe to the bottom of a monitoring well, if there is sufficient layer thickness to register on the probe. If there is a sufficiently thick dense phase present, a teflon double check valve bailer must be used to obtain a sample.

The Permittee may use an alternative method if the Director approves the method.

III. Field Log Book

A field log book must be maintained in the facility operating record and must be available for review. It must include a record of the following information:

- Identification of well
- Well depth and date of measurements
- Static water level depth and measurement technique, and date of measurement
- Presence of immiscible layers and detection method, if applicable
- Well yield -- high or low
- Purge volume/calculation and purge/sample pumping rate
- Time well purged
- For low yielding wells, the time needed for well to recover enough to collect a sample after purging
- Collection method for immiscible layers, if applicable
- Sample identification numbers
- Well evacuation procedure/equipment
- Sample withdrawal procedure/equipment
- Date and time of sample collection
- Types of sample containers used, parameter to be analyzed and sample identification information and number
- Preservative(s) used
- Parameters requested for analysis (e.g., volatile organics, total metals)
- Field analysis data and method(s)
- Sample distribution and transporter
- Field observations on sampling event.
- Name of sample collector

- Weather conditions including air temperatures, wind velocity and direction
- Internal temperatures of refrigerated field and shipping containers
- Well condition
  - security of well cap
  - presence of cracks in concrete apron
  - presence of standing water around well
  - condition of protective posts
  - condition of inner and outer well casing
  - presence of cracks, holes and/or burrows in the ground near the well or RCRA unit
- Purpose of sampling, e.g. detection, compliance, corrective action
- Sequence in which the samples are collected (e.g., volatile organics, extractable organics, total metals, etc.)
- Any problems that were encountered

IV. Equipment Decontamination

The nondedicated sampling and purging equipment must be decontaminated as follows depending on whether the sample will be analyzed for inorganic or organic parameters:

A. For inorganic analysis

1. nonphosphate detergent wash
2. tap water rinse
3. dilute acid rinse HNO3 or HCL
4. distilled or deionized water rinse
5. air dry before use

B. For organic analysis

1. nonphosphate detergent wash
2. tap water rinse
3. distilled/deionized water rinse
4. acetone or methanol rinse (optional)
5. pesticide grade hexane rinse

6. distilled/deionized water rinse (optional)
7. air dry before use

Decontamination of nondedicated sampling containers must be in accordance with the procedures described in the most recent edition of Test Methods for Evaluating Solid Waste (SW-846).

V. Sample Withdrawal and Collection

A. Purging Techniques and Field Measurements

For high yielding wells, unofficial field measurements of pH, temperature, and specific conductance must be obtained before, during and after purging in order to verify that these parameters have stabilized. Stabilization indicates that the well has been sufficiently purged.

Stability is achieved when two consecutive measurements are plus or minus 0.01 pH units for pH, plus or minus twenty (20) umhos for conductivity, and plus or minus one (1) degree for temperature. Alternative standards may be approved by the Director.

Field measurements should be used to determine purge efficiency unless it can be demonstrated that stabilization occurs after a specific volume of water has been purged. The specific purge volume required for stabilization may change as the well casing volume changes through time. The Permittee may determine and provide documentation to the Director of the purge volume necessary for the seasonal high water level and use that purge volume year round. This purge volume must be updated when the seasonal high water level changes significantly.

During purging, the discharge rate of the wells should not be faster than the rate used during development. In addition, the purge rate must not be so fast that the recharging water rushes turbulently into the well, creating an audible noise.

Low yielding wells should be purged no more than once to dryness and the official field measurements for pH, temperature, and specific conductance and the groundwater samples must be obtained as soon as the well has recovered enough to yield water for a sample.

For higher yielding wells, the official field measurements for pH, temperature, and specific conductance must be determined after the unofficial field

parameters have stabilized.

The official field measurements must be recorded to the 0.01 pH unit and the pH meter must be accurate to the 0.01 pH unit. The conductivity measurements must be recorded to the nearest 20 umhos and the conductivity meter must be accurate to the 20 umhos. Alternative standards may be approved by the Director.

Purge water will meet water quality specifications of the City of Albuquerque Sewer Use and Wastewater Control Ordinance and will be containerized on site as produced. Following purging and sampling operations, purge water will be removed from the site by a commercial septic tank pumping service and transported to the municiple sewage treatment plant, with a manifest of the purge water, for disposal.

B. Sampling Equipment

A PTFE bailer or any fluorocarbon or stainless steel bailer that is constructed of inert material with a bottom filling-bottom emptying device or a positive gas displacement PTFE bladder pump must be used to withdraw samples from monitor wells.

The bailer cord must be specified in the field log book and composed of inert material or be discarded between sampling points.

Precautions in using sampling equipment must be taken to insure that parts that come in contact with well fluid are constructed of inert material and can be decontaminated or disposed of between uses.

C. Sample Collection Techniques

If a pump is used to collect samples, the flow rate must be one hundred (100) ml/minute or less for collecting the volatile organic samples. The pump must be operated to prevent surging or pulsing, if possible.

If a bailer is used, it must be handled in such a manner to minimize agitation and aeration of the groundwater, (e.g., the bailer must not be dropped down the well casing or allowed to splash the water surface in the casing.)

The contents of the bailer must be transferred to the appropriate containers using procedures to minimize agitation and aeration and in order of sensitivity to volatization as listed below:

- Volatile Organics (VOA)
- Total Organic Halogen (TOX)
- Total Organic Carbon (TOC)
- Extractable Organics
- Total Metals
- Phenols
- Cyanide
- Sulfate and Chloride
- Turbidity
- Nitrate and Ammonia
- Radionuclides

The Permittee must analyze for total metals instead of filtered metals because filtering can remove mobile particles. The purpose of the sampling is to identify constituents that may be moving through the aquifer. New studies indicate that a sample that is filtered with a 0.45 micron filter does not represent a dissolved phase nor does it represent what may be moving through the aquifer.

VI. Sample Containers and Preservation

The appropriate sample volumes, preservatives, container types, and holding times must be as described in Table 1.

Sample labels must include the Permittee facility name, date, preservatives used, sample identification numbers and parameters to be analyzed for (e.g. TOX, TOC, VOA, Acid Extractable, Base/Neutral Extractable, General Chemistry, etc.).

Sample labels must remain legible even if wet.

Sample labels must remain firmly attached even when wet.

Custody seals must be placed on the sample shipping containers in such a manner that ensures that the samples are not altered.

Water samples for organic and inorganic (including metal) analyses must not be filtered.

Samples for metal analyses must be analyzed for total metals.

The bottles for VOA, TOX, and TOC analysis will be filled to eliminate headspace (no air bubbles).

Sample containers should be packaged in a manner that prevents breakage (e.g., there should not be direct contact between glass containers).

Sample containers should be packaged in a manner that prevents the wet labels from rubbing together.

Volatile septum vials should be packaged and transported upside down with the teflon septum on bottom to prevent leakage of gas through the septum.

Volatile septum vials should be packaged in a manner that prevents cross-contamination through the teflon septum. For example, the vials should be placed in plastic baggies or whirlpacks.

VII. Field QA/QC Program

Field QA/QC samples must be collected and reported to ensure that the groundwater samples are representative of the groundwater quality and to ensure that cross-contamination has not occurred.

Duplicate samples are required as an indication of variability in water quality or the precision of the laboratory analyses.

Sample collection techniques, sample containers and preservation must be as described in TABLE 1.

A. Trip Blanks

1. Preparation

   The Permittee's laboratory will prepare at least one trip blank for each sampling event. The trip blank will be prepared by filling two 40 ml vials with deionized, distilled water. The bottles must be filled to eliminate headspace. The deionized or distilled water must be free of contamination.

2. Handling

   The trip blank must be transported from the laboratory to the sampling location and returned to the laboratory in a manner identical to the handling

procedure used for the sampling.

3. Analysis

The trip blanks must be analyzed for volatile organic constituents. Additional trip blanks must be prepared and analyzed for other sample parameters (e.g., extractable organics, total metals, etc.) if the sample containers are suspected of causing cross-contamination.

4. Contamination

Trip blank contamination can be attributed to improperly cleaned containers, contaminated deionized, distilled water, or cross-contamination during the trip or at the laboratory.

If contamination is detected in a trip blank, the Permittee must adequately demonstrate the probable cause of the contamination within thirty (30) days of receipt of the laboratory report. If the contaminant in question is a potential constituent from the Permittee's site, the Permittee will immediately modify the laboratory or field procedure in question in order to prevent future contamination by the contaminant in question and provide documentation of this modification to the Director within sixty (60) days of receipt of the laboratory report.

Trip blank analyses must not be used to correct the groundwater sample data.

B. Equipment Blanks

1. Preparation

During the course of a sampling event, all nondedicated sampling devices must be checked to determine if the device has been effectively cleaned between sampling points.

Distilled, deionized water must be poured or pumped through the sampling device, and collected directly by the water sample containers. The distilled, deionized water must be free of contamination. If possible this water should be provided by the Permittee's analytical laboratory.

At least one equipment blank must be collected per day of sampling or one equipment blank per 10 wells,

when nondedicated sampling devices are used.

2. Handling and Analysis

The equipment blanks must be handled in a manner identical to the handling procedures used for the water samples.

The equipment blanks must be returned to the laboratory for volatile, extractable (semi-volatile) constituents, and total metal analyses.

3. Contamination

Dedicated sampling equipment must be used if previous equipment blank analysis indicates any organic or inorganic contamination above background or the reporting limit, excluding those constituents whose presenses was caused by laboratory procedure contamination or field equipment decontamination.

If contamination is detected in an equipment blank, the Permittee must either adequately demonstrate that the contamination was caused by laboratory procedure or field equipment decontamination within thirty (30) days of receipt of the laboratory report or use dedicated sampling equipment for future sampling. If the above mentioned procedures are proven to cause the contamination, then the Permittee will immediately modify the laboratory procedure and/or the equipment decontamination in order to prevent future contamination by the contaminant in question and provide documentation of this modification to the Director within sixty (60) days of receipt of the laboratory report.

Equipment blank analyses must not be used to correct the groundwater sample data.

C. Duplicate Samples

1. Preparation

For each sampling event, at least one set of duplicate samples must be collected from one well per each day of sampling or one set of duplicate samples per ten (10) wells. The volatile duplicate sample must be collected immediately after the "primary" volatile sample, the "primary" extractable organic sample must be collected followed by the duplicate extractable organic sample. This pattern must continue until a set of duplicate samples have

been collected for every "primary" sample at the well. The order of sample collection must be as described in Section V of this Sampling and Analysis Plan.

Duplicate sample analyses must not be used to correct the groundwater sample data.

2. Handling and Analyses

The duplicate samples must be handled in a manner identical to the handling procedures used for the "primary" groundwater samples.

The duplicate samples are analyzed for the same parameters as the "primary" groundwater samples.

D. Calibration and Decontamination of Field Equipment

The following discussion refers to the pH and conductivity meters.

Before and after the daily sampling event, a calibration check against a known standard must be performed and noted in the field logbook. The equipment manufacturer's procedures for calibration must be used and any deviations, problems, and repairs will be noted in the field log book.

The pH meter must be calibrated with a pH 7 buffer and either a pH 4 buffer if the pH is below 7, or a pH 10 buffer if the pH is above 7. If the general pH is not known, then pH paper can be used to determine which buffer to use.

The batteries must be tested prior to using the equipment. Spare batteries should be carried in the field and used whenever the instrument provides unstable readings.

The equipment manufacturer's procedures must be maintained in the facility operating record.

The instrument's cell or sampling cup must be repeatedly flushed with distilled water before and after use and in between actual sampling events. Flushing must be of a duration to prevent cross contamination.

For the sampling event, the cup or cell must be flushed three times with the liquid to be sampled before measurements are made.

The manufacture approved method of cleaning and storage must be used and any deviations, or problems must be noted in the field logbook.

Additionally, if the groundwater samples are obviously contaminated with oil or any other substance which could cause the pH/EC probe response to deteriorate, then the probe must be cleaned per manufacturer's procedure and recalibrated before the measurement.

E. Chain of Custody and Sample Request Forms

The chain of custody must ensure that the samples are never left unattended unless they are in a secure, locked location and only authorized people have access to the samples.

The sample request form provides the necessary information to the laboratory (e.g., identification of sample, analyses requested, preservatives used or requested, etc.).

The chain of custody record and sample request form information may be combined on the same document and must include the following:

1. Facility name

2. Sample identification number

3. Date and time of collection if different from sample identification number

4. Identification number or name of well(s)

5. Number of containers and parameters required (e.g., VOA, total metals)

6. Preservatives used or required

7. Internal temperatures or presence of ice in shipping container upon opening at the laboratory

8. Signature, date, and time of receipt of collector and all person(s) in the chain of possession

9. Laboratory personnel statement of the condition of seals at time of receipt at laboratory

VIII. Laboratory Quality Assurance and Quality Control Program

The Permittee must ensure the laboratory performing the sample analysis adheres to QA/QC procedures and methods described in the TEGD, or the most recent edition of SW-846 or other EPA approved or cross-referenced (e.g.,ASTM, USGS, Standard Methods) laboratory QA/QC procedures.

A. The laboratory QA/QC program must insure the validity and reliability of laboratory data and include the following:

1. Use of EPA-acceptable sample preparation and analytical methods as specified in the permit.

2. Calibration of laboratory instruments to within acceptable limits according to EPA or manufacture's specifications before, after, and during use, as appropriate. Reference standards must be used when necessary.

3. Periodic inspection, maintenance, and servicing (as necessary) of all laboratory instruments and equipment.

4. Periodic training, testing and evaluation of laboratory personnel to insure accurate performance.

5. The use of reference standards and QC samples (e.g., checks, spikes, laboratory blanks, duplicate, splits) as necessary to determine the accuracy and precision of procedures, instruments, and operators, as well as the identification of potential interference by the sample matrix.

6. QA/QC samples must not to be used to correct data.

7. The use of adequate statistical procedures (e.g. QC charts) to monitor the precision and accuracy of the data and to establish acceptable confidence limits.

8. The use of the appropriate percentage of the reference standards, spiked standards, blanks and split samples based on EPA standards.

9. If an alternative method for analysis is used, split samples must be run with another

laboratory for comparison purposes and must be included with the laboratory data.

10. Continuous review of results to identify and correct problems within the measurement system (e.g. instrumentation problems, inadequate operator training, inaccurate measurement methodologies.)

11. Documenting the performance of systems and operators.

12. Documenting any deviation from SW-846 or other EPA approved procedure (latest editions).

13. Use of acceptable sample identification and, as necessary, formal chain-of-custody procedures in the laboratory.

14. Maintenance and storage of complete records, charts, and logs of all pertinent laboratory calibration, analytical, and QC activities and data.

15. Insure all data outputs are presented in their prescribed format. The following information must be provided for each parameter and included on the laboratory data report for each sampling event: well number, detection limit, percent recovery, surrogate standards, date that sample was collected, date that sample was received by laboratory, date that sample was extracted if applicable, and date that sample was analyzed.

16. Laboratory documentation must include the following:

    a. Observation of headspace in any sample received for volatile analysis

    b. Results for all QA/QC samples

    c. Time, data, and name of person for each processing step

    d. Sample preparation technique (e.g. extraction)

    e. Instrumental methods

    f. The actual holding time information

g. Laboratory sample number (if different from field number)

h. Analyses to be performed

IX. Groundwater Quality Data

A. Reporting of Low and Zero Concentration Values

The Permittee must insure that MDL's (method detection limits) be set as low as possible consistent with SW846 and Appendix B of 40 CFR 136. If detection limits are greater than the New Mexico Water Quality Control Commission Standards as listed in Section 3-103A, WQCC 82-1 Amendment No. 4 or the EPA Drinking Water Standards, (or the Groundwater Protection Standard or background as defined in the Permit), and the constituent is not detected, then the well must be resampled within fourteen (14) days and analyzed with detection limits as outlined above.

Detection limits that are high or vary from past detection limits must be reported and explained to the Director within fourteen (14) days of receipt of the laboratory analyses. This report will be evaluated by the Director to determine if the detection limits must be reduced in future work by laboratory procedures that remove or control interfering constituents that potentially cause detection limits to be elevated.

Regarding GC/MS analyses, the numerical concentration values of any hazardous constituents found at levels below the practical quantitation limit and above the method detection limit must be reported if these constituents have been detected in samples from the well in question by previous GC/MS or GC analyses.

B. Reporting Raw Data

For each sample, the laboratory report must indicate monitor well number, date sampled, date extracted and date analyzed. In addition the detection limits, percent recovery, and surrogate used, and confidence limits must be reported for each sample.

C. Missing Data Values

The Permittee must statistically evaluate all missing data values in accordance with the TEGD, Section 4.7.2.

D. Outliers

"Outlier" values must be handled and documented in accordance with the TEGD, Section 4.7.3.

E. Units of Measure

The Permittee must report each parameter analytical value with consistent, unambiguous units of measure. The units must be consistent from one sampling event to the next.

Reporting in a consistent number of significant digits, at least three, is required. Rounding techniques must not be used to alter the apparent precision of a measurement. If a constituent concentration cannot be measured to three significant digits, then the reasons must be documented and no more than a ten (10) percent error will be allowed in a one unit change in the last significant digit of a data value.

F. Missing Constituent(s) and/or Parameter(s)

Should a laboratory analytical report be received that does not include the analysis of a required constituent(s) and/or parameter(s), then the following actions must occur:

1. The Permittee must immediately contact the laboratory to determine if there are archive samples that can be retrieved and analyzed for the constituent(s) and/or parameter(s) of concern within specified holding times and if not;

2. The Permittee must resample for the required constituent(s) and/or parameter(s) of concern within fourteen (14) days of contacting the laboratory.

3. All such actions must be recorded in the facility operating record and noted in the annual report.

G. Exceeding Maximum SW-846 Holding Times

Samples must not exceed their maximum holding times as listed in Table 1. The Permittee must review the laboratory analytical reports within fourteen (14) days after receipt from the laboratory. If a laboratory analytical report indicates that groundwater samples have exceeded their maximum holding times before the appropriate analysis had been performed, then the following actions should occur:

1. The Permittee must immediately verbally notify

the EID that such has occurred and;

2. The Permittee must within fourteen (14) calendar days resample for any constituent and/or parameter that has exceeded its maximum holding times.

H. Unsampled Ground-Water Monitoring Wells

If a designated groundwater monitoring well cannot be sampled due to reasons beyond the Permittee's control, then the following actions should occur:

1. The Permittee must immediately contact the EID by telephone and in writing, stating the reasons why said well could not be sampled.

2. The Permittee must sample said well within fourteen (14) calendar days unless conditions preventing the sampling remain beyond the control of the Permittee and the Director accepts the Permittee's reasons.

X. Operation and Maintenance Program

A. Operation and Maintenance Log Book

A separate record must be kept in an Operation and Maintenance (O&M) log book that tracks the integrity and maintenance of the monitor wells and the sampling equipment. This log book must at least include the date and time of inspection, the name of the inspector, a notation of the observations made, and the date and nature of any repairs or other remedial actions. This log book must be maintained in the facility operating record and must be available for review.

B. Maintenance of Sampling Equipment

1. The Permittee must maintain an inventory of sampling equipment and devices used in the sampling program in the O&M log book.

2. One month before each sampling event, the Permittee must inspect all sampling equipment (pumps, bailers, pH meter, and other field equipment) to ensure that the equipment is in good working order and that all necessary equipment is available for the upcoming sampling event.

This check and any problems must be noted in the O&M log book.

Sampling equipment that is found to be deteriorated or malfunctioning must be repaired before the next sampling event.

C. Maintenance of Monitor Wells

1. Once every five years (or more often if warranted or if directed by the Director) the Permittee must have the top of the casing of the monitor well resurveyed by a licensed surveyor to elevation above sea level. This information must be reported to the Director in the annual report of that year.

2. One month after each sampling event, the Permittee must inspect all monitor wells to determine whether the wells are maintained in good working order.

   Visual or geochemical evidence of physical degradation of casing material; concrete pad; significant changes in the well depth, recovery rate, and turbidity measurements; and damage to the well casing etc., must be investigated, and recorded in the O&M log book. Investigation may require the use of a borehole camera or caliper logs.

   Any problem with a well must be corrected within two months of the sampling event. A detailed plan to correct or replace any well must be developed and submitted to the Director. If the problem cannot be corrected then the well must be replaced with a Director-approved well within three months of the sampling event.

3. Well samples must be analyzed for turbidity at least once a year (or more often if warranted or if directed by the Director) to determine whether the well is structurally stable or to determine whether the well needs to be redeveloped.

4. If during a sampling event, a monitor well yields a ground water sample that measures a turbidity greater than 5 turbidity units, or measures significantly greater turbidity than in the past, or the total depth has decreased with time, or the recovery rate has decreased with time, then the well must be redeveloped within two months after this sampling event.

Redevelopment must not employ a discharge rate that exceeds the recovery rate and must include a surge and flow reversal method to dislodge the fine particles from the filter pack. Redevelopment must continue until the turbidity is below 5 turbidity units or until another Director-approved standard is achieved.

Air must never be used to redevelop the wells.

5. If redevelopment does not lower the turbidity to acceptable levels, the Permittee must determine the reason for the increased turbidity. If the turbidity is caused by damage to the well or incorrect filter pack or screen slot size, then the well must be replaced.

6. If a well evidences high pH that is not caused by a contaminant plume, then the well must be repaired or replaced.

7. The Director must be provided with "as built" drawings of all recovery, observation, or monitor wells. If the Director-approved specifications do not coincide with the "as built" drawings then these wells must not be used unless the Director accepts the alternative specifications.

XI. Revision of Sampling and Analysis Plan

Sampling and analysis technology is dynamic and is currently being updated as new studies demonstrate better ways to obtain, analyze, and otherwise ensure a more representative sample. Therefore, this S&A plan will be revised and updated whenever directed by the Director. The Permittee may initiate a revision of this S&A plan if it can be demonstrated to the Director's satisfaction that the new procedures will ensure a more representative sample.

EXHIBIT 1

Investigatory Approach for Characterization of the Horizontal and Vertical Rate and Extent of Contaminant Migration

The groundwater assessment plan for the contaminant plume moving offsite from Person Generation Station will rely heavily on existing geological, hydrogeological, groundwater level and chemical analyses, and soil gas survey data and information compiled over the past eight years since the discovery of the waste oil tank leakage in October 1983. This existing information currently provides adequate information regarding the vertical and horizontal rate and extent of the contaminant plum as it exists on Person Station property.

This proposed groundwater assessment plan shall further characterize the contaminant plume as to its vertical and horizontal rate and extent offsite from the Person Generating Station property.

Investigation of Horizontal Extent

Because the Person Station property already contains 10 RCRA groundwater monitoring wells, several of which demonstrate containment of the contaminated plume within the property boundary, this investigation can be limited to offsite movement of the contaminant plume in the vicinity of well PSMW-8A.

For this reason, PSMW-8A has been chosen as the physical starting point for the location and installation of new RCRA monitoring wells beyond the boundary of the property. The horizontal plume boundary, is defined in the Technical Schedule of the Corrective Action Directive (CAD) as that location where plume contaminants are at or below Maximum Concentration Limits (MCLs) for each respective contaminant. New upper flow zone monitor wells will be installed at locations 200 to 300 feet north, east, and south of

PSMW-8A to delineate the boundary of the offsite plume. If MCL values are exceeded at any one of these three wells, an additional well will be placed 200 to 300 feet down gradient from the well where the MCL was exceeded until the maximum extent of the plume has been defined.

Topographical features east from PSMW-8A, such as the borrow pit and the mound will place some restrictions on the exact location of the new monitor wells.

Placement of the new monitor wells will be guided to some extent by the results of the May 1990 soil gas survey conducted by Tracer Research. These results were reported in Shallow Soil Gas Investigation, Person Generating Station, Albuquerque, New Mexico (previously submitted to the NMED). The concentration contour maps for the soil gas study agree with corresponding data from the existing monitor well network. One apparent anomaly is a tail of the soil gas plume located on the northeast edge of the property at PSMW-6 is not confirmed by recent groundwater sampling at PSMW-6. This anomaly can possibly be explained by the fact that a portion of the plume did extend in that direction at one time, but slight changes in groundwater gradient and significant drops in groundwater levels have resulted in the trapping of contaminants in the vadose zone above the water level. This residual is being measured in the soil gas but not in the groundwater. However, to address specific concerns of HRMB that a wave of plume contamination has previously moved beyond existing well PSMW-6, an additional new well will be located approximately 200 to 300 feet north-northeast from PSMW-6.

Investigation of Vertical Extent

The vertical extent is defined as the point at which the volatile contaminant levels are at or below the MDL values.

The Person Station monitor well network currently contains two lower flow zone wells, neither of which show contamination from the plume. This provides some evidence that the contaminant plume is shallow in nature with no tendency to move deeper. To further investigate this hypothesis, PNM proposes to drill one additional lower flow zone well (designated PSMW-15B) located 400-500 feet southeast of PSMW-3B, screened from 25-35 feet below the water table. The three wells (PSMW-3B, 8B, and 15B) will be used to determine the groundwater flow direction in the lower flow zone. A well nest consisting of a minimum of two wells (designated PSMW-12A and 12B) will subsequently be located 200-300 feet downgradient from source area (see Attachment C). The first well will be an upper flow zone well screened from +5 to 15 feet below the water table. The second well will, PSMW-12B, be a lower flow zone well screened at 25 to 35 feet below the water table. A third lower flow zone well (screened at 45 to 55 feet below the water table) will only be drilled if contamination is detected at the second well at levels exceeding the MDL.

Additional lower flow zone wells will be installed at any new monitor well drilled to assess the horizontal extent of the plume, if contaminant levels at that well exceed the MCL. Screen depths will be as described above. The result being that well clusters will exist at these locations.

Rate of Contaminant Migration

Procedures for determination of the rate of contaminant migration will be selected after data from the proposed investigation is available. Procedures which will be considered include evaluation of aquifer coefficients, groundwater flow gradients, and statistical analyses of groundwater monitoring data.

Sampling Parameters and Sampling Schedule

PNM has sampled existing wells PSMW-1, 3B, 5, 6, 7, 8A and 8B for complete Appendix IX constituents in April 1990, July 1990, and April 1991. These results have shown that the only contaminants of concern are certain organic volatile compounds (as measured by the SW-846 Method 8240).

The NMED has contended that the Person Station plume also contains high levels of chromium and lead. Their claim is based on results from their Comprehensive Monitoring Evaluation (CME) conducted in April 1989 which showed total lead levels as high as 0.11 mg/l (220% of the New Mexico groundwater standard) and chromium levels as high as 2.10 mg/l (4200% of the New Mexico groundwater standard). PNM believes that the high levels measured by the NMED are not related to the contaminant plume but are in fact an artifact of the sampling conditions at the time of the CME. At that time, PNM sampled the Person Station monitor wells using dedicated stainless steel bailers. The bailers produced very turbid water containing high amounts of Total Suspended Solids (TSS) comprised of soil particles from around the monitor well screen. Because the laboratory analyzed for total metals, any metal parameter naturally occurring in the soil particles were also measured.

PNM reported to EPA and the NMED in RCRA Facility Investigation, Report of Findings, Revised, for Person Generating Station Hazardous Water Storage Facility - Natural Pit Area, August 20, 1990 results of soil analysis for heavy metal contamination. Background soil levels of lead ranged from 2.8 to 18.2 mg/kg while background soil levels for chromium ranged from 1.0 to 6.6 mg/kg. These results were obtained for soils down to a level of five feet.

These results provide an explanation for why the NMED measured high lead and chromium values. In March 1990, PNM installed dedicated bladder pumps in wells PSMW-1, 3B, 5, 6, 7, 8A and 8B. These wells

now produce low TSS, low turbidity groundwater. All samples collected by PNM since the installation of the bladder pumps have been at the detection limits for lead and chromium, except at PSMW-8A. This well decreased from 0.84 mg/l (NMED CME) to levels around 0.05 mg/l at all subsequent PNM samples. PNM has conducted six samplings for lead and chromium at PSMW-8A since the NMED CME. Results have been as follows:

Pb and Cr at PSMW-8A

Date	Lead (mg/l)	Chromium (mg/l)
April 1990	<0.002	0.070
July 1990	<0.002	0.050
October 1990	0.005	0.130
January 1991	<0.002	0.062
April 1991	<0.002	0.033
July 1991	<0.002	0.041
Average	0.002	0.064

This data clearly demonstrates that lead should not be an issue relative to the NMED's CAD. PNM also believes that chromium should not be an issue relative to this investigation. PNM does not dispute the fact that chromium is present at PSMW-8A above MCL levels, however, we do not believe that its presence is there because of groundwater contamination related to the waste water tank. There are two more likely explanations for this phenomenon. First, the delivered groundwater may contain sufficient suspended soil particles to yield MCL level values. Soil analysis results described above indicate the presence of naturally occurring chromium. Second, the hydrogeology industry recognizes that stainless steel monitor wells are not ideally suited for metals analysis of the groundwater. Stainless steel monitor wells have been shown to bias groundwater samples upward for chromium under both chemically corrosive conditions and certain microbiologically corrosive conditions. Included as an enclosure with this proposal

is a copy of a recent article in Water Well Journal which further describes this phenomenon (Selection of Well Construction Materials, Karen L. Royse, WWJ, August 1991).

For this reason, PNM believes that the investigation should be limited to chemical parameters measurable by the SW-846 Method 8240 (i.e., volatiles), with the primary parameters being 1,1,1-trichloroethane, 1,1-dichloroethylene, and perchloroethylene. As such, PNM proposes to sample each new well after development for SW-846 Method 8240 parameters. Additionally, as regularly scheduled quarterly compliance monitoring is conducted at existing Person Station monitor wells, all new wells will be included until such time as the NMED and PNM agree upon an established subset list of monitor wells to incorporate into a routine sampling program.

EXHIBIT 2

Table of Newly Proposed Monitor Wells and Piezometers

Well ID (Tentative)	Approximate Location	Approximate Depth	Relative To Water Table
PSMW-9	200-300 feet North of PSMW-8A	150	+5 to 15 feet below WT
PSMW-10	200-300 feet East of PSMW-8A	185	+5 to 15 feet below WT
PSMW-11	200-300 feet North of PSMW-S	170	+5 to 15 feet below WT
PSMW-12A	200 feet ENE from PSMW-1	145	+5 to 15 feet below WT
PSMW-12B	200 feet ENE from PSMW-1	165	25 to 35 feet below WT
PSMW-13	200-300 feet south of PSMW-8A	180	+5 to 15 feet below WT
PSMW-14	200-300 feet NNE from PSMW-6	160	+5 to 15 feet below WT
PSMW-15B	400-500 feet SE from PSMW-3B	170	25 to 35 feet below WT

EXHIBIT 3

UPPER FLOW ZONE MONITOR WELLS

When possible, the upper flow zone wells will be drilled using a hollow stem auger rig since it prevents infiltration of drilling fluids into the aquifer. Soil samples will be collected during the drilling operation using a Central Mine Equipment Continuous Sampling system. Typical construction details for an auger drilled well are presented in the attached drawing. In the event that the depth limitations of the auger rig are exceeded at an upper flow zone well location, a single cased, 4 inch, rotary drilled well will be substituted.

Drill cuttings and development water will be drummed as the work progresses. The development water will be analyzed for volatile contaminants. If it meets the requirements, it will be disposed of at the municipal sewage treatment plant under an agreement with the City of Albuquerque.

The headspace in the each drum containing cuttings will be checked with an Hnu meter. If the headspace readings are at or below background levels, the cuttings will be spread on the ground at the site. If the headspace readings exceed the background levels, the cuttings will be treated as hazardous waste.

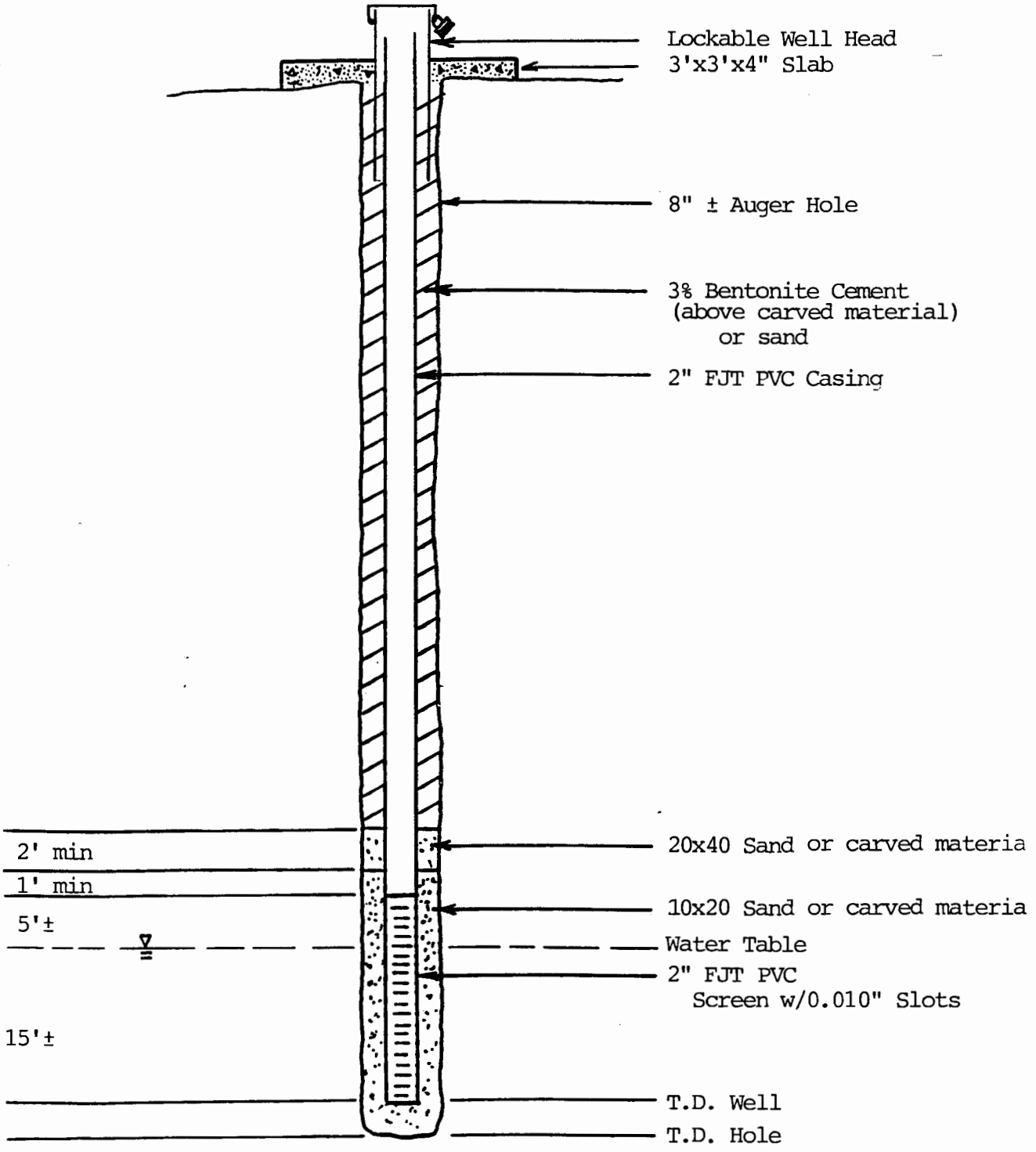


EXHIBIT 4

UPPER FLOW ZONE

WELL CONSTRUCTION

EXHIBIT 5

SECOND AND THIRD FLOW ZONE MONITOR WELLS

Second and third flow zone wells will be drilled with a rotary mud rig due to the depth limitations of the auger drilling technique. Cuttings samples will be collected at 5 feet intervals as the drilling progresses. Below the water table, drilling will proceed at 5 feet intervals with intermediate periods of fluid circulation to keep the cuttings from one interval segregated from the cuttings from the previous or subsequent interval. Typical construction details for a rotary drilled well are presented in the attached drawing.

Drill cuttings, drilling fluids and development water will be containerized as the work progresses. The development water will be analyzed for volatile contaminants. If it meets the requirements, it will be disposed of at the municipal sewage treatment plant under an agreement with the City of Albuquerque.

The headspace in the each drum containing cuttings will be checked with an Hnu meter. If the headspace readings are at or below background levels, the cuttings will be spread on the ground at the site. If the headspace readings exceed the background levels, the cuttings will be treated as hazardous waste.

Well development will be accompished by a combination of bailing, surging, water jetting and pumping with a submersible pump.

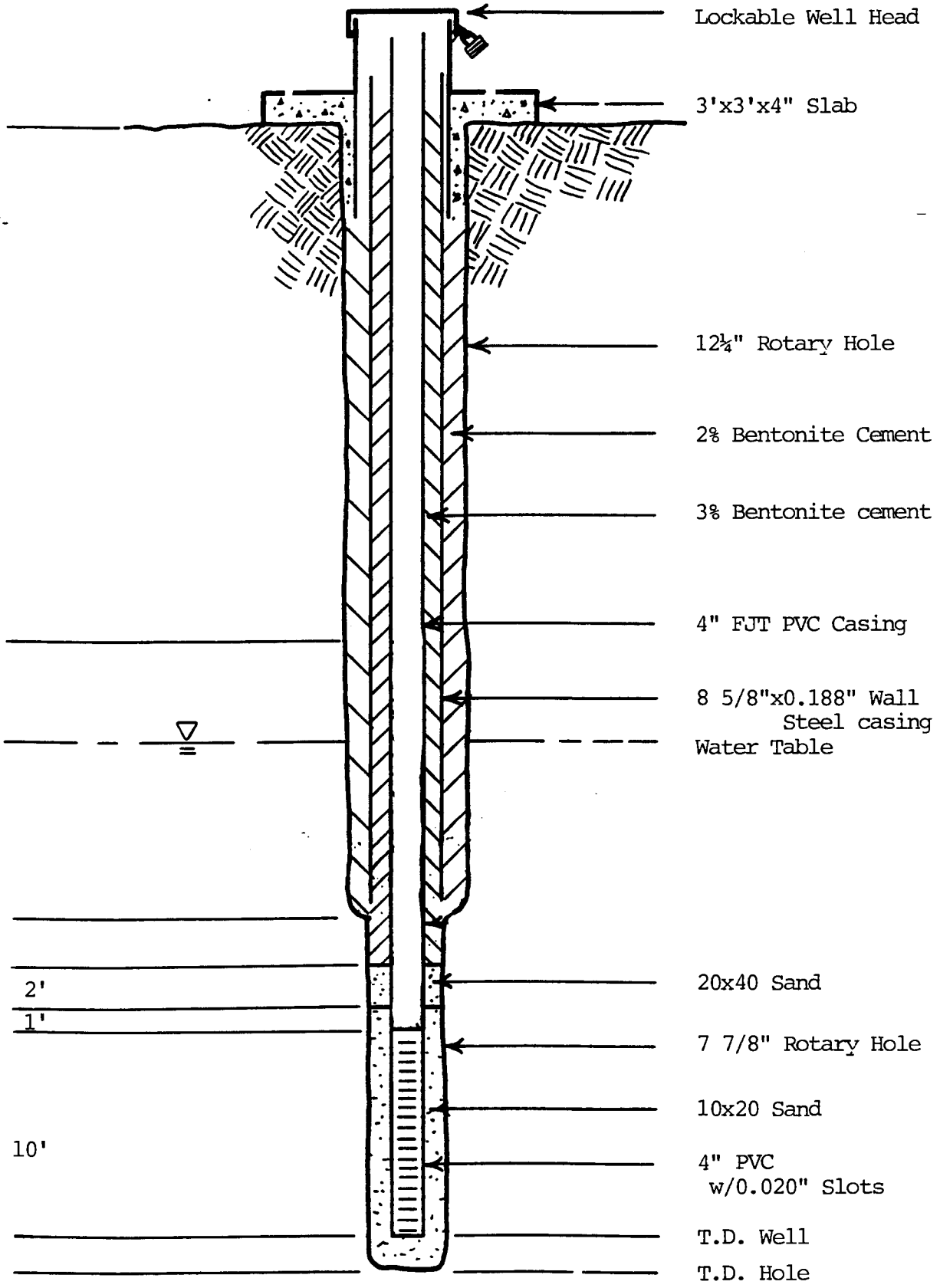


EXHIBIT 6

SECOND AND THIRD FLOW ZONE

WELL CONSTRUCTION

EXHIBIT 7

Schedule of Implementation

Item No.	Start Date	End Date	Task Description
1	09/21/91	11/21/91	PNM prepares groundwater assessment proposal and submits to HRMB
2	11/21/91	12/21/91	HRMB reviews PNM's proposal and provides comments back to PNM
3	12/21/91	01/20/92	PNM incorporates HRMB comments, resubmits proposal to HRMB
4	--	01/24/92	HRMB approves groundwater assessment plan, assessment program begins
5	01/27/92	04/17/92	Install and sample monitoring wells
6	--	06/12/92	Cutting/Core Logs submitted to HRMB
7	--	07/14/92	Assessment summary report submitted to HRMB
8	--	07/14/92	Corrective Measures Technology report submitted to HRMB
9	--	08/28/92	PNM receives comments on Assessment summary report from HRMB

* Some items are contingent on access to adjacent property.

Exhibit 8

SITE SAFETY AND HEALTH PLAN

PERSON GENERATING STATION
ALBUQUERQUE

CORRECTIVE ACTION DIRECTIVE
GROUNDWATER ASSESSMENT PLAN

30 OCTOBER 1991

CERL, INC. ENVIRONMENTAL CONSULTANTS

1808 Second St, Suite D P.O. Box 4673 Santa Fe, NM 87502 Phone (505) 988-4143 FAX (505) 982-6759

Signature Page

By signing below I certify that I have read and understand the contents of this Health and Safety Plan, and that I agree to abide by all requirements contained herein.

Printed Name	Signature	Organization	Date

TABLE OF CONTENTS

LIST OF TABLES

APPENDIX

1.0 INTRODUCTION

This section of the site health and safety plan defines general applicability and general responsibilities with respect to compliance with health and safety programs.

1.1 Scope and Applicability of the Site Health and Safety Plan

The purpose of this site health and safety plan is to define the requirements and designate protocols to be followed at the site during investigation. Applicability extends to all PNM employees, contractors, subcontractors, and visitors.

All personnel on site, contractors and subcontractors included, shall be informed of the site emergency response procedures and any potential fire, explosion, health, or safety hazards of the operation. This health and safety plan summarizes those hazards in tables 3.1, and defines protective measures planned for the site.

This plan must be reviewed and an agreement to comply with the requirements must be signed by all personnel prior to entering any exclusion zone at the site.

During development of this plan consideration was given to current safety standards as defined by EPA/OSHA/NIOSH, health effects and standards for known contaminants, and procedures designed to account for the potential for exposure to unknown substances. Specifically, the following reference sources have been consulted:

- OSHA 29 CFR 1910.120 and EPA 40 CFR 311
- NIOSH Pocket Guide to Chemical Hazards
- (ACGIH) Threshold Limit Values - 1992
- OSHA 29 CFR 1910.1001 and 1926.58
- OSHA 29 CFR 1910.1200
- AIHA Respiratory Protection - A Manual and Guideline 2nd Ed.
- NIOSH/OSHA/USCG/EPA Occupational Safety and Health Manual for Hazardous Waste Site Activities
- EPA Standard Operating Safety Guides - Office of Emergency and Remedial Response
- State of New Mexico - Hazardous Materials Emergency Response Plan and Procedures Manual

1.2 Visitors

All visitors entering an exclusion zone at the Site will be required to read and verify compliance with the provisions of this health and safety plan. In addition, visitors will be expected to comply with any applicable OSHA requirements. Visitors will also be expected to provide their own protective equipment (if applicable).

2.0 KEY PERSONNEL/IDENTIFICATION OF HEALTH AND SAFETY PERSONNEL

2.1 Key Personnel

The following personnel and organizations are critical to the planned activities at the Site. The organizational structure will be reviewed and updated periodically by the Site Supervisor.

Public Service Company of New Mexico (PNM)
- Ron Johnson
- Dan Pacheco
- Tony Hurst
- Jean Arya
- John Ferraiuolo
- Elaine Beckett

Metric Corporation
- Gary Richardson
- Pete Metzner
- Don Briggs
- Corey Campbell
- Richard McCulloch

2.2 Site Specific Health and Safety Personnel

The Site Health and Safety Officer (HSO) has total responsibility for ensuring that the provisions of this health and safety plan are adequate and implemented in the field. Changing field conditions may require decisions to be made concerning adequate protection programs. Therefore, it is vital that personnel assigned as HSO be experienced and meet the additional training requirements specified by OSHA in 29 CFR 1910.120.The HSO is also responsible for conducting site inspections on a regular basis in order to ensure the effectiveness of this plan.

The HSO at the site is Dan Pacheco, CIH

Designated alternates include:

- Ron Johnson
- Gary Richardson
- Pete Metzner
- Tony Hurst
- John Ferraiuolo
- Don Briggs

3.0 TASK/OPERATION SAFETY AND HEALTH RISK ANALYSIS

3.1 Historical Overview of Site

In October 1983, PNM detected a leak in a waste oil storage tank at Person Station. A subsequent investigation determined that oily waste material had contaminated the vadose zone (ground area above the water table) and chlorinated solvents had contaminated the vadose zone and the groundwater.

The underground tank and nearby contaminated soil were removed, and the remaining contaminated soil was closed in place by the placement of concrete cap over two high density polyethylene liners. The cap effectively prevents the further infiltration of water and thereby prevents further migration of the contaminants into underlying groundwater. PNM was issued a Post Closure RCRA permit which requires periodic sampling of several groundwater monitor wells.

The three primary constituents identified in the groundwater contaminant plume are 1,1,1-Trichloroethane (TCA), 1,1-Dichloroethylene (DCE), and 1,1,2,2-Tetrachloroethylene (i.e, Perchloroethylene, PCE).

Groundwater sampling since October 1989 has shown levels of TCA, DCE, and PCE above permit established Maximum Concentration Limits at the east property boundary well PSMW-8A. This discovery has led to NMED action requiring additional groundwater assessment of the off-site plume, and corrective action to remediate off-site contamination.

3.2 Task by Task Risk Analysis

The evaluation of hazards is based upon the knowledge of site background presented in Section 3.1, and anticipated risks posed by the specific operation.

The following subsections describe each location/operation in terms of the specific hazards associated with it. In addition, the protective measures to be implemented during completion of those operations are also identified.

The site is the Person Generating Station, located at Broadway and Rio Bravo streets in Albuquerque, New Mexico.

The evaluation of hazards at Person Generating Station has and will occur in specific locations by conducting several tasks. The tasks include: bore hole drilling and monitoring well sampling. Other related activities such as soil sampling, etc. are included as possible, but not scheduled, events.

- Driving vehicles on uneven or unsafe surfaces can result in accidents such as overturned vehicles or flat tires.

- Heat stress/cold stress exposure.

- On-site low level chemical hazards depending on contaminant location and contact or disturbances of contaminated areas.

HAZARD PREVENTION

- Wear long sleeved clothing and slacks to minimize contact with irritant and toxic plants and to protect against insect bites. Appropriate first aid for known allergic reactions.

- Be alert and observe terrain while walking to minimize slips and falls. Steel toed boots provide additional support and stability.

- Use proper lifting techniques to prevent back strain.

- Avoid wildlife when possible. In case of an animal bite, perform first aid and capture the animal, if possible, for rabies testing.

- Ensure all maintenance is performed on vehicles before going to the field. A site surveillance on foot might be required to choose clear driving paths.

- Implement heat or cold stress management techniques such as ambient temperature consideration, shifting work hours, fluid intake, and on-site monitoring of employees, especially high risk workers.

- A wind chill chart (See Appendix B) will be consulted to ensure that work does not occur in wind chill conditions that are lower than -20 °F. Skin covering and appropriate layered dry clothing will be used. Clothing will be kept dry.

- Exposure monitoring for hazardous chemicals.

3.3.3 Soil Sampling:

Hazards encountered during soil sampling include chemical agents, and are as follows:

- Exposure to airborne contaminants released during sampling activities.
- Dermal contact with contaminants during sampling activities.

HAZARD PREVENTION

- Monitor for airborne contaminants and provide respiratory protection and protective clothing where necessary.
- Use of personal protective equipment (nitrile gloves), when soil samples must be touched.

3.3.4 Monitor Well Sampling:

Hazards encountered during monitor well sampling include both chemical and physical agents, and are as follows:

- Exposure to airborne contaminants released during sampling activities.
- Dermal contact with contaminants during sampling activities.

HAZARD PREVENTION

- Monitor for airborne contaminants and provide respiratory protection and protective clothing where necessary.
- Use of personal protective equipment (nitrile gloves), when collecting and handling water samples.

5.0 PERSONAL PROTECTIVE EQUIPMENT TO BE USED

This section describes the general requirements of the EPA and OSHA designated Levels of Protection (A-D), and the specific levels of protection required for each task at the Site.

All personnel on the work sites will be required to wear hardhats, eye protection and steel toed shoes.

5.1 Levels of Protection

Personnel must wear protective equipment when response activities involve known or suspected atmospheric contamination, when vapors, gases, or particulates may be generated by site activities, or when direct contact with skin-affecting substances may occur. Full facepiece respirators protect lungs, gastrointestinal tract, and eyes against airborne toxicants. Chemical-resistant clothing protects the skin from contact with skin-destructive and absorbable chemicals.

The specific levels of protection and necessary components for each have been divided into four categories according to the degrees of protection afforded:

Level A: Should be worn when the highest level of respiratory, skin, and eye protection is needed.

Level B: Should be worn when the highest level of respiratory protection is needed, but a lesser level of skin protection. Level B is the primary level of choice when encountering unknown environments.

Level C: Should be worn when the criteria for using air-purifying respirators are met, and a lesser level of skin protection is needed.

Level D: Should be worn only as a work uniform and not in any area with respiratory or skin hazards. It provides minimal protection against chemical hazards.

Modifications of these levels are permitted, and routinely employed during site work activities to maximize efficiency. For example, Level C respiratory protection and Level D skin protection may be required for a given task. Likewise the type of chemical protective ensemble (i.e., material, format) will depend upon contaminants and degrees of contact.

The Level of Protection selected is based upon the following:

- Type and measured concentration of the chemical substance in the

effectiveness of PPE.

- Contaminants other than those previously identified are encountered.

- Change in ambient levels of contaminants. If ambient HNU readings measure organic contamination 5 ppm to 10 ppm above ambient background, Level C - Modified PPE will be initiated.

- Change in work scope which affects the degree of contact with contaminants, such as drilling within 50 feet of the concrete cap center.

5.4 Work Mission Duration

Before the workers actually begin work in their PPE ensembles, the anticipated duration of the work task should be established. Several factors limit the length, workers can work each day including:

- Ambient temperature and weather conditions (heat stress, cold stress).

- Capacity of personnel to work in PPE.

5.5 Chemical Resistance and Integrity of Protective Material

The following specific clothing materials are recommended for the site:

Surface soil sampling - (Level D - Modified)
Gloves - Nitrile
Boots - Steel Toe
Outer Garment/Coveralls - Cotton

Borehole drilling - (Level D - Modified)
Gloves - Work: cloth or leather
Sample handling: Nitrile
Boots - Steel Toe
Outer Garment/Coveralls - Cotton

Monitor Well Sampling - (Level D - Modified)
Gloves - Nitrile
Boots - Steel Toe
Outer Garment/Coveralls - Cotton

5.7 Specific Levels of Protection Planned for the Site

The following levels of protection will be utilized during activities at the Site:

- Level D
- Level D - Modified

Table 5.1 presents the level of protection planned for the completion of individual task assignments and the specific components of each protective ensemble.

TABLE 5.1
SPECIFIC LEVELS OF PROTECTION PLANNED FOR THE TASK ASSIGNMENTS AT THE SITE

Level A Tasks

- No Activities

Level B Tasks

- No Activities

Level C Tasks

- No Activities

Level D Tasks

- Walk Through

Level D - Modified Tasks

- Soil sampling
- Borehole drilling
- Monitor well sampling

7.0 FREQUENCY AND TYPES OF PERSONAL AIR MONITORING/SAMPLING

This section explains the general concepts of an air monitoring program and specifies the surveillance activities that will take place during project completion at the Site.

The purpose of air monitoring is to identify and quantify airborne contaminants in order to verify and determine the level of worker protection needed. Initial screening for identification is often qualitative, i.e., the contaminant, or the class to which it belongs, is demonstrated to be present but the determination of its concentration (quantification) must await subsequent testing. Two principal approaches are available for identifying and/or quantifying airborne contaminants:

- The on-site use of direct-reading instruments. This will be used during bore hole drilling if odors are detected or soil discoloration is observed.

- Laboratory analysis of air samples obtained by gas sampling bag, collection media (i.e., filter, sorbent), and/or wet-contaminant collection methods. Air quality monitoring will be conducted during initial bore hole work and again if necessary, or if bore hole work is conducted within 50 feet of the RCRA concrete cap.

7.1 Direct-Reading Monitoring Instruments

Unlike air sampling devices, which are used to collect samples for subsequent analysis in a laboratory, direct-reading instruments provide information at the time of sampling, enabling rapid decision-making. Data obtained from the real-time monitors are used to assure proper selection of personnel protection equipment, engineering controls, and work practices. Overall, the instruments provide the user the capability to determine if site personnel are being exposed to concentrations which exceed exposure limits or action levels for specific hazardous materials.

Of significant importance, especially during initial entries, is the potential for IDLH conditions or oxygen deficient atmospheres. Real-time monitors can be useful in identifying IDLH conditions, toxic levels of airborne contaminants, flammable atmospheres, or radioactive hazards. Periodic monitoring of conditions is critical, especially if exposures may have increased since initial monitoring or if new site activities have commenced.

Table 7.1, excerpted from Occupational Safety and Health Guidelines for Hazardous Waste Site Activities, provides an overview of available monitoring instrumentation and their specific operating parameters.

8.0 SITE CONTROL MEASURES

The following section defines measures and procedures for maintaining site control. Site control is an essential component in the implementation of the site health and safety program.

8.1 Site Communications Plan

Successful communications between field teams and contact with personnel in the support zone is essential. The following communications systems will be available during activities at the Site.

- Hand Signals

Signal	Definition
Hands clutching throat	Out of air/cannot breath
Hands on top of head	Need assistance
Thumbs up	OK/I am alright/I understand
Thumbs down	No/negative
Arms waving upright	Send backup support
Grip partners wrist	Exit area immediately

8.2 Work Zone Definition

The two general work zones established for this project are the Exclusion Zone, and the Support Zone.

The Exclusion Zone is defined as the area where low level contamination is possible or because of activity, will provide a potential to cause harm to personnel due to safety hazards. Entry into the Exclusion Zone requires familiarity with this Health and Safety Plan and the use of any required personnel protective equipment. The Exclusion Zone consists of a 50 ft. radius around the drilling equipment.

The Support Zone is situated in clean areas where the chance to encounter hazardous materials or conditions is minimal. Personal protective equipment is not required in the Support Zone.

9.0 DECONTAMINATION PLAN

Table 5.1 lists the tasks and specific levels of protection required for each task. All tasks are to be performed in Level D or Level D (modified) protection, thus exposure to harmful contaminants and subsequent need for decontamination is not anticipated.

9.1 Standard Operating Procedures

Decontamination involves the orderly controlled removal of contaminants. If unanticipated situations occur where exposure to contaminants is possible, all site personnel should minimize contact with contaminants in order to minimize the need for extensive decontamination.

9.2 Levels of Decontamination Protection Required for Personnel

The level of protection required for personnel assisting with decontamination will be Level D.

Modifications include: none

The Site Safety Officer is responsible for developing and monitoring decontamination procedures and then determining their effectiveness.

9.3 Equipment Decontamination

Equipment and monitor well construction materials will be cleaned using high pressure steam cleaning to minimize the cross contamination between materials and groundwater. This is standard operating procedure for water monitor well installation.

10.3 Emergency Recognition/Prevention

Table 3.1 provides a listing of chemical hazards on-site. Additional hazards as a direct result of site activities are listed in Table 10.1, as are prevention and control techniques/mechanisms. Personnel will be familiar with techniques of hazard recognition from preassignment training and site specific briefings. The HSO is responsible for ensuring that prevention devices or equipment are available to personnel.

10.4 Evacuation Routes/Procedures

In the event of an emergency which necessitates an evacuation of the site, the following alarm procedures will be implemented:

THREE CONSECUTIVE (5 SECOND) BLASTS ON THE AIR HORN

Personnel will be expected to evacuate the area immediately, proceed to the closest exit, and move to the safe distance area associated with the evacuation route. Personnel will remain at that area until the Re-entry alarm (Three 5 second blasts on an air horn) is sounded or the HSO authorizes or provides further instructions.

TABLE 10.1
EMERGENCY RECOGNITION/CONTROL MEASURES

Specific Condition/ Hazard	Location	Prevention\Control
Fire/Explosion	All areas	Fire extinguisher Fire Inspections
Spill	Berms/Dikes Ponds	Shovels

Appendix 'A' provides a map depicting evacuation routes for the site and immediate area. Also indicated are locations for site telephone and First Aid Kits.

10.6 Emergency Medical Treatment Procedures

No special decontamination procedures are required for emergency medical treatment at this site. Also, special training is not required for medical emergency response personnel needing access to this site.

10.7 Fire or Explosion

In the event of a fire or explosion, the local fire department should be summoned immediately. Upon their arrival, the project manager or designated alternate will advise the fire commander of the location, nature, and identification of the hazardous materials on-site.

If the HSO or Site Supervisor deems it safe to do so, site personnel may:

- Use fire fighting equipment (hand-held fire extinguishers) available on-site to control or extinguish the fire; and,

- Remove or isolate flammable or other hazardous materials which may contribute to the fire.

10.8 Emergency Equipment/Facilities

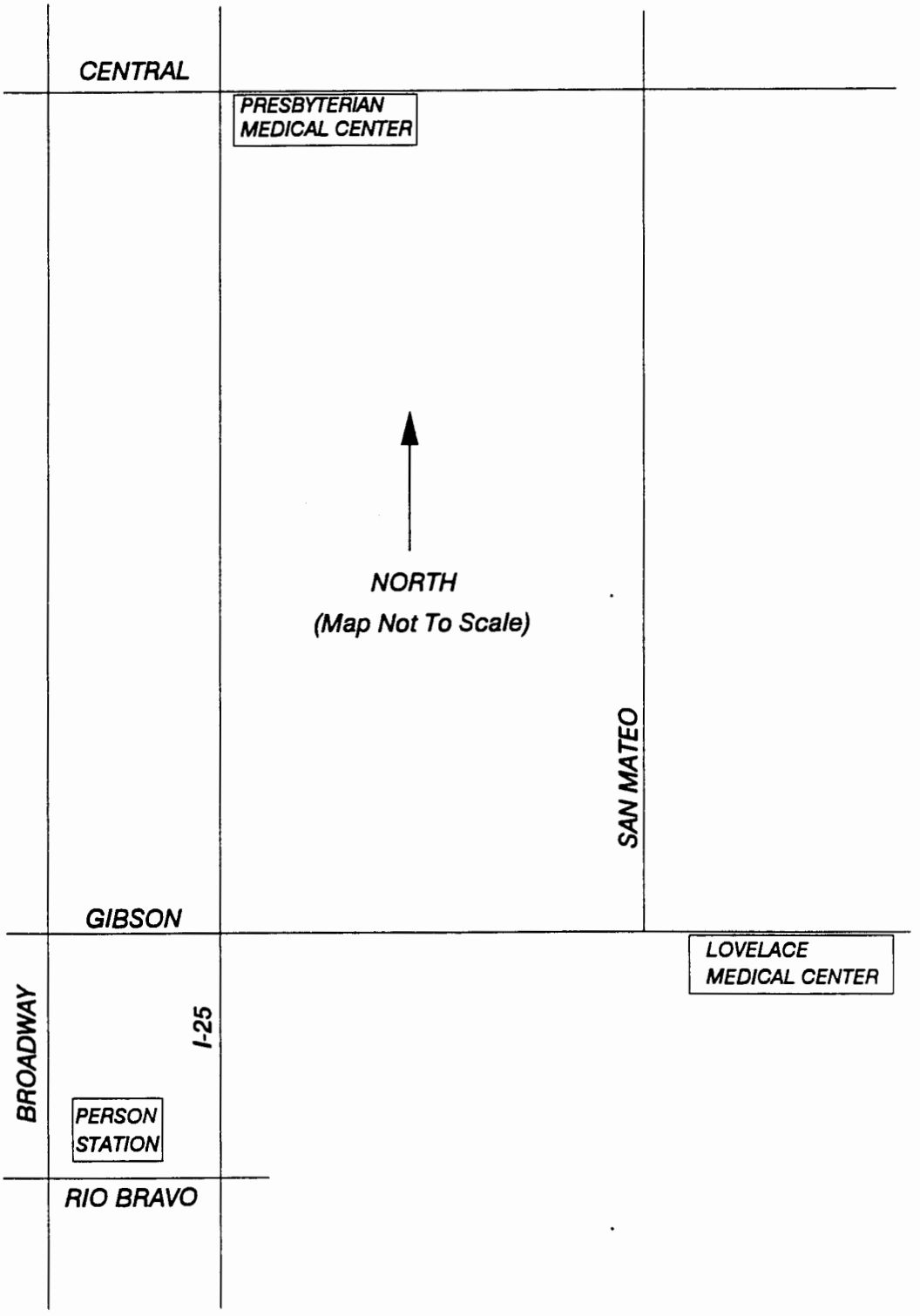
Appendix 'A' provides a map of the site and identifies the location of the following emergency equipment:

- First Aid Kit (Also available in vehicles)
- Fire Extinguisher (Also available in vehicles)
- Site Telephone
- Eye Wash

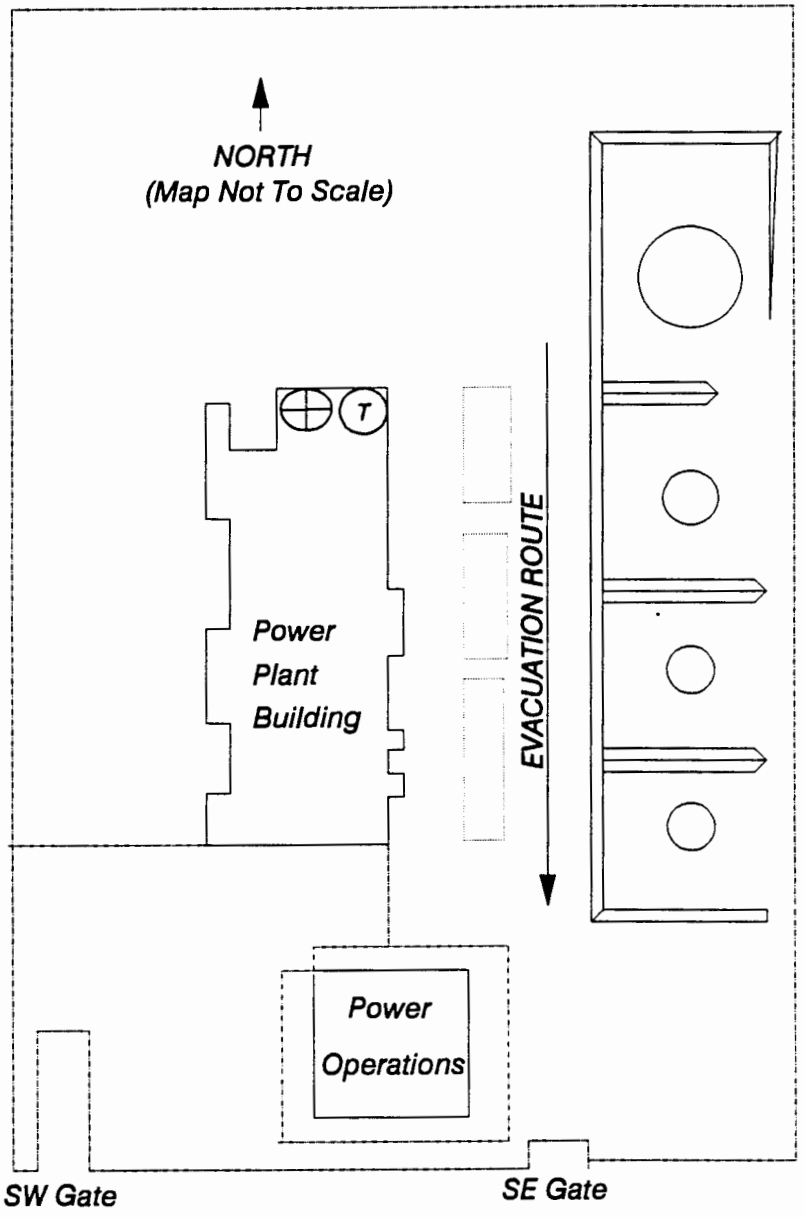
APPENDIX
A

PROJECT MAPS

MAP DEPICTING ROUTE TO NEAREST MEDICAL FACILITIES



MAP SHOWING EVACUATION ROUTE
TELEPHONE, AND FIRST AID KIT



First Aid Kit

T Telephone

APPENDIX
B

WIND CHILL CHART

WIND CHILL CHART

WIND SPEED (MPH)	LOCAL TEMPERATURE (F) 32	23	14	5	-4	-13	-22	-31	-40	-49	-58
5	29	20	10	1	- 9	-18	-28	-37	-47	-56	-65
10	18	7	-4	-15	-26	-37	-48	-59	-70	-81	-92
15	13	-1	-13	-25	-37	-49	-61	-73	-85	-97	-109
20	7	-6	-19	-32	-44	-57	-70	-83	-96	-109	-121
25	3	-10	-24	-37	-50	-64	-77	-90	-104	-117	-130
30	1	-13	-27	-41	-54	-68	-82	-97	-109	-123	-137
35	-1	-15	-29	-43	-57	-71	-85	-99	-113	-127	-142
40	-3	-17	-31	-45	-59	-74	-87	-102	-116	-131	-145
45	-3	-18	-32	-46	-61	-75	-89	-104	-118	-132	-147
50	-4	-18	-33	-47	-62	-76	-91	-105	-120	-134	-148

For Properly Clothed Persons	Little Danger	Considerable Danger	Very Great Danger

DANGER FROM FREEZING OF EXPOSED FLESH