6805 U-007-306 .45

TRANSMITTAL OF RESPONSES TO THE U. S. ENVIRONMENTAL PROTECTION AGENCY AND THE OHIO ENVIRONMENTAL PROTECTION AGENCY COMMENTS ON THE PROJECT SPECIFIC PLAN FOR THE SOUTHFIELD PUMPING TEST

04/10/95

DOE-0750-95
DOE-FN EPAS
12
RESPONSES

6805

Department of Energy
Fernald Environmental Management Project
P. O. Box 538705
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APR 10 1995

DOE-0750-95

Mr. James A. Saric, Remedial Project Director
U.S. Environmental Protection Agency
Region V - 5HRE-8J
77 W. Jackson Boulevard
Chicago, Illinois 60604-3590

Mr. Tom Schneider, Project Manager
Ohio Environmental Protection Agency
401 East 5th Street
Dayton, Ohio 45402-2911

Dear Mr. Saric and Mr. Schneider:

TRANSMITTAL OF RESPONSES TO THE U.S. ENVIRONMENTAL PROTECTION AGENCY AND THE OHIO ENVIRONMENTAL PROTECTION AGENCY COMMENTS ON THE PROJECT SPECIFIC PLAN FOR THE SOUTHFIELD PUMPING TEST

Reference: 1) Letter, Thomas A. Schneider (OEPA) to Jack Craig (DOE-FN), "Hamilton County Comments - Southfield Pump Test," dated February 14, 1995.

2) Letter, James A. Saric (U.S.EPA) to Jack Craig (DOE-FN), "Conditional approval of the OU-5 South Field Pump Test Work Plan," dated March 13, 1995.

This serves to transmit responses to the U.S. Environmental Protection Agency (U.S.EPA) and the Ohio Environmental Protection Agency (OEPA) comments on the Project Specific Plan (PSP) for the Southfield Pumping Test (Reference).

Enclosed is a copy of the revised PSP for the Southfield Pumping Test.

If you have any questions, please contact John Kappa at (513) 648-3149.

Sincerely,

Johnny Reising

for Jack R. Craig
Fernald Remedial Action
Project Manager

FN:Kappa

Enclosures: As Stated

Recycled and Recyclable

1

cc w/encs:

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D. R. Kozlowski, EM-423/QO
G. Jablonowski, USEPA-V, HRE-8J
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R. D. George, FERMCO/52-2
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cc w/o encs:

R. L. Glenn, Parsons
J. Thiesing, FERMCO
M. Yates, FERMCO/9

RESPONSES TO U.S AND OHIO EPA COMMENTS ON THE PROJECT SPECIFIC PLAN FOR THE SOUTHFIELD PUMPING TEST

Commenting Organization: U.S. EPA Commentor: Saric
Section#: 5.1 Pg.#: 7 Line#: Code:
Original Comment# 1

Comment: The plan states that the observation wells will be screened across a 5-foot interval with the base of the well screen coinciding with the midpoint of the aquifer. Common procedure in designing pumping tests require that the observation wells be screened across the same interval as the pumping well (Driscoll 1986 and Walton 1988). The U.S. Department of Energy (DOE) should explain why it has deviated from this approach and should describe the impact on the pumping test results.

Response: Agree, the observation wells will be screened across a 5-foot interval, with the base of the screens coinciding with the mid-point of the length of the screen in the pumping well. The current work plan for the pumping test does state that the depth is referenced to the pumping well. A copy of the current work plan is attached.

Action: None.

Commenting Organization: U.S. EPA Commentor: Saric
Section#: 6.3 Pg.#: 12 Line#: Code:
Original Comment# 2

Comment: The plan states pumped groundwater from both the step test and the pumping test will be discharged to the Great Miami River without treatment. In addition, the plan states that the concentration of uranium in the discharged water will not exceed allowable levels. DOE should state how purge water generated during the development of wells will be handled. In addition, DOE should provide an estimate of the uranium concentration of the discharge water and the total estimated mass loading of uranium to the Great Miami River.

Response: Purge water collected during the development of the six observation wells will be collected in a tank at the wellsite and transported to the general sump for disposal. The development water will be treated to about 3 parts per billion (ppb) uranium concentration prior to discharge to the Great Miami River (GMR). The mass

3

discharged to the river from this purge water will be approximately 1.5×10^{-4} lbs of uranium.

However, groundwater that is pumped from the recovery well will be disposed of in a different manner. This water will be diverted into the south plume force main (through a temporary line) and mixed with south plume water (see Attachment). Prior to these two streams combining, the uranium concentration in the south plume flow is approximately 18 ppb at a pumping rate of 1400 gallons per minute (gpm) while the average concentration of pump test water was estimated to be approximately 183 ppb at a pumping rate of 500 gpm. The combined flow of these two streams results in a uranium concentration of approximately 61.4 ppb at a rate of 1900 gpm.

Because the current available treatment capacity for groundwater is 550 gpm, the flow stream of 1900 gpm will be split. Approximately 29% (i.e., 550 gpm) will be directed to the SPIT, IAWWT, and AWWT (at an estimated concentration of 61.4 ppb) and treated to a concentration of approximately 3 ppb prior to discharge. The remaining 71% of the flow (concentration remains at 61.4 ppb) will be recombined with the treated flow stream (concentration at 3 ppb) and will be discharged to the GMR. The concentration of this discharge water is estimated to be 37.6 ppb. (It should be noted that the value of 183 ppb was a conservative estimate based on extrapolation from limited monitoring well data. A sample collected from the extraction well during development identified an actual concentration of 37 ppb (compared to the estimated 183 ppb). Thus it is unlikely that the 20 ppb target limit will be exceeded during the pump tests).

During the duration of the pump test, maximum treatment capacity will be maintained (i.e., SPIT, IAWWT, and AWWT will be operating at full capacity) to ensure that discharges to the GMR are minimized.

The discharge concentration calculation of 37.6 ppb to the GMR assumes that the concentration of uranium being discharged from the recovery well is 183 ppb, the average pumping rate during aquifer testing is 500 gpm, and that the total time of pumping for both the step and constant rate test is 10,400 minutes (approximately 8 days). As noted above, however, initial data collected during development activities indicates that the estimated uranium being

4

discharged from the recovery well is much higher than actual discharge concentrations.

Development of the recovery well, and performance of the step and the constant rate test (using the assumptions listed above) would result in a mass discharge to the Great Miami River of approximately 5.6 lbs of uranium.

Ultimately, all future remediation wells will have the ability to selectively send discharge from any recovery well to the treatment facility. This greater flexibility will allow for higher concentrated flow streams to be treated more efficiently and therefore minimize discharges to the GMR.

Action: None.

Commenting Organization: U.S. EPA Commentor: Saric
Section#: 6.3 Pg.#: 12 Line#: Code:
Original Comment# 3
Comment: The plan proposes to monitor pumped groundwater for total suspended solids and dissolved oxygen. DOE should also monitor the pumped water for total uranium at regular intervals to establish the actual contribution of uranium mass to the Great Miami River from the step and pumping test.

Response: The pumped water will be monitored for total uranium. (See attachment C of the current work plan). It has been decided to increase the frequency of sampling to 1 sample every 12 hours during the constant rate test.

Action: None.

Commenting Organization: OHIO EPA Commentor:
Section#: Pg.#: Line#: Code:
Original Comment# 1
Comment: The work plan needs to have a specific work schedule.

Response: Work schedules have been prepared for the project and are attached.

Action: None.

5

Commenting Organization: OHIO EPA Commentor:
Section#: 2.0 Pg.#: 2 Line#: para 4 Code:
Original Comment# 2
Comment: The second bullet needs to state that the Geologist in charge is responsible for being present whenever a borehole is being advanced and during the well installation and development activities.

Response: The geologist in charge is present during well development activities. This requirement is in the current work plan. The bullet now reads; "The geologist in charge is responsible for being present whenever a borehole is being advanced, casing and screen is being installed, and during well development activities."

Action: None.

Commenting Organization: OHIO EPA Commentor:
Section#: 5.2 Pg.#: 7 Line#: Code:
Original Comment# 3
Comment: What drilling technology will be used if Rotosonic drilling unavailable? Accurate borehole logging is critical to this project, therefore, Ohio EPA recommends that only technologies that yield quality borehole logs be used.

Response: Agree. Rotosonic is available however and is being used.

Action: None.

Commenting Organization: OHIO EPA Commentor:
Section#: 5.2 Pg.#: 7 Line#: Code:
Original Comment# 4
Comment: Why is sand being mixed with the bentonite? What is the ratio of sand to bentonite? What is the size and source of the sand?

Response: A mixture of sand and bentonite is being used to temporarily abandon the recovery well above the water table. This work has already been completed. Re-drilling through bentonite is very messy. Using a mixture of sand and bentonite rather than pure bentonite will cut down on some of the mess.

6

Fifteen, 50 pound bags of bentonite were mixed with 300 lbs of sand and placed into the borehole from the water table to the surface. The sand was purchased from Global Drilling Supplies, Inc. Sieve analysis results and technical data on the sand are attached.

The work plan states that a mixture of sand and bentonite will be used to seal the hole below the screen (for those wells drilled deeper than the proposed screen depth) and to temporarily abandon the control well. Information learned during the drilling of the rotosonic core at the control well indicates that the mixture of sand and bentonite is only needed above the water table. The aquifer readily collapses below the water table.

ACTION: None.

Commenting Organization: OHIO EPA Commentor:
Section#: 5.2 Pg.#: 8 Line#: bullet 2 Code:
Original Comment# 5
Comment: The entire core should also be video taped with the head geologist's comments and description of the log as narration.

Response: A video tape was attempted for the first core (well 31550) but it was decided to photograph the cores using a 35 millimeter camera instead. Core descriptions and sampling are being conducted from a trailer at the well site. The trailer is heated and provides good working conditions during the cold weather. The trailer though is very cramped, making the use of the 35 millimeter camera easier than a video camera.

Action: None.

Commenting Organization: OHIO EPA Commentor:
Section#: 5.3 Pg.#: 9 Line#: Code:
Original Comment# 6
Comment: If a large amount of fines are encountered, the wells should not be surged. Instead wells should be pumped until turbidity stabilizes.

Response: Agree. To date though a large amount of fines has not been encountered.

7

Action: If a large amount of fines are encountered the well will be pumped during development rather than surged.

Commenting Organization: OHIO EPA Commentor:
Section#: 6.0 Pg.#: 10 Line#: bullet 7 Code:
Original Comment# 7
Comment: Change "uranium to "total uranium content".

Response: This change has already been made. Text in the current work plan now reads "total uranium".

Action: None.

Commenting Organization: OHIO EPA Commentor:
Section#: 6.1 Pg.#: 10 Line#: bullet 1 Code:
Original Comment# 8
Comment: What is DOE's contingency plan if 300 to 1200 gpm pumping range is insufficient for the pumping tests?

Response: The range is more than sufficient for the pumping test. This range is discussed in the work plan on pages 3 through 5. The range has already been reduced to 200 gpm to 800 gpm due to the design of the control well.

The intent is to use the control well as an extraction well following the pumping test. Water sampling results for the control well indicate that the uranium contamination is limited to the upper 20 feet of the water table. The length of the screen is being reduced from 40 feet to 20 feet to target the contamination.

Sieve analysis indicates a natural completion would require a 30 slot screen. The maximum screen transmitting capacity of a 20 foot long, 12-inch ID, .030 inch, continuous-slot stainless steel screen is calculated to be 477.4 gpm. Although this transmitting capacity would support recovery operations it would not support the pumping test where higher pumping is needed to adequately stress the aquifer.

A filter pack completion with a .060 inch slot continuous-slot stainless steel screen is being used. Twenty feet of 12-inch ID, .060 inch continuous-slot stainless screen has a maximum screen

8

transmitting capacity of 837 gpm. Below this maximum screen transmitting capacity the entrance velocity will not exceed .10 feet/second. Rough calculations indicate that a pumping rate of 800 gpm will induce adequate drawdown during the pumping test.

Action: None.

Commenting Organization: OHIO EPA Commentor:
Section#: 6.1 Pg.#: 10 Line#: bullet 3 Code:
Original Comment# 9
Comment: Electrical circuitry should be structured so as to prevent accidental shut-off of the pumping test. Additionally, the electrical back up should be able to automatically cut in with a minimal interruption in case of a power interruption.

Response: Agree.

Action: Electrical circuitry will be designed to prevent accidental shut-off of the pumping test and the electrical back up will be designed to cut in with minimal interruption in case of a power failure.

Commenting Organization: OHIO EPA Commentor:
Section#: 6.4 Pg.#: 13 Line#: bullet 3 Code:
Original Comment# 10
Comment: If a large precipitation event occurs, DOE, Ohio EPA, and USEPA need to evaluate continuation or cessation of the pumping tests.

Response: DOE will reserve the right to control the continuation or cessation of the pumping tests. Whenever possible though, Ohio EPA and USEPA will be consulted for input prior to any such decision.

The objective of the testing is to provide the DOE, Ohio EPA, and USEPA with good, usable data. If a storm event occurs and the Ohio EPA and USEPA feel that the storm has adversely effected the data then the need for further action will be discussed.

Action: None.

Commenting Organization: OHIO EPA Commentor:
Section#: 6.7 Pg.#: 16 Line#: bullet 1 Code:
Original Comment# 11

Comment: How will water levels be manually taken without affecting the readings from the pressure transducers?

Response: The purpose of the manual measurements is to record that the automatic measuring equipment is performing adequately. The manual readings will effect the automatic readings. The time that manual readings are collected will be recorded, and scheduled for non critical times during the test (i.e., between automatic readings whenever possible). By noting when the manual readings are being taken, data collected by the data loggers can be qualified to account for the disturbance.

Action: None.

Commenting Organization: OHIO EPA Commentor:
Section#: 6.7 Pg.#: 17 Line#: last para Code:
Original Comment# 12
Comment: The Ohio EPA and USEPA should be immediately notified in case of disruption of pumping.

Response: Agree.

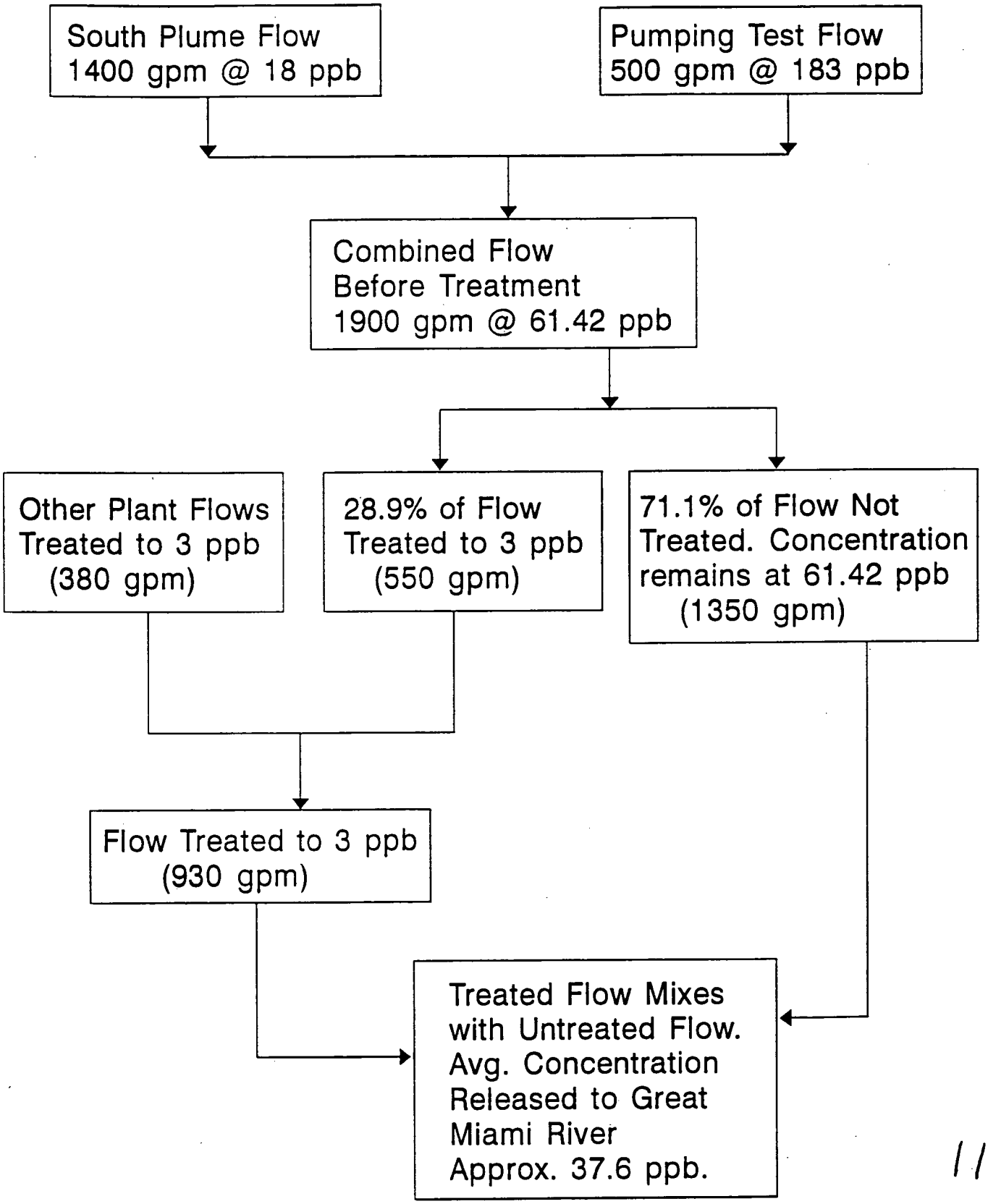
Action: The Ohio and USEPA will be notified immediately if the pumping test is disrupted.

Commenting Organization: OHIO EPA Commentor:
Section#: 8.0 Pg.#: 19 Line#: last para Code:
Original Comment# 13
Comment: Data files from the data logger should be provided to the Ohio EPA and USEPA as soon as the tests are completed.

Response: Agree.

Action: Data files from the data logger will be provided to the Ohio EPA and USEPA as soon as the tests are completed.

Strategy for Managing Groundwater During Pumping Test



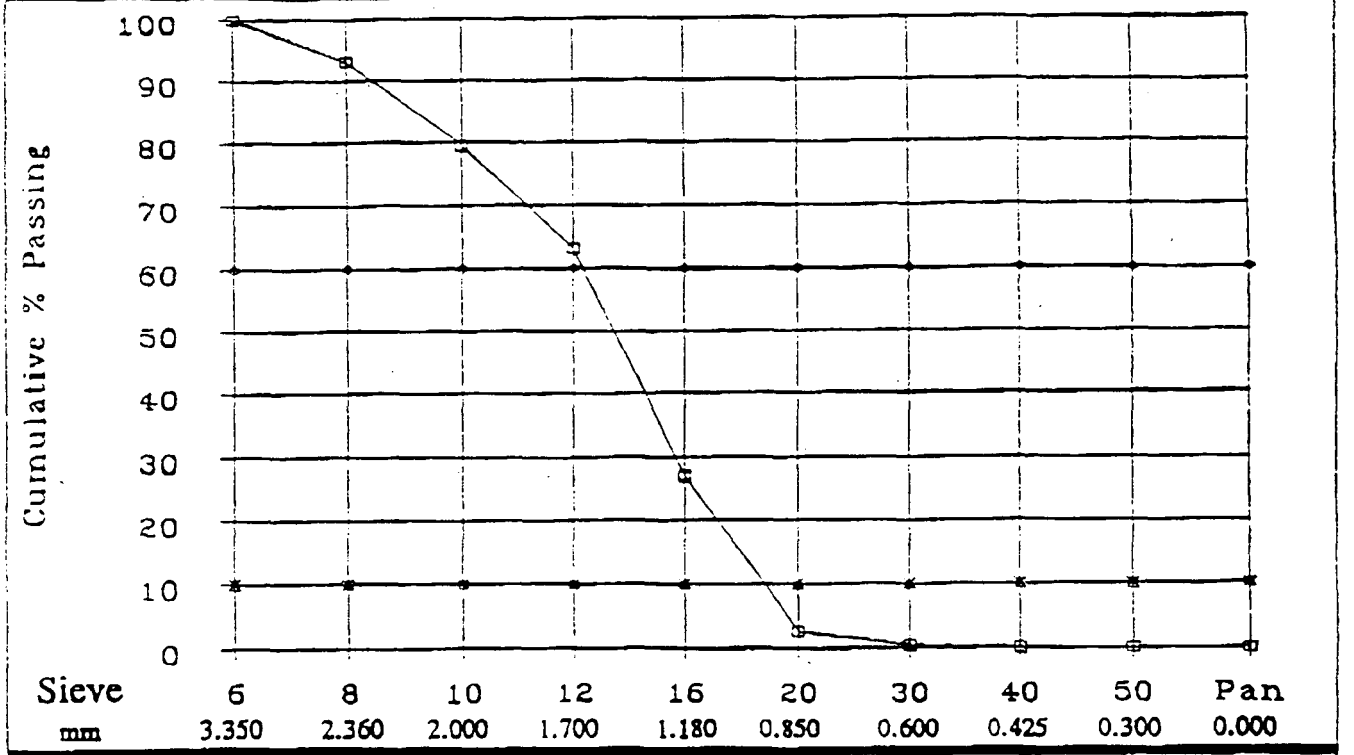
Rev. 10

SO. FIELD PUMPING TEST SCHEDULE **3/23/95**

Action	Start/Finish	Duration
1. Kickoff meeting	Jan 12	1 Day
2. Mobilize	Jan 17	1 Day
3. Site kickoff meeting	Jan 18	1 Day
4. Drill control well pilot hole	Jan 19-26	6 Days
5. Drill observation wells (collect water samples)	Jan 27-Feb 28	23 Days
6. Demob Rotosonic rig	Mar 1-2	2 Days
7. Drill/set 20" temp. casing	Feb 16-Mar 3	12 Days
8. Set 12" well	Mar 6-9	4 Days
9. Pull 20" temp. casing	Mar 10-21	8 Days
10. Test/repair discharge line	Mar 22-Apr 4	10 Days
11. Develop control & observation wells	Mar 16-Apr 7	10 Days
12. Install pump and pumping test systems	Apr 10-11	2 Days
13. Test equipment	Apr 12	1 Day
14. Pre test monitoring	Apr 13-19	7 Days
15. 12 Hour Step test	Apr 20	1 Day
16. Recovery period (4-7 days)	Apr 21-27	7 Days
17. 3 or 7 day constant rate pumping test	Apr 28-30 or May 4	3 or 7 Days
18. Recovery monitoring (4-7 days)	May 1-7 or May 5-11	7 Days
19. Calculations	May 1-12 or May 5-18	10 Days
20. Demob.	May 1-2 or May 5-8	2 Days

Global Drilling Suppliers, Inc.

Global Drilling # 5 — Product Analysis Report — 10-Oct-94



Sieve Analysis:

Sieve Size	% Retained	% Cumulative	% Passing
6	0.0	0.0	100.0
8	7.0	7.0	93.0
10	13.5	20.5	79.5
12	16.3	36.8	63.2
16	36.2	73.0	27.0
20	24.3	97.3	2.7
30	2.2	99.5	0.5
40	0.4	99.9	0.1
50	0.1	100.0	0.0
Pan	0.0	100.0	0.0
Effective Size		0.95	
Uniformity Coefficient		1.74	

Technical Data:

Acid Solubility	< 1%	% Fe2O3	0.068
Specific Gravity	2.64	% Al2O3	0.096
Porosity	40	% MgO	0.002
Moh Hardness	7	% Na2O	0.007
% SiO2	> 99%	% Cr2O3	0.001
% Fractured Faces	< 25%	% CaO	0.008
Roundness	.77 ***	% K2O	0.028
Sphericity	.85 ***	% TiO2	0.016

*** As determined by an independent lab using the methods in "Elements of Water Supply and Wastewater Disposal", 2nd edition, John Wiley and Sons, Inc., New York, p. 404 to p. 406

Customer: Current Production Average