DEPARTMENT OF AGRICULTURE

ATTACHMENT 1

GROUNDWATER MONITORING REPORTING REQUIREMENTS

MONITORING REPORTS (QUARTERLY, OR SEMI ANNUALLY)

Information submitted to MDA should include:

1. Analytical results for samples including QA samples;
2. Stabilization, purge volume and/or recovery rate test forms;
3. Copies of "*chain-of-custody*" forms, lab analytical reports, lab QA/QC reports, and MDA Laboratory Data Review Checklist (GD29 Attachment);
4. Copies of field records;
5. Water level measurements to the nearest 0.01 foot from the surveyed point referenced to the National Geodetic Vertical Datum or an identified benchmark;
6. A table showing all water level information to date;
7. A table showing all analytical results to date. Include numerical information (specify reporting limit) rather than “non detect” for those parameters not detected above reporting limits;
8. A detailed site map showing the location of all monitoring wells with ground water elevation contours. The map should clearly indicate the elevations of ground water contour lines and ground water elevations in each well. The map should also indicate expected direction of ground water flow with a directional arrow. All maps should have a north arrow and scale;
9. A brief description of how the ground water contour map was completed (for example, the name of the ground water model used);
10. A statement explaining the reasons for and ramifications of any deviation in sampling, analytical techniques or equipment from those stated above or in the laboratory quality assurance/quality control plan;
11. A hydrograph showing changes in water level elevations over time;
12. Provide all calculations needed to determine unionized ammonia concentrations, if required, and
13. Provide all calculations needed to determine the horizontal hydraulic conductivity from slug or plug test data.

ANNUAL MONITORING REPORT

Once a year, or as agreed to by MDA, a summary and discussion of the monitoring results should be submitted to the MDA. This annual summary should:

1. Identify recent and long-term trends in the concentrations of monitored constituents and in water elevations;
2. Tabulate the analytical results to date and highlight those that exceeded ground water regulatory standards (such as Health Risk Limits, Health Based Values or Maximum Contaminant Levels). On tables, include numerical information such as <0.1 rather than “Not Detected” for those parameters not detected above reporting limits and list the regulatory standards***;***
3. Provide concentration vs. time graphs for selected analytical parameters. Use an appropriate scale so that all data is easily seen;
4. Provide a hydrograph showing changes in water level elevations over time;
5. Evaluate the effect the facility is having on ground water;
6. Suggest any additions, changes, or maintenance needed in the monitoring program; and
7. Provide a ground water flow map (see #8 above).

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ATTACHMENT 2

CHAIN OF CUSTODY RECORD

MSD	PROJECT LEADER	REMARKS			
PROJECT NAME/LOCATION					
ESD SAMPLE TYPES 1 SURFACE WATER 5 SOIL/SEDIMENT 2 GROUND WATER 7 SLUDGE 3 POTABLE WATER 8 WASTE 4 WASTEWATER 9 AIR 5 LEACHATE 10 FISH 11 OTHER	SAMPLER	DATA TO:			

STATION NO.	SAMPLE TYPE	19__ DATE	TIME	COMP	GRAB	STATION LOCATION/DESCRIPTION	TOTAL CONTAINERS	CIRCLE/ADD parameters desired list no. of containers submitted	ANALYSIS: VOA	Semivolatile org. cpds.	PEST/PCBs	METALS	CYANIDE		TAG NO/REMARKS	Custody seals intact at lab	Seals not intact upon receipt by lab	LAB USE ONLY

RELINQUISHED BY: (PRINT) / (SIGN)	DATE/TIME	RECEIVED BY: (PRINT) / (SIGN)	RELINQUISHED BY: (PRINT) / (SIGN)	DATE/TIME	RECEIVED BY: (PRINT) / (SIGN)
RELINQUISHED BY: (PRINT) / (SIGN)	DATE/TIME	RECEIVED BY: (PRINT) / (SIGN)	RELINQUISHED BY: (PRINT) / (SIGN)	DATE/TIME	RECEIVED BY: (PRINT) / (SIGN)

DISTRIBUTION White and Yellow copies accompany sample shipment to Laboratory; Yellow copy retained by Laboratory
White copy is returned to samplers; Pink copy returned by samplers

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ATTACHMENT 3

Containers, Preservation Techniques and Holding Times

Parameter	Container	Preservative[1]	Maximum Holding Time[2]
Nitrate + Nitrite	100 ml. poly	cool 4°C, H_2SO_4 to pH<2	28 days
Ammonia	100 ml. poly	cool 4°C, H2SO4 to pH<2	record pH and temp. at time of collection 28 days
Base Neutral Pesticides (MDA List 1)	1000 ml. amber glass	cool 4°C	follow applicable method holding times
Acid Pesticides (MDA List 2)	1000 ml. amber glass	cool 4°C, H_2SO_4 to pH<2	follow applicable method holding times
Carbamates (MDA List 3)	1000 ml. amber glass	cool 4°C, 5 mls. of 1% phosphoric acid	follow applicable method holding times
Pentachlorophenol	1000 ml. amber glass	cool 4°C, H_2SO_4 to pH<2	7 days until extraction

NOTES:

[1]Sample preservation should be performed immediately upon sample collection.

[2]Samples should be analyzed as soon as possible after collection. The times listed are the **maximum** holding times that samples may be held before analysis and still be considered valid.

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ATTACHMENT 4

Advantages and Disadvantages of Various Groundwater Sampling Devices (modified from EPA/540/P-91/007 January 1991)

Device	Advantages	Disadvantages
Bailer	• The only practical limitations are size and materials • No power source needed • portable • Inexpensive; it can be dedicated and hung in a well reducing the chances of cross-contamination • Minimal outgassing of volatile organics while sample is in bailer • Readily available • Removes stagnant water first • Rapid, simple method for removing small volumes of purge water	• Time consuming, especially for large wells • Transfer of sample may cause aeration
Submersible Pump	• Portable; can be used on an unlimited number of wells • Relatively high pumping rate (dependent on depth and size of pump) • Generally very reliable; does not require priming	• Potential for effects on analysis of trace organics • Heavy and cumbersome, particularly in deeper wells • Expensive • Power source needed • Susceptible to damage from silt or sediment • Impractical in low yielding or shallow wells
Non-Gas Contact Bladder Pump	• Maintains integrity of sample • Easy to use	• Difficult to clean although dedicated tubing and bladder may be used • Only useful to approximately 100 feet in depth • Supply of gas for operation (bottled gas and/or compressor) is difficult to obtain and is cumbersome
Suction Pump	• Portable, inexpensive, and readily available	• Only useful to approximately 25 feet or less in depth • Vacuum can cause loss of dissolved gases and volatile organics • Pump must be primed and vacuum is often difficult to maintain • May cause pH modification
Inertia Pump	• Portable, inexpensive, and readily available • Rapid method for purging relatively shallow wells	• Only useful to approximately 70 feet or less in depth • May be time consuming to use • Labor intensive • WaTerra pump is only effective in 2-inch diameter wells