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Montana Department of Environmental Quality
Permitting and Compliance Division
Water Protection Bureau
PO Box 200901
Helena, MT 59620-0901

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PERMITTING & COMPLIANCE DIV.

August 30, 2010

Dear Lisa,

Please find the enclosed Monitoring Well Installation Details and Effluent Flow Monitoring Method Report on behalf of Sun Mountain Lumber, Permit Number MTX000125.

This report includes the following information:

- Well installation details of MW-4 on July 12, 2010;
- The first set of analytical results from MW-1 and MW-4 as sampled on July 22, 2010; and
- Proposed flow monitoring methods for outfall 001 and outfall 002.

The following appendices are included with the report:

- Appendix A Well Log
- Appendix B Analytical Results
- Appendix C Flow Meter for Outfall 001
- Appendix D Flow Meter for Outfall 002.

The electronic copies of all enclosed documents were sent in an email on August 30, 2010.

Thank you very much for your time. Please call me if there are any concerns or questions.

Sincerely,

Kim Draper

Kim Draper
Staff Engineer

CC: Bruce Thomas, Sun Mountain Lumber

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**Monitoring Well Installation Details
And
Effluent Flow Monitoring Method
Sun Mountain Lumber
Permit Number MTX000125**



Prepared For:

**Montana Department of Environmental Quality
Permitting and Compliance Division
Water Protection Bureau
PO Box 200901
Helena, MT 59620-0901**

**Sun Mountain Lumber
181 Greenhouse Road
Deer Lodge, MT 59719**

Prepared By:

**Water & Environmental Technologies, PC
480 E. Park Street, Suite 200
Butte, MT 59701**

August 2010

Introduction

This report is intended to satisfy the Montana Department of Environmental Quality (MDEQ) Montana Groundwater Pollution Control System (MGWPCS) permit number MTX000125 requirement to submit a report documenting the installation of monitoring well MW-4 and to define the effluent flow monitoring method prior to August 30th, 2010.

Monitoring Well MW-4 Installation

Monitoring well MW-4 was installed on July 12th, 2010 by O'Keefe Drilling using a hollow stem auger rig. The well is located at the midpoint between the drainfields for Outfall 001 and 002 as instructed by MDEQ and is no greater than 500 feet downgradient of either of the drainfields. The distances from the respective drainfields are 361 and 480 feet respectively as shown in **Figure 1**.

The well was drilled to a total depth of 28.7 feet and is constructed of 2-inch PVC. It is screened from 8.2 to 28.2 feet below the ground surface with 0.02-inch factory slotted screen. As measured on July 12, 2010, the static water level was 13.19 feet below ground surface. Thus the well meets the MDEQ requirement that the well is screened from the top of the high water table to 15 feet below the low water table.

The well annulus was sand packed with 10/20 Colorado Silica sand from the bottom of the well to two feet above the top of the screen, and a bentonite seal was emplaced from the top of the sand to one foot below the ground surface. A cement surface seal and a 1.4-foot cemented steel monitoring well riser pipe were installed above the well for protection. During well construction, four feet of sand heaved into the well bore through the screen openings. The majority of the sediment was removed during well development, but approximately 6 inches of sediment remains in the solid PVC pipe section and cap at the bottom of the well.

A well log was completed by Water & Environmental Technologies and submitted to O'Keefe Drilling. A copy is included in **Attachment A**. Drill cuttings were spread in the surrounding area to match original contours.

Development

Well development consisted of bailing approximately 15 gallons on water followed by pumping approximately 15 more gallons of water with a 12 volt submersible pump.

Well Monitoring Well Sampling Event - July

Quarterly monitoring was initiated on July 22, 2010 for MW-1 and MW-4 by Bruce Thomas of Sun Mountain Lumber. Dedicated weighted tape measures were used to determine static water level rather than an electric water tape as initially written in the Monitoring Well Installation Work Plan. Three well volumes were purged from the wells prior to sampling.

The monitoring wells MW-1 and MW-4 were sampled in the month of July for the required quarterly sampling. Results are summarized below and the report from the analytical laboratory is included in **Attachment B**.

Table 1. Ground Water Monitoring Results

Ground Water Monitoring Results – July 22, 2010		
Parameter (units) Permit MTX000125 Table 5	Upgradient MW-1	Downgradient MW-4
Static Water Level, ft	22.33	13.0
Specific Conductance, μ mhos/cm	382.0	1167
Chloride, mg/L	3.66	197
Fluoride, mg/L	0.214	0.324
Aluminum Dissolved, mg/L	<0.060	<0.060
Arsenic Dissolved, mg/L	<0.00150	0.00251
Copper Dissolved, mg/L	<0.00125	<0.00125
Manganese Dissolved, mg/L	0.00195	3.220
Sulfate, mg/L	17.3	60.8
Iron Dissolved, mg/L	<0.050	4.330
Total Dissolved Solids, mg/L	248	808
Total Phosphorus, mg/L	1.57	4.04
Nitrate + nitrite as N	0.323	<0.030
Oil and Grease	4.80	1.40

Flow monitoring method

Per (MGWPCS) permit number MTX000125, Sun Mountain Lumber began monthly effluent monitoring in April 2010. This includes monitoring outfall flow to the best of their ability. The flow monitoring method will be submitted to MDEQ for approval before August 30, 2010 and the designated flow meters as detailed below will be installed prior to April 1, 2011. Guidance from MDEQ is as follows:

By April 1, 2011 the permittee shall install effluent flow monitoring equipment approved by the Department. The flow meter shall be installed immediately prior to discharge to the drainfield. The flow meter must be capable of measuring continuous flow. The measurement method shall be either by recorder or a totalizing flow meter, or other department approved method, dose counts or pump run-times will not be accepted.

Outfall 001

The Cleaver Brooks Boiler is currently down due to low lumber demand. This outfall receives a minimal amount of water (approximately 95 gallons per day) from the water softener bypass and receives water softener regeneration water every 12 days. Flow volumes were collected in a tote to determine quantities for the DMR report.

A paddlewheel sensor and flowmeter with totalizer is specified for this system. A list of proposed parts is listed below and equipment sheets are included in **Attachment C**. If a less expensive but equally reliable paddlewheel sensor with totalizing flowmeter is available between now and the

installation in March 2011, the lower-cost equipment will be installed. MDEQ will be notified of specification changes at least four weeks in advance.

- Flowmeter = +GF+ Signet model 3-8550-1P panel mount digital flow meter. This unit will provide a digital display of flow rate, (2) totalizers (resettable, non-resettable), and a 4-20 mA output signal.
- Sensor = +GF+ Signet 3-2536-P0 low-flow paddlewheel style flow sensor for 1/2" to 4" pipe sizes

- Installation Fitting = +GF+ Signet IR4S040 2" sensor installation saddle.

Outfall 002

This outfall receives effluent from boiler blowdown, kiln condensate, and water softener regeneration water. The boiler intake water meter volumes were used to estimate the volume of effluent at outfall 002. A calculation error from the service provider has since been detected. The April – July DMR indicated that average effluent was approximately 120 gallons per day. It is now estimated that an average of 1700 gallons per day flow to the drainfield. There is some disagreement between the water meter values and the calculation performed by Nalco regarding the boiler process and conductivity results. Thus the flowmeter specified for this system will be installed shortly after MDEQ approval in order to determine if there is a problem with the existing boiler intake water meter.

The temperatures and pH of the effluent are elevated in this system. In order to install the equipment in a timely fashion, a magmeter that can withstand higher temperatures and a pH of 11.8 was chosen. Once the flowrate is characterized, a pH system will be designed to neutralize the effluent between the required 6.5 and 8.5 pH levels.

A list of proposed parts for the sensor and magmeter with totalizer is listed below and equipment sheets are included in **Attachment D**. If a less expensive but equally reliable magmeter sensor with totalizing flowmeter is available between now and the installation in Fall 2010, the lower-cost equipment will be installed. MDEQ will be notified of specification changes at least four weeks in advance.

- Flowmeter = +GF+ Signet model 3-8550-1P panel mount digital flow meter. This unit will provide a digital display of flow rate, (2) totalizers (resettable, non-resettable), and a 4-20 mA output signal.
- Sensor = +GF+ Signet 3-2552-11-A-11 Stainless steel insertion magmeter (rated to 185° continuous duty), with frequency output, and 1.25" NPT connections.
- Installation Fitting = no special installation fitting needed.

Attachment A

Well Log

