FINAL REPORT

For Industrial Hygiene Monitoring During VirkonTM Use and Mixing at the Peshtigo Service Center

WISCONSIN DEPARTMENT OF NATURAL RESOURCES
Ms. M. Present, Safety Manager

June 13, 2014
Project No. 193700658
June 12, 2014

Ms. Marsha Present
DNR Safety Manager
Wisconsin Department of Natural Resources
101 N Ogden Road, Suite A
Peshtigo, WI 54157

RE: Final Report – Industrial Hygiene Monitoring During Virkon Mixing, Wisconsin DNR, Peshtigo, WI
Stantec Project Number: 193700658

Dear Ms. Present:

Wisconsin Department of Natural Resources (WDNR) retained Stantec Consulting Services Inc. (Stantec) to perform employee breathing zone air monitoring during Dupont Virkon™ Aquatic (Virkon) mixing at the facility located at 101 Ogden Road, in Peshtigo, WI (the Facility). The site contact was Ms. Marsha Present, WDNR Safety Manager, and the monitoring was conducted on May 28, 2014 by Stantec’s Senior Scientist, Mr. Rick Pager.

The intent of the air monitoring was to evaluate compliance with the Wisconsin Department of Safety and Professional Services (SPS) permissible exposure limits (PELs), as adopted from the federal Occupational Safety and Health Administration (OSHA), as well as the American Conference of Governmental Industrial Hygienists’ (ACGIH) advisory threshold limit values (TLVs) established for the specific agents, as well as recommending control measures, including personal protective equipment, based on the results.

SUMMARY AND FINDINGS

The results for Sulfamic Acid (measured as total dust as the marker or surrogate) and Potassium Peroxymonosulfate (measured as Potassium as the surrogate) showed concentrations below the analytical limits for both compounds. Thus, no remedial or corrective actions are required for the inhalation potential. However, it was noted that the employees wore no special eye protection while mixing the Virkon. Based on the significant eye and face hazard that this agent poses in the concentrated state, it should be considered mandatory that safety glasses and either a full faceshield or chemical goggles be worn whenever handling this product in an open container, along with nitrile gloves. Additionally, an emergency eyewash should be readily available during mixing activities, and when using this product.

SAMPLING STRATEGY

Both the sulfamic acid and potassium samples were collected utilizing Sensidyne GilAir5 personal sampling pumps and drawing air through a 37 mm, match-weighed, mixed cellulose ester (MCE) filters enclosed in a three-piece polycarbonate cassette at a rate of
approximately 2.0 liters per minute. The pumps were calibrated prior to and after sampling utilizing a BIOS Defender 510-M primary flow calibrator.

The air samples were sent to, and analyzed, by Galson Laboratories, East Syracuse, New York, which is certified by the American Industrial Hygiene Association (AIHA). National Institute of Occupational Safety and Health (NIOSH) Methods were utilized for analysis including field blanks.

DISCUSSION

The DNR utilizes the Virkon as a disinfectant on boats and equipment after they have been removed from a waterway. The product is also used as a boot wash at State fish hatcheries to disinfect shoes prior to entering operational areas. The Virkon product is a powder, packaged in a plastic-lined tub, and mixed with water prior to use. The powder is mixed at a concentration of approximately a 100 milliters (ml) per gallon of water for disinfection of a boat, and at 200 ml/gallon as a boot wash in the fish hatcheries.

In regard to the mixing activities, Mr. Ron Rhode, wearing a rain jacket and nitrile gloves, used a small scoop to fill a measuring cup to the proper volume of product. The measured powder was poured into a sprayer, water was added, and then the sprayer was pressurized by hand pumping. As a second operation, Mr. Rhode used the scoop to fill the measuring cup to the proper level, poured the powder into a tub, and added water to the tub to the proper level, and sloshed the tub back and forth to mix the product to simulate the operations at the hatcheries.

Mr. Brad Ryan, wearing waders, rain jacket and nitrile gloves used the measuring cup to scoop the appropriate volume of product, poured it into the sprayer, and added water. The sprayer was pressurized and a boat was sprayed over the entire exterior and interior. The spraying operation did not saturate the boat as to cause runoff from the spraying. Mr. Ryan then placed a set of waders on the boat and sprayed them to simulate the disinfection process.

It was stated that once a solution of Virkon is mixed, it stays in the sprayer and is used until it is consumed. Then a new batch is mixed for use. The spraying may occur at a boat launch if the boat will be taken to another water body. As an alternative, the boat can be brought back to the Facility for disinfection.

CONCLUSIONS & RECOMMENDATIONS

Based on the test results, the conditions on the day of the testing, and on the authorized scope of this project, the following recommendations and conclusions are provided for DNR’s consideration:

- It is concluded that the airborne concentrations of Virkon are minimal and well below any applicable regulatory limits;
RE: Final Report – Industrial Hygiene Monitoring During Virkon Mixing, Wisconsin DNR 
Peshtigo, WI

- It is recommended that the employees always wear nitrile gloves, chemical splash goggles and/or face shield while mixing the Virkon product, and that an emergency eyewash is readily available in the immediate area of use; and

- It is recommended that the monitoring results from this survey be shared with the respective employees.

Stantec appreciates the opportunity to provide these services to the Wisconsin DNR. Please feel free to contact me at 262-643-9156 or Dan Feldt at 262-643-9176 if you have any questions.

Sincerely,

STANTEC CONSULTING SERVICES INC.

[Signatures]

Richard Pager
Sr. Scientist

Daniel G. Feldt, MPH, CIH
Senior Industrial Hygienist

Attachments
Table 1 – Air Monitoring Results
Galson Laboratory Results

LIMITATIONS
The contents of this report reflect conditions and controls that Stantec was retained specifically to identify with at the time of the survey only, and may not reflect all conditions or potential exposures at this facility with regard to occupational safety and industrial hygiene. Stantec completed this industrial hygiene study in accordance with the degree of care and technical skill appropriately exercised by professionals currently practicing in this area. Conclusions contained in this report represent professional judgment and are based upon available information and technically accepted industrial hygiene and environmental health practices at the present time and location. Other than this, no warranty is implied or expressed.
## Table 1
### Air Monitoring Results
Wisconsin Department of Natural Resources
101 N Ogden Road, Suite A
Peshtigo, WI 54157
May 28, 2014

<table>
<thead>
<tr>
<th>SAMPLE #/ID</th>
<th>NAME*</th>
<th>Activity</th>
<th>CHEMICAL</th>
<th>DURATION (MINS.)</th>
<th>ANALYTICAL RESULTS</th>
<th>8 HR. TWA</th>
<th>WDSPS PEL</th>
<th>ACGIH TLV</th>
</tr>
</thead>
<tbody>
<tr>
<td>D 101</td>
<td>Brad Ryan</td>
<td>mixing /disinfection</td>
<td>Sulfamic Acid (as total dust)</td>
<td>480**</td>
<td>&lt;0.42 mg/m³</td>
<td>&lt;0.001 mg/m³</td>
<td>15 mg/m³</td>
<td>10 mg/m³</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Potassium</td>
<td></td>
<td>&lt;0.031 mg/m³</td>
<td>&lt;0.0008 mg/m³</td>
<td>ND</td>
<td>0.1^ mg/m³</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Peroxymonosulfate (as Potassium)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D 102</td>
<td>Ron Rhode</td>
<td>mixing</td>
<td>Sulfamic Acid (as total dust)</td>
<td>480**</td>
<td>&lt;0.42 mg/m³</td>
<td>&lt;0.0096 mg/m³</td>
<td>15 mg/m³</td>
<td>10 mg/m³</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Potassium</td>
<td></td>
<td>&lt;0.031 mg/m³</td>
<td>&lt;0.0007 mg/m³</td>
<td>ND</td>
<td>0.1^ mg/m³</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Peroxymonosulfate (as Potassium)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D 105</td>
<td>Field Blank</td>
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<td>Sulfamic acid (as total dust)</td>
<td></td>
<td>&lt;0.20 mg</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Potassium</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Peroxymonosulfate (as Potassium)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>&lt;15 ug</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Analytical Laboratory:** Galson Laboratory - East Syracuse, New York. AIHA Certified
**Analytical Methods:** Total Dust mod. NIOSH 0500, Gravimetric; Potassium mod. NIOSH 7300/mod. OSHA ID-125G, IPC/I
**Sampling Equipment:** Sensidyne GilAir 5 Sampling Pumps; BIOS Defender Primary Standard Calibrator
**WDSPS:** Wisconsin Department of Safety and Professional Services
**ACGIH:** American Conference of Governmental Industrial Hygienists
**PEL:** Permissible exposure limit/8 hr. time-weighted average
**TLV:** ACGIH Threshold Limit Value/8 hr. time-weighted average
**mg/m³:** milligrams per cubic meter of air
**Table 1**

**Air Monitoring Results**

Wisconsin Department of Natural Resources  
101 N Ogden Road, Suite A  
Peshtigo, WI 54157  
May 28, 2014

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>*:</td>
<td>Employees and areas selected by WDNR</td>
</tr>
<tr>
<td>&lt;:</td>
<td>Less Than. The analyte was detected but at a level too low to be accurately quantitated by the method used. The actual amount is less than the reported value.</td>
</tr>
<tr>
<td>ND</td>
<td>None Determined</td>
</tr>
<tr>
<td>^</td>
<td>as Persulfate</td>
</tr>
<tr>
<td>***</td>
<td>Actual Sample time for B Ryan was 13 minutes, for R Rhode was 11 minutes</td>
</tr>
</tbody>
</table>
Ms. Sherry Garza
Parker Services Inc
1800 North Point Drive
Stevens Point, WI 54481

DOH ELAP #11626 Account# 21621 Login# L319759
AIHA-LAP #100324

June 05, 2014

Dear Ms. Garza:

Enclosed are the analytical results for the samples received by our laboratory on May 29, 2014. All test results meet the quality control requirements of AIHA-LAP and NELAC unless otherwise stated in this report. All samples on the chain of custody were received in good condition unless otherwise noted.

Results in this report are based on the sampling data provided by the client and refer only to the samples as they were received at the laboratory. Unless otherwise requested, all samples will be discarded 14 days from the date of this report, with the exception of IOMs, which will be cleaned and disposed of after seven calendar days.

Current Scopes of Accreditation can be viewed at www.galsonlabs.com in the accreditations section under the “about Galson” tab.

Please contact Patty Gregorich at (888)-432-5227, if you would like any additional information regarding this report.

Thank you for using Galson Laboratories.

Sincerely,

Galson Laboratories

Mary G. Unangst
Laboratory Director

Enclosure(s)
<table>
<thead>
<tr>
<th>Parameter</th>
<th>LOQ</th>
<th>Total</th>
<th>Conc</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Potassium</td>
<td>15.</td>
<td>&lt;15</td>
<td>&lt;0.031</td>
<td>mg/m3</td>
</tr>
</tbody>
</table>

**COMMENTS:** Please see attached lab footnote report for any applicable footnotes.

**Collection Media**: Filter

**Submitted by**: mlh/kml

**Approved by**: keg

**Date**: 03-JUN-14  **NYS DOH #:** 11626

**QC by**: Tony D'Amico

< -Less Than | mg -Milligrams | m3 -Cubic Meters | kg -Kilograms
> -Greater Than | ug -Micrograms | l -Liters | NS -Not Specified
NA -Not Applicable | ND -Not Detected | ppm -Parts per Million | LOQ-Limit of Quantitation

Field sampling was not performed by Galson. Galson presents results based on sampling data provided by clients.
Client ID: D 102  |  Lab ID: L319759-2  |  Air Volume: 480 Liter  
Date Sampled: 05/28/14  |  Date Analyzed: 06/02/14

<table>
<thead>
<tr>
<th>Parameter</th>
<th>LOQ</th>
<th>Total</th>
<th>Conc</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Potassium</td>
<td>15.</td>
<td>&lt;15</td>
<td>&lt;0.031</td>
<td>mg/m3</td>
</tr>
</tbody>
</table>

**COMMENTS:** Please see attached lab footnote report for any applicable footnotes.

Collection Media: Filter  
Submitted by: mlh/kml  
Approved by: keg  
Date: 03-JUN-14  
NYS DOH #: 11626  
QC by: Tony D’Amico

Field sampling was not performed by Galson. Galson presents results based on sampling data provided by clients.
<table>
<thead>
<tr>
<th>Parameter</th>
<th>LOQ</th>
<th>Total</th>
<th>Conc</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Potassium</td>
<td>15.</td>
<td>&lt;15</td>
<td>NA</td>
<td>mg/m3</td>
</tr>
</tbody>
</table>

**COMMENTS:** Please see attached lab footnote report for any applicable footnotes.

Field sampling was not performed by Galson. Galson presents results based on sampling data provided by clients.
# LABORATORY ANALYSIS REPORT

**Client:** Parker Services, Inc  
**Site:** DNR Peshtigo  
**Address:** East Syracuse, NY 13057  
**Phone:** (315) 432-5227  
**Fax:** (315) 437-0571  
**Website:** www.galsonlabs.com

**Date Sampled:** 28-MAY-14  
**Account No.:** 21621

**Date Analyzed:** 30-MAY-14  
**Login No.:** L319759

**Report ID:** 834005

---

<table>
<thead>
<tr>
<th>Parameter</th>
<th>LOQ (mg)</th>
<th>Total (mg)</th>
<th>Conc (mg/m3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Dust</td>
<td>0.20</td>
<td>&lt;0.20</td>
<td>&lt;0.42</td>
</tr>
</tbody>
</table>

---

**Comments:** Please see attached lab footnote report for any applicable footnotes.

---

**Collection Media:** Filter  
**Submitted by:** PAH  
**Approved by:** CRI  
**Date:** 30-MAY-14  
**NYS DOH #:** 11626  
**QC by:** Tony D'Amico

---

< -Less Than  
> -Greater Than  
NA -Not Applicable

**mg -Milligrams**  
**ug -Micrograms**  
**ND -Not Detected**  
**m3 -Cubic Meters**  
**l -Liters**  
**ppm -Parts per Million**  
**kg -Kilograms**  
**NS -Not Specified**  
**LOQ-Limit of Quantitation**

---

Field sampling was not performed by Galson. Galson presents results based on sampling data provided by clients.
**LABORATORY ANALYSIS REPORT**

Client: Parker Services, Inc  
6601 Kirkville Road  
East Syracuse, NY 13057  
(315) 432-5227  
FAX: (315) 437-0571  
www.galsonlabs.com  

Site: DNR Peshtigo  
Project No.: 19370658 Virkon Sampling  

Date Sampled: 28-MAY-14  
Date Analyzed: 30-MAY-14  

Account No.: 21621  
Login No.: L319759  

Report ID: 834005

---

**Client ID:** D 102  
**Lab ID:** L319759-2  
**Air Volume:** 480 Liter  

<table>
<thead>
<tr>
<th>Parameter</th>
<th>LOQ (mg)</th>
<th>Total (mg)</th>
<th>Conc (mg/m³)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Dust</td>
<td>0.20</td>
<td>&lt;0.20</td>
<td>&lt;0.42</td>
</tr>
</tbody>
</table>

**COMMENTS:** Please see attached lab footnote report for any applicable footnotes.

Collection Media: Filter  
Submitted by: PAH  
QC by: Tony D'Amico  

Field sampling was not performed by Galson. Galson presents results based on sampling data provided by clients.
**Client** : Parker Services, Inc  
**Site** : DNR Peshtigo  
**Project No.** : 19370658 Virkon Sampling  
**Date Sampled** : 28-MAY-14  
**Date Analyzed** : 30-MAY-14  
**Account No.** : 21621  
**Login No.** : L319759

<table>
<thead>
<tr>
<th>Parameter</th>
<th>LOQ mg</th>
<th>Total mg</th>
<th>Conc mg/m3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Dust</td>
<td>0.20</td>
<td>&lt;0.20</td>
<td>NA</td>
</tr>
</tbody>
</table>

**COMMENTS: ** Please see attached lab footnote report for any applicable footnotes.

**Collection Media** : Filter  
**Submitted by** : PAH  
**Approved by** : CRI  
**Date** : 30-MAY-14  
**NYS DOH #** : 11626  
**QC by** : Tony D'Amico

< -Less Than        mg -Milligrams | m3 -Cubic Meters | kg -Kilograms
> -Greater Than     ug -Micrograms  | l -Liters        | NS -Not Specified
NA -Not Applicable  ND -Not Detected | ppm -Parts per Million | LOQ-Limit of Quantitation

Field sampling was not performed by Galson. Galson presents results based on sampling data provided by clients.
Unless otherwise noted below, all quality control results associated with the samples were within established control limits or did not impact reported results.

Unrounded results are carried through the calculations that yield the final result and the final result is rounded to the number of significant figures appropriate to the accuracy of the analytical method. Please note that results appearing in the columns preceding the final result column may have been rounded in order to fit the report format and therefore, if carried through the calculations, may not yield an identical final result to the one reported.

The stated LOQs for each analyte represent the demonstrated LOQ concentrations prior to correction for desorption efficiency (if applicable).

Unless otherwise noted below, reported results have not been blank corrected for any field blank or method blank.

L319759 (Report ID: 834684):
Reported results reflect elemental analysis of the requested metals. Certain compounds may not be solubilized during digestion, resulting in data that is biased low.
SOPs: MT-SOP-9(25), im-nwvfilt(20)

Accuracy and mean recovery data presented below is based on a 95% confidence interval (k=2). The estimated uncertainty applies to the media, technology, and SOP referenced in this report and does not account for the uncertainty associated with the sampling process.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Accuracy</th>
<th>Mean Recovery</th>
</tr>
</thead>
<tbody>
<tr>
<td>Potassium</td>
<td>+/-7.3%</td>
<td>97.9%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Method</th>
<th>PEL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Potassium</td>
<td>mod. NIOSH 7300/mod. OSHA ID-125G; ICP/I</td>
<td>NA</td>
</tr>
</tbody>
</table>

L319759 (Report ID: 834005):
PNOR = Particulates Not Otherwise Regulated.
SOPs: GRAV-SOP-7(4)
Dust analytical accuracy is within +/- 0.036 mg (95% confidence interval or k=2). The estimated uncertainty applies to the media, technology, and SOP(s) referenced in this report and does not account for any uncertainty associated with the sampling process.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Method</th>
<th>PEL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Dust</td>
<td>mod. NIOSH 0500; Gravimetric</td>
<td>PNOR 15 mg/m³ (TWA)</td>
</tr>
</tbody>
</table>

< -Less Than  mg -Milligrams  m³ -Cubic Meters  kg -Kilograms
> -Greater Than ug -Micrograms  l -Liters  NS -Not Specified
NA -Not Applicable ND -Not Detected  ppm -Parts per Million
<table>
<thead>
<tr>
<th>Sample Identification*</th>
<th>Date Sampled* (mm/dd/yy)</th>
<th>Collection Medium</th>
<th>Sample Volume, Sample Time, or Sample Area*</th>
<th>Sample Units*</th>
<th>Analysis Requested*</th>
<th>Method Reference*</th>
<th>Hexavalent Chromium Process (ex. welding, plating, painting, etc.)*</th>
</tr>
</thead>
<tbody>
<tr>
<td>D 101</td>
<td>05/28/14</td>
<td>37mm MW MCE</td>
<td>480</td>
<td>L</td>
<td>potassium, total dust</td>
<td></td>
<td></td>
</tr>
<tr>
<td>D 102</td>
<td>05/28/14</td>
<td>37 mm MW MCE</td>
<td>480</td>
<td>L</td>
<td>potassium, total dust</td>
<td></td>
<td></td>
</tr>
<tr>
<td>D 105</td>
<td>05/28/14</td>
<td>37 mm MW MCE</td>
<td>Blank</td>
<td>Blank</td>
<td>potassium, total dust</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Galson Laboratories will substitute our routine/preferred method if it does not match the method listed on the COC unless this box is checked: [ ] Use method(s) listed on COC

For metals analysis: if requesting an analyte with the option of a lower LOQ please indicate if the lower LOQ is required (only available for certain analytes see SAG):

For crystalline silica: form(s) of silica needed must be indicated (Quartz, Cristobalite, and/or Tridymite)*:

Chain of Custody | Print Name | Signature | Date/Time
--- | --- | --- | ---
Received by LAB: |          |          | 5/29/14 12:51

*Required fields, failure to complete these fields may result in a delay in your samples being processed.