Lakeland Restoration Services, LLC
78 E River Spur Rd, Priest River, ID 83856
Phone/Fax: (208) 448-2222
www.lakelandrs.com

2015 MOSES LAKE INVASIVE AQUATIC VEGETATION CONTROL HERBICIDE AND ALGAECIDE TREATMENT
Moses Lake Irrigation & Rehabilitation District
Moses Lake, Washington

FINAL REPORT

Introduction

On June 22nd, 23rd and 24th, 2015 Lakeland Restoration Services, LLC (LRS) performed Phase 1 of an aquatic herbicide treatment in the continued effort to control aquatic invasive nuisance pond weeds specifically, Eurasian water milfoil (myriophyllum spicatum) EWM and nuisance pondweeds on Moses Lake. The second phase of the herbicide treatment was performed on August 17th, 2015. On August1st, 2015 LRS performed an algaecide treatment to manage Blue Green Algae. The goals of this report are to describe the work performed by LRS before, during and after treatments.

Public & Agency Notifications/Shoreline Posting

The following is a list of notifications that were delivered as required by the Washington State Department of Ecology Aquatic Plant and Algae Management General Permit #WAG994180:

- A Business and Resident Notice was mailed to all property owners within ¼ mi. of all treatment areas on June 6th, 2015 for Phase 1. Notification of Phase 2 was mailed with the same criteria on August 3rd, 2015. (Attached please see Appendix A).
- Pre/Post Treatment reports were provided to the Department of Ecology (attached – see Appendix B).
- Shoreline Notices were printed on white paper and posted (Appendix C). Signs were posted facing the water and the shore and were placed on each private or public property within 10 feet of shoreline, within 400 feet of the treatment area, and within every 100 feet of the shoreline. Signs were removed after all applicable restrictions were lifted.
- Public Access signs, 2 feet by 3 feet in size were posted at each public access area along with a 8 ½ x 11 map showing the reader's location and the treatment areas in both English and Spanish. Signs were removed after all applicable restrictions were lifted.

Public Outreach

The MLIRD began educational outreach when the Moses Lake EWM control project was started in 2008. After the survey was conducted, survey results and maps were used at meetings to plan for the control project and, as a teaching tool for the public and at District Board meetings.

As the control project planning and implementation progressed, the educational tools put into place included:

- **Internet:** A LRS website project page was posted at www.lakelandrs.com, dedicated specifically to the Moses Lake invasive nuisance pond weed control project. The page included information about how the project would proceed, what the public could expect in the way of restrictions, the kind of herbicide being used and maps of the lake showing where herbicide treatment would occur.
- **Email**: An email contact address, info@lakelandrs.com was available, giving the public a means to ask questions directly of the contractor and irrigation district. These emails were routed to a LRS representative that returned the answer via email or phone call if requested by the customer.
- **Phone**: A toll-free, dedicated phone number (877-273-6674) was available which gave the public pre-recorded information about the project. Information became available for the Moses Lake project on June 22nd, 2015. The number allowed customers to leave a message, and a return call was made by a LRS representative to answer any questions or concerns.

Product Delivery/Distribution

Product was supplied and delivered as follows:

- Cygnet Enterprises supplied the herbicides for this project. Product was delivered to the LRS warehouse at 932 A Wheeler Rd. Moses Lake, WA. Algaecide was provided by MLIRD.

Personnel

The following personnel were present for this project:

- David L. Kluttz – license #66448 – Applicator/Airboat Pilot
- Jim Pogue – license # 90277 - Applicator
- Jake Nesbitt – license # 88023 - Applicator
- Cathy Allen - Mixer/Loader Cert. – Mixer/Loader
- Charles Glaser - Mixer/Loader Cert. – Mixer/Loader

Product Information

The following tables outline the average depth, total surface acres, and amount of herbicides applied by treatment area (treatment maps attached please see Appendix D):

Phase 1 Treatment Areas:

Lake Name: Moses Lake 2015

TREATMENT AREAS

Area Name	Area	Avg Depth	Surface Acres	2,4-D (gallons)	#of containers	Load 1	Diquat (gallons)	#of containers	Load 1	Aquathol	# of containers	Load 1	Notes
Mont Lake	1	3	24	162.0	65.0		48.0	19.0		0.0	0.0		
Mont Lake SE	2	3	25	162.0	65.0		50.0	20.0		0.0	0.0		
Wild Goose	3	3	6	0.0	0.0		12.0	5.0		27.0	10.0		
Parker Horne N	4	5	10	0.0	0.0		20.0	8.0		75.0	30.0		
Marina Drive Across from Blue Heron	5	9	15	303.0	121.0		30.0	12.0		0.0	0.0		
Mont Lake S	6	4	15	135.0	54.0		30.0	12.0		0.0	0.0		
The Fill	7	3	10	0.0	0.0		20.0	8.0		45.0	18.0		
Totals:			105	762.0	305.0		210.0	84.0		147.0	58.0		

Phase 2 Treatment Areas:

Area	Location	Avg. Depth	Surface Acreage	Aquathol @ 1.5 ppm	Diquat @ 2 GPA
1	Laguna	4	30	180	60
2	Wild Goose	4	30	180	60
3	Cove West	6	15	135	30
4	Cascade Valley	4	20	120	40
Totals:			95	665	190

†Total acres treated were determined by encompassing tracks. This process was accomplished by importing tracks recorded during the application process using GPS technology into Arcview GIS.

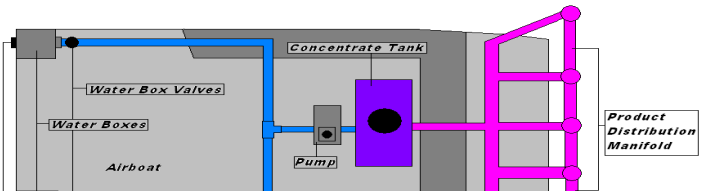
*Changes in acreage or product occurred due to boat drift, submerged obstacles, mapping discrepancies, or changes made at the request of the Project Manager.

Treatment Methodology

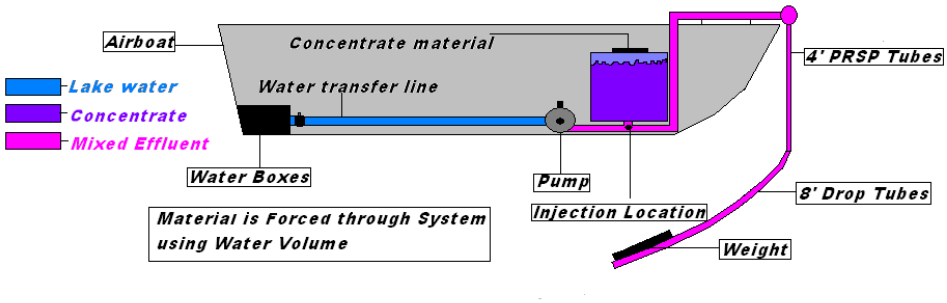
The application of Aquathol, Diquat and 2, 4-D was accomplished using 1 airboat using the following methodology:

Herbicide was applied at an average speed of 5 mph using a manifold boom style sub-surface injection system that is attached to the airboat (pictures at right/diagram below). The collection side of the system gathers lake water from built in water boxes at the rear of the boat using a high volume, close tolerance pump powered by a 5hp Honda motor. The pump generates pressure through a manifold system causing a venturi effect, which pulls the concentrate from the tank, thereby mixing it with the lake water to be injected directly into the water column through the manifold boom. The boom is 8' wide and has 5 drop tubes, each 4' long.

Diagram A-1: System – top



Liquid Injection view/side view



Herbicide was continually poured from each 2.5 gallon container into a 25 gallon tank ensuring a consistent application. Each container was triple-rinsed in the treatment area during the treatment, rendered incapable of reuse, and stored at the LRS facility for recycling.

Equipment

The following equipment was used for this project:

- 18-foot Airboat with 364 ci 550-hp motor capable of carrying 2,500-lb payload
- 16-foot Airboat with 364 ci 550-hp motor capable of carrying 2,500-lb payload
- 16-foot Airboat with 454 Chevy 425-hp motor capable of carry 2,000-lb payload.
- Liquid injection system with a 25-gallon tank and five 4-foot subsurface injection nozzle system
- Garmin GPS equipment used to plot and track treatments
- Arcview GIS) to provide a means to map treatment areas, analyze results, and provide ArcGIS compatible shapefiles
- BioBase mapping program
- Gehl Skid Steer and Bobcat Skid Steer for moving pallets of herbicide product.
- 18-foot tractor trailer for moving product
- 2008 Ford F350 truck used to haul equipment and supplies
- 2013 Ford F150 truck used to haul equipment and supplies

Logs, Maps, and Tracking

The entire treatment was monitored with the use of Global Positioning System (GPS) technology. Treatment routes were pre-planned using Arcview GIS 10.2.1 and pre-loaded into four (4) GPS devices (two [2] per treatment vessel).

Following the treatment, tracks were downloaded into Arcview, and analyzed for thoroughness of the treatment. Treatment area and treatment track maps were forwarded to Mr. Overland.

A WSDA approved Pesticide Application Record was completed for each treatment day as required (Attached please see Appendix E). These records will be retained for 7 years with the project file.

Algaecide Treatments

On August1st, 2015 LRS performed a 20 acre treatment on Moses Lake to manage Blue Green Algae blooms with algaecides as directed by MLIRD. Phycomycin was applied at a rate of 100 pounds per acre resulting in a total of 2,000 pounds of Phycomycin used in treatment.

Conclusion

Two herbicide applications were performed in 2015. BioBase acoustic mapping was conducted to calculate average depths. (Attached please see Appendix F.)

Chris Overland's decision to have a two phase application was very helpful. Previous surveys indicated EWM presence which was targeted in the Phase 1 treatment as well as the control of nuisance pondweeds. In Phase 2 Clasping Leaf Pondweed (potamogeton perfoliatus) CLPW was targeted.

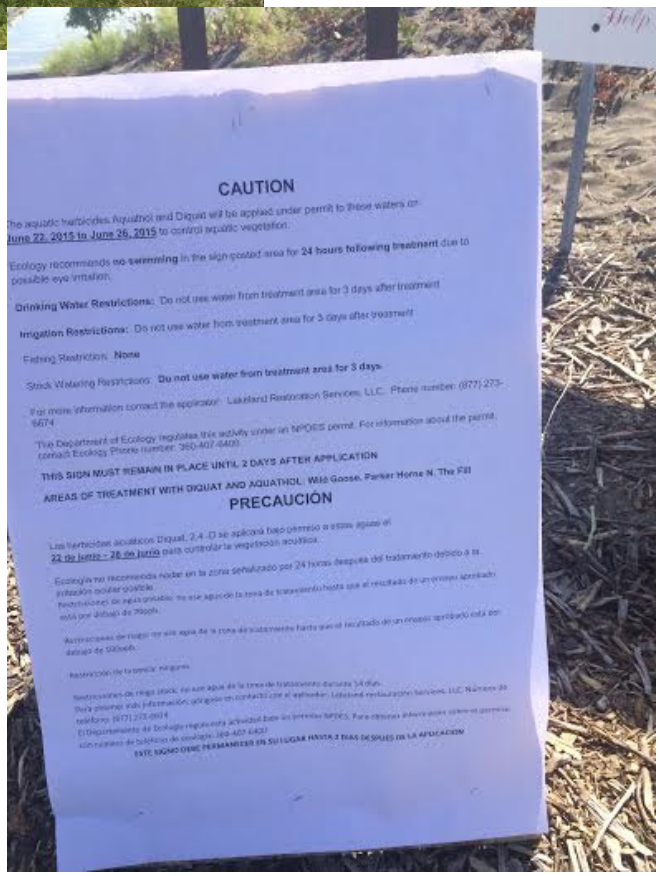
The presence of CLPW, a native plant, can be a nuisance for the public and property owners. CLPW provides habitat for the fish and wildlife. I recommend continued targeting of pondweeds, where problematic while leaving beds undisturbed where possible to provide natural habitat for fish and wildlife.

Residents are not familiar with this plant CLPW. CLPW did not proliferate prior to the EWM treatment in 2010 – 2011. CLPW was identified in 2012 by residents as a problem. In 2013 LRS began targeting CLPW for control. Proper planning and education will continue to ensure the continuation of effective and safe treatments.

I would like to survey Moses Lake in April 2016. This survey, along with a plan will help schedule the first application in June. The two phase approach was very helpful in prioritizing treatment.

I would be happy to meet with board in March 2016 to discuss 2015 and prepare for 2016.

The Lakeland Crew at Work


CAUTION
June 22, 2015 to June 26, 2015
Drinking Water Restrictions: Do not use water from treatment area for 3 days after treatment
Irrigation Restrictions: Do not use water from treatment area for 3 days after treatment
Fishing Restriction: None
Stock Watering Restrictions: Do not use water from treatment area for 3 days.
THIS SIGN MUST REMAIN IN PLACE UNTIL 2 DAYS AFTER APPLICATION
AREAS OF TREATMENT WITH DIQUAT AND AQUATHOL: Wild Goose, Parker Horse N, The Fill
PRECAUCIÓN
22 de junio - 26 de junio


130
4X4

Appendix A

Business and Residential Notice

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Herbicide/Algaecide Treatment
Business and Residential Notice

Distribution Date: June 6, 2015

Moses Lake will be treated with aquatic herbicide/*algaecide on/or **between** June 22, 2015 and June 26, 2015
*Algaecide treatments will occur on an as needed basis.

In order to help prevent fragmentation, **please DO NOT cut, rake, or hand-pull plants prior to treatment.**

This application will involve the use of airboats. Please remove items from docks such as lawn chairs, flower pots, personal/recreational devices, etc.

Product(s) planned for use: Aquathol K, Diquat, DMA-4
Algaecide: Phycomicin

Active ingredient(s): (Dipotassium salt of endothall),(Diquat dibromide [6,7-dihydrodipyrido (1,2-a:2'1'-c) pyrazinediium dibromide]),(2,4-Dichloropheoxyacetic acid, dimethylamine salt)

Algaecide: (Sodium Carbonate Peroxyhydrate)

It has been advised that no swimming occur within the treated area(s) during or for 24 hours following herbicide treatment.
It has been advised that no swimming occur within the treated area(s) during or for 2 hours following algaecide treatment.
If you are using the lake itself as a potable, irrigation and/or domestic or livestock water source, please contact Lakeland Restoration Services, LLC to determine if any restrictions apply: (877) 273-6674 or info@lakelandrs.com

Details of treatment time and the end of use restrictions will be announced at www.lakelandrs.com.

Swimming: Swimming advisory for 24 hours post treatment
Fishing: no restriction.
Livestock: Do not use treated water for animal consumption within 14 days
Irrigation: 3 days for ornamental, 7 days for food and production ornamental

Location of Treatment(s): Mont Lake, Wild Goose area, Parker Horne (N), Marina Drive, The Fill. Other sites may be added. Algaecide treatments are on an as needed basis.

Signs will be posted treated and potentially affected areas prior to application. The signs will describe any water use restrictions or advisories.

If you would like to request additional notification prior to treatment, or have further questions, please contact Lakeland Restoration Services, LLC at (877) 273-6674 or info@lakelandrs.com.

This herbicide treatment is regulated under a permit issued by the Washington State Department of Ecology. Permit No. WAG994180

June 11th, 2015

To: Moses Lake Property Owners/Residents/Business Owners

Re: 2015 Herbicide/Algaecide Treatment Business and Residential Notice

On June 6th, 2015, Lakeland Restoration Services, mailed on our behalf, a Herbicide/Algaecide Treatment Business and Residential Notice that had a letter from MLIRD on one side and a notification from Lakeland Restoration Services, LLC on the other side. To clarify any discrepancy, please read the following important information below.

Treatment Dates: June 22nd, 2015 – June 26th, 2015

Restrictions for Swimming: It is advised that no swimming occur within the treated area(s) during or for *24 hours* following the *herbicide* treatment and during or for *2 hours* following the *algaecide* treatment.

Restrictions for Fishing: There are *no* restrictions for fishing.

Restrictions for Livestock: Do *not* use treated water for animal consumption within *14 days*.

Restrictions for Irrigation: Do *not* use treated water for ornamental plants *3 days* following treated areas and do *not* use treated water for food or production ornamental plants *7 days* following treated areas.

Location of Treatments: Pelican Horn/Montlake area, Wild Goose Area, (N) Parker Horn Area, Marina Drive area, and Alder Street Fill areas.

Signs will be posted in treated areas and possible affected areas prior to the application. The signs will describe any water use restrictions and/or advisories.

Application of the herbicide and algaecide treatments will involve the use of airboats, so please remove items from docks such as lawn chairs, flower pots, and personal recreational devices, etc.

MLIRD will keep any further updated information on our website at www.mlird.org/weed_harvest.aspx

If you have any further questions, please do not hesitate to call MLIRD at (509) 765-8716.

Sincerely,

Chris Overland
MLIRD | General Manager

Moses Lake Irrigation and Rehabilitation District, P.O. Box 98, Moses Lake, WA 98837
Phone: 509-765-8716 Fax: 509-764-8425

July 31, 2015

To: Moses Lake Property Owners/Residents/Business Owners

Re: 2015 Herbicide/Algaecide Treatment Business and Residential Notice

On August 17th, 2015, Lakeland Restoration Services, will begin herbicide weed treatment in the Laguna and Wild Goose areas of Moses Lake.

Treatment Dates: Between August 17, 2015 and August 21, 2015. Every effort is being made to finish Laguna on August 17th, 2015.

Restrictions: See attached Lakeland Restoration Services documentation

Location of Treatments: Laguna and Wild Goose lake areas.

Signs will be posted in treated areas and possible affected areas prior to the application. The signs will also describe any water use restrictions and/or advisories.

Application of the herbicide treatments will involve the use of airboats, so please remove items from docks such as lawn chairs, flower pots, and personal recreational devices, etc.

MLIRD will keep any further updated information on our website at www.mlird.org/weed_harvest.aspx

If you have any further questions, please do not hesitate to call MLIRD at (509) 765-8716 or Lakeland at (208) 448-2222 (www.lakelandrs.com).

Sincerely,

Chris Overland
MLIRD | General Manager

Dave Kluttz
Lakeland Restoration Services, LLC

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Herbicide/Algaecide Treatment
Business and Residential Notice

Distribution Date: July 30, 2015

The Laguna area of Moses Lake will be treated with aquatic herbicide on/or **between** August 17, 2015 and August 21, 2015 however, we anticipate being finished with Laguna on August 17th.

In order to help prevent fragmentation, **please DO NOT cut, rake, or hand-pull plants prior to treatment.**

This application will involve the use of airboats. Please remove items from docks such as lawn chairs, flower pots, personal/recreational devices, etc.

Product(s) planned for use: Aquathol K, Diquat,

Active ingredient(s): (Dipotassium salt of endothall),(Diquat dibromide [6,7-dihydrodipyrido (1,2-a:2'1'-c) pyrazinediium dibromide])

It has been advised that no swimming occur within the treated area(s) during or for 24 hours following herbicide treatment.
If you are using the lake itself as a potable, irrigation and/or domestic or livestock water source, please contact Lakeland Restoration Services, LLC to determine if any restrictions apply: (877) 273-6674 or info@lakelandrs.com

Details of treatment time and the end of use restrictions will be announced at www.lakelandrs.com and at http://www.mlird.org/Weed_Harvest.aspx

Swimming: Swimming advisory for 24 hours post treatment
Fishing: no restriction.
Livestock: Do not use treated water for animal consumption within 14 days
Irrigation: 3 days for ornamental, 7 days for food and production ornamental

Location of Treatment(s): Laguna

Signs will be posted treated and potentially affected areas prior to application. The signs will describe any water use restrictions or advisories.

If you would like to request additional notification prior to treatment, or have further questions, please contact Lakeland Restoration Services, LLC at (877) 273-6674 or info@lakelandrs.com.

This herbicide treatment is regulated under a permit issued by the Washington State Department of Ecology. Permit No. WAG994180

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Herbicide/Algaecide Treatment
Business and Residential Notice

Distribution Date: July 30, 2015

The Wild Goose area of Moses Lake will be treated with aquatic herbicide on/or **between** August 17, 2015 and August 21, 2015

In order to help prevent fragmentation, **please DO NOT cut, rake, or hand-pull plants prior to treatment.**

This application will involve the use of airboats. Please remove items from docks such as lawn chairs, flower pots, personal/recreational devices, etc.

Product(s) planned for use: 2,4-D, Diquat

Active ingredient(s): (2,4-Dichloropheoxyacetic acid, dimethylamine salt), (Diquat dibromide [6,7-dihydrodipyrido (1,2-a:2'1'-c) pyrazinediium dibromide])

It has been advised that no swimming occur within the treated area(s) during or for 24 hours following herbicide treatment. If you are using the lake itself as a potable, irrigation and/or domestic or livestock water source, please contact Lakeland Restoration Services, LLC to determine if any restrictions apply: (877) 273-6674 or info@lakelandrs.com

Details of treatment time and the end of use restrictions will be announced at www.lakelandrs.com and at http://www.mlird.org/Weed_Harvest.aspx

Swimming: Swimming advisory for 24 hours post treatment
Fishing: no restriction.
Livestock: Do not use treated water for animal consumption within 14 days
Irrigation: When residue drops below 100 ppb

Location of Treatment(s): Wild Goose area

Signs will be posted treated and potentially affected areas prior to application. The signs will describe any water use restrictions or advisories.

If you would like to request additional notification prior to treatment, or have further questions, please contact Lakeland Restoration Services, LLC at (877) 273-6674 or info@lakelandrs.com.

This herbicide treatment is regulated under a permit issued by the Washington State Department of Ecology. Permit No. WAG994180

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Herbicide/Algaecide Treatment
Business and Residential Notice

Distribution Date: August 7, 2015

The Cove West and Cascade Valley areas of Moses Lake will be treated with aquatic herbicide on/or **between August 17, 2015 and August 21, 2015.**

In order to help prevent fragmentation, **please DO NOT cut, rake, or hand-pull plants prior to treatment.**

This application will involve the use of airboats. Please remove items from docks such as lawn chairs, flower pots, personal/recreational devices, etc.

Product(s) planned for use: Aquathol K, Diquat

Active ingredient(s): (Dipotassium salt of endothall),(Diquat dibromide [6,7-dihydrodipyrido (1,2-a:2'1'-c) pyrazinediium dibromide])

It has been advised that no swimming occur within the treated area(s) during or for 24 hours following herbicide treatment.
If you are using the lake itself as a potable, irrigation and/or domestic or livestock water source, please contact Lakeland Restoration Services, LLC to determine if any restrictions apply: (877) 273-6674 or info@lakelandrs.com

Details of treatment time and the end of use restrictions will be announced at www.lakelandrs.com and at http://www.mlird.org/Weed_Harvest.aspx

Swimming: Swimming advisory for 24 hours post treatment
Fishing: no restriction.
Livestock: Do not use treated water for animal consumption within 14 days
Irrigation: 3 days for ornamental, 7 days for food and production ornamental

Location of Treatment(s): Cove West, Cascade Valley

Signs will be posted treated and potentially affected areas prior to application. The signs will describe any water use restrictions or advisories.

If you would like to request additional notification prior to treatment, or have further questions, please contact Lakeland Restoration Services, LLC at (877) 273-6674 or info@lakelandrs.com.

This herbicide treatment is regulated under a permit issued by the Washington State Department of Ecology. Permit No. WAG994180

Appendix B

Pre/Post Treatment Notification

DEPARTMENT OF ECOLOGY

Aquatic Treatment Email Form

Email to: _**JOJE461@ecy.wa.gov,** nlub461@ecy.wa.gov

From: Lakeland Restoration Services, LLC

Office Phone No: 208-448-2222

Pre-Treatment Notification

Week of Treatment (date and year): June 22, 2015

Water body name	County	Location where treatment will begin	Chemicals/products proposed for use	Targeted plants* & algae	Proposed date & treatment start time
Moses Lake	Grant	Moses Lake	Diquat, 2,4-D, Aquathol	Pondweeds and EWM	June 22, 2015

*** This should either be the full common name (i.e., Eurasian watermilfoil), or the genus and species of targeted plants (i.e., *Myriophyllum spicatum*), or genus where species is not known (i.e., *Potamogetons* or native *Elodea*)**

Additional Information: _____

Post-Treatment Notification

Week of Treatment: June 22, 2015

Water body name	County	Chemicals/products used	Targeted plants* & algae	Acres treated	Amount of product applied (lbs. or gallons)	Date treatment occurred
Moses Lake-Mont Lake	Grant	2,4-D and Diquat	EWM and Nuisance Pondweeds	Surface acres-24	162 gallons – 2,4-D 48 gallons - Diquat	June 22
Moses Lake- Mont Lake SE	Grant	2,4-D and Diquat	EWM and Nuisance Pondweeds	Surface acres-25	162 gallons – 2,4-D 50 gallons - Diquat	June 22
Moses Lake- Wild Goose	Grant	Diquat and Aquathol	EWM and Nuisance Pondweeds	Surface acres-6	12 gallons- Diquat 27 gallons-Aquathol	June 22
Moses Lake-Parker Horne N	Grant	Diquat and Aquathol	EWM and Nuisance Pondweeds	Surface acres-10	20 gallons- Diquat 75 gallons-Aquathol	June 22
Marina Drive Across from Blue Heron	Grant	2,4-D and Diquat	EWM and Nuisance Pondweeds	Surface acres-15	303 gallons- 2,4-D 30 gallons- Diquat	June 22
Mont Lake S	Grant	2,4-D and Diquat	EWM and Nuisance Pondweeds	Surface acres-15	135 gallons- 2,4-D 30 gallons- Diquat	June 22
The Fill	Grant	Diquat and Aquathol	EWM and Nuisance Pondweeds	Surface acres-10	20 gallons- Diquat 45 gallons-Aquathol	June 22

DEPARTMENT OF ECOLOGY

Aquatic Treatment Email Form

Email to: _**JOJE461@ecy.wa.gov,** nlub461@ecy.wa.gov

From: Lakeland Restoration Services, LLC

Office Phone No: 208-448-2222

Pre-Treatment Notification

Week of Treatment (date and year): August 17, 2015

Water body name	County	Location where treatment will begin	Chemicals/products proposed for use	Targeted plants* & algae	Proposed date & treatment start time
Moses Lake	Grant	Boat Launch	Aquathol and Diquat	Nuisance Pondweeds and EWM	August 17th 8 a.m.

*** This should either be the full common name (i.e., Eurasian watermilfoil), or the genus and species of targeted plants (i.e., *Myriophyllum spicatum*), or genus where species is not known (i.e., *Potamogetons* or native *Elodea*)**

Additional Information:

Areas being treated include Wild Goose, Laguna, Cove West, and Cascade Valley on Moses Lake.

Post-Treatment Notification

Week of Treatment: August 17, 2015

Water body name	County	Chemicals/products used	Targeted plants* & algae	Acres treated	Amount of product applied (lbs. or gallons)	Date treatment occurred
Moses Lake	Grant	Diquat and Aquathol	Pondweeds and Algae (spot treatments)	96	Diquat– 195 gal. Aquathol– 665 gal.	August 17

*** This should either be the full common name (i.e., Eurasian watermilfoil), or the genus and species of targeted plants (i.e., *Myriophyllum spicatum*), or genus where species is not known (i.e., *Potamogetons*)**

Additional Information: _____

Knowingly submitting false information shall result in permit termination.

DEPARTMENT OF ECOLOGY

Aquatic Treatment Email Form

Email to: JOJE461@ecy.wa.gov,JRYF461@ecy.wa.gov

From: Lakeland Restoration Services, LLC

Office Phone No: 208-448-2222

Pre-Treatment Notification

Week of Treatment (date and year): July 26th, 2015

Water body name	County	Location where treatment will begin	Chemicals/products proposed for use	Targeted plants* & algae	Proposed date & treatment start time
Moses Lake	Grant	Boat Launch	Phycomycin	Blue green algae	August 1st – 8am

*** This should either be the full common name (i.e., Eurasian watermilfoil), or the genus and species of targeted plants (i.e., *Myriophyllum spicatum*), or genus where species is not known (i.e., *Potamogetons* or native *Elodea*)**

Additional Information: _____

Post-Treatment Notification

Week of Treatment: July 26th, 2015

Water body name	County	Chemicals/products used	Targeted plants* & algae	Acres treated	Amount of product applied (lbs. or gallons)	Date treatment occurred
Moses Lake	Grant	phycomycin	Blue green algae	20 acres	2000 lbs	08-01-2015

*** This should either be the full common name (i.e., Eurasian watermilfoil), or the genus and species of targeted plants (i.e., *Myriophyllum spicatum*), or genus where species is not known (i.e., *Potamogetons*)**

Additional Information: _____

Knowingly submitting false information shall result in permit termination.

Appendix C

Shoreline Postings

CAUTION

The aquatic herbicides Aquathol and Diquat will be applied under permit to these waters on **June 22, 2015 to June 26, 2015** to control aquatic vegetation.

Ecology recommends **no swimming** in the sign-posted area for **24 hours following treatment** due to possible eye irritation.

Drinking Water Restrictions: Do not use water from treatment area for 3 days after treatment

Irrigation Restrictions: Do not use water from treatment area for 3 days after treatment

Fishing Restriction: **None**

Stock Watering Restrictions: **Do not use water from treatment area for 3 days.**

For more information contact the applicator: Lakeland Restoration Services, LLC. Phone number: (877) 273-6674

The Department of Ecology regulates this activity under an NPDES permit. For information about the permit, contact Ecology Phone number: 360-407-6400

THIS SIGN MUST REMAIN IN PLACE UNTIL 2 DAYS AFTER APPLICATION

AREAS OF TREATMENT WITH DIQUAT AND AQUATHOL: Wild Goose, Parker Horne N, The Fill

PRECAUCIÓN

Los herbicidas acuáticos Diquat, 2,4 -D se aplicará bajo permiso a estas aguas el **22 de junio – 26 de junio** para controlar la vegetación acuática.

Ecología no recomienda nadar en la zona señalizado por 24 horas después del tratamiento debido a la irritación ocular posible.

Restricciones de agua potable: no use agua de la zona de tratamiento hasta que el resultado de un ensayo aprobado está por debajo de 70ppb.

Restricciones de riego: no use agua de la zona de tratamiento hasta que el resultado de un ensayo aprobado está por debajo de 100ppb.

Restricción de la pesca: ninguno

Restricciones de riego stock: no use agua de la zona de tratamiento durante 14 días.

Para obtener más información, póngase en contacto con el aplicador: Lakeland restauración Services, LLC. Número de teléfono: (877) 273-6674

El Departamento de Ecología regula esta actividad bajo un permiso NPDES. Para obtener información sobre el permiso, con número de teléfono de ecología: 360-407-6400

ESTE SIGNO DEBE PERMANECER EN SU LUGAR HASTA 2 DÍAS DESPUÉS DE LA APLICACIÓN

CAUTION

The aquatic herbicides Aquathol and Diquat will be applied under permit to these waters on **August 17, 2015 to August 21, 2015** to control aquatic vegetation.

Ecology recommends **no swimming** in the sign-posted area for **24 hours following treatment** due to possible eye irritation.

Drinking Water Restrictions: Do not use water from treatment area for 3 days after treatment

Irrigation Restrictions: Do not use water from treatment area for 3 days after treatment

Fishing Restriction: None

Stock Watering Restrictions: Do not use water from treatment area for 3 days.

For more information contact the applicator: Lakeland Restoration Services, LLC. Phone number: (877) 273-6674

The Department of Ecology regulates this activity under an NPDES permit. For information about the permit, contact Ecology Phone number: 360-407-6400

THIS SIGN MUST REMAIN IN PLACE UNTIL 2 DAYS AFTER APPLICATION

AREAS OF TREATMENT WITH DIQUAT AND AQUATHOL: Wild Goose, Laguna, Cove West, and Cascade Valley areas of Moses Lake

PRECAUCIÓN

Los herbicidas acuáticos Diquat y Aquathol se aplicará bajo permiso a estas aguas el **17 de augusto– 21 de augusto** para controlar la vegetación acuática.

Ecología no recomienda nadar en la zona señalizado por 24 horas después del tratamiento debido a la irritación ocular posible.

Restricciones de agua potable: no use agua de la zona de tratamiento hasta que el resultado de un ensayo aprobado está por debajo de 70ppb.

Restricciones de riego: no use agua de la zona de tratamiento hasta que el resultado de un ensayo aprobado está por debajo de 100ppb.

Restricción de la pesca: ninguno

Restricciones de riego stock: no use agua de la zona de tratamiento durante 3 días.
Para obtener más información, póngase en contacto con el aplicador: Lakeland restauración Services, LLC. Número de teléfono: (877) 273-6674

El Departamento de Ecología regula esta actividad bajo un permiso NPDES. Para obtener información sobre el permiso, con número de teléfono de ecología: 360-407-6400

ESTE SIGNO DEBE PERMANECER EN SU LUGAR HASTA 2 DÍAS DESPUÉS DE LA APLICACIÓN

CAUTION

Phycomycin (Sodium carbonate peroxyhydrate) will be applied under permit to these waters on _____to control algae.

Ecology recommends no swimming in the sign-posted area for 12 hours following treatment due to possible eye irritation.

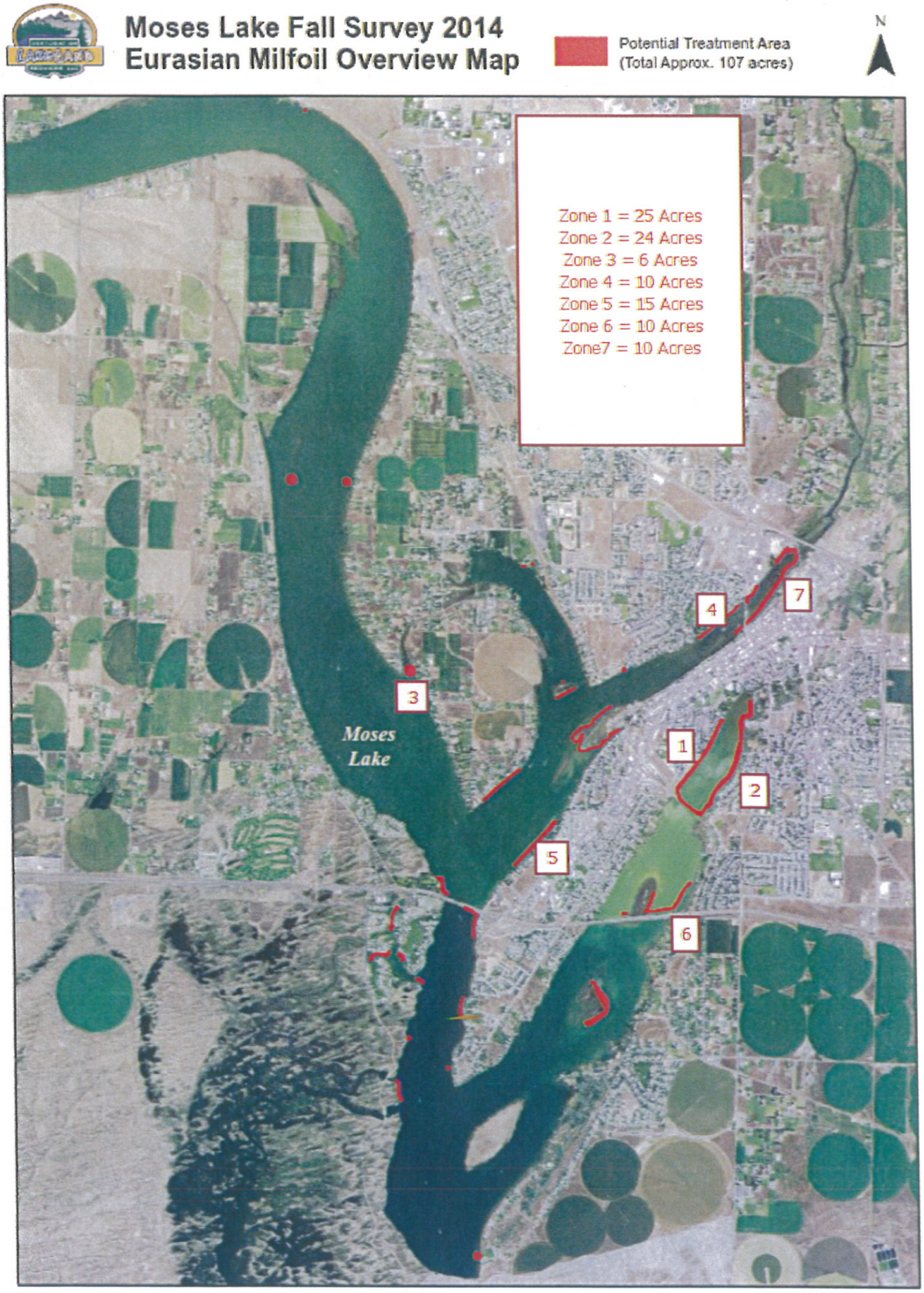
Drinking Water Restrictions: **None**
Irrigation Restrictions: **None**
Stock Watering Restrictions: **None**

For more information contact the applicator: Lakeland Restoration Services, LLC
Phone Number: (877) 273-6674
Or the Department of Ecology at (360) 407-6400

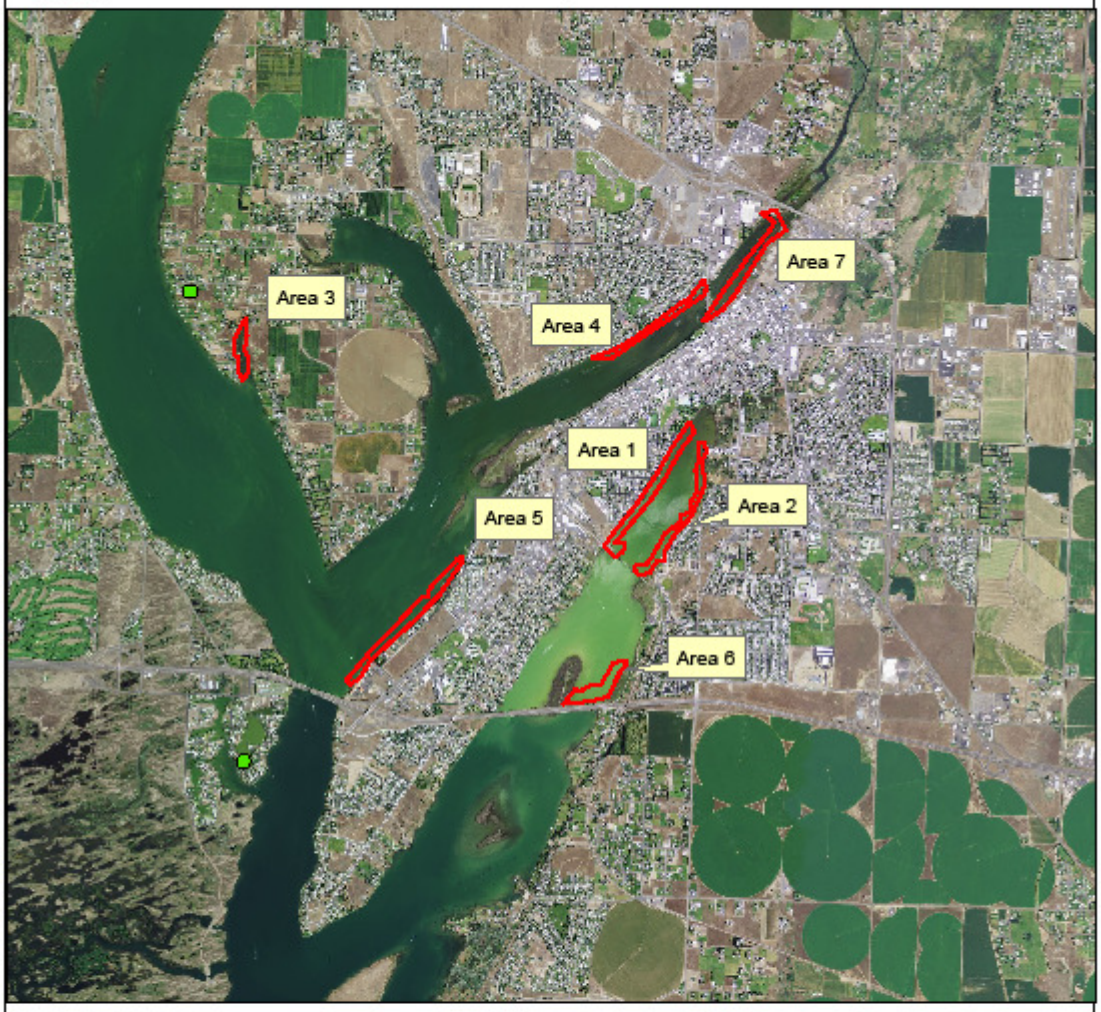
THIS SIGN MUST REMAIN IN PLACE UNTIL 2 DAYS AFTER APPLICATION

Appendix D

Maps


Moses Lake Fall Survey 2014
Eurasian Milfoil Overview Map
Potential Treatment Area
(Total Approx. 107 acres)
N
Zone 1 = 25 Acres
Zone 2 = 24 Acres
Zone 3 = 6 Acres
Zone 4 = 10 Acres
Zone 5 = 15 Acres
Zone 6 = 10 Acres
Zone7 = 10 Acres
Moses Lake
1
2
3
4
5
6
7

Moses Lake Aquatic Treatment
June 22, 2015



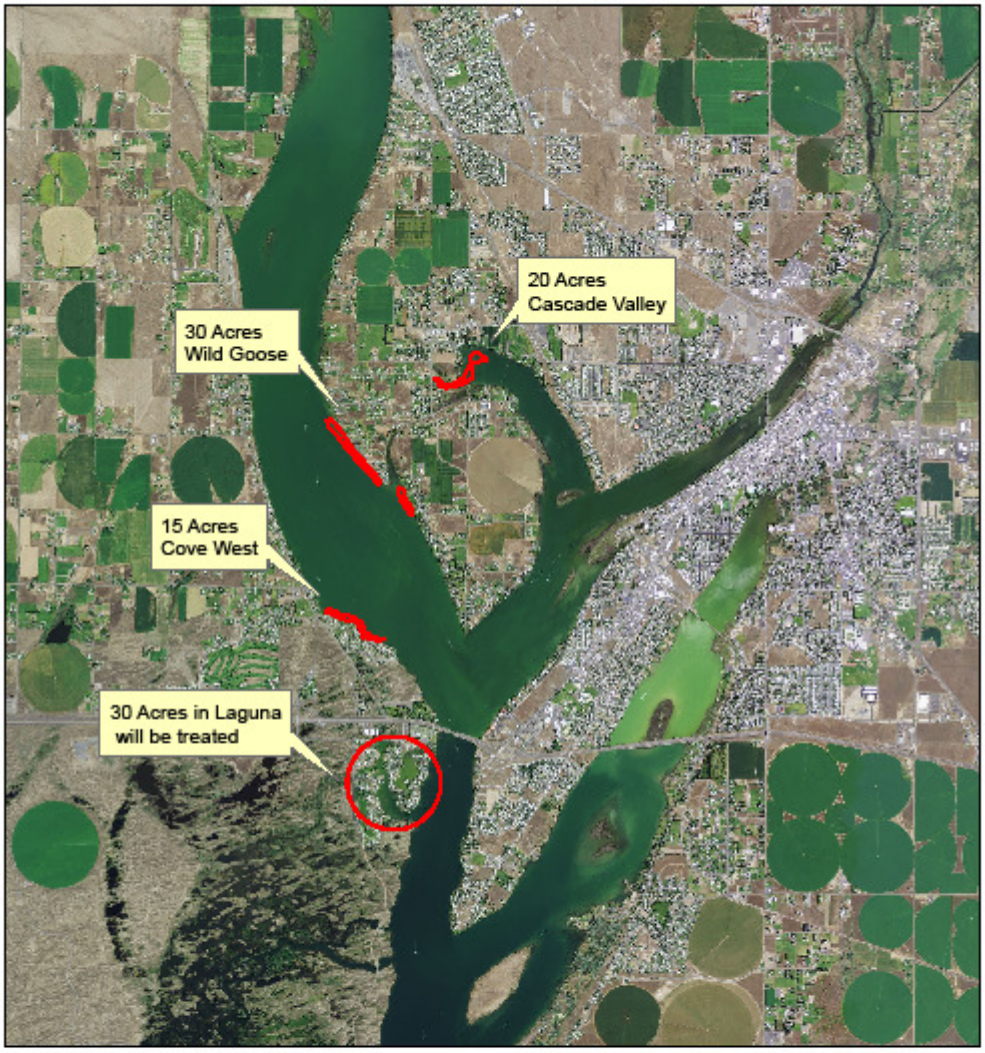
Mose Lake Treatment	
Week of June 22, 2015	
Area	Acres
1	27
2	20
3	10
4	14
5	27
6	16
7	23
Total	137

N

No warranty is made by Lakeland Restoration Services as to the accuracy, reliability, or completeness of these data for individual or aggregate use with other data. Original data was compiled from various sources.

Date: 7/22/15

Moses Lake Treatment 2015
Phase 2



N

Lakeland Restoration Services Map Disclaimer
No warranty is made by Lakeland Restoration Services as to the accuracy, reliability, or completeness of these data for individual or aggregate use with other data. Original data was compiled from various sources.

Moses Lake Phase 2
2015 Treatment

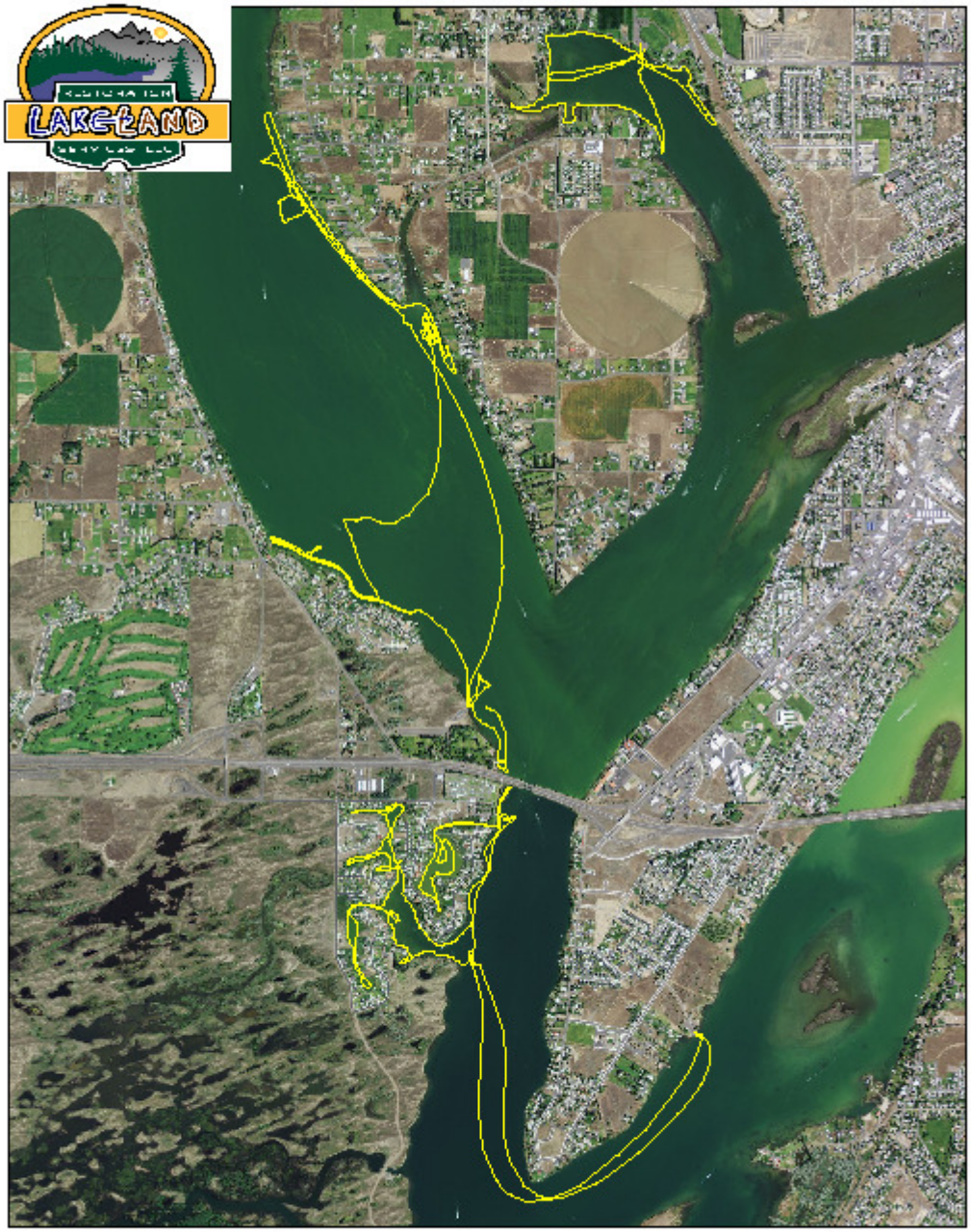
Legend

Treatment Polygons

N

Lakeland Restoration Services Map Disclaimer
No warranty is made by Lakeland Restoration Services as to the accuracy, reliability, or completeness of these data for individual or aggregate use with other data. Original data was compiled from various sources.

Moses Lake Phase 2 Treatment 2015



Legend

Treatment Tracks

N

Lakeland Restoration Services Map Disclaimer
No warranty is made by Lakeland Restoration Services as to the accuracy, reliability, or completeness of these data for individual or aggregate use with other data. Original data was compiled from various sources.

Moses Lake Algae Treatment
August 1, 2015
Blue Heron
10 Acres

Legend

Blue.Heron.Algae

N

Lakeland Restoration Services Map Disclaimer
No warranty is made by Lakeland Restoration Services as to the accuracy, reliability, or completeness of these data for individual or aggregate use with other data. Original data was compiled from various sources.

Moses Lake Algae Treatment
August 1, 2015
Connely Park
10 Acres

Legend

Connely Park Algae

N

Lakeland Restoration Services Map Disclaimer
No warranty is made by Lakeland Restoration Services as to the accuracy, reliability, or completeness of these data for individual or aggregate use with other data. Original data was compiled from various sources.

Appendix E

Pesticide Application Records

Washington State

PESTICIDE APPLICATION RECORD (Version 1)

NOTE: This form must be completed same day as the application and it must be retained for 7 years (Ref. chapter 17.21 RCW)

1. Date of Application - Year: 2015 Month: June Day: 22 Start Time: 8:00am
   Stop Time: 5:00pm
2. Name of person for whom the pesticide was applied: Chris Overland
   Firm Name (if applicable): Moses Lake Irrigation and Rehabilitation District
   Street Address: PO Box 98 City: Moses Lake State: WA Zip: 98837
3. Licensed Applicator's Name (if different from #2 above): David Kluttz License No.: 66448
   Firm Name (if applicable): Lakeland Restoration Services, LLC Tel No.: 208-448-2222
   Street Address: 78 E River Spur Rd City: Priest River State: ID Zip: 83856
4. Name of person(s) who applied the pesticide (if different from #3 above): Jim Pouge
   License No(s). If applicable: 90277
5. Application Crop or Site: Moses Lake Mont Lake NW/SE
6. Total Area Treated (acre, sq. ft., etc.): 49 acres
7. Was this application made as a result of a WSDA Permit? ☐ No ☒ Yes (If yes, give Permit No.) # WAG994180
8. Pesticide Information (please list all information for each pesticide, including adjuvants (buffer, surfactant, etc.), in the tank mix):

a) Full Product Name	b) EPA Reg. No.	c) Total Amount of Pesticide Applied in Area Treated	d) Pesticide Applied/Acre (or other measure)	e) Concentration Applied
2,4-D	62719-3	459 gals	2.25 / GPAF	
Diquat	100-1091	128 gals	2 / GPA	
			/	
			/	
			/	

9. Address ***or exact location*** of application. NOTE: If the application is made to one acre or more of agricultural land, the field location must be shown on the map on page two of this form.

   See attached Maps

10. Wind direction and estimated velocity (mph) during the application: 55-87 F 6mph SSW
11. Temperature during the application: See above
12. Apparatus license plate number (if applicable): E818
13. ☐ Air ☒ Ground ☐ Chemigation
14. Miscellaneous Information: Airboat

AGR FORM 640-4226 (R/4/07) Page 1 of 3

Washington State

PESTICIDE APPLICATION RECORD (Version 1)

NOTE: This form must be completed same day as the application and it must be retained for 7 years (Ref. chapter 17.21 RCW)

1. Date of Application - Year: 2015 Month: June Day: 23 Start Time: 8:00am
   Stop Time: 5:00pm
2. Name of person for whom the pesticide was applied: Chris Overland
   Firm Name (if applicable): Moses Lake Irrigation and Rehabilitation District
   Street Address: PO Box 98 City: Moses Lake State: WA Zip: 98837
3. Licensed Applicator's Name (if different from #2 above): David Kluttz License No.: 66448
   Firm Name (if applicable): Lakeland Restoration Services, LLC Tel No.: 208-448-2222
   Street Address: 78 E River Spur Rd City: Priest River State: ID Zip: 83856
4. Name of person(s) who applied the pesticide (if different from #3 above): Jim Pouge
   License No(s). If applicable: 90277
5. Application Crop or Site: Moses Lake Wild Goose
6. Total Area Treated (acre, sq. ft., etc.): 6 acres
7. Was this application made as a result of a WSDA Permit? ☐ No ☒ Yes (If yes, give Permit No.) # WAG994180
8. Pesticide Information (please list all information for each pesticide, including adjuvants (buffer, surfactant, etc.), in the tank mix):

a) Full Product Name	b) EPA Reg. No.	c) Total Amount of Pesticide Applied in Area Treated	d) Pesticide Applied/Acre (or other measure)	e) Concentration Applied
Aquathol K	70506-176	27 gals	1.96 / GPAF	
Diquat	100-1091	12 gals	2 / GPA	
			/	
			/	
			/	

9. Address ***or exact location*** of application. NOTE: If the application is made to one acre or more of agricultural land, the field location must be shown on the map on page two of this form.

   See attached Maps

10. Wind direction and estimated velocity (mph) during the application: 57-88 F 7 mph SSW
11. Temperature during the application: See above
12. Apparatus license plate number (if applicable): E818
13. ☐ Air ☒ Ground ☐ Chemigation
14. Miscellaneous Information: Airboat

AGR FORM 640-4226 (R/4/07) Page 1 of 3

Washington State

PESTICIDE APPLICATION RECORD (Version 1)

NOTE: This form must be completed same day as the application and it must be retained for 7 years (Ref. chapter 17.21 RCW)

1. Date of Application - Year: 2015 Month: June Day: 24 Start Time: 8:00am
   Stop Time: 5:00pm
2. Name of person for whom the pesticide was applied: Chris Overland
   Firm Name (if applicable): Moses Lake Irrigation and Rehabilitation District
   Street Address: PO Box 98 City: Moses Lake State: WA Zip: 98837
3. Licensed Applicator's Name (if different from #2 above): David Kluttz License No.: 66448
   Firm Name (if applicable): Lakeland Restoration Services, LLC Tel No.: 208-448-2222
   Street Address: 78 E River Spur Rd City: Priest River State: ID Zip: 83856
4. Name of person(s) who applied the pesticide (if different from #3 above): Jim Pouge
   License No(s). If applicable: 90277
5. Application Crop or Site: Moses Lake Parker Horne, The Fill, Marina Drive across from Blue Heron
6. Total Area Treated (acre, sq. ft., etc.): 50 acres
7. Was this application made as a result of a WSDA Permit? ☐ No ☒ Yes (If yes, give Permit No.) # WAG994180
8. Pesticide Information (please list all information for each pesticide, including adjuvants (buffer, surfactant, etc.), in the tank mix):

a) Full Product Name	b) EPA Reg. No.	c) Total Amount of Pesticide Applied in Area Treated	d) Pesticide Applied/Acre (or other measure)	e) Concentration Applied
2,4-D	62719-3	303 gals	2.25 / GPAF	
Diquat	100-1091	70 gals	2 / GPA	
Aquathol K	7056-176	120 gals	1.96 / GPAF	
			/	
			/	

9. Address ***or exact location*** of application. NOTE: If the application is made to one acre or more of agricultural land, the field location must be shown on the map on page two of this form.

   See attached Maps

10. Wind direction and estimated velocity (mph) during the application: 63-89 F 6 mph SSW
11. Temperature during the application: See above
12. Apparatus license plate number (if applicable): E818
13. ☐ Air ☒ Ground ☐ Chemigation
14. Miscellaneous Information: Airboat

AGR FORM 640-4226 (R/4/07) Page 1 of 3

Washington State

PESTICIDE APPLICATION RECORD (Version 1)

NOTE: This form must be completed same day as the application and it must be retained for 7 years (Ref. chapter 17.21 RCW)

1. Date of Application - Year: 2015 Month: August Day: 17 Start Time: 8:00am

   Stop Time: 5:00pm

2. Name of person for whom the pesticide was applied: Chris Overland

   Firm Name (if applicable): Moses Lake Irrigation and Rehabilitation District

   Street Address: PO Box 98 City: Moses Lake State: WA Zip: 98837

3. Licensed Applicator's Name (if different from #2 above): David Kluttz License No.: 66448

   Firm Name (if applicable): Lakeland Restoration Services, LLC Tel No.: 208-448-2222

   Street Address: 78 E River Spur Rd City: Priest River State: ID Zip: 83856

4. Name of person(s) who applied the pesticide (if different from #3 above): Jake Nesbitt

   License No(s). If applicable: 88023

5. Application Crop or Site: Cove West, Cascade Valley, Wild Goose, Laguna, and Blue Heron areas of Moses Lake

6. Total Area Treated (acre, sq. ft., etc.): approx.96 acres

7. Was this application made as a result of a WSDA Permit? ☐ No ☒ Yes (If yes, give Permit No.) # WAG994180

8. Pesticide Information (please list all information for each pesticide, including adjuvants (buffer, surfactant, etc.), in the tank mix):

a) Full Product Name	b) EPA Reg. No.	c) Total Amount of Pesticide Applied in Area Treated	d) Pesticide Applied/Acre (or other measure)	e) Concentration Applied
Aquathol	70506-176	665gals	1.5 / PPM	
Diquat	100-1091	195 gals	2 Gallon / acre	
			/	
			/	
			/	

9. Address ***or exact location*** of application. NOTE: If the application is made to one acre or more of agricultural land, the field location must be shown on the map on page two of this form.

   See attached Maps

10. Wind direction and estimated velocity (mph) during the application: 3mph (S)

11. Temperature during the application: 51 F - 87 F

12. Apparatus license plate number (if applicable): E818

13. ☒ Air ☐ Ground ☐ Chemigation

14. Miscellaneous Information:

AGR FORM 640-4226 (R/4/07) Page 1 of 3

PESTICIDE APPLICATION RECORD (Version 1)

NOTE: This form must be completed same day as the application and it must be retained for 7 years (Ref. chapter 17.21 RCW)

Washington State Department of Agriculture
Pesticide Management Division
PO Box 42560
Olympia WA 98504-2560
(877) 301-4555

1. Date of Application - Year: 2015 Month: August Day: 1 Start Time: 8:00am
   Stop Time: 4:00pm
2. Name of person for whom the pesticide was applied: Chris Overland
   Firm Name (if applicable): Moses Lake Irrigation and Rehabilitation District
   Street Address: PO Box 98 City: Moses Lake State: WA Zip: 98837
3. Licensed Applicator's Name (if different from #2 above): David Kluttz License No.: 66448
   Firm Name (if applicable): Lakeland Restoration Services, LLC Tel No.: 208-448-2222
   Street Address: 78 E River Spur Rd City: Priest River State: ID Zip: 83856
4. Name of person(s) who applied the pesticide (if different from #3 above):
   License No(s). If applicable:
5. Application Crop or Site: Moses Lake – Connolly Park Blue Green Algae and Blue Heron
6. Total Area Treated (acre, sq. ft., etc.): 20 acres
7. Was this application made as a result of a WSDA Permit? ☐ No ☒ Yes (If yes, give Permit No.) # WAG994180
8. Pesticide Information (please list all information for each pesticide, including adjuvants (buffer, surfactant, etc.), in the tank mix):

a) Full Product Name	b) EPA Reg. No.	c) Total Amount of Pesticide Applied in Area Treated	d) Pesticide Applied/Acre (or other measure)	e) Concentration Applied
Phycomycin	68660-9-8959	2000 lbs	100 lbs / acre	
			/	
			/	
			/	
			/	

9. Address ***or exact location*** of application. NOTE: If the application is made to one acre or more of agricultural land, the field location must be shown on the map on page two of this form.

   See attached Maps

10. Wind direction and estimated velocity (mph) during the application: W 4 mph
11. Temperature during the application: 47 F -99 F
12. Apparatus license plate number (if applicable): E818
13. ☐ Air ☒ Ground ☐ Chemigation
14. Miscellaneous Information: Airboat

AGR FORM 640-4226 (R/4/07) Page 1 of 3

Appendix F

BioBase

(/) (http://www.contourinnovations.com)

BIOBASE by Navico, Inc.

David Kluttz (/Account/UserProfile) LOG OFF

DASHBOARD (/) | MY ACCOUNT (/ACCOUNT/USERPROFILE) | SUPPORT & RESOURCES (/HOME/SUPPORTRESOURCES) | BLOG (HTTP://CIBIOBASE.BLOGSPOT.COM/) |

Moses Lake, *Grant County, Washington*

Single Trip

NOW VIEWING: final fill map 2015, 6/18/2015

VIEW REPORT (HTTP://FILES3.DIGITALMARINE.COM/S5/REPORTOUTPUT/BCAF1A13-9C36-4319-95EF-2D6DD3D46ADC/REPORT.HTM) | DOWNLOAD REPORT (CREATEREPORTDOWNLOAD?T=221076&C=8035 CONTACTTYPE=TRIPASSISTANCE&FIRSTNAME=DAVID&LASTNAME=KLUTTZ&EMAIL=LAKELAND%40LAKELANDRS.COM&COMMENTS=CONTACT%20ME%20ABOUT%20THIS%20TRIP.&REFURL=HTTP%3A%2F%2F

Getting depth points: 73% completed.

Map | Data Offset | Trip Reprocessing | Merge Trips | Export Data

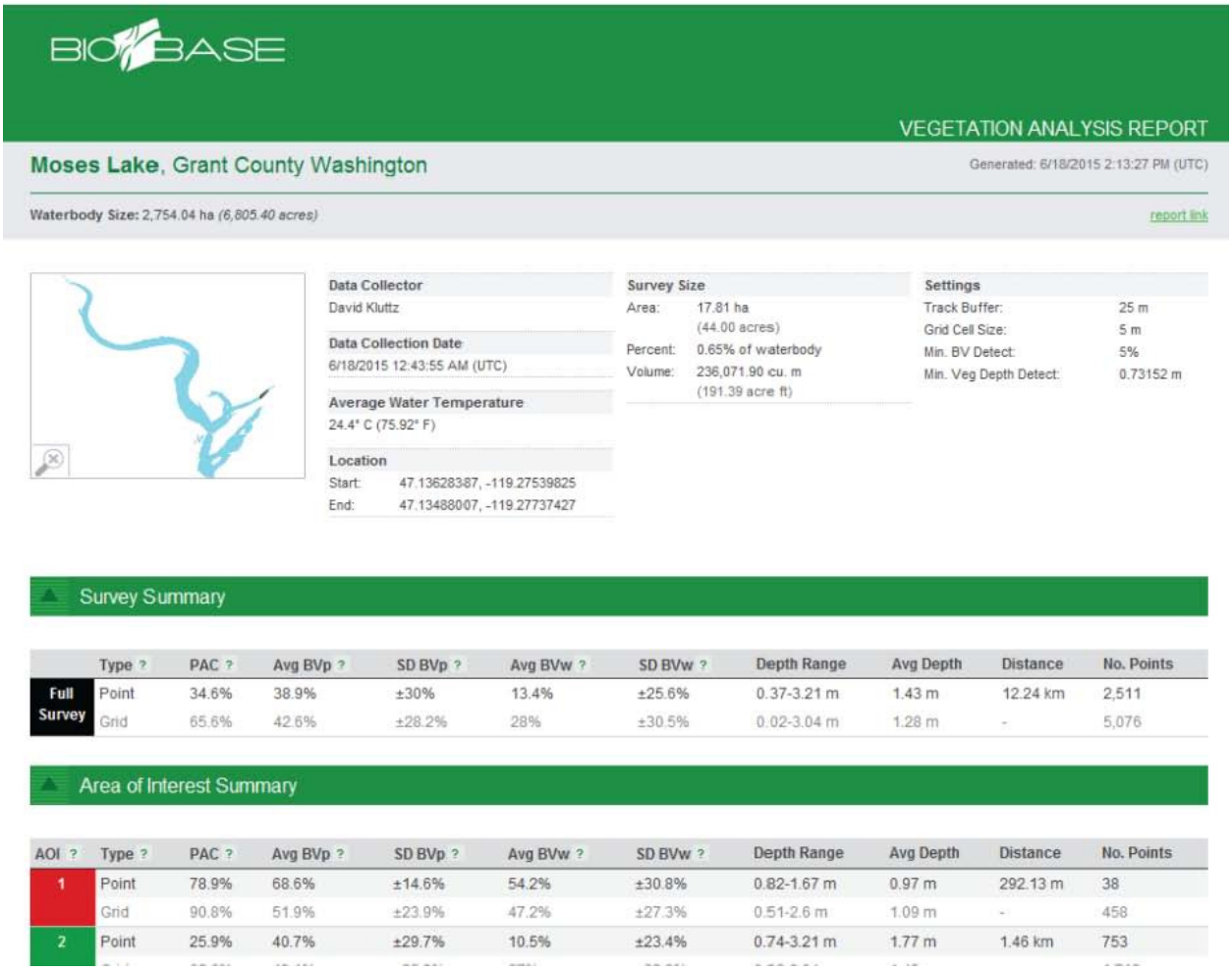
Depth | Vegetation | Composition

Link Tables to Map

Delete	Latitude	Longitude	MPH	Depth	Distance	Ref No.
	47.136283	-119.275398	1.593952	-3.864	0	5
	47.136283	-119.275398	1.885529	-3.872	0	10
	47.136277	-119.275398	1.691145	-3.874	0.68237	15
	47.136277	-119.275398	1.885529	-3.857	0.68237	20
	47.13627	-119.275398	1.982721	-3.787	1.36474	25
	47.136264	-119.275398	1.885529	-3.749	2.04711	30
	47.136264	-119.275398	2.196544	-3.669	2.04711	35
	47.136258	-119.275398	2.099352	-3.677	2.72948	40
	47.136258	-119.275398	1.788337	-3.673	2.72948	45
	47.136252	-119.275398	2.196544	-3.693	3.41185	50
	47.136246	-119.275407	2.390929	-3.64	3.41185	60
	47.13624	-119.275407	2.293736	-3.557	4.09422	65
	47.136228	-119.275407	2.390929	-3.588	5.45896	70
	47.136228	-119.275407	2.099352	-3.517	5.45896	75
	47.136221	-119.275416	2.099352	-3.51	6.42398	80
	47.136215	-119.275416	2.196544	-3.522	7.10635	85
	47.136209	-119.275416	2.196544	-3.571	7.78872	90
	47.136209	-119.275416	2.293736	-3.571	7.78872	95
	47.136203	-119.275416	2.293736	-3.581	8.47109	100

Download Report Image

Click Here or Right Click "Save Target As..." (http://files3.digitalmarine.com/s5/ReportOutput/bcaf1a13-9c36-4319-95ef-2d6dd3d46adc/bcaf1a13-9c36-4319-95ef-2d6dd3d46adc.png)



BIOBASE

VEGETATION ANALYSIS REPORT

Moses Lake, Grant County Washington

Generated: 6/18/2015 2:13:27 PM (UTC)

Waterbody Size: 2,754.04 ha *(6,805.40 acres)*

report link

Data Collector
David Kluttz

Data Collection Date
6/18/2015 12:43:55 AM (UTC)

Average Water Temperature
24.4° C (75.92° F)

Location
Start: 47.13628387, -119.27539825
End: 47.13488007, -119.27737427

Survey Size
Area: 17.81 ha (44.00 acres)
Percent: 0.65% of waterbody
Volume: 236,071.90 cu. m (191.39 acre ft)

Settings
Track Buffer: 25 m
Grid Cell Size: 5 m
Min. BV Detect: 5%
Min. Veg Depth Detect: 0.73152 m

Survey Summary

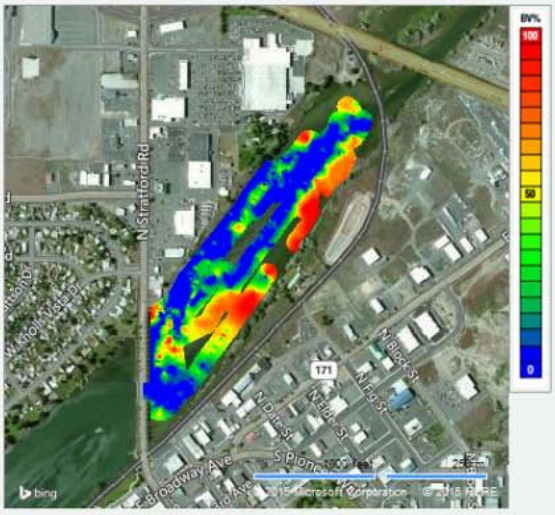
	Type	PAC	Avg BVp	SD BVp	Avg BVw	SD BVw	Depth Range	Avg Depth	Distance	No. Points
Full Survey	Point	34.6%	38.9%	±30%	13.4%	±25.6%	0.37-3.21 m	1.43 m	12.24 km	2,511
	Grid	65.6%	42.6%	±28.2%	28%	±30.5%	0.02-3.04 m	1.28 m	-	5,076

Area of Interest Summary

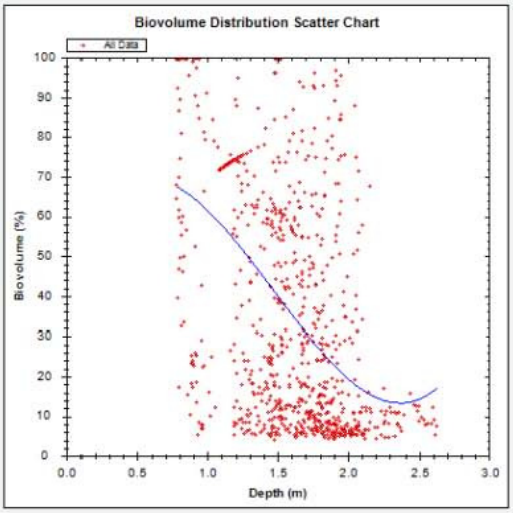
AOI	Type	PAC	Avg BVp	SD BVp	Avg BVw	SD BVw	Depth Range	Avg Depth	Distance	No. Points
1	Point	78.9%	68.6%	±14.6%	54.2%	±30.8%	0.82-1.67 m	0.97 m	292.13 m	38
	Grid	90.8%	51.9%	±23.9%	47.2%	±27.3%	0.51-2.6 m	1.09 m	-	458
2	Point	25.9%	40.7%	±29.7%	10.5%	±23.4%	0.74-3.21 m	1.77 m	1.46 km	753

	Grid	62.6%	43.1%	±25.9%	27%	±29.2%	0.02-3.04 m	1.45 m	-	1,719
3	Point	47.9%	34.4%	±28.5%	16.5%	±26.2%	0.9-2.77 m	1.76 m	219.43 m	188
	Grid	77.2%	39.2%	±22.2%	30.3%	±25.5%	0.47-2.64 m	1.39 m	-	329
4	Point	35.5%	33.9%	±26.8%	12%	±22.8%	0.37-2.71 m	1.45 m	5.69 km	1,166
	Grid	54.6%	27.9%	±20.5%	15.2%	±20.5%	0.06-3.04 m	1.37 m	-	2,774
5	Point	38.3%	47.4%	±36.3%	18.1%	±32.2%	0.38-2.8 m	1.05 m	3.18 km	366
	Grid	71.1%	53.1%	±30%	37.7%	±34.9%	0.05-3.04 m	1.08 m	-	1,872

Vegetation Biovolume Heat Map



Biovolume Distribution Scatter Chart



Biovolume Analysis by Quantity

AOI ?	0-5%	5-20%	20-40%	40-60%	60-80%	>80%
1	21.05%	2.63%	2.63%	2.63%	71.05%	0%
2	74.1%	11.29%	1.2%	2.26%	10.89%	0.27%
3	52.13%	26.06%	1.6%	5.32%	13.83%	1.06%
4	64.49%	15.01%	8.49%	5.57%	3.34%	3.09%
5	61.75%	14.21%	5.19%	3.55%	4.92%	10.38%

Biovolume Analysis by Depth

AOI ?	Depth	Type ?	Count	PAC ?	Avg BVp ?	SD BVp ?	Avg BVw ?	SD BVw ?
1	0-1m	Point	0	-	-	-	-	-
	1-2m		38	78.9%	68.6%	±14.6%	54.2%	±30.8%
	2-3m		0	-	-	-	-	-
	3-4m		0	-	-	-	-	-
	4-5m		0	-	-	-	-	-
	5-6m		0	-	-	-	-	-
	6-7m		0	-	-	-	-	-
	7-8m		0	-	-	-	-	-
	8-9m		0	-	-	-	-	-
	>9m		0	-	-	-	-	-
	0-1m	Grid	240	94.6%	53%	±23.1%	50.1%	±25.5%
	1-2m		206	90.8%	50.7%	±24.8%	46.1%	±27.8%
	2-3m		12	16.7%	44.8%	±24.7%	7.5%	±19.5%
	3-4m		0	-	-	-	-	-

	4-5m		0	-	-	-	-	-
	5-6m		0	-	-	-	-	-
	6-7m		0	-	-	-	-	-
	7-8m		0	-	-	-	-	-
	8-9m		0	-	-	-	-	-
	>9m		0	-	-	-	-	-
AOI ?	Depth	Type ?	Count	PAC ?	Avg BVp ?	SD BVp ?	Avg BVw ?	SD BVw ?
2	0-1m	Point	0	-	-	-	-	-
	1-2m		392	39%	48.8%	±28.1%	19%	±29.6%
	2-3m		354	11.9%	11.1%	±9.4%	1.3%	±4.8%
	3-4m		7	0%	-	-	0%	±0%
	4-5m		0	-	-	-	-	-
	5-6m		0	-	-	-	-	-
	6-7m		0	-	-	-	-	-
	7-8m		0	-	-	-	-	-
	8-9m		0	-	-	-	-	-
	>9m		0	-	-	-	-	-
	0-1m	Grid	302	98.7%	55.5%	±21.3%	54.8%	±22%
	1-2m		1211	62.5%	39.1%	±25.7%	24.5%	±27.8%
	2-3m		204	10.3%	9.1%	±5.1%	0.9%	±3.2%
	3-4m		2	0%	-	-	0%	±0%
	4-5m		0	-	-	-	-	-
	5-6m		0	-	-	-	-	-
	6-7m		0	-	-	-	-	-
	7-8m		0	-	-	-	-	-
	8-9m		0	-	-	-	-	-
	>9m		0	-	-	-	-	-
AOI ?	Depth	Type ?	Count	PAC ?	Avg BVp ?	SD BVp ?	Avg BVw ?	SD BVw ?
3	0-1m	Point	0	-	-	-	-	-
	1-2m		99	65.7%	44.2%	±27.8%	29%	±30.8%
	2-3m		89	28.1%	9%	±4.6%	2.5%	±4.7%
	3-4m		0	-	-	-	-	-
	4-5m		0	-	-	-	-	-
	5-6m		0	-	-	-	-	-
	6-7m		0	-	-	-	-	-
	7-8m		0	-	-	-	-	-
	8-9m		0	-	-	-	-	-
	>9m		0	-	-	-	-	-
	0-1m	Grid	81	95.1%	54.5%	±14.6%	51.8%	±18.5%
	1-2m		214	76.2%	34.1%	±21.5%	26%	±23.8%
	2-3m		34	41.2%	14.7%	±12.5%	6.1%	±10.8%
	3-4m		0	-	-	-	-	-
	4-5m		0	-	-	-	-	-
	5-6m		0	-	-	-	-	-
	6-7m		0	-	-	-	-	-
	7-8m		0	-	-	-	-	-
	8-9m		0	-	-	-	-	-
	>9m		0	-	-	-	-	-
AOI ?	Depth	Type ?	Count	PAC ?	Avg BVp ?	SD BVp ?	Avg BVw ?	SD BVw ?
4	0-1m	Point	0	-	-	-	-	-
	1-2m		1035	37.5%	34%	±26.9%	12.8%	±23.3%
	2-3m		131	19.8%	32.2%	±24.7%	6.4%	±16.9%
	3-4m		0	-	-	-	-	-
	4-5m		0	-	-	-	-	-
	5-6m		0	-	-	-	-	-

	6-7m		0	-	-	-	-	-
	7-8m		0	-	-	-	-	-
	8-9m		0	-	-	-	-	-
	>9m		0	-	-	-	-	-
	0-1m	Grid	655	66.6%	34.4%	±22.2%	22.9%	±24.3%
	1-2m		1918	52.8%	25.7%	±19.3%	13.6%	±19%
	2-3m		200	33%	19.2%	±14.8%	6.3%	±12.4%
	3-4m		1	0%	-	-	0%	±0%
	4-5m		0	-	-	-	-	-
	5-6m		0	-	-	-	-	-
	6-7m		0	-	-	-	-	-
	7-8m		0	-	-	-	-	-
	8-9m		0	-	-	-	-	-
	>9m		0	-	-	-	-	-
AOI ?	Depth	Type ?	Count	PAC ?	Avg BVp ?	SD BVp ?	Avg BVw ?	SD BVw ?
5	0-1m	Point	103	79.6%	62.9%	±34.6%	50.1%	±39.9%
	1-2m		186	28.5%	27.3%	±26.2%	7.8%	±18.7%
	2-3m		77	6.5%	6%	±0.8%	0.4%	±1.5%
	3-4m		0	-	-	-	-	-
	4-5m		0	-	-	-	-	-
	5-6m		0	-	-	-	-	-
	6-7m		0	-	-	-	-	-
	7-8m		0	-	-	-	-	-
	8-9m		0	-	-	-	-	-
	>9m		0	-	-	-	-	-
	0-1m	Grid	1084	93.8%	60.4%	±28.4%	56.6%	±31.1%
	1-2m		656	45.3%	30.2%	±21.7%	13.7%	±21%
	2-3m		130	13.1%	13.4%	±11.7%	1.8%	±6.2%
	3-4m		2	0%	-	-	0%	±0%
	4-5m		0	-	-	-	-	-
	5-6m		0	-	-	-	-	-
	6-7m		0	-	-	-	-	-
	7-8m		0	-	-	-	-	-
	8-9m		0	-	-	-	-	-
	>9m		0	-	-	-	-	-

Glossary

AOI

Area of Interest: Defines the individual transects or contiguous data samples as depicted by the color coding of each trip line. Seperate areas of interest can be generated through merging of multiple trips, appending data to a single sonar log or lapses in time (greater than five minutes) within a sonar log.

BVp

Biovolume (Plant): Refers to the percentage of the water column taken up by vegetation when vegetation exists. Areas that do not have any vegetation are not taken into consideration for this calculation.

BVw

Biovolume (All water): Refers to the average percentage of the water column taken up by vegetation regardless of whether vegetation exists. In areas where no vegetation exists, a zero value is entered into the calculation, thus reducing the overall biovolume of the entire area covered by the survey.

PAC

Percent Area Covered: Refers to the overall surface area that has vegetation growing.

Grid

Geostatistical Interpolated Grid: Interpolated and evenly spaced values representing kriged (smoothed) output of aggregated data points. The gridded data is most accurate summary of individual survey areas.

Point

Individual Coordinate Point: A single point represents a summary of sonar pings and the derived bottom and canopy depths. Individual point data create an irregularly spaced dataset that may have overlaps and/or gaps in the data resulting in a increased potential for error.

(/) (http://www.contourinnovations.com)

BIOBASE by Navico, Inc.

David Kluttz (/Account/UserProfile) LOG OFF

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Moses Lake, *Grant County, Washington*

Single Trip

NOW VIEWING: Merge, 6/17/2015

VIEW REPORT (HTTP://FILES3.DIGITALMARINE.COM/S5/REPORTOUTPUT/E4107D9C-7921-4173-B8C2-5E0C112F9CBF/REPORT.HTM) | DOWNLOAD REPORT (CREATEREPORTDOWNLOAD?T=221086&C=80353

CONTACTTYPE=TRIPASSISTANCE&FIRSTNAME=DAVID&LASTNAME=KLUTTZ&EMAIL=LAKELAND%40LAKELANDRS.COM&COMMENTS=CONTACT%20ME%20ABOUT%20THIS%20TRIP.&REFURL=HTTP%3A%2F%2F

Map | Data Offset | Trip Reprocessing | Merge Trips | Export Data

Depth | Vegetation | Composition

Link Tables to Map

Please click on the tab to load the data.

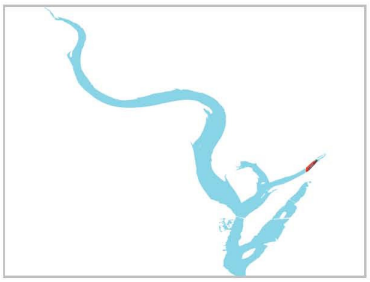
BIOBASE

VEGETATION ANALYSIS REPORT

Moses Lake, Grant County Washington

Generated: 6/18/2015 1:35:29 PM (UTC)

Waterbody Size: 2,754.04 ha *(6,805.40 acres)*



Data Collector
David Kluttz

Data Collection Date
6/17/2015 9:21:45 PM (UTC)

Average Water Temperature
24.4° C (75.92° F)

Location
Start: 47.13531494, -119.27804565
End: 47.13297272, -119.2779007

Survey Size
Area: 18.09 ha (44.71 acres)
Percent: 0.66% of waterbody
Volume: 247,778.70 cu. m (200.88 acre ft)

Settings
Track Buffer: 25 m
Grid Cell Size: 5 m
Min. BV Detect: 5%
Min. Veg Depth Detect: 0.73152 m

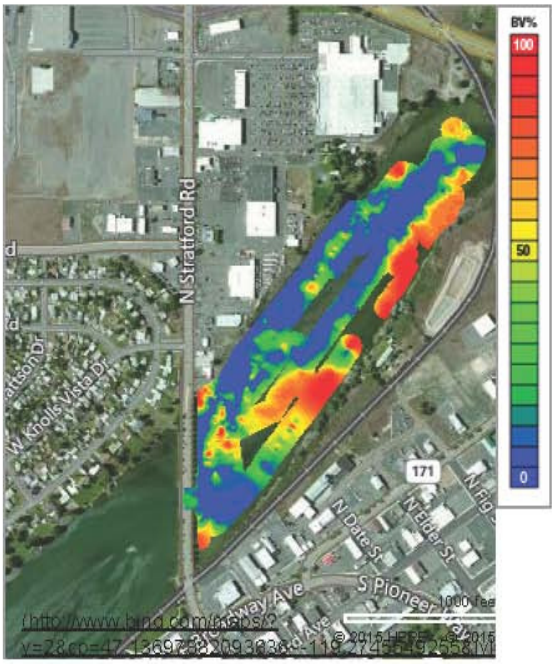
Survey Summary

	Type	PAC	Avg BVp	SD BVp	Avg BVw	SD BVw	Depth Range	Avg Depth	Distance	No. Points
Full Survey	Point	37.2%	35.5%	±29.4%	13.2%	±24.8%	0.36-30.48 m	1.48 m	13.59 km	2,707
	Grid	66.6%	42.5%	±28.2%	28.3%	±30.5%	0.07-3.76 m	1.28 m	-	5,136

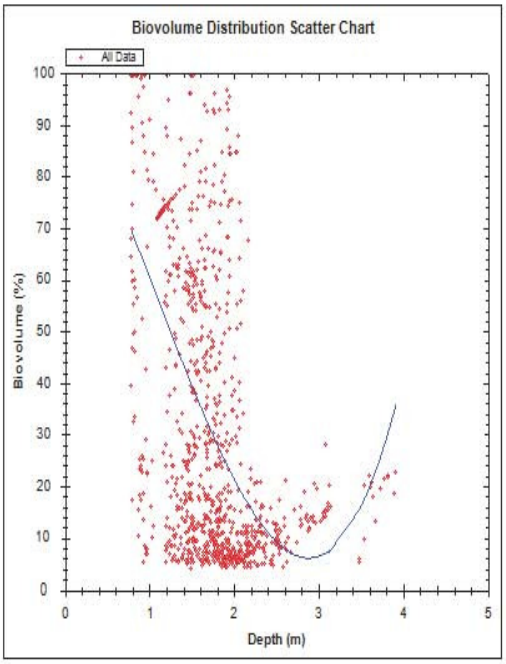
Area of Interest Summary

AOI	Type	PAC	Avg BVp	SD BVp	Avg BVw	SD BVw	Depth Range	Avg Depth	Distance	No. Points
1	Point	70.4%	14.5%	±10.6%	10.2%	±11.1%	0.74-4.08 m	2.19 m	286.2 m	196
	Grid	59.9%	33.3%	±25.5%	19.9%	±25.6%	0.12-3.76 m	1.66 m	-	289
2	Point	NaN%	NaN%	±NaN%	NaN%	±NaN%	0.36-1.95 m	1.06 m	279.78 m	0
	Grid	64.8%	32.9%	±22.3%	21.3%	±23.9%	0.34-2.6 m	1.44 m	-	244
3	Point	NaN%	NaN%	±NaN%	NaN%	±NaN%	0.88-1.44 m	1.05 m	110.21 m	0
	Grid	88.2%	34.9%	±19.1%	30.8%	±21.2%	0.52-1.43 m	0.9 m	-	170
4	Point	78.9%	68.6%	±14.6%	54.2%	±30.8%	0.82-1.67 m	0.97 m	292.13 m	38
	Grid	90.2%	52.3%	±23.7%	47.2%	±27.3%	0.5-2.28 m	1.09 m	-	459
5	Point	25.9%	40.7%	±29.7%	10.5%	±23.4%	0.74-3.21 m	1.77 m	1.46 km	753
	Grid	63.1%	42.6%	±25.9%	26.9%	±29.1%	0.07-3.18 m	1.44 m	-	1,714
6	Point	47.9%	34.4%	±28.5%	16.5%	±26.2%	0.9-2.77 m	1.76 m	219.43 m	188
	Grid	76.9%	38.4%	±22.1%	29.6%	±25.3%	0.34-2.6 m	1.39 m	-	347
7	Point	35.5%	33.9%	±26.8%	12%	±22.8%	0.37-2.71 m	1.45 m	5.69 km	1,166
	Grid	56.4%	28.7%	±21.2%	16.2%	±21.4%	0.1-3.76 m	1.38 m	-	2,808
8	Point	38.3%	47.4%	±36.3%	18.1%	±32.2%	0.38-2.8 m	1.05 m	3.18 km	366
	Grid	71.2%	53.5%	±29.8%	38.1%	±34.9%	0.07-3.18 m	1.07 m	-	1,887

Vegetation Biovolume Heat Map



Biovolume Distribution Scatter Chart



Biovolume Analysis by Quantity

AOI	0-5%	5-20%	20-40%	40-60%	60-80%	>80%
1	29.59%	59.69%	9.18%	0.51%	0%	1.02%
2	21.05%	2.63%	2.63%	2.63%	71.05%	0%
3	74.1%	11.29%	1.2%	2.26%	10.89%	0.27%
4	52.13%	26.06%	1.6%	5.32%	13.83%	1.06%
5	64.49%	15.01%	8.49%	5.57%	3.34%	3.09%
6	61.75%	14.21%	5.19%	3.55%	4.92%	10.38%

Biovolume Analysis by Depth

AOI	Depth	Type	Count	PAC	Avg BVp	SD BVp	Avg BVw	SD BVw
1	0-1m	Point	0	-	-	-	-	-
	1-2m		29	41.4%	13%	±3.1%	5.4%	±6.7%
	2-3m		134	71.6%	13.9%	±12.3%	10%	±12.1%
	3-4m		33	90.9%	16.8%	±4.8%	15.2%	±6.7%
	4-5m		0	-	-	-	-	-
	5-6m		0	-	-	-	-	-
	6-7m		0	-	-	-	-	-
	7-8m		0	-	-	-	-	-

	8-9m		0	-	-	-	-	-
	>9m		0	-	-	-	-	-
	0-1m	Grid	62	98.4%	52.4%	±26.4%	51.5%	±27%
	1-2m		123	43.9%	22.6%	±16.5%	9.9%	±15.7%
	2-3m		98	53.1%	23.5%	±19.7%	12.5%	±18.6%
	3-4m		6	100%	19.6%	±1.5%	19.6%	±1.5%
	4-5m		0	-	-	-	-	-
	5-6m		0	-	-	-	-	-
	6-7m		0	-	-	-	-	-
	7-8m		0	-	-	-	-	-
	8-9m		0	-	-	-	-	-
	>9m		0	-	-	-	-	-
AOI	**Depth**	**Type**	**Count**	**PAC**	**Avg BVp**	**SD BVp**	**Avg BVw**	**SD BVw**
2	**0-1m**	Point	0	-	-	-	-	-
	1-2m		0	-	-	-	-	-
	2-3m		0	-	-	-	-	-
	3-4m		0	-	-	-	-	-
	4-5m		0	-	-	-	-	-
	5-6m		0	-	-	-	-	-
	6-7m		0	-	-	-	-	-
	7-8m		0	-	-	-	-	-
	8-9m		0	-	-	-	-	-
	>9m		0	-	-	-	-	-
	0-1m	Grid	39	76.9%	34.7%	±18.5%	26.7%	±21.8%
	1-2m		178	65.7%	34%	±23.3%	22.4%	±24.8%
	2-3m		27	40.7%	16.7%	±13.7%	6.8%	±12%
	3-4m		0	-	-	-	-	-
	4-5m		0	-	-	-	-	-
	5-6m		0	-	-	-	-	-
	6-7m		0	-	-	-	-	-
	7-8m		0	-	-	-	-	-
	8-9m		0	-	-	-	-	-
	>9m		0	-	-	-	-	-
AOI	**Depth**	**Type**	**Count**	**PAC**	**Avg BVp**	**SD BVp**	**Avg BVw**	**SD BVw**
3	**0-1m**	Point	0	-	-	-	-	-
	1-2m		0	-	-	-	-	-
	2-3m		0	-	-	-	-	-
	3-4m		0	-	-	-	-	-
	4-5m		0	-	-	-	-	-
	5-6m		0	-	-	-	-	-
	6-7m		0	-	-	-	-	-
	7-8m		0	-	-	-	-	-
	8-9m		0	-	-	-	-	-
	>9m		0	-	-	-	-	-

	0-1m	Grid	120	89.2%	38.1%	±19.3%	33.9%	±21.7%
	1-2m		50	86%	27%	±16.1%	23.2%	±17.6%
	2-3m		0	-	-	-	-	-
	3-4m		0	-	-	-	-	-
	4-5m		0	-	-	-	-	-
	5-6m		0	-	-	-	-	-
	6-7m		0	-	-	-	-	-
	7-8m		0	-	-	-	-	-
	8-9m		0	-	-	-	-	-
	>9m		0	-	-	-	-	-
AOI	**Depth**	**Type**	**Count**	**PAC**	**Avg BVp**	**SD BVp**	**Avg BVw**	**SD BVw**
4	**0-1m**	Point	0	-	-	-	-	-
	1-2m		38	78.9%	68.6%	±14.6%	54.2%	±30.8%
	2-3m		0	-	-	-	-	-
	3-4m		0	-	-	-	-	-
	4-5m		0	-	-	-	-	-
	5-6m		0	-	-	-	-	-
	6-7m		0	-	-	-	-	-
	7-8m		0	-	-	-	-	-
	8-9m		0	-	-	-	-	-
	>9m		0	-	-	-	-	-
	0-1m	Grid	229	93.9%	53.6%	±22.9%	50.3%	±25.7%
	1-2m		219	90%	51.1%	±24.3%	46%	±27.7%
	2-3m		11	18.2%	37.9%	±32.7%	6.9%	±20.2%
	3-4m		0	-	-	-	-	-
	4-5m		0	-	-	-	-	-
	5-6m		0	-	-	-	-	-
	6-7m		0	-	-	-	-	-
	7-8m		0	-	-	-	-	-
	8-9m		0	-	-	-	-	-
	>9m		0	-	-	-	-	-
AOI	**Depth**	**Type**	**Count**	**PAC**	**Avg BVp**	**SD BVp**	**Avg BVw**	**SD BVw**
5	**0-1m**	Point	0	-	-	-	-	-
	1-2m		392	39%	48.8%	±28.1%	19%	±29.6%
	2-3m		354	11.9%	11.1%	±9.4%	1.3%	±4.8%
	3-4m		7	0%	-	-	0%	±0%
	4-5m		0	-	-	-	-	-
	5-6m		0	-	-	-	-	-
	6-7m		0	-	-	-	-	-
	7-8m		0	-	-	-	-	-
	8-9m		0	-	-	-	-	-
	>9m		0	-	-	-	-	-
	0-1m	Grid	326	98.2%	55.5%	±20.7%	54.5%	±21.8%

	1-2m		1195	62.3%	37.9%	±25.9%	23.6%	±27.5%
	2-3m		191	9.4%	8.7%	±4.3%	0.8%	±2.9%
	3-4m		2	0%	-	-	0%	±0%
	4-5m		0	-	-	-	-	-
	5-6m		0	-	-	-	-	-
	6-7m		0	-	-	-	-	-
	7-8m		0	-	-	-	-	-
	8-9m		0	-	-	-	-	-
	>9m		0	-	-	-	-	-
AOI	**Depth**	**Type**	**Count**	**PAC**	**Avg BVp**	**SD BVp**	**Avg BVw**	**SD BVw**
6	**0-1m**	Point	0	-	-	-	-	-
	1-2m		99	65.7%	44.2%	±27.8%	29%	±30.8%
	2-3m		89	28.1%	9%	±4.6%	2.5%	±4.7%
	3-4m		0	-	-	-	-	-
	4-5m		0	-	-	-	-	-
	5-6m		0	-	-	-	-	-
	6-7m		0	-	-	-	-	-
	7-8m		0	-	-	-	-	-
	8-9m		0	-	-	-	-	-
	>9m		0	-	-	-	-	-
	0-1m	Grid	79	88.6%	52.1%	±15%	46.2%	±21.7%
	1-2m		240	77.5%	34.6%	±22.2%	26.8%	±24.3%
	2-3m		28	39.3%	16.7%	±13.7%	6.5%	±11.8%
	3-4m		0	-	-	-	-	-
	4-5m		0	-	-	-	-	-
	5-6m		0	-	-	-	-	-
	6-7m		0	-	-	-	-	-
	7-8m		0	-	-	-	-	-
	8-9m		0	-	-	-	-	-
	>9m		0	-	-	-	-	-
AOI	**Depth**	**Type**	**Count**	**PAC**	**Avg BVp**	**SD BVp**	**Avg BVw**	**SD BVw**
7	**0-1m**	Point	0	-	-	-	-	-
	1-2m		1035	37.5%	34%	±26.9%	12.8%	±23.3%
	2-3m		131	19.8%	32.2%	±24.7%	6.4%	±16.9%
	3-4m		0	-	-	-	-	-
	4-5m		0	-	-	-	-	-
	5-6m		0	-	-	-	-	-
	6-7m		0	-	-	-	-	-
	7-8m		0	-	-	-	-	-
	8-9m		0	-	-	-	-	-
	>9m		0	-	-	-	-	-
	0-1m	Grid	662	69.8%	38.4%	±24.1%	26.8%	±26.8%
	1-2m		1923	53.5%	25.2%	±18.5%	13.5%	±18.5%
	2-3m		217	40.1%	19.3%	±17.4%	7.7%	±14.5%

	3-4m		6	100%	19.6%	±1.5%	19.6%	±1.5%
	4-5m		0	-	-	-	-	-
	5-6m		0	-	-	-	-	-
	6-7m		0	-	-	-	-	-
	7-8m		0	-	-	-	-	-
	8-9m		0	-	-	-	-	-
	>9m		0	-	-	-	-	-
AOI	**Depth**	**Type**	**Count**	**PAC**	**Avg BVp**	**SD BVp**	**Avg BVw**	**SD BVw**
8	**0-1m**	Point	103	79.6%	62.9%	±34.6%	50.1%	±39.9%
	1-2m		186	28.5%	27.3%	±26.2%	7.8%	±18.7%
	2-3m		77	6.5%	6%	±0.8%	0.4%	±1.5%
	3-4m		0	-	-	-	-	-
	4-5m		0	-	-	-	-	-
	5-6m		0	-	-	-	-	-
	6-7m		0	-	-	-	-	-
	7-8m		0	-	-	-	-	-
	8-9m		0	-	-	-	-	-
	>9m		0	-	-	-	-	-
	0-1m	Grid	1087	94.2%	61.2%	±27.8%	57.6%	±30.6%
	1-2m		682	44.9%	29.4%	±21.5%	13.2%	±20.5%
	2-3m		116	12.1%	20.4%	±23.9%	2.5%	±10.7%
	3-4m		2	0%	-	-	0%	±0%
	4-5m		0	-	-	-	-	-
	5-6m		0	-	-	-	-	-
	6-7m		0	-	-	-	-	-
	7-8m		0	-	-	-	-	-
	8-9m		0	-	-	-	-	-
	>9m		0	-	-	-	-	-

(/) (http://www.contourinnovations.com)

BIOBASE by Navico, Inc.

David Kluttz (/Account/UserProfile) LOG OFF

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Moses Lake, *Grant County, Washington*

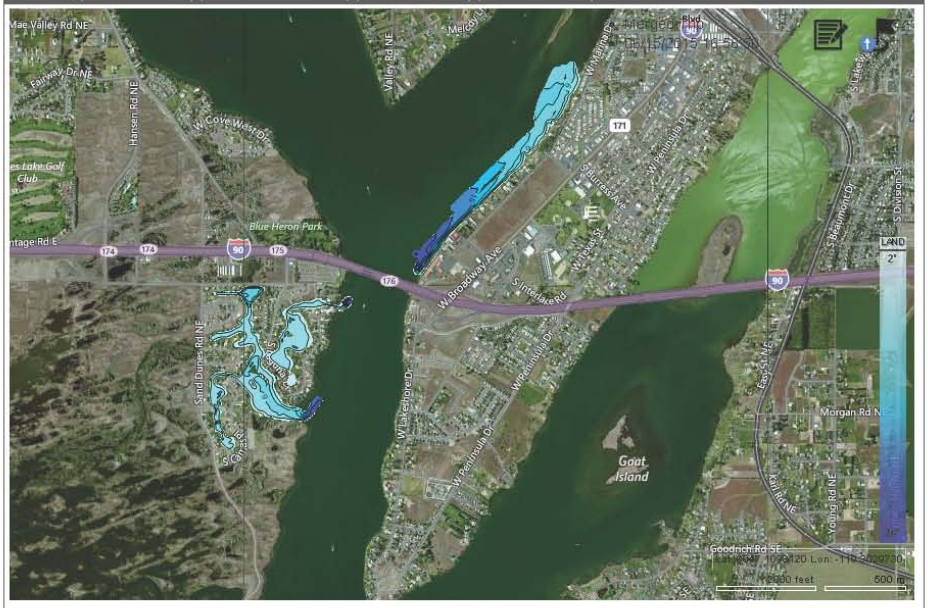
Single Trip

NOW VIEWING: Merge, 6/15/2015

VIEW REPORT (HTTP://FILES3.DIGITALMARINE.COM/S5/REPORTOUTPUT/159FB2AA-0E6F-472C-987F-82BD531D84D3/REPORT.HTM) | DOWNLOAD REPORT (CREATEREPORTDOWNLOAD?T=220575&C=80353

CONTACTTYPE=TRIPASSISTANCE&FIRSTNAME=DAVID&LASTNAME=KLUTTZ&EMAIL=LAKELAND%40LAKELANDRS.COM&COMMENTS=CONTACT%20ME%20ABOUT%20THIS%20TRIP.&REFURL=HTTP%3A%2F%2F

Map | Data Offset | Trip Reprocessing | Merge Trips | Export Data



Depth | Vegetation | Composition

Link Tables to Map

Please click on the tab to load the data.

BIOBASE

VEGETATION ANALYSIS REPORT

Moses Lake, Grant County Washington

Generated: 6/17/2015 9:48:21 PM (UTC)

Waterbody Size: 2,754.04 ha *(6,805.40 acres)*

Data Collector
David Kluttz

Data Collection Date
6/15/2015 4:58:50 PM (UTC)

Average Water Temperature
23.9° C (75.03° F)

Location
Start: 47.10086823, -119.3252182
End: 47.10114288, -119.32480621

Survey Size
Area: 86.46 ha (213.64 acres)
Percent: 3.14% of waterbody
Volume: 1,790,192.20 cu. m (1,451.33 acre ft)

Settings

Track Buffer:	25 m
Grid Cell Size:	5 m
Min. BV Detect:	5%
Min. Veg Depth Detect:	0.73152 m

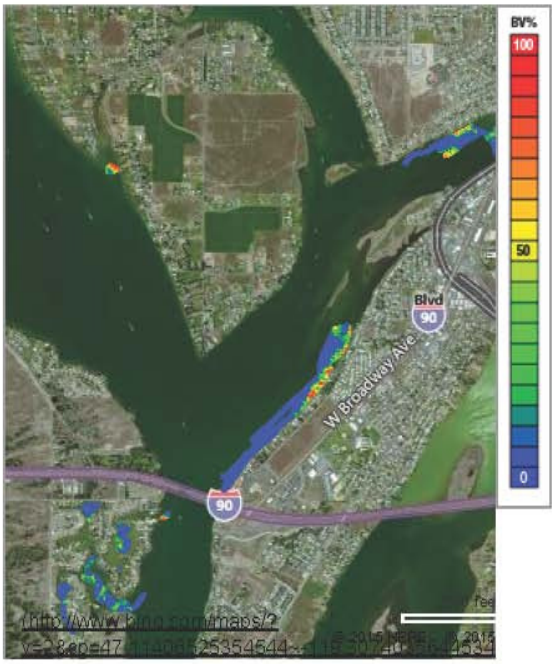
Survey Summary

	Type	PAC	Avg BVp	SD BVp	Avg BVw	SD BVw	Depth Range	Avg Depth	Distance	No. Points
Full Survey	Point	26.9%	38.2%	±27.3%	10.3%	±22.1%	0.66-7.9 m	2.01 m	32.12 km	5,467
	Grid	44.9%	33.5%	±25.3%	15%	±23.8%	0-7.95 m	2.36 m	-	47,610

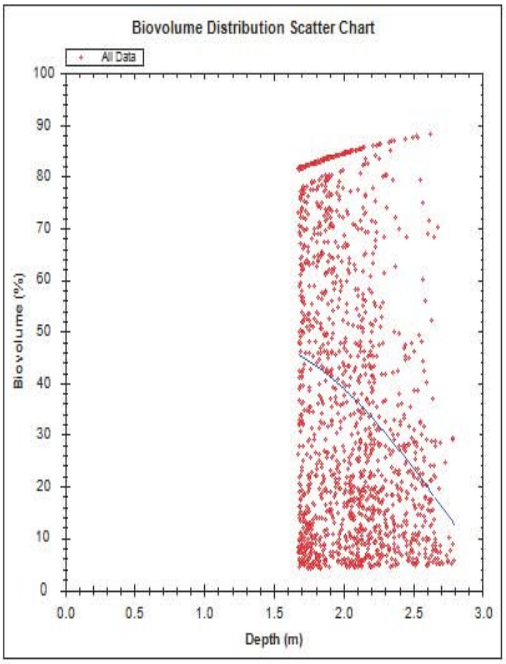
Area of Interest Summary

AOI	Type	PAC	Avg BVp	SD BVp	Avg BVw	SD BVw	Depth Range	Avg Depth	Distance	No. Points
1	Point	42.6%	42.5%	±34%	18.1%	±30.6%	0.68-7.9 m	1.3 m	3.19 km	202
	Grid	47.5%	21.5%	±22.2%	10.2%	±18.7%	0-7.95 m	1.89 m	-	2,367
2	Point	23.4%	35%	±24.5%	8.2%	±19%	1.03-7.36 m	3.3 m	6.77 km	2,301
	Grid	29.2%	33.5%	±24.5%	9.8%	±20.2%	0.02-7.4 m	3.29 m	-	15,906
3	Point	72.5%	47.6%	±30.5%	34.6%	±33.6%	0.66-1.87 m	1.18 m	2.16 km	51
	Grid	97.5%	51.4%	±27.4%	50.1%	±28.2%	0.35-1.88 m	1.56 m	-	685
4	Point	32.3%	46.6%	±28.2%	15%	±27%	0.68-3.52 m	1.74 m	11.65 km	1,704
	Grid	56.9%	38.3%	±25.8%	21.8%	±27.2%	0.03-3.95 m	1.86 m	-	20,588
5	Point	21.5%	24.1%	±19.7%	5.2%	±13.5%	0.68-6.76 m	1.82 m	7.83 km	1,209
	Grid	39.8%	16.2%	±11.1%	6.4%	±10.6%	0.02-7.06 m	2.05 m	-	8,064

Vegetation Biovolume Heat Map



Biovolume Distribution Scatter Chart



Biovolume Analysis by Quantity

AOI	0-5%	5-20%	20-40%	40-60%	60-80%	>80%
1	57.43%	19.8%	1.98%	3.96%	4.46%	12.38%
2	76.58%	8.17%	7.48%	2.91%	2.74%	2.13%
3	27.45%	25.49%	5.88%	5.88%	17.65%	17.65%
4	67.72%	8.8%	4.87%	5.99%	6.4%	6.22%
5	78.49%	12.82%	3.97%	2.81%	1.57%	0.33%

Biovolume Analysis by Depth

AOI	Depth	Type	Count	PAC	Avg BVp	SD BVp	Avg BVw	SD BVw
1	0-1m	Point	0	-	-	-	-	-
	1-2m		154	36.4%	23.3%	±25.4%	8.5%	±19%
	2-3m		31	96.8%	78.4%	±11.4%	75.8%	±17.8%
	3-4m		0	-	-	-	-	-
	4-5m		0	-	-	-	-	-
	5-6m		6	0%	-	-	0%	±0%
	6-7m		3	0%	-	-	0%	±0%
	7-8m		8	0%	-	-	0%	±0%
	8-9m		0	-	-	-	-	-

	>9m		0	-	-	-	-	-
	0-1m	Grid	402	62.9%	24%	±25.3%	15.1%	±23.2%
	1-2m		1700	42.5%	17.6%	±18.1%	7.5%	±14.7%
	2-3m		44	100%	57.3%	±31%	57.3%	±31%
	3-4m		24	87.5%	47.8%	±25.1%	41.8%	±28.3%
	4-5m		24	58.3%	38.5%	±17.5%	22.5%	±23.2%
	5-6m		37	37.8%	31.8%	±10.5%	12%	±16.8%
	6-7m		51	39.2%	21.5%	±5.8%	8.4%	±11.1%
	7-8m		85	41.2%	10.4%	±3.7%	4.3%	±5.7%
	8-9m		0	-	-	-	-	-
	>9m		0	-	-	-	-	-
AOI	**Depth**	**Type**	**Count**	**PAC**	**Avg BVp**	**SD BVp**	**Avg BVw**	**SD BVw**
2	**0-1m**	Point	0	-	-	-	-	-
	1-2m		213	90.1%	53.1%	±27.3%	47.9%	±30.3%
	2-3m		783	44.3%	25%	±15.4%	11.1%	±16.1%
	3-4m		643	0%	-	-	0%	±0%
	4-5m		371	0%	-	-	0%	±0%
	5-6m		171	0%	-	-	0%	±0%
	6-7m		112	0%	-	-	0%	±0%
	7-8m		8	0%	-	-	0%	±0%
	8-9m		0	-	-	-	-	-
	>9m		0	-	-	-	-	-
	0-1m	Grid	888	58.2%	57.4%	±25.5%	33.4%	±34.3%
	1-2m		1985	74.6%	46.9%	±25%	35%	±29.7%
	2-3m		5169	51.1%	21.5%	±14.9%	11%	±15.1%
	3-4m		3061	0.5%	6.4%	±1.1%	0%	±0.4%
	4-5m		2441	0%	-	-	0%	±0%
	5-6m		1258	0%	-	-	0%	±0%
	6-7m		751	0%	-	-	0%	±0%
	7-8m		353	0%	-	-	0%	±0%
	8-9m		0	-	-	-	-	-
	>9m		0	-	-	-	-	-
AOI	**Depth**	**Type**	**Count**	**PAC**	**Avg BVp**	**SD BVp**	**Avg BVw**	**SD BVw**
3	**0-1m**	Point	0	-	-	-	-	-
	1-2m		51	72.5%	47.6%	±30.5%	34.6%	±33.6%
	2-3m		0	-	-	-	-	-
	3-4m		0	-	-	-	-	-
	4-5m		0	-	-	-	-	-
	5-6m		0	-	-	-	-	-
	6-7m		0	-	-	-	-	-
	7-8m		0	-	-	-	-	-
	8-9m		0	-	-	-	-	-
	>9m		0	-	-	-	-	-
	0-1m	Grid	41	100%	78.4%	±3.9%	78.4%	±3.9%

	1-2m		644	97.4%	49.7%	±27.4%	48.4%	±28.2%
	2-3m		0	-	-	-	-	-
	3-4m		0	-	-	-	-	-
	4-5m		0	-	-	-	-	-
	5-6m		0	-	-	-	-	-
	6-7m		0	-	-	-	-	-
	7-8m		0	-	-	-	-	-
	8-9m		0	-	-	-	-	-
	>9m		0	-	-	-	-	-
AOI	**Depth**	**Type**	**Count**	**PAC**	**Avg BVp**	**SD BVp**	**Avg BVw**	**SD BVw**
4	**0-1m**	Point	0	-	-	-	-	-
	1-2m		606	53.8%	52.5%	±26.8%	28.2%	±32.7%
	2-3m		1066	21%	38.1%	±28%	8%	±20.1%
	3-4m		32	0%	-	-	0%	±0%
	4-5m		0	-	-	-	-	-
	5-6m		0	-	-	-	-	-
	6-7m		0	-	-	-	-	-
	7-8m		0	-	-	-	-	-
	8-9m		0	-	-	-	-	-
	>9m		0	-	-	-	-	-
	0-1m	Grid	1442	65.7%	57.2%	±27.5%	37.6%	±35.1%
	1-2m		10904	74.4%	40.3%	±25.5%	30%	±28.1%
	2-3m		7849	33.4%	25.9%	±19.9%	8.7%	±16.8%
	3-4m		393	9.7%	12.6%	±6.7%	1.2%	±4.3%
	4-5m		0	-	-	-	-	-
	5-6m		0	-	-	-	-	-
	6-7m		0	-	-	-	-	-
	7-8m		0	-	-	-	-	-
	8-9m		0	-	-	-	-	-
	>9m		0	-	-	-	-	-
AOI	**Depth**	**Type**	**Count**	**PAC**	**Avg BVp**	**SD BVp**	**Avg BVw**	**SD BVw**
5	**0-1m**	Point	0	-	-	-	-	-
	1-2m		611	20.9%	27.2%	±21.8%	5.7%	±14.9%
	2-3m		411	32.1%	21.1%	±17%	6.8%	±13.8%
	3-4m		133	0%	-	-	0%	±0%
	4-5m		6	0%	-	-	0%	±0%
	5-6m		9	0%	-	-	0%	±0%
	6-7m		39	0%	-	-	0%	±0%
	7-8m		0	-	-	-	-	-
	8-9m		0	-	-	-	-	-
	>9m		0	-	-	-	-	-
	0-1m	Grid	1268	54.5%	15.9%	±10.7%	8.7%	±11.2%
	1-2m		3945	39.9%	17.2%	±12.4%	6.9%	±11.5%

2-3m	1755	50.3%	14.6%	±8.8%	7.4%	±9.6%
3-4m	441	9.5%	16.3%	±10.1%	1.6%	±5.7%
4-5m	71	23.9%	8.2%	±2.9%	2%	±3.8%
5-6m	211	0%	-	-	0%	±0%
6-7m	365	0%	-	-	0%	±0%
7-8m	8	0%	-	-	0%	±0%
8-9m	0	-	-	-	-	-
>9m	0	-	-	-	-	-

Glossary

AOI

Area of Interest: Defines the individual transects or contiguous data samples as depicted by the color coding of each trip line. Seperate areas of interest can be generated through merging of multiple trips, appending data to a single sonar log or lapses in time (greater than five minutes) within a sonar log.

BVp

Biovolume (Plant):: Refers to the percentage of the water column taken up by vegetation when vegetation exists. Areas that do not have any vegetation are not taken into consideration for this calculation.

BVw

Biovolume (All water): Refers to the average percentage of the water column taken up by vegetation regardless of whether vegetation exists. In areas where no vegetation exists, a zero value is entered into the calculation, thus reducing the overall biovolume of the entire area covered by the survey.

PAC

Percent Area Covered: Refers to the overall surface area that has vegetation growing.

Grid

Geostatistical Interpolated Grid: Interpolated and evenly spaced values representing kriged (smoothed) output of aggregated data points. The gridded data is most accurate summary of individual survey areas.

Point

Individual Coordinate Point: A single point represents a summary of sonar pings and the derived bottom and canopy depths. Individual point data create an irregularily spaced dataset that may have overlaps and/or gaps in the data resulting in a increased potential for error.

Additional Information

No additional information

Report URL: http://files3.digitalmarine.com/s5/ReportOutput/159fb2aa-0e6f-472c-987f-82bd531d84d3/report.htm (http://files3.digitalmarine.com/s5/ReportOutput/159fb2aa-0e6f-472c-987f-82bd531d84d3/report.htm)

Appendix G

Treatment Plan Phase 1

Lakeland Restoration Services, LLC
78 E River Spur Rd, Priest River, ID 83856
Phone/Fax: (208) 448-2222
www.lakelandrs.com

2015 INVASIVE AQUATIC VEGETATION CONTROL
HERBICIDE AND ALGAECIDE TREATMENT
Moses Lake Irrigation & Rehabilitation District (MLIRD)
Moses Lake, Washington

TREATMENT PLAN

Project Preparation

Lakeland Restoration Services, LLC (LRS) will follow the procedures outlined in the Aquatic Herbicide Treatment Project Initialization Protocol. The protocol outlines the deliverables associated with obtaining and verifying pre-treatment data, herbicide procurement, site inspection procedures, equipment preparation, and mobilization.

Product Information

The following table outlines the products to be used for this project, along with the application rates and target species:

Product	Active Ingredient	Target Application Rate	Target Species
Reward®: Diquat	Diquat dibromide [6,7-dihydrodipyrido (1,2-a:2',1'-c	1.00 – 2.00 gal./ac.	Curly Leaf Pondweed, Big Leaf Pondweed, American Pondweed, Eurasian Watermilfoil
Aquathol® K: Endothall (mono-salt)	Dipotassium salt of endothall	1.96 GPAF	Curly Leaf Pondweed, Big Leaf Pondweed, American Pondweed, Eurasian Watermilfoil
DMA-4	2,4,-D	2.25 gallons/acre foot	Eurasian Water Milfoil

Area	Location	Avg. Depth	Surface Acreage	Aquathol @ 1.9 GPAF 85.00Gallon	Diquat @ 2 GPA 85.00 Gallon	2,4-D @ 2.25 GPAF 19.50 gallon
1	Mont Lake NW	3	24	0	50	170
2	Mont Lake SE	3	25	0	48	162
3	Wild Goose	4	6	48	12	0
4	Parker Horne N	3	10	60	20	0
5	Marina Drive	4	15	0	30	135
6	Mont Lake S	4	15	0	20	68
7	The Fill	3	10	60	10	0
Totals:			100	168	190	535
		Herbicide Total:		14280.00	16150.00	10432.50

Herbicide Cost	40862.50	**Notes:**
Application	24,500.00	
Mobilization and Demobilization	1500.00	
Treatment Plan	2,100.00	
Shoreline Posting, removal, & 21 day notice including printing	7,500.00	
GPS Monitoring	5000.00	
Toll Free Number, Website	500.00	
Water Quality Testing *Cost may be lowered due to products used.*	4500.00	***Because we are using 2,4-D water testing will need to be completed. Budgeted for 6 tests at 750.00, may not need 6 tests.***
NPDES maintenance and Final Report	2500.00	
Sub Total:	**88,962.50**	
Tax 7.9%	**7028.04**	
Treatment Plan Total:	**95,990.54**	***Any additional acres will be charged at a rate of 889.00 per acre***

Treatment Areas

The following table outlines the average depth, total surface acres, and amount of herbicides to be used for each of the areas to be treated along with the treatment plan projected total cost.

Algaecide treatment information 2015

Algaecide treatments will be performed on an on call basis. Prices are as follows.

Task	Qty.	Price	Total Price Per Acre
Phycomycin	100 lbs/acre	$1.57 lb.	$157.00 per acre
Shoreline Posting & Removal – Including Printing			$ 40.00 per acre
Application			$225.00 per acre
GIS/Website/Freedom Voice			$ 50.00 per acre
Mobilization/Demobilization			$ 25.00 per acre
		Total	**$497.00 per acre***
*Total does not include 7.9% WA State Sales Tax			

Treatment Daily Schedule & Project Timeline

Daily Schedule

Our crew will arrive on site at 7:00 am to prepare equipment and perform last minute safety checks. We will begin treatment between 8:30 am and 9:00 am, and head back to the project staging area to wrap up the day by 5:00 pm.

Projected Project Timeline

Task	Projected Completion Date
Treatment Plan	June 1, 2015
Business & Resident Notice sent out	June 5, 2015
Mobilization/Pre-Treatment Site Visit	June 17, 2015
Department of Ecology Pre-Treatment Notice	June 19, 2015
Shoreline Posting	June 20 & 21, 2015
Herbicide Application	June 26,2015
Department of Ecology Post-Treatment Notice	June 26, 2015
Final Report/GPS Data	November 1, 2015

Public Notifications

Lakeland Restoration Services will compose letters as directed by WSDOE and mail to all Business & Resident within a ¼ mile of the treatment areas. Herbicide and algaecide treatment letters will be sent at the same time.

Shoreline Posting

As outlined in the Aquatic Plant and Algae Management General Permit issued by the State of Washington Department of Ecology, shoreline notices will be distributed as follows:

- *Shoreline notices*
  - Signs shall be posted no more than 48 hours prior to treatment and shall remain in place until the end of the period of water use restrictions.
  - Signs shall be printed on white paper and drafted in English and Spanish.
  - Signs shall face the water and shore and be placed on each private or public property within 10 feet of shoreline and within 400 feet of the treatment area. One (1) sign shall be posted every 100 feet of the shoreline. Signs will be secured from the normal effects of weather and water currents.
- *Shoreline Public Access Areas* – includes swim beaches, docks, and boat launches at resorts, privately-owned community access areas, and anywhere the public can reasonably gain access.
  - Signs shall be a minimum of 2 feet by 3 feet in size, be made of weather resistant material, have the word "CAUTION" in bold black type at least 2 inches high, with all other words at least ½ inch high.
  - Signs shall face both the water and the shore and be placed within 25 feet of the shoreline within ¼ mile of the treatment area. One sign shall be posted along every 100 feet of shoreline in the public access areas.
  - An 8 ½ x 11 weather resistant map detailing the treatment areas for each product and the reader's location must be included on the sign.

LRS will remove all signs after the applicable restrictions have been lifted. The status of all applicable water restrictions will be posted at www.lakelandrs.com and on Lakeland's Project Line (877) 273-6674 for a minimum of 30 days after being lifted.

*Applicable restrictions for this project are as follows:

		LABEL				
Product	WA ECY	Drinking	Irrigation	Livestock	Fishing	Swimming
Reward® Diquat Dibromide	Swimming Advisory during and 24 hour post treatment	3 days	3 days for turf & ornamental. 5 days for food and production ornamental	Do not use treated water for animal consumption within 1 day	N/A	N/A
Aquathol® K	Swimming Advisory during and 24 hour post treatment	Less than 0.1ppm	7 days for annual nursery, green house crops, and newly seeded or transplanted annual crops, newly seeded or transplanted ornamentals, and newly seeded or sodded turf	Do not use treated water for animal consumption within 14 days	N/A	N/A
DMA®4 IVM	Swimming Advisory during and 24 hour post treatment	Less than 70 ppb	21 days or less than 100 ppb	N/A	N/A	N/A

Product Delivery/Distribution

Products will be supplied and stored as follows:

- Product will be delivered and stored at 920 East Wheeler, Moses Lake Washington.

.

Product will be stored in each location in a secured warehouse facility. The storage area will be secured and posted according to the guidelines established by the Washington State Department of Agriculture. Product will be transported as needed by LRS personnel to one or all of the following staging areas:

- Mont Lake Park/Boat Launch/Docks - 401 Linden Ave.
- Lower Peninsula Park/Boat Launch/Docks - 3519 Peninsula Drive
- Blue Heron Park/Boat Launch/Docks - 111 West Shore Drive

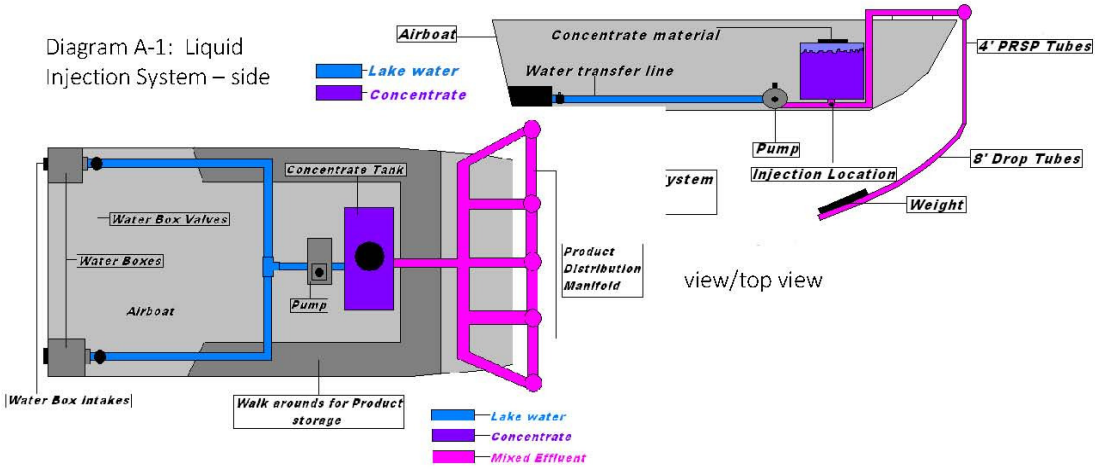
Two (2) Skid Steer loaders with pallet forks will be used to move product; one located at the storage site and one located at the launch site to unload the product. Product will be attended at all times by a company representative.

Treatment Methods

The application will be accomplished using one (1) nurse boat, and two (1) airboats using the following methodology:

Herbicide will be applied using a manifold boom style, sub-surface injection system that is attached to each airboat (pictures at right/diagram below). The collection side of the system gathers lake water from built-in water boxes at the rear of the boat, using a high volume, close tolerance pump powered by a 5hp Honda motor. The pump generates pressure through a manifold system causing a venturi effect, which pulls the concentrate from the tank, thereby mixing it with the lake water to be injected directly into the water column through the manifold boom. The boom is 8' wide and has 5 drop tubes, each 4' long.
For greater depths, if needed, weighted hoses are attached to each drop tube, to allow for the injection to be delivered directly into the plant bed. The weights are mounted in a vertical fashion so they will not collect plant debris. Injecting the herbicide directly into the plant bed exposes the plants to a higher concentration of herbicide and protects the herbicide from breaking down too rapidly due to ultraviolet light or water temperature thereby increasing the half life. This is especially important for the treatment of hybrid milfoil, as it typically grows lower in the water column and is more profuse.

Diagram A-1: Liquid Injection System – side



The concentrated herbicide will be monitored with a liquid volume meter that is attached to the manifold system. The applicator will control the flow of herbicide with a hand-operated valve in order to achieve the desired concentration. Herbicide will be continually poured from each 2.5 gallon container into a 25 gallon tank insuring a consistent application. Each container will be triple-rinsed in the treatment area during the treatment, and rendered incapable of reuse.

Personnel and Equipment

The following personnel and equipment will be used for this project:

- Four crew members, including two licensed applicators.
- 18-foot Airboat with 364 ci 550-hp motor capable of carrying 2,500-lb payload.
- 16-foot Airboat with 364 ci 500-hp motor capable of carrying 2,000-lb payload.
- 16-foot Airboat with 454 Chevy 425-hp motor capable of carrying 2,000-lb payload.
- 20-foot Hewescraft with 130-hp Honda motor, capable of 1,800-lb payload to be used as a nurse boat.
- Liquid injection system with 25-gallon tank and 5-foot subsurface injection nozzles.
- Garmin GPS equipment used to plot and track treatments.
- ARC View GIS 10.2.1 system to provide maps of treatment areas, analyze results, and supply ArcGIS compatible shape files.
- Biobase mapping program
- GEHL Skid Steer and Bobcat Skid Steer for moving pallets of herbicide product.
- Two (2) 18-foot tractor trailers for moving product.
- 2008 Ford F350 truck, used to haul equipment.
- 2013 Ford F150 truck, used to haul equipment.

Chemical and DO monitoring

Herbicide Residue Testing

When required by the NPDES permit, or at the request of the MLIRD appointed project manager, water will be collected and tested for herbicide residues. This activity will be planned based on the distribution of treatment areas around the water body.

Water samples will be collected using a Kemmerer bottle sampler at two (2) meters depth in all sites.

LRS will:

- Set up sample sites:
  - Two (2) inside the treatment areas.
  - Two (2) 500 feet outside of treatment areas.
- Water samples will be collected prior to the application of herbicides from all four (4) sites to establish a clean sample baseline.
- A second set of water samples will be collected approximately 24 –hours after the application of herbicide from all four (4) sites.
- A final set of four (4) water samples will be collected approximately 72-hours after the application of herbicide.

For testing analysis, all samples collected will be delivered the day of collection to an independent laboratory facility, Anatek Labs in Moscow, ID (www.anateklabs.com).

Analysis results will be available

- Within two (2) weeks for the pre-treatment samples.
- Within 24-hours for the post-treatment samples.
- The results of the 72-hour, post-treatment samples are asked for within 24-hours so additional sampling can be conducted if water use restrictions are still in place. (Please see the applicable restrictions table listed under *Shoreline Posting* above).
- The status of all applicable water restrictions will be posted at www.lakelandrs.com and on Lakeland's Project Line (877) 273-6674 for a minimum of 30 days after being lifted.

Dissolved oxygen monitoring

Dissolved oxygen (DO) is necessary for life in a water body. Dissolved oxygen is the concentration of oxygen dissolved in water, expressed in milligrams per liter (mg/l) ‡. Dissolved oxygen gets into the water by diffusion from the atmosphere, aeration of the water as it tumbles over falls and rapids, and as a waste product of photosynthesis. Dissolved oxygen levels can range from 0 mg/l to a maximum of 18 mg/l.

Large daily fluctuations in DO are characteristic of bodies of water with lots of plant growth; DO levels rise from morning through the afternoon as a result of photosynthesis, reaching a peak in

late afternoon. Photosynthesis stops at night, but plants and animals continue to respire and consume oxygen. As a result, DO levels fall to a low point just before dawn. Dissolved oxygen levels may dip below 4 mg/l in such waters - the minimum amount needed to sustain warm water fish like bluegill, bass, and pike†.

When large numbers of herbicide treated aquatic plants die, they support increasing amounts of bacteria which use large amounts of DO. Monitoring of DO will be done at a depth of two (2) meters, pre-, during and post-treatment at specific treatment sites. A maximum DO level will be recorded at the beginning of the herbicide application process; previous DO project levels post-treatment have reached 6 mg/l.

‡ from www.biologyonline.org/dictionary
†from http://www.water-research.net/Watershed/dissolvedoxygen.htm

Logs, Maps, and Tracking

The entire treatment will be monitored with the use of Global Positioning System (GPS) technology. Treatment routes will be pre-planned using ARC GIS 10.2.1, and pre-loaded into four (4) GPS devices (two (2) for each application vessel). By using two (2) GPS devices, the applicator can monitor their progress within the treatment area from multiple perspectives. In addition, using two (2) devices insures retention of data.

GPS tracks will be downloaded to Manifold System 8.0 GIS at the end of each treatment day. Tracks will be analyzed for thoroughness of treatment application, than reviewed by the MLIRD appointed Project Manager at the end of each day at the project site.
A biobase program will also be used this year.

A WSDA approved Herbicide Application Log (sample attached) will be completed to include the following:

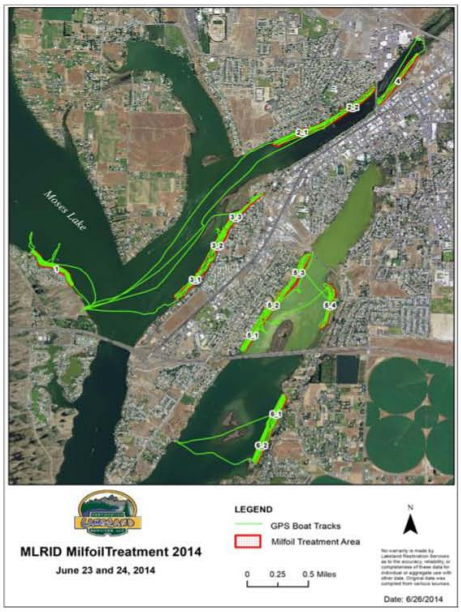
- Date
- Owner, Application Location, and Crop
- Approximate size of area treated
- Start and End times of the treatment
- Staff Names and License Numbers
- Weather conditions (temperature, wind etc.)
- Pesticide Information

A final report will be submitted to MLIRD appointed project manager within 60 days of the completion of treatment. The final report will include a summary of each of the following aspects of the project:

- Project Initialization
- Listing of Personnel who worked on the project
- Equipment used
- Posting/Notifications delivered
- Treatment (incl. methodology used and acreage/product totals)
- Logs, Maps, and Tracking procedures
- Product Delivery & Storage
- Environmental Protection Measures/Safety Equipment

The final report will also include the following:

- Copies of Herbicide Application Logs
- GPS Track logs showing treatment vessel paths and areas treated in both electronic (Arc View compatible) and hard copy formats (hard copy example at right).



<u>Environmental Protection Measures/Safety Equipment</u>

In order to minimize spills, herbicide will be manually loaded into and delivered by a nurse boat in sealed 2.5 gallon containers. The nurse boat will ferry the herbicide from its on-shore storage location directly to the application boat, which will remain in the target area throughout the day, insuring a contiguous application. Herbicide will be inventoried each time the nurse boat delivers it to the application boat to insure the correct amount of herbicide is applied to each area. Each load will be documented. Empty containers will be retrieved and taken to the airport and will be recycled.

Personal Protection Equipment will be provided to workers, as per the herbicide label information, and a spill kit and absorption materials will be available near the loading site and with each boat, to be used in the unlikely event of a spill. A copy of the project's ***Safety Plan*** is attached. There will be a safety orientation for all employees prior to treatment start.

Appendix H

Safety Plan Phase 1

Lakeland Restoration Services, LLC
78 E River Spur Rd, Priest River, ID 83856
Phone/Fax: (208) 448-2222
www.lakelandrs.com

Moses Lake
AQUATIC VEGETATION CONTROL
SITE SPECIFIC SAFETY PLAN
June 22 to June 26, 2015

Table of Contents

1.0 ORGANIZATIONAL STRUCTURE

(in compliance with 29 CFR 1910.120(b)(2))

This chapter of the Health and Safety Plan describes lines of authority, responsibility, and communication as they pertain to health and safety functions at this site. The purpose of this chapter is to identify the personnel who impact the development and implementation of the site health and safety plan and to describe their roles and responsibilities. This chapter also identifies other contractors and subcontractors involved in work operations and establishes the lines of communication among them for safety and health matters.

The organizational structure of this site's safety and health program is consistent with OSHA requirements in 29 CFR 1910.120(b)(2) and provides the following site-specific information:

* the general supervisor who has the responsibility and authority to direct all hazardous waste operations
* the site safety and health officer who has the responsibility and authority to develop and implement this HASP and verify compliance
* other personnel needed for hazardous waste operations and emergency response and their general functions and responsibilities
* the lines of authority, responsibility, and communication for safety and health functions

This section is reviewed and updated as necessary to reflect the current organizational structure at this site.

1.1 Roles and Responsibilities

All personnel and visitors on this site must comply with the requirements of this HASP. The specific responsibilities and authority of management, safety and health, and other personnel on this site are detailed in the following paragraphs. A site organizational chart illustrating the hierarchy of personnel and lines of communication within this company and with additional contractors on site is found in Figure 1-1.

Project Manager (PM)

The Project Manager (PM) for this site is Dave Kluttz. The PM has responsibility and authority to direct all work operations. The PM coordinates safety and health functions with the Site Safety and Health Officer (SSHO), has the authority to oversee and monitor the performance of the SSHO, and bears ultimate responsibility for the proper implementation of this HASP. The specific duties of the PM are:

Preparing and coordinating the site work plan; providing site supervisor(s) with work assignments and overseeing their performance; coordinating safety and health efforts with the SSHO; ensuring effective emergency response through coordination with the Emergency Response Coordinator (ERC); serving as primary site liaison with public agencies and officials and site contractors.

The qualified alternate Project Manager (PM) for this site is Jake Nesbitt.

Site Safety and Health Officer (SSHO)

The Site Safety and Health Officer (SSHO) for this site is Dave Kluttz. The SSHO has full responsibility and authority to develop and implement this HASP and to verify compliance. The SSHO reports to the Project Manager. The SSHO is on site or readily accessible to the site during all work operations and has the authority to halt site work if unsafe conditions are detected. The specific responsibilities of the SSHO are:

Managing the safety and health functions on this site; serving as the site's point of contact for safety and health matters; ensuring site monitoring, worker training, and effective selection and use of PPE; assessing site conditions for unsafe acts and conditions and providing corrective action; assisting the preparation and review of this HASP; maintaining effective safety and health records as described in this HASP; coordinating with the Emergency Response Coordinator (ERC), Site Supervisor(s), and others as necessary for safety and health efforts.

The qualified alternate Site Safety and Health Officer (SSHO) for this site is Jake Nesbitt.

Emergency Response Coordinator (ERC)

The Emergency Response Coordinator (ERC) for this site is Dave Kluttz. The ERC is responsible for assessing site conditions and directing and controlling emergency response activities in accordance with the Site Emergency Response Plan. The ERC reports to the Project Manager (PM). The ERC will ensure the evacuation, emergency transport, and treatment of site personnel and will notify the appropriate emergency response units and management staff in accordance with the emergency response plan of this HASP. Specific duties of the ERC include:

Developing and reviewing the emergency response plan; conducting emergency response rehearsals; ensuring effective emergency response to and evacuation of the site; coordinating emergency response functions with the Site Safety and Health Officer (SSHO), and integrating site emergency response plans with the disaster, fire, and/or emergency response plans of local, state, and federal organizations and agencies.

The qualified alternate Emergency Response Coordinator (ERC) for this site is Jake Nesbitt.

The qualified second alternate Emergency Response Coordinator (ERC) for this site is Cathy Girffin.

Site Workers

Site workers are responsible for complying with this HASP, using the proper PPE, reporting unsafe acts and conditions, and following the work and safety and health instructions of the Project Manager (PM), Site Safety and Health Officer (SSHO), and Site Supervisor.

1.2 Identification of Other Site Contractors

There are no other contractors or subcontractors on this site.

2.0 JOB HAZARD ANALYSIS

(in compliance with 29 CFR 1910.120(b)(4)(ii)(A),and 1910.120(i))

This chapter of the HASP describes the safety and health hazards associated with site work and the control measures selected to protect workers. The purpose of a job hazard analysis (JHA) is to identify and quantify the health and safety hazards associated with each site task and operation, and to evaluate the risks to workers. Using this information, appropriate control methods are selected to eliminate the identified risks if possible, or to effectively control them. The control methods are documented in each task-specific JHA. The information contained in this chapter is essential to effective preparation of all other chapters of the HASP. This section of the HASP includes:

* job hazard analysis
* hazardous substance information
* employee notification of hazards

The person responsible for ongoing job hazard analysis at this site Dave Kluttz.

2.1 Job Hazard Analysis

Each site-specific JHA appears on a separate copy of Table 2-1. Each JHA lists a task or operation required during site operations and the location(s) where that task or operation is performed. A single JHA may be used for a task/operation performed in multiple locations if the hazards, potential exposures, and controls are the same in each location.

Each JHA lists the chemical hazards associated with that task and their known or anticipated concentrations during performance of the task. Each JHA also identifies anticipated physical and biological hazards and potential exposure levels or the likelihood of exposure. The final section of each JHA lists the control measures implemented to protect employees from exposure to the identified hazards. The information provided here is designed to satisfy the job hazard analysis requirements of 1910.120(b)(4)(ii)(A) and the workplace hazard assessment requirements of 1910.132(d). Health hazard information for all chemical substance identified in site JHAs appears in hazard data sheets attached to this chapter.

Dave Kluttz modifies site-specific JHAs and the accompanying data sheets when:

* the scope of work is changed by adding, eliminating, or modifying tasks
* new methods of performing site tasks are selected
* observation of the performance of site tasks results in a revised characterization of the hazards
* new chemical, biological, or physical hazards are identified
* exposure data indicate changes in the concentration and/or likelihood of exposure
* new/different control measures are selected

When JHAs are modified, related provisions in other chapters of this HASP are modified as needed.

Table 2-1: Site-Specific Job Hazard Analysis

Operational Phase	Phase No	Task/Operation	Location Where Task/Operation Performed
JH 01	1	On shore loading and handling	Moses Lake

Conducted	Print Name	Signature
June 22,2015	Dave Kluttz	

Chemical Hazards

Chemical Name	Source	Concentration	Exposure Potential During Operations
Aquathol	Containers and Decks	100	Unlikely
DMA 4 IVM	Containers and Decks	100	Unlikely
Reward	Containers and Decks	100	Unlikely

Physical Hazards

Name of Physical Hazard	Source	Exposure Potential During Operations
Falling Down Bank	Steep Banks	Unlikely
Falling Overboard	Water	Unlikely

Biological Hazards

Name of Biological Hazard	Source	Exposure Potential During Operations

No Biological Hazards

Control Measures Used

Engineering Controls: Locate pump, tank and hoses to reduce tripping hazards.
Work Practices: Exercise care when loading and handling, exercise care when moving and transporting equipment and use proper Personal Protection Equipment to reduce exposure hazard. Follow Aquatic Herbicide Label instructions.

Level of PPE:
- Long Sleeve Shirt or Coveralls
- Shoes with socks
- Gloves
- Eye Protection
- Hats

PPE Upgrade: No

PPE Downgrade: No

Table 2-1: Site-Specific Job Hazard Analysis

Operational Phase	Phase No	Task/Operation	Location Where Task/Operation Performed
JH 02	1	On boat application to targeted vegetation	Moses Lake

Conducted	Print Name	Signature
June 22, 2015	Dave Kluttz	

Chemical Hazards

Chemical Name	Source	Concentration	Exposure Potential During Operations
Aquathol	Containers, Hoses, and Pumps	100	Unlikely
DMA 4 IVM	Containers, Hoses, and Pumps	100	Unlikely
Reward	Containers, Hoses, and Pumps	100	Unlikely

Physical Hazards

Name of Physical Hazard	Source	Exposure Potential During Operations
Tripping over hoses	Hoses	Unlikely
Falling Overboard	Water	Unlikely

Biological Hazards

Name of Biological Hazard	Source	Exposure Potential During Operations
No Biological Hazards		

Control Measures Used

Engineering Controls: Locate pump, tank and hoses to reduce tripping hazards.
Work Practices: Exercise care when loading and handling, exercise care when moving and transporting equipment and use proper Personal Protection Equipment to reduce exposure hazard. Follow Aquatic Herbicide Label instructions.

Level of PPE:
- Long Sleeve Shirt or Coveralls
- Shoes with socks
- Gloves
- Eye Protection
- Hats

PPE Upgrade: No

PPE Downgrade: No

2.2 Employee Notification of Hazards and Overall Site Information Program

The information in the JHAs and the attached data sheets is made available to all employees who could be affected by it prior to the time they begin their work activities. Modifications to JHAs and the accompanying data sheets are communicated during routine briefings.

The person responsible for providing site information, this HASP, and any modifications to the HASP to other contractors and subcontractors working on this site is: Dave Kluttz.

AQUATHOL® K

AQUATIC HERBICIDE

For aquatic plant control in quiescent, slow moving, and flowing water aquatic sites.

ACTIVE INGREDIENT:	
Dipotassium salt of endothall*	40.3%
OTHER INGREDIENTS:	59.7%
TOTAL	100.0%

Contains 4.23 lbs. dipotassium endothall* per gallon
*7-oxabicyclo [2.2.1]heptane-2,3-dicarboxylic acid equivalent 28.6%

KEEP OUT OF REACH OF CHILDREN

DANGER PELIGRO

Si usted no entiende la etiqueta, busque a alguien para que se la explique a usted en detalle. (If you do not understand the label, find someone to explain it to you in detail.)

FIRST AID

IF IN EYES:
- Hold eye open and rinse slowly and gently with water for 15-20 minutes.
- Remove contact lenses, if present, after the first 5 minutes, then continue rinsing.
- Call a poison control center or doctor for treatment advice.

IF SWALLOWED:
- Call a poison control center or doctor immediately for treatment advice.
- Have person sip a glass of water if able to swallow.
- Do not induce vomiting unless told by a poison control center or doctor.
- Do not give anything by mouth to an unconscious person.

IF ON SKIN OR CLOTHING:
- Take off contaminated clothing.
- Rinse skin immediately with plenty of water for 15-20 minutes.
- Call a poison control center or doctor for treatment advice.

IF INHALED:
- Move person to fresh air.
- If person is not breathing, call 911 or ambulance, then give artificial respiration, preferably mouth-to-mouth if possible.
- Call a poison control center or doctor for treatment advice.

HOT LINE NUMBER: Have the product container or label with you when calling a poison control center or doctor, or going for treatment. You may also contact 866-673-6671 (Rocky Mountain Poison Control Center) for emergency medical treatment information.

See inside for additional precautionary statements.

NOTE TO PHYSICIAN: Measures against circulatory shock, respiratory depression, and convulsion may be needed.

EPA Registration No. 70506-176

Batch/Lot No.: _____

Net Contents: _____

United Phosphorus, Inc.
630 Freedom Business Center, Suite 402
King of Prussia, PA 19406
1-800-438-6071

PRODUCT INFORMATION

Aquathol K is a liquid concentrate soluble in water which is effective against a broad range of aquatic plants. Dosage rates indicated for the application of Aquathol K are measured in parts per million (ppm) of dipotassium endothall.

PRECAUTIONARY STATEMENTS
HAZARDS TO HUMANS AND DOMESTIC ANIMALS

DANGER

CORROSIVE. CAUSES IRREVERSIBLE EYE DAMAGE. MAY BE FATAL IF SWALLOWED. HARMFUL IF INHALED OR ABSORBED THROUGH SKIN. DO NOT GET IN EYES, ON SKIN, OR ON CLOTHING. AVOID BREATHING VAPORS OR SPRAY MIST. PROLONGED OR FREQUENTLY REPEATED SKIN CONTACT MAY CAUSE ALLERGIC REACTIONS IN SOME INDIVIDUALS.

Personal Protective Equipment (PPE)

Mixers, Loaders, Applicators and other handlers must wear:

- Long-sleeved shirt and long pants,
- Shoes and socks,
- Chemical-resistant gloves made of any waterproof material,
- Protective eyewear,
- NIOSH-approved respirator with a dust/mist filter with MSHA/NIOSH approval number prefix TC-21C or any N, R, P, or HE filter.

  Exception: During application, the respirator need not be worn, provided that the pesticide is applied in a manner (such as direct metering or subsurface application from the rear of a vessel that is moving into the wind) such that the applicator will have no contact with the pesticide.

See Engineering Controls for additional requirements.

User Safety Requirements:

Follow the manufacturers' instructions for cleaning/maintaining PPE. If no such instructions for washables exist, use detergent and hot water. Keep and wash PPE separately from other laundry.

Discard clothing or other absorbent materials that have been drenched or heavily contaminated with this product's concentrate. Do not reuse them.

Engineering Controls:

When mixers and loaders use a closed system designed by the manufacturer to enclose the pesticide to prevent it from contacting handlers or other people AND the system is functioning properly and is used and maintained in accordance with the manufacturers written operating instructions, the handlers need not wear a respirator, provided the required respirator is immediately available for use in an emergency such as a spill or equipment breakdown.

When handlers use closed systems, enclosed cabs, or aircraft in a manner that meets the requirements listed in the Worker Protection Standard (WPS) for agricultural pesticides [40 CFR 170.240(d)(4-6)], the handler PPE requirements may be reduced or modified as specified in the WPS.

User Safety Recommendations

User should:

- Wash hands before eating, drinking, chewing gum, using tobacco, or using the toilet.
- Remove clothing/PPE immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing.
- Remove PPE immediately after handling this product. Wash the outside of gloves before removing. As soon as possible, wash thoroughly and change into clean clothing.

ENVIRONMENTAL HAZARDS

Do not contaminate water by cleaning of equipment or disposal of equipment washwaters.

This pesticide is toxic to mammals.

Treatment of aquatic plants can result in oxygen loss from decomposition of dead plants. This loss can cause fish suffocation. Water bodies containing very high plant density should be treated in sections to prevent suffocation of fish.

DIRECTIONS FOR USE

It is a violation of Federal law to use this product in a manner inconsistent with its labeling.

Do not apply this product in a way that will contact workers or other persons, either directly or through drift.

- For quiescent or slow moving water treatments: Waters treated with Aquathol K may be used for swimming, fishing, and irrigating turf, ornamental plants and crops immediately after treatment with the following exceptions: Do not use the Aquathol K treated water to irrigate the following for 7 days after the treatment: annual nursery or greenhouse crops including hydroponics and newly seeded or transplanted annual crops, newly seeded or transplanted ornamentals, and newly sodded or seeded turf. Do not use treated water for animal consumption within the following periods:

  0.5 ppm dipotassium salt – 7 days after application

  4.25 ppm dipotassium salt – 14 days after application

  5.0 ppm dipotassium salt – 25 days after application
- For flowing water treatments: Waters treated with Aquathol K may be used for swimming, fishing, livestock watering, and irrigating turf, ornamental plants and crops immediately after treatment with the following exceptions: Do not use the Aquathol K treated water to irrigate the following: annual nursery or greenhouse crops including hydroponics and newly seeded or transplanted annual crops, newly seeded or transplanted ornamentals, and newly sodded or seeded turf.
- Phytotoxicity is not expected on plants or crops irrigated with Aquathol K treated water, however, all species and cultivars (varieties) have not been tested.
- Undiluted Aquathol K may be injurious to crops, grass, ornamentals, and other foliage.
- Do not use Aquathol K treated water for chemigation as interactions between Aquathol K and other pesticides and fertilizers are not known.
- Do not use Aquathol K in brackish or saltwater.
- Wash out spray equipment with water after each operation.
- Avoid contact of spray concentrate (product) directly or by drift with non-target plants or crops as injury may result.

HOW TO APPLY:

Aquathol K is a contact herbicide; consequently, apply when target plants are present.

Aquathol K should be sprayed on the water or injected below the water surface. It may be applied as a concentrate or diluted with water depending on the equipment.

In instances where the plant(s) to be controlled is an exposed surface problem (i.e., some of the broad-leaved pond weeds) coverage is important. For best results, apply the concentrate with the least amount of water compatible with the application equipment.

Drinking Water (Potable Water)

Consult with appropriate state or local water authorities before applying this product to public waters. State or local agencies may require permits.

The drinking water (potable water) restrictions on this label are to ensure that consumption of water by the public is allowed only when the concentration of endothall acid in the water is less than the MCL (Maximum Contamination Level) of 0.1 ppm. Applicators should consider the unique characteristics of the treated waters to assure that endothall acid concentrations in potable drinking water do not exceed 0.1 ppm at the time of consumption.

For Lakes, Ponds, and other Quiescent Water Bodies:

- For Aquathol K applications, the drinking water setback distance from functioning potable water intakes in the treated water body must be greater than or equal to 600 feet.
- Note: Existing potable water intakes that are no longer in use, such as those replaced by a connection to a municipal water system or a potable water well, are not considered to be functioning potable water intakes.

For Irrigation Canals and other Flowing Water Bodies:

- Applicator is responsible to assure that treated water does not enter potable water intakes. For Aquathol K applications, potable water intakes must be closed when treated water is present at the intake. In the event the water intake cannot be closed, treatments must only be made downstream from the intake in order to assure Aquathol K treated water does not enter the potable water system.

QUIESCENT OR SLOW MOVING WATER TREATMENTS: SURFACE OR INJECTED APPLICATIONS

For aquatic plant control in quiescent or slow moving water, Aquathol K recommended use rates can be found in the following chart. Since the active ingredient is water soluble and tends to diffuse from the treated area, select the dosage rate applicable to the area to be treated. Marginal treatments of large bodies of water require higher rates as indicated.

Use higher labeled rates of Aquathol K when making treatments to small areas with an increased potential for rapid dilution or when treating narrow areas such as boat lanes or shoreline treatments where dilution may reduce the exposure of plants to Aquathol K.

Use lower labeled rates of Aquathol K for large contiguous treatment blocks or in protected areas such as coves where reduced water movement will not result in rapid dilution of Aquathol K from the target treatment area or when treating entire lakes or ponds.

PLANTS CONTROLLED AND AQUATHOL K DOSAGE RATE CHART

	APPLICATION RATE			
	Entire Pond/Lake or Large Area Treatment		Spot or Lake Margin Treatment	
Aquatic Plant	ppm Dipotassium Endothall	gallons Aquathol K per Acre Ft.	ppm Dipotassium Endothall	gallons Aquathol K per Acre Ft.
Bur Reed, Sparganium spp.	3.0-4.0	1.9-2.6	4.0-5.0	2.6-3.2
Coontail, Ceratophyllum spp.	2.0-3.0	1.3-1.9	3.0-5.0	1.9-3.2
Horned Pondweed, Zannichellia palustris	2.0-3.0	1.3-1.9	3.0-5.0	1.9-3.2
Sago Pondweed, Stuckenia pectinata	1.0-2.0	0.6-1.3	2.0-5.0	1.3-3.2
Hydrilla, Hydrilla verticillata	1.0-4.0	0.6-2.6	2.0-5.0	1.3-3.2
Hygrophila*, Hygrophila polysperma	4.0-5.0	2.6-3.2	5.0	3.2
Milfoil, Myriophyllum spp.	2.0-3.0	1.3-1.9	3.0-5.0	1.9-3.2
Naiad, Najas spp.	2.0-4.0	1.3-2.6	3.0-5.0	1.9-3.2
Pondweed, Potamogeton spp.	0.75-3.0	0.45-1.9	1.5-5.0	1.0-3.2
Including:				
American, P. nodosus	2.0-3.0	1.3-1.9	3.0-5.0	1.9-3.2
Largeleaf (Bass Weed), P. amplifolius	2.0-3.0	1.3-1.9	3.0-5.0	1.9-3.2
Curlyleaf, P. crispus	0.75-1.5	0.45-1.0	1.5-5.0	1.0-3.2
Flatstem, P. zosteriformis	2.0-3.0	1.3-1.9	3.0-5.0	1.9-3.2
Floating-leaf, P. natans	1.0-2.0	0.6-1.3	2.0-5.0	1.3-3.2
Illinois, P. Illinoensis	1.5-2.5	1.0-1.6	2.5-5.0	1.6-3.2
Narrowleaf, P. pusillus	1.0-2.0	0.6-1.3	2.0-5.0	1.3-3.2
Threadleaf, P. filiformis	2.0-3.0	1.3-1.9	3.0-5.0	1.9-3.2
Variable Leaf, P. diversifolius	1.0-2.0	0.6-1.3	2.0-5.0	1.3-3.2
Parrotfeather, Myriophyllum aquaticum	2.0-3.0	1.3-1.9	3.0-5.0	1.9-3.2
Water Stargrass, Heteranthera spp.	2.0-3.0	1.3-1.9	3.0-5.0	1.9-3.2

* Suppression only

The following charts indicate the quantity of Aquathol K to be applied.

Gallons of Aquathol K to Treat One Acre-Foot of Water

	Rate (ppm)						
	0.75	**1.0**	**1.5**	**2.0**	**3.0**	**4.0**	**5.0**
	gallons/A-ft.						
1 acre ft.	0.45	0.6	1.0	1.3	1.9	2.6	3.2

Fluid Ounces of Aquathol K to Treat 1,000 Square-Feet per Foot of Depth

	Rate (ppm)						
	0.75	**1.0**	**1.5**	**2.0**	**3.0**	**4.0**	**5.0**
	fl. oz./1,000 ft.^{2}						
1,000 ft.^{2}	1.4	1.9	2.8	3.8	5.7	7.6	9.4

FLOWING WATER TREATMENTS (WITH THE EXCEPTION OF IRRIGATION CANALS): DRIP OR METERING SYSTEM APPLICATIONS

For aquatic plant control in flowing water, Aquathol K recommended use rates can be found in the following chart. Apply Aquathol K in a manner to achieve the desired rate and adequate mixing so product is distributed throughout the entire water column. Adequate concentration (rate) and exposure time (length of treatment) will impact Aquathol K efficacy on the target plant species. Although Aquathol K is a contact herbicide adequate exposure time is critical. The rates and the length of treatment are guidelines to control the target species. The following rate chart has been developed based on Concentration Exposure Time (CET) data for Aquathol K. The CET concept allows rates and the length of exposure to be adjusted for different treatment scenarios.

AQUATHOL K APPLICATION RATES FOR FLOWING WATER TREATMENTS

	Length of Treatment (hours)							
	6	**8**	**12**	**18**	**24**	**36**	**48**	**72**
Plant Species	Rate (ppm)							
Pondweeds (Potamogeton spp.) Sago Pondweed (Stuckenia pectinata)	4.0-5.0	3.0-4.0	2.0-3.0	1.5-2.5	1.0-2.0	0.75-1.5	0.5-1.0	0.5
Milfoil (Myriophyllum spp.) Parrotfeather (Myriophyllum aquaticum) Coontail (Ceratophyllum spp.) Horned pondweed (Zannichellia spp.) Hydrilla (Hydrilla verticillata) Naiad (Najas spp.) Water Stargrass (Heteranthera spp.)	5.0	4.0-5.0	3.0-4.0	2.0-3.0	1.5-2.5	1.0-2.0	0.75-1.5	0.5-1.0

NOTE: Hygrophila (Hygrophila polysperma) may be suppressed at the higher application rates listed in this table.

Restrictions: Do not apply more than 30 ppm per growing season, not to exceed 5 ppm per application. Do not apply more than a total of 5 ppm within a 7-day interval.

Note: There is no Pre-harvest Interval (PHI) for crops irrigated with treated water.

To calculate the amount of Aquathol K required for a particular treatment use the following formula:

[Cubic Feet per Second (CFS) X Length of Treatment (hrs.) X Rate (ppm)] x 0.052947 = Gallons of Aquathol K Needed for Treatment

To calculate the amount of Aquathol K to be applied per hour use the following formula:

Gallons of Aquathol K per Hour = Total Gallons of Aquathol K / Length of Treatment (hrs.)

STORAGE AND DISPOSAL

Do not contaminate water, food, or feed by storage and disposal.

Pesticide Storage: Store in the original container. Do not store in a manner where cross-contamination with other pesticides, fertilizers, food or feed could occur. Storage at temperatures below 32°F may result in the product freezing or crystallizing. Should this occur the product must be warmed to 50°F or higher and thoroughly agitated. In the event of a spill during handling or storage, absorb with sand or other inert material and dispose of absorbent in accordance with the Pesticide Disposal instructions listed below.

Pesticide Disposal: Pesticide wastes are acutely hazardous. Improper disposal of excess pesticide, spray mixture, or rinsate is a violation of Federal law. If these wastes cannot be disposed of by use according to label instructions, contact your State Pesticide or Environmental Control Agency, or the Hazardous Waste representative at the nearest EPA Regional Office for guidance.

Container Handling:

(for Nonrefillable containers)

Nonrefillable container. Do not reuse or refill this container. Triple rinse or pressure rinse container (or equivalent) promptly after emptying.

For containers 5 gallons or less:

Triple rinse as follows: Empty the remaining contents into application equipment or a mix tank and drain for 10 seconds after the flow begins to drip. Fill the container 1/4 full with water and recap. Shake for 10 seconds. Pour rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Drain for 10 seconds after the flow begins to drip. Repeat this procedure two more times.

Or

Pressure rinse as follows: Empty the remaining contents into application equipment or a mix tank and continue to drain for 10 seconds after the flow begins to drip. Hold container upside down over application equipment or mix tank or collect rinsate for later use or disposal. Insert pressure rinsing nozzle in the side of the container, and rinse at about 40 PSI for at least 30 seconds. Drain for 10 seconds after the flow begins to drip.

For containers more than 5 gallons:

Triple rinse as follows: Empty the remaining contents into application equipment or a mix tank. Fill the container 1/4 full with water. Replace and tighten closures. Tip container on its side and roll it back and forth, ensuring at least one complete revolution, for 30 seconds. Stand container on its end and tip it back and forth several times. Turn the container over onto its other end and tip it back and forth several times. Empty the rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Repeat this procedure two more times.

Or

Pressure rinse as follows: Empty the remaining contents into application equipment or a mix tank. Insert pressure rinsing nozzle in the side of the container, and rinse at about 40 PSI for at least 30 seconds. Pour or pump rinsate into application equipment or rinsate collection system. Drain for 10 seconds after the flow begins to drip.

Then offer for recycling if available or puncture and dispose of in a sanitary landfill, or by incineration, or, if allowed by state and local authorities, by burning. If burned, stay out of smoke.

(for Refillable containers)

Refillable container. Refill this container with pesticide only. Do not use this container for any other purpose. Cleaning the container before final disposal is the responsibility of the person disposing of the container. Cleaning before refilling is the responsibility of the refiller. To clean the container before final disposal empty the remaining contents from this container into application equipment or mix tank. Fill the container about 10 percent full with water. Agitate vigorously or recirculate water with the pump for 2 minutes. Pour or pump rinsate into application equipment or rinsate collection system. Repeat this rinsing procedure two more times. Then offer for recycling if available or reconditioning if appropriate or puncture and dispose of in a sanitary landfill, or by other procedures approved by state and local authorities.

EMERGENCY TELEPHONE NUMBERS

CHEMTREC: (800) 424-9300

MEDICAL: (866) 673-6671 Rocky Mountain Poison Control Center

IMPORTANT INFORMATION
READ BEFORE USING PRODUCT

CONDITIONS OF SALE AND LIMITATION OF WARRANTY AND LIABILITY

NOTICE: Read the entire Directions for Use and Conditions of Sale and Limitation of Warranty and Liability before buying or using this product. If the terms are not acceptable, return the product at once, unopened, and the purchase price will be refunded.

The Directions for Use of this product reflect the opinion of experts based on field use and tests, and must be followed carefully. It is impossible to eliminate all risks associated with the use of this product. Crop injury, ineffectiveness or other unintended consequences may result because of such factors as manner of use or application, weather or crop conditions, presence of other materials or other influencing factors in the use of the product, which are beyond the control of United Phosphorus, Inc. or Seller. Handling, storage, and use of the product by Buyer or User are beyond the control of United Phosphorus, Inc. and Seller. All such risks shall be assumed by Buyer and User, and Buyer and User agree to hold United Phosphorus, Inc. and Seller harmless for any claims relating to such factors.

TO THE EXTENT CONSISTENT WITH APPLICABLE LAW, UNITED PHOSPHORUS, INC. AND SELLER MAKE NO WARRANTIES OF MERCHANTABILITY OR OF FITNESS FOR A PARTICULAR PURPOSE NOR ANY OTHER EXPRESS OR IMPLIED WARRANTY EXCEPT AS STATED ON THIS LABEL.

To the extent consistent with applicable law, United Phosphorus, Inc. or Seller shall not be liable for any incidental, consequential or special damages resulting from the use or handling of this product and **THE EXCLUSIVE REMEDY OF THE USER OR BUYER, AND THE EXCLUSIVE LIABILITY OF UNITED PHOSPHORUS, INC. AND SELLER FOR ANY AND ALL CLAIMS, LOSSES, INJURIES OR DAMAGES (INCLUDING CLAIMS BASED ON BREACH OF WARRANTY, CONTRACT, NEGLIGENCE, TORT, STRICT LIABILITY OR OTHERWISE) RESULTING FROM THE USE OR HANDLING OF THIS PRODUCT, SHALL BE THE RETURN OF THE PURCHASE PRICE OF THE PRODUCT OR, AT THE ELECTION OF UNITED PHOSPHORUS, INC. OR SELLER, THE REPLACEMENT OF THE PRODUCT.**

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Rev. 9/15/11

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Made in U.S.A.

syngenta

MATERIAL SAFETY DATA SHEET

Syngenta Crop Protection, LLC
Post Office Box 18300
Greensboro, NC 27419

In Case of Emergency, Call
1-800-888-8372

1. PRODUCT IDENTIFICATION

Product Name:	REWARD LANDSCAPE AND AQUATIC HERBICIDE	Product No.:	A12872A
EPA Signal Word:	Caution		
Active Ingredient(%):	Diquat Dibromide (37.3%)	CAS No.:	85-00-7
Chemical Name:	[6,7-dihydrodipyrido(1,2-a:2',1'-c)pyrazinediium dibromide]		
Chemical Class:	Bipyridilium (dipyridilium) contact herbicide		

EPA Registration Number(s): 100-1091 **Section(s) Revised: 14**

2. HAZARDS IDENTIFICATION

Health and Environmental

Toxic if inhaled. Harmful if swallowed. Causes mild eye and skin irritation.

Hazardous Decomposition Products

Flammable hydrogen gas may be formed on contact with aluminum. See "Conditions to Avoid", Section 10.

Physical Properties

Appearance: Dark brown liquid

Odor: Odorless

Unusual Fire, Explosion and Reactivity Hazards

This product may form flammable and explosive hydrogen gas when in contact with aluminum.

During a fire, irritating and possibly toxic gases may be generated by thermal decomposition or combustion.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Material	OSHA PEL	ACGIH TLV	Other	NTP/IARC/OSHA Carcinogen
Diquat Dibromide (37.3%)	Not Established	0.5 mg/m³ TWA	0.5 mg/m³ TWA (0.5 total; 0.08 respirable) ***	No

*** Syngenta Occupational Exposure Limit (OEL)

Ingredients not precisely identified are proprietary or non-hazardous. Values are not product specifications.
Syngenta Hazard Category: C, S

4. FIRST AID MEASURES

Have the product container, label or Material Safety Data Sheet with you when calling Syngenta (800-888-8372), a poison contol center or doctor, or going for treatment.

Ingestion:	If swallowed: Call Syngenta (800-888-8372), a poison control center or doctor immediately for treatment advice. Have the person sip a glass of water if able to swallow. Do not induce vomiting unless told to do so after calling 800-888-8372 or by a poison control center or doctor. Do not give anything by mouth to an unconscious person.
Eye Contact:	If in eyes: Hold eye open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after 5 minutes, then continue rinsing eye. Call Syngenta (800-888-8372), a poison control center or doctor for treatment advice.
Skin Contact:	If on skin or clothing: Take off contaminated clothing. Rinse skin immediately with plenty of water for 15-20 minutes. Call Syngenta (800-888-8372), a poison control center or doctor for treatment advice.
Inhalation:	If inhaled: Move person to fresh air. If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably mouth-to-mouth if possible. Call Syngenta (800-888-8372), a poison control center or doctor for further treatment advice.

Notes to Physician

To be effective, treatment for ingestion of the product must begin IMMEDIATELY. Treatment consists of binding the active ingredient, diquat, in the gut with suspensions of activated charcoal or bentonite clay, administration of cathartics to enhance elimination and removal of diquat from the blood by charcoal hemoperfusion or continuous hemodialysis.

Medical Condition Likely to be Aggravated by Exposure

None known.

5. FIRE FIGHTING MEASURES

Fire and Explosion

Flash Point (Test Method):	Not Applicable	
Flammable Limits (% in Air):	Lower: Not Applicable	Upper: Not Applicable
Autoignition Temperature:	Not Applicable	
Flammability:	Not Applicable	

Unusual Fire, Explosion and Reactivity Hazards

This product may form flammable and explosive hydrogen gas when in contact with aluminum.

During a fire, irritating and possibly toxic gases may be generated by thermal decomposition or combustion.

In Case of Fire

Use dry chemical, foam or CO2 extinguishing media. Wear full protective clothing and self-contained breathing apparatus. Evacuate nonessential personnel from the area to prevent human exposure to fire, smoke, fumes or products of combustion. Prevent use of contaminated buildings, area, and equipment until decontaminated. Water runoff can cause environmental damage. If water is used to fight fire, dike and collect runoff.

6. ACCIDENTAL RELEASE MEASURES

In Case of Spill or Leak

Control the spill at its source. Contain the spill to prevent from spreading or contaminating soil or from entering sewage and drainage systems or any body of water. Clean up spills immediately, observing precautions outlined in Section 8. Cover entire spill with absorbing material and place into compatible disposal container. Scrub area with hard water detergent (e.g. commercial products such as Tide, Joy, Spic and Span). Pick up wash liquid with additional absorbent and place into compatible disposal container. Once all material is cleaned up and placed in a disposal container, seal container and arrange for disposition.

7. HANDLING AND STORAGE

This product reacts with aluminum to produce flammable hydrogen gas. Do not mix or store in containers or systems made of aluminum or having aluminum fittings.

Store the material in a well-ventilated, secure area out of reach of children and domestic animals. Do not store food, beverages or tobacco products in the storage area. Prevent eating, drinking, tobacco use, and cosmetic application in areas where there is a potential for exposure to the material. Wash thoroughly with soap and water after handling.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

THE FOLLOWING RECOMMENDATIONS FOR EXPOSURE CONTROLS/PERSONAL PROTECTION ARE INTENDED FOR THE MANUFACTURE, FORMULATION AND PACKAGING OF THIS PRODUCT.

FOR COMMERCIAL APPLICATIONS AND/OR ON-FARM APPLICATIONS CONSULT THE PRODUCT LABEL.

Ingestion:	Prevent eating, drinking, tobacco usage and cosmetic application in areas where there is a potential for exposure to the material. Wash thoroughly with soap and water after handling.
Eye Contact:	Where eye contact is likely, use chemical splash goggles.
Skin Contact:	Where contact is likely, wear chemical-resistant gloves (such as barrier laminate, butyl rubber, nitrile rubber, neoprene rubber, natural rubber, polyvinyl chloride [PVC] or Viton), coveralls, socks and chemical-resistant footwear.
Inhalation:	A respirator is not normally required when handling this substance. Use effective engineering controls to comply with occupational exposure limits. In case of emergency spills, use a NIOSH approved respirator with any N, R, P or HE filter.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Dark brown liquid
Odor:	Odorless
Melting Point:	Not Applicable
Boiling Point:	Not Available
Specific Gravity/Density:	1.202 g/ml @ 68°F (20°C)
pH:	4 - 6

Solubility in H2O

Diquat Dibromide: 718,000 mg/l @ 68°F (20°C) and pH 7.2

Vapor Pressure

Diquat Dibromide: < 10(-8) mmHg @ 77°F (25°C)

10. STABILITY AND REACTIVITY

Stability:	Stable under normal use and storage conditions.
Hazardous Polymerization:	Will not occur.
Conditions to Avoid:	Concentrate should not be stored in aluminum containers. Spray solutions should not be mixed, stored or applied in containers other than plastic, plastic-lined steel, stainless steel or fiberglass.
Materials to Avoid:	Strong alkalis and anionic wetting agents (e.g., alkyl and alkylaryl sulfonates). Corrosive to aluminum.
Hazardous Decomposition Products:	Flammable hydrogen gas may be formed on contact with aluminum. See "Conditions to Avoid", Section 10.

11. TOXICOLOGICAL INFORMATION

Acute Toxicity/Irritation Studies (Finished Product)

Ingestion:		
	Oral (LD50 Female Rat) :	886 mg/kg body weight
Dermal:		
	Dermal (LD50 Rabbit) :	> 5050 mg/kg body weight
Inhalation:		
	Inhalation (LC50 Rat) :	0.62 mg/l air - 4 hours
Eye Contact:	Mildly Irritating (Rabbit)	
Skin Contact:	Slightly Irritating (Rabbit)	
Skin Sensitization:	Not a Sensitizer (Guinea Pig)	

Reproductive/Developmental Effects

Diquat Dibromide: Mutagenicity: No evidence in in vivo assays.
Development Toxicity: In rabbit studies a small percentage of fetuses had minor defects at 3 and 10 mg ion/kg/d.

Chronic/Subchronic Toxicity Studies

Diquat Dibromide: Kidney weight decreases and cataracts seen in dogs at 12.5 mg ion/kg/d.
No evidence for neurotoxic effects in rats dosed up to 400 ppm ion in the diet for 13 weeks.

Carcinogenicity

Diquat Dibromide: No evidence of carcinogenicity in rat and mouse studies.

Other Toxicity Information

None

Toxicity of Other Components

Not Applicable

Target Organs

Active Ingredients

Diquat Dibromide: Eye, kidney

Inert Ingredients

Not Applicable

12. ECOLOGICAL INFORMATION

Ecotoxicity Effects

Diquat Dibromide:

Fish (Rainbow Trout) 96-hour LC50 14.83 ppm

Invertebrate (Water Flea) Daphnia Magna 48-hour EC50 0.77 ppm

Green Algae 4-day EC50 9.4 ppb

Bird (Mallard Duck) 14-day LD50 60.6 mg/kg

Environmental Fate

Diquat Dibromide:

The information presented here is for the active ingredient, diquat dibromide.
Stable in soil and water. Immobile in soil. Sinks in water (after 24 h).

13. DISPOSAL CONSIDERATIONS

Disposal

Do not reuse product containers. Dispose of product containers, waste containers, and residues according to local, state, and federal health and environmental regulations.

Characteristic Waste: Not Applicable

Listed Waste: Not Applicable

14. TRANSPORT INFORMATION

DOT Classification

Ground Transport - NAFTA

Proper Shipping Name: Corrosive Liquid, N.O.S. (Diquat Dibromide)
Hazard Class: Class 8
Identification Number: UN 1760
Packing Group: PG III

Comments

Water Transport - International
Proper Shipping Name: Corrosive Liquid, N.O.S. (Diquat Dibromide), Marine Pollutant
Hazard Class: Class 8
Identification Number: UN 1760
Packing Group: PG III

Air Transport
Proper Shipping Name: Corrosive Liquid, N.O.S. (Diquat Dibromide)
Hazard Class: Class 8
Identification Number: UN 1760
Packing Group: PG III

15. REGULATORY INFORMATION

EPCRA SARA Title III Classification

Section 311/312 Hazard Classes: Acute Health Hazard

Section 313 Toxic Chemicals: Not Applicable

California Proposition 65

None

CERCLA/SARA 302 Reportable Quantity (RQ)

Report product spills >= 268 gal. (based on diquat [RQ = 1,000 lbs.] content in the formulation)

RCRA Hazardous Waste Classification (40 CFR 261)

Not Applicable

TSCA Status

Exempt from TSCA, subject to FIFRA

16. OTHER INFORMATION

NFPA Hazard Ratings		HMIS Hazard Ratings	
Health:	2	Health:	2
Flammability:	1	Flammability:	1
Instability:	0	Reactivity:	0

0	Minimal
1	Slight
2	Moderate
3	Serious
4	Extreme

For non-emergency questions about this product call:

1-800-334-9481

Original Issued Date: 4/11/2002
Revision Date: 2/4/2011 Replaces: 7/14/2010

The information and recommendations contained herein are based upon data believed to be correct. However, no guarantee or warranty of any kind, expressed or implied, is made with respect to the information contained herein.

Dow AgroSciences LLC encourages and expects you to read and understand the entire (M)SDS, as there is important information throughout the document. We expect you to follow the precautions identified in this document unless your use conditions would necessitate other appropriate methods or actions.

1. Product and Company Identification

Product Name
DMA* 4 IVM Herbicide

COMPANY IDENTIFICATION
Dow AgroSciences LLC
A Subsidiary of The Dow Chemical Company
9330 Zionsville Road
Indianapolis, IN 46268-1189
United States

Customer Information Number: 800-992-5994
SDSQuestion@dow.com

EMERGENCY TELEPHONE NUMBER

24-Hour Emergency Contact: 800-992-5994
Local Emergency Contact: 352-323-3500

2. Hazards Identification

Emergency Overview
Color: Brown
Physical State: Liquid.
Odor: Musty
Hazards of product:

DANGER! Combustible liquid and vapor. Causes severe eye burns. May cause skin irritation. Evacuate area. Keep upwind of spill. Toxic fumes may be released in fire situations.

OSHA Hazard Communication Standard
This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

Potential Health Effects
Eye Contact: May cause severe irritation with corneal injury which may result in permanent impairment of vision, even blindness. Chemical burns may occur.

Skin Contact: Prolonged contact may cause slight skin irritation with local redness. Repeated contact may cause skin burns. Symptoms may include pain, severe local redness, swelling, and tissue damage. May cause more severe response on covered skin (under clothing, gloves).
Skin Absorption: Prolonged skin contact is unlikely to result in absorption of harmful amounts.
Inhalation: No adverse effects are anticipated from single exposure to mist.
Ingestion: Low toxicity if swallowed. Small amounts swallowed incidentally as a result of normal handling operations are not likely to cause injury; however, swallowing larger amounts may cause injury.
Effects of Repeated Exposure: For the active ingredient(s): In animals, effects have been reported on the following organs: Bone marrow. Adrenal gland. Eye. Kidney. Liver. Spleen. Testes. Thyroid.
Birth Defects/Developmental Effects: For similar active ingredient(s). 2,4-Dichlorophenoxyacetic acid. Has been toxic to the fetus in laboratory animals at doses toxic to the mother.
Reproductive Effects: For similar active ingredient(s). 2,4-Dichlorophenoxyacetic acid. In laboratory animals, excessive doses toxic to the parent animals caused decreased weight and survival of offspring.

3. Composition Information

Component	CAS #	Amount
2,4-D Dimethylamine Salt	2008-39-1	46.3 %
Ethylenediamine tetraacetic acid	60-00-4	3.0 %
Dimethylamine	124-40-3	1.0 %
2,4-Dichlorophenol	120-83-2	0.1 %
Balance	Not available	49.6 %

4. First-aid measures

Description of first aid measures
Inhalation: Move person to fresh air. If person is not breathing, call an emergency responder or ambulance, then give artificial respiration; if by mouth to mouth use rescuer protection (pocket mask etc). Call a poison control center or doctor for treatment advice.
Skin Contact: Take off contaminated clothing. Rinse skin immediately with plenty of water for 15-20 minutes. Call a poison control center or doctor for treatment advice. Wash clothing before reuse. Shoes and other leather items which cannot be decontaminated should be disposed of properly.
Eye Contact: Wash immediately and continuously with flowing water for at least 30 minutes. Remove contact lenses after the first 5 minutes and continue washing. Obtain prompt medical consultation, preferably from an ophthalmologist.
Ingestion: Call a poison control center or doctor immediately for treatment advice. Have person sip a glass of water if able to swallow. Do not induce vomiting unless told to do so by the poison control center or doctor. Never give anything by mouth to an unconscious person.
Most important symptoms and effects, both acute and delayed
Aside from the information found under Description of first aid measures (above) and Indication of immediate medical attention and special treatment needed (below), no additional symptoms and effects are anticipated.
Indication of immediate medical attention and special treatment needed
Chemical eye burns may require extended irrigation. Obtain prompt consultation, preferably from an ophthalmologist. If burn is present, treat as any thermal burn, after decontamination. No specific antidote. Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient. Have the Safety Data Sheet, and if available, the product container or label with you when calling a poison control center or doctor, or going for treatment.

5. Fire Fighting Measures

Suitable extinguishing media
To extinguish combustible residues of this product use water fog, carbon dioxide, dry chemical or foam.

Special hazards arising from the substance or mixture
Hazardous Combustion Products: During a fire, smoke may contain the original material in addition to combustion products of varying composition which may be toxic and/or irritating. Combustion products may include and are not limited to: Nitrogen oxides. Hydrogen chloride. Carbon monoxide. Carbon dioxide. Combustion products may include trace amounts of: Ammonia.
Unusual Fire and Explosion Hazards: This material will not burn until the water has evaporated. Residue can burn. If exposed to fire from another source and water is evaporated, exposure to high temperatures may cause toxic fumes. Dense smoke is produced when product burns.

Advice for firefighters
Fire Fighting Procedures: Keep people away. Isolate fire and deny unnecessary entry. Use water spray to cool fire exposed containers and fire affected zone until fire is out and danger of reignition has passed. To extinguish combustible residues of this product use water fog, carbon dioxide, dry chemical or foam. Contain fire water run-off if possible. Fire water run-off, if not contained, may cause environmental damage. Review the "Accidental Release Measures" and the "Ecological Information" sections of this (M)SDS.
Special Protective Equipment for Firefighters: Wear positive-pressure self-contained breathing apparatus (SCBA) and protective fire fighting clothing (includes fire fighting helmet, coat, trousers, boots, and gloves). Avoid contact with this material during fire fighting operations. If contact is likely, change to full chemical resistant fire fighting clothing with self-contained breathing apparatus. If this is not available, wear full chemical resistant clothing with self-contained breathing apparatus and fight fire from a remote location. For protective equipment in post-fire or non-fire clean-up situations, refer to the relevant sections.

6. Accidental Release Measures

Personal precautions, protective equipment and emergency procedures: Evacuate area. Refer to Section 7, Handling, for additional precautionary measures. Only trained and properly protected personnel must be involved in clean-up operations. Keep upwind of spill. Ventilate area of leak or spill. No smoking in area. Use appropriate safety equipment. For additional information, refer to Section 8, Exposure Controls and Personal Protection.

Environmental precautions: Prevent from entering into soil, ditches, sewers, waterways and/or groundwater. See Section 12, Ecological Information.
Methods and materials for containment and cleaning up: Contain spilled material if possible. Small spills: Absorb with materials such as: Clay. Dirt. Sand. Sweep up. Collect in suitable and properly labeled containers. Large spills: Contact Dow AgroSciences for clean-up assistance. See Section 13, Disposal Considerations, for additional information.

7. Handling and Storage

Handling
General Handling: Keep out of reach of children. Do not swallow. Avoid breathing vapor or mist. Use with adequate ventilation. Wash thoroughly after handling. Keep container closed. Containers, even those that have been emptied, can contain vapors. Do not cut, drill, grind, weld, or perform similar operations on or near empty containers. Keep away from heat, sparks and flame.

Storage

Store in a dry place. Store in original container. Keep container tightly closed when not in use. Do not store near food, foodstuffs, drugs or potable water supplies.

8. Exposure Controls / Personal Protection

Exposure Limits

Component	List	Type	Value
Dimethylamine	ACGIH	TWA	5 ppm
	ACGIH	STEL	15 ppm
	OSHA Table Z-1	PEL	18 mg/m3 10 ppm
2,4-Dichlorophenol	AIHA WEEL	TWA	6.7 mg/m3 1 ppm SKIN*

RECOMMENDATIONS IN THIS SECTION ARE FOR MANUFACTURING, COMMERCIAL BLENDING AND PACKAGING WORKERS. APPLICATORS AND HANDLERS SHOULD SEE THE PRODUCT LABEL FOR PROPER PERSONAL PROTECTIVE EQUIPMENT AND CLOTHING.
It is intended to alert the reader that inhalation may not be the only route of exposure and that measures to minimize dermal exposures should be considered.
*Absorbed rapidly through the skin in molten or heated liquid form in amounts that have caused rapid death in humans.
A "skin" notation following the inhalation exposure guideline refers to the potential for dermal absorption of the material including mucous membranes and the eyes either by contact with vapors or by direct skin contact.

Personal Protection

Eye/Face Protection: Use chemical goggles. Eye wash fountain should be located in immediate work area.
Skin Protection: Use protective clothing chemically resistant to this material. Selection of specific items such as face shield, boots, apron, or full body suit will depend on the task. Remove contaminated clothing immediately, wash skin area with soap and water, and launder clothing before reuse or dispose of properly.

> **Hand protection:** Use gloves chemically resistant to this material. Examples of preferred glove barrier materials include: Butyl rubber. Natural rubber ("latex"). Neoprene. Nitrile/butadiene rubber ("nitrile" or "NBR"). Polyethylene. Ethyl vinyl alcohol laminate ("EVAL"). Polyvinyl chloride ("PVC" or "vinyl"). NOTICE: The selection of a specific glove for a particular application and duration of use in a workplace should also take into account all relevant workplace factors such as, but not limited to: Other chemicals which may be handled, physical requirements (cut/puncture protection, dexterity, thermal protection), potential body reactions to glove materials, as well as the instructions/specifications provided by the glove supplier.

Respiratory Protection: Respiratory protection should be worn when there is a potential to exceed the exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, wear respiratory protection when adverse effects, such as respiratory irritation or discomfort have been experienced, or where indicated by your risk assessment process. For most conditions no respiratory protection should be needed; however, if discomfort is experienced, use an approved air-purifying respirator. The following should be effective types of air-purifying respirators: Organic vapor cartridge with a particulate pre-filter.
Ingestion: Use good personal hygiene. Do not consume or store food in the work area. Wash hands before smoking or eating.

Engineering Controls

Ventilation: Use local exhaust ventilation, or other engineering controls to maintain airborne levels below exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, general ventilation should be sufficient for most operations. Local exhaust ventilation may be necessary for some operations.

9. Physical and Chemical Properties

Appearance	
Physical State	Liquid.
Color	Brown
Odor	Musty
Odor Threshold	No test data available
pH	8.29 (@ 1 %) *pH Electrode*
Melting Point	Not applicable
Freezing Point	No test data available
Boiling Point (760 mmHg)	No test data available.
Flash Point - Closed Cup	> 100 °C (> 212 °F) *Closed Cup*
Flammable Limits In Air	**Lower**: No test data available **Upper**: No test data available
Vapor Pressure	No test data available
Vapor Density (air = 1)	No test data available
Specific Gravity (H2O = 1)	
Solubility in water (by weight)	water based product
Autoignition Temperature	No test data available
Decomposition Temperature	No test data available
Kinematic Viscosity	No test data available
Liquid Density	1.17 g/cm3 @ 20 °C

10. Stability and Reactivity

Reactivity
No dangerous reaction known under conditions of normal use.
Chemical stability
Thermally stable at typical use temperatures.

Possibility of hazardous reactions
Polymerization will not occur.
Conditions to Avoid: Active ingredient decomposes at elevated temperatures. Generation of gas during decomposition can cause pressure in closed systems.

Incompatible Materials: Avoid contact with: Acids. Oxidizers.
Hazardous decomposition products
Decomposition products depend upon temperature, air supply and the presence of other materials. Decomposition products can include and are not limited to: Carbon monoxide. Carbon dioxide. Hydrogen chloride. Nitrogen oxides. Toxic gases are released during decomposition. Decomposition products can include trace amounts of: Ammonia.

11. Toxicological Information

Acute Toxicity
Ingestion
LD50, rat, female 3,129 mg/kg
Dermal
LD50, rat, male and female > 5,000 mg/kg
Inhalation
LC50, 4 h, Aerosol, rat, male and female > 5.34 mg/l
Eye damage/eye irritation
May cause severe irritation with corneal injury which may result in permanent impairment of vision, even blindness. Chemical burns may occur.
Skin corrosion/irritation

Prolonged contact may cause slight skin irritation with local redness. Repeated contact may cause skin burns. Symptoms may include pain, severe local redness, swelling, and tissue damage. May cause more severe response on covered skin (under clothing, gloves).

Sensitization

Skin

Did not demonstrate the potential for contact allergy in mice.

Repeated Dose Toxicity

For the active ingredient(s): In animals, effects have been reported on the following organs: Bone marrow. Adrenal gland. Eye. Kidney. Liver. Spleen. Testes. Thyroid.

Chronic Toxicity and Carcinogenicity

Available data are inadequate to evaluate carcinogenicity. For similar active ingredient(s). Various animal cancer tests have shown no reliably positive association between 2,4-D exposure and cancer. Epidemiology studies on herbicide use have been both positive and negative with the majority being negative.

Carcinogenicity Classifications:

Component	List	Classification
2,4-Dichlorophenol	IARC	Possibly carcinogenic to humans.; 2B

Developmental Toxicity

For similar active ingredient(s). 2,4-Dichlorophenoxyacetic acid. Has been toxic to the fetus in laboratory animals at doses toxic to the mother. For similar active ingredient(s). 2,4-Dichlorophenoxyacetic acid. Did not cause birth defects in laboratory animals.

Reproductive Toxicity

For similar active ingredient(s). 2,4-Dichlorophenoxyacetic acid. In laboratory animals, excessive doses toxic to the parent animals caused decreased weight and survival of offspring.

Genetic Toxicology

For the active ingredient(s): In vitro genetic toxicity studies were predominantly negative. For the active ingredient(s): Animal genetic toxicity studies were inconclusive

12. Ecological Information

Toxicity

Data for Component: **2,4-D Dimethylamine Salt**

Material is highly toxic to aquatic organisms on an acute basis (LC50/EC50 between 0.1 and 1 mg/L in the most sensitive species tested). Material is practically non-toxic to birds on a dietary basis (LC50 > 5000 ppm). Material is moderately toxic to birds on an acute basis (LD50 between 51 and 500 mg/kg).

Fish Acute & Prolonged Toxicity
LC50, Oncorhynchus mykiss (rainbow trout), static test, 96 h: 100 - 420 mg/l
Aquatic Invertebrate Acute Toxicity
EC50, Daphnia magna (Water flea), 48 h, immobilization: 4 mg/l
Aquatic Plant Toxicity
ErC50, Pseudokirchneriella subcapitata (green algae), Growth rate inhibition, 5 d: 66.5 mg/l
EbC50, Lemna minor (duckweed), biomass growth inhibition, 14 d: 0.58 mg/l
Aquatic Invertebrates Chronic Toxicity Value
Daphnia magna (Water flea), flow-through test, 21 d, NOEC: 27.5 mg/l, LOEC: 59.6 mg/l
Toxicity to Above Ground Organisms
oral LD50, Colinus virginianus (Bobwhite quail): 500 mg/kg bodyweight.
dietary LC50, Colinus virginianus (Bobwhite quail): 5620 mg/kg diet.
LD50, Apis mellifera (bees): > 100 micrograms/bee

Data for Component: **Ethylenediamine tetraacetic acid**

Material is practically non-toxic to aquatic organisms on an acute basis (LC50/EC50/EL50/LL50 >100 mg/L in the most sensitive species tested).

Fish Acute & Prolonged Toxicity
LC50, Fish, 96 h: 1,000 mg/l
Aquatic Invertebrate Acute Toxicity

EC50, Daphnia magna (Water flea), static test, 48 h, immobilization: 113 mg/l

Data for Component: **Dimethylamine**

Material is moderately toxic to aquatic organisms on an acute basis (LC50/EC50 between 1 and 10 mg/L in the most sensitive species tested).

Fish Acute & Prolonged Toxicity
LC50, Oncorhynchus mykiss (rainbow trout), 96 h: 17 - 118 mg/l
Aquatic Invertebrate Acute Toxicity
EC50, Daphnia magna (Water flea), 24 h, immobilization: 48 - 105 mg/l
LC50, Daphnia magna (Water flea), 48 h, immobilization: 50 mg/l
Aquatic Plant Toxicity
EC50, Pseudokirchneriella subcapitata (green algae), biomass growth inhibition, 96 h: 9 mg/l
Toxicity to Micro-organisms
NOEC; Bacteria: 1,000 mg/l

Data for Component: **2,4-Dichlorophenol**

Material is moderately toxic to aquatic organisms on an acute basis (LC50/EC50 between 1 and 10 mg/L in the most sensitive species tested).

Fish Acute & Prolonged Toxicity
LC50, Pimephales promelas (fathead minnow), flow-through test: 6.7 - 11.6 mg/l
LC50, Carassius auratus (goldfish), flow-through test, 4 h: 1.24 - 1.76 mg/l
Aquatic Invertebrate Acute Toxicity
EC50, Daphnia magna (Water flea), 24 h, immobilization: 2.50 - 6.0 mg/l
EC50, Daphnia magna (Water flea), 48 h: 1.4 - 5.1 mg/l
Aquatic Plant Toxicity
LC50, alga Scenedesmus sp., biomass growth inhibition, 48 h: 11.5 mg/l
Toxicity to Micro-organisms
EC50; activated sludge: 52.5 mg/l
EC50; Bacteria: 55 - 75 mg/l
Toxicity to Soil Dwelling Organisms
LC50, Eisenia fetida (earthworms), 2 d: 0.0025 mg/cm2

Persistence and Degradability

Data for Component: **2,4-D Dimethylamine Salt**

Biodegradation under aerobic static laboratory conditions is high (BOD20 or BOD28/ThOD > 40%).
Stability in Water (1/2-life):
0.5 - 11 d
Biological oxygen demand (BOD):

BOD 5	BOD 10	BOD 20	BOD 28
100 %	100 %	100 %	

Chemical Oxygen Demand: 0.72 mg/mg

Data for Component: **Ethylenediamine tetraacetic acid**

Material is inherently biodegradable (reaches > 20% biodegradation in OECD test(s) for inherent biodegradability).
OECD Biodegradation Tests:

Biodegradation	Exposure Time	Method	10 Day Window
37 %	14 d	OECD 302B Test	Not applicable
0 %	30 d	OECD 301D Test	fail

Indirect Photodegradation with OH Radicals

Rate Constant	Atmospheric Half-life	Method
1.81E-10 cm3/s	2.12 h	Estimated.

Theoretical Oxygen Demand: 1.37 mg/mg

Data for Component: **Dimethylamine**

Material is readily biodegradable. Passes OECD test(s) for ready biodegradability.
OECD Biodegradation Tests:

Biodegradation	Exposure Time	Method	10 Day Window
30 - 100 %	14 d	OECD 301C Test	Not applicable
77 %	13 d	OECD 301E Test	pass
51 %	14 d	OECD 301C Test	Not applicable

Indirect Photodegradation with OH Radicals

Rate Constant	Atmospheric Half-life	Method
6.553E-11 cm3/s	0.163 d	Estimated.

Biological oxygen demand (BOD):

BOD 5	BOD 10	BOD 20	BOD 28
64 %		100 %	

Theoretical Oxygen Demand: 2.06 mg/mg

Data for Component: **2,4-Dichlorophenol**

Biodegradation under aerobic static laboratory conditions is high (BOD20 or BOD28/ThOD > 40%).

Indirect Photodegradation with OH Radicals

Rate Constant	Atmospheric Half-life	Method
2.98E-12 cm3/s	3.59 d	Estimated.

Biological oxygen demand (BOD):

BOD 5	BOD 10	BOD 20	BOD 28
76.000 %	77.000 %	77.000 %	

Theoretical Oxygen Demand: 1.18 mg/mg

Bioaccumulative potential

Data for Component: **2,4-D Dimethylamine Salt**

Bioaccumulation: Bioconcentration potential is low (BCF < 100 or Log Pow < 3).
Partition coefficient, n-octanol/water (log Pow): 0.65 Measured
Bioconcentration Factor (BCF): 0.1 - 0.47; Fish; Measured

Data for Component: **Ethylenediamine tetraacetic acid**

Bioaccumulation: Bioconcentration potential is low (BCF < 100 or Log Pow < 3).
Partition coefficient, n-octanol/water (log Pow): -3.86 Estimated.
Bioconcentration Factor (BCF): 1.1; Fish; Measured

Data for Component: **Dimethylamine**

Bioaccumulation: Bioconcentration potential is low (BCF < 100 or Log Pow < 3).
Partition coefficient, n-octanol/water (log Pow): -0.38 Measured

Data for Component: **2,4-Dichlorophenol**

Bioaccumulation: Bioconcentration potential is moderate (BCF between 100 and 3000 or Log Pow between 3 and 5).
Partition coefficient, n-octanol/water (log Pow): 3.06 Measured
Bioconcentration Factor (BCF): 34; Fish; Measured

Mobility in soil

Data for Component: **2,4-D Dimethylamine Salt**

Mobility in soil: Potential for mobility in soil is high (Koc between 50 and 150).
Partition coefficient, soil organic carbon/water (Koc): 72 - 136 Measured
Henry's Law Constant (H): 1.45E-16 atm*m3/mole; 25 °C Estimated using a bond contribution method.

Data for Component: **Ethylenediamine tetraacetic acid**

Mobility in soil: Potential for mobility in soil is high (Koc between 50 and 150).
Partition coefficient, soil organic carbon/water (Koc): 98Data for Component: **Dimethylamine**

Mobility in soil: Potential for mobility in soil is very high (Koc between 0 and 50).
Partition coefficient, soil organic carbon/water (Koc): 13 - 435 Estimated.
Henry's Law Constant (H): 1.77E-05 atm*m3/mole; 25 °C Measured
Distribution in Environment: Mackay Level 1 Fugacity Model:

Air	Water.	Biota	Soil	Sediment
38 %	62 %	0 %	0 %	0 %

Data for Component: **2,4-Dichlorophenol**
Mobility in soil: Potential for mobility in soil is low (Koc between 500 and 2000).
Partition coefficient, soil organic carbon/water (Koc): 550 Measured
Henry's Law Constant (H): 2.19E-06 atm*m3/mole; 25 °C Measured

13. Disposal Considerations

If wastes and/or containers cannot be disposed of according to the product label directions, disposal of this material must be in accordance with your local or area regulatory authorities. This information presented below only applies to the material as supplied. The identification based on characteristic(s) or listing may not apply if the material has been used or otherwise contaminated. It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste identification and disposal methods in compliance with applicable regulations. If the material as supplied becomes a waste, follow all applicable regional, national and local laws.

14. Transport Information

DOT Non-Bulk
Proper Shipping Name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.
Technical Name: 2,4-D DIMETHYLAMINE SALT
Hazard Class: 9 **ID Number:** UN3082 **Packing Group:** PG III

DOT Bulk
Proper Shipping Name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.
Technical Name: 2,4-D DIMETHYLAMINE SALT
Hazard Class: 9 **ID Number:** UN3082 **Packing Group:** PG III

IMDG
Proper Shipping Name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.
Technical Name: 2,4-D DIMETHYLAMINE SALT
ID Number: UN3082 **Packing Group:** PG III
EMS Number: F-A,S-F
Marine pollutant.: Yes

ICAO/IATA
Proper Shipping Name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.
Technical Name: 2,4-D DIMETHYLAMINE SALT
Hazard Class: 9 **ID Number:** UN3082 **Packing Group:** PG III
Cargo Packing Instruction: 964
Passenger Packing Instruction: 964
Additional Information

Reportable quantity: 216 lb – 2,4 D SALT

MARINE POLLUTANT

This information is not intended to convey all specific regulatory or operational requirements/information relating to this product. Additional transportation system information can be obtained through an authorized sales or customer service representative. It is the responsibility of the transporting organization to follow all applicable laws, regulations and rules relating to the transportation of the material.

15. Regulatory Information

OSHA Hazard Communication Standard
This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Sections 311 and 312

Immediate (Acute) Health Hazard	Yes
Delayed (Chronic) Health Hazard	Yes
Fire Hazard	Yes
Reactive Hazard	No
Sudden Release of Pressure Hazard	No

Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Section 313
This product contains the following substances which are subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and which are listed in 40 CFR 372.

Component	CAS #	Amount
Dimethylamine	124-40-3	1.0%
Chlorophenols		0.1%

Pennsylvania (Worker and Community Right-To-Know Act): Pennsylvania Hazardous Substances List and/or Pennsylvania Environmental Hazardous Substance List:
The following product components are cited in the Pennsylvania Hazardous Substance List and/or the Pennsylvania Environmental Substance List, and are present at levels which require reporting.

Component	CAS #	Amount
Ethylenediamine tetraacetic acid	60-00-4	3.0%
Dimethylamine	124-40-3	1.0%

Pennsylvania (Worker and Community Right-To-Know Act): Pennsylvania Special Hazardous Substances List:
The following product components are cited in the Pennsylvania Special Hazardous Substance List, and are present at levels which require reporting.

Component	CAS #	Amount
Chlorophenols		0.1%

Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) Section 103
This product contains the following substances which are subject to CERCLA Section 103 reporting requirements and which are listed in 40 CFR 302.4.

Component	CAS #	Amount
Ethylenediamine tetraacetic acid	60-00-4	3.0%
Dimethylamine	124-40-3	1.0%
2,4-Dichlorophenol	120-83-2	0.1%

California Proposition 65 (Safe Drinking Water and Toxic Enforcement Act of 1986)
This product contains no listed substances known to the State of California to cause cancer, birth defects or other reproductive harm, at levels which would require a warning under the statute.

Toxic Substances Control Act (TSCA)
All components of this product are on the TSCA Inventory or are exempt from TSCA Inventory requirements under 40 CFR 720.30

16. Other Information

Hazard Rating System

NFPA	Health	Fire	Reactivity
	3	2	1

Revision

Identification Number: 53061 / 1016 / Issue Date 07/12/2012 / Version: 1.11
DAS Code: XRM-4436
Most recent revision(s) are noted by the bold, double bars in left-hand margin throughout this document.

Legend

N/A	Not available
W/W	Weight/Weight
OEL	Occupational Exposure Limit
STEL	Short Term Exposure Limit
TWA	Time Weighted Average
ACGIH	American Conference of Governmental Industrial Hygienists, Inc.
DOW IHG	Dow Industrial Hygiene Guideline
WEEL	Workplace Environmental Exposure Level
HAZ_DES	Hazard Designation
Action Level	A value set by OSHA that is lower than the PEL which will trigger the need for activities such as exposure monitoring and medical surveillance if exceeded.

Dow AgroSciences LLC urges each customer or recipient of this (M)SDS to study it carefully and consult appropriate expertise, as necessary or appropriate, to become aware of and understand the data contained in this (M)SDS and any hazards associated with the product. The information herein is provided in good faith and believed to be accurate as of the effective date shown above. However, no warranty, express or implied, is given. Regulatory requirements are subject to change and may differ between various locations. It is the buyer's/user's responsibility to ensure that his activities comply with all federal, state, provincial or local laws. The information presented here pertains only to the product as shipped. Since conditions for use of the product are not under the control of the manufacturer, it is the buyer's/user's duty to determine the conditions necessary for the safe use of this product. Due to the proliferation of sources for information such as manufacturer-specific (M)SDSs, we are not and cannot be responsible for (M)SDSs obtained from any source other than ourselves. If you have obtained an (M)SDS from another source or if you are not sure that the (M)SDS you have is current, please contact us for the most current version.

3.0 EMERGENCY RESPONSE PLAN

(in compliance with 29 CFR 1910.120(l) and 1910.120(b)(4)(ii)(H)

This is the site-specific emergency response plan. This chapter of the Health and Safety Plan describes potential emergencies at this site, procedures for responding to those emergencies, roles and responsibilities during emergency response, and training that workers must receive in order to follow emergency procedures.

This emergency response plan is consistent with the requirements of 29 CFR 1910.120(l) and provides the following site-specific information:

* pre-emergency planning
* personnel roles, lines of authority, and communication
* emergency recognition and prevention
* emergency medical treatment and first aid
* PPE and emergency equipment

3.1 Pre-emergency Planning

This site has been evaluated for potential emergency occurrences, based on site hazards, the tasks within the work plan.

Table 3-1 Potential Site Emergencies

Type of Emergency	Source of Emergency	Location of Source
Chemical Spill	Containers	All Loading and Handling Areas
Physical Injury	Lifting, Falling, Tripping, Drowning	All Loading, Handling and Application Sites

3.2 On-Site Emergency Response Equipment

Emergency procedures may require specialized equipment to facilitate worker rescue, contamination control and reduction, or post-emergency clean-up. Emergency response equipment stocked on this site is listed in Table 11-2. The equipment inventory and storage locations are based on the potential emergencies described in Table 11-1. This equipment inventory is designed to meet on-site emergency response needs and any specialized equipment needs that off-site responders might require because of the hazards at this site but not ordinarily stocked.

Any additional PPE required and stocked for emergency response is also listed in Table 3-2 below. During an emergency, the Emergency Response Coordinator is responsible for specifying the level of PPE required for emergency response.

Emergency response equipment is inspected at regular intervals and maintained in good working order. The equipment inventory is replenished as necessary to maintain response capabilities.

Table 3-2 Emergency Equipment and Emergency PPE

Emergency	Specific Type	Quantity Stocked	Location Stored
Fire extinguisher		5	Boats and Trucks
First Aid and Eye Wash Kits		2	Boats
Spill Kits		2	Loading Area
Emergency PPE	**Specific Type**	**Quantity Stocked**	**Location Stored**
Rubber gloves		24	Boats and Trucks
Eye protection		12	Boats and Trucks

Figure 3-3a provides a map to the nearest emergency medical assistance.

Figure 3-3 Map to Nearest Emergency Medical Assistance

Samaritan Hospital
801 E Wheeler Road, Moses Lake WA 509-765-5606

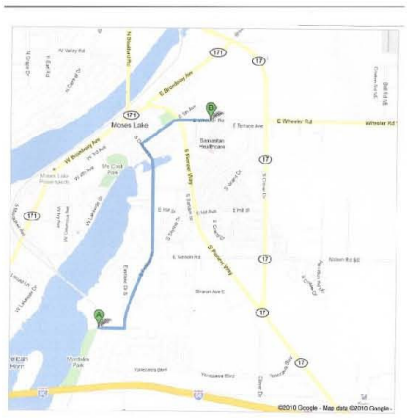


Figure 3-3b Contains driving instructions to the nearest Emergency Medical Assistance and is posted in the following locations;

Montlake Park Launch to Samaritan Hospital

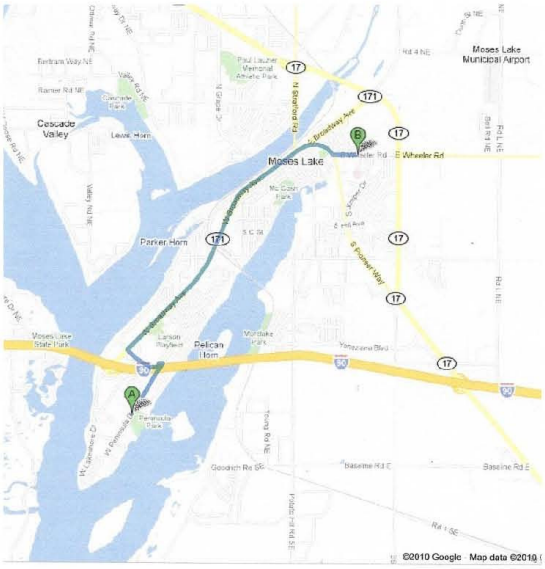
401 Linden Ave., Moses Lake, WA 98837

1. Head east on W Linden Ave toward S Beaumont Dr
2. Take the 2nd left onto S Division St, (about 4 mins)
3. Turn right at E 5th Ave (about 1 min)
4. Continue onto E Wheeler Rd (destination on right, about 1 min).

Figure 3-3 Maps to Nearest Emergency Medical Assistance

Samaritan Hospital

801 E Wheeler Road, Moses Lake WA 509-765-5606



Lower Peninsula Park Launch to Samaritan Hospital

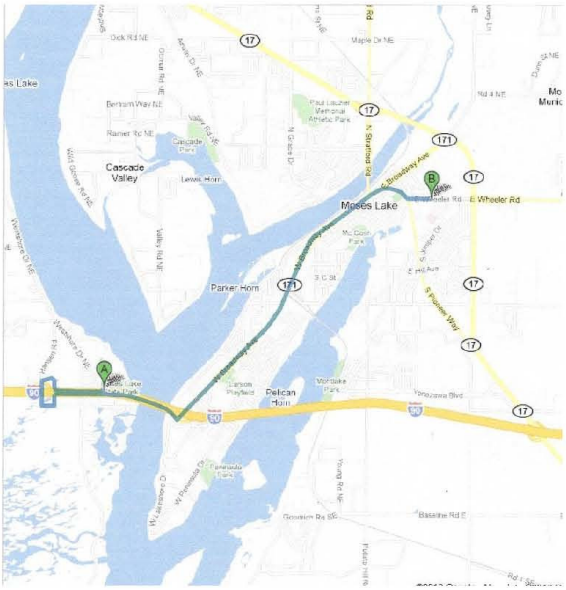
3519 W Peninsula Drive, Moses Lake WA 98837

1. Head northeast on W Peninsula Dr toward S Atlantic St (about 2 mins)
2. Turn left a S Interlake Rd (about 1 min)
3. Take the 2nd right onto W Broadway Ave (about 5 mins)
4. Continue onto S Pioneer Way
5. Turn left at E Wheeler Rd (destination will be on right, about 1 min).

Figure 3-3 Maps to Nearest Emergency Medical Assistance

Samaritan Hospital

801 E Wheeler Road, Moses Lake WA 509-765-5606



Blue Heron Park Launch to Samaritan Hospital

111 Westshore Dr NE, Moses Lake WA 98837

1. Head southeast on Westshore Dr NE
2. Take 1st right toward Westlake Rd
3. Turn right at Westlake Rd (about 2 mins)
4. Take the 1st left onto Hansen Rd (about 1 min)
5. Turn left at I-90 Frontage Rd
6. Take the 1st left toward Prichard Rd (about 1 min)
7. Continue straight onto Prichard Rd (about 1 min)
8. Take the ramp onto I-90 E
9. Take exit 176 for WA-171 N toward I-90 BUS/Moses Lake
10. Turn left a W Lakeshore Dr/WA-171 E (continue to follow WA-171 E about 6 mins)
11. Continue onto S Pioneer Way
12. Turn left at E Wheeler Rd (destination on right, about 1 min).

3.4 Roles and Responsibilities for On-Site and Off-Site Personnel

Dave Kluttz is responsible for implementing the emergency response plan and coordinates emergency response activities on this site. He/she provides specific direction for emergency action based upon information available regarding the incident and response capabilities and initiates emergency procedures, including protection of the public and notification of appropriate authorities.

In the event of an emergency, site personnel are evacuated and do not participate in emergency response activities, except as indicated below.

Limited On-Site Emergency Response Activities

For spills

Turn off all pumps
Close all valves
Surround spill with containment dike
Use Absorbent mats to clean up spill
Place in plastic containment bags

For Injuries

Assess extent of injury
Administer First Aid if appropriate
Contact Emergency Medical Personnel
Transport to **Samaritan Hospital801 E Wheeler Road, Moses Lake WA, 509-765-5606**

3.5 Emergency Medical Treatment and First Aid

Personnel who require medical care and/or who are transferred to a medical facility are accompanied by MSDSs and other applicable hazard data to apprise caregivers of the chemicals and hazards to which the victim has been potentially exposed. The emergency medical care facility for this site is **Samaritan Hospital801 E Wheeler Road, Moses Lake WA, 509-765-5606**. The route to the facility is shown in Figure 3-3 a & b.

Table 3.6 Emergency Contact Information

The list of telephone numbers below are the emergency contact numbers for this site. These emergency numbers are verified to be accurate, working numbers. Site personnel are trained and rehearsed in site-specific emergency calling procedures. A copy of this contact information is posted at the following locations:

Trucks and Boats

SITE PERSONNEL

Title	**Contact**	**Telephone**
Project Manager (PM)	Dave Kluttz	208-597-6601
Site Safety and Health Officer (SSHO)	Dave Kluttz	208-597-6601
Emergency Response Coordinator (ERC)	Dave Kluttz	208-597-6601
Emergency Response Coordinator 1st Alternate	Jake Nesbitt	360-244-3337
Emergency Response Coordinator 2nd Alternate	Cathy Griffin	208-597-1841

Agency		**Address/Location**	**Telephone**
Ambulance/EMS			911
Police			911
Fire			911
Primary Medical Facility	Samaritan Hospital	801 E Wheeler Road	509-565-5606
State Police			911
Local Emergency Response Agency			911
Emergency Medical Assistance			911
Poison Control Center			800-424-9300

4.0 TRAINING PROGRAM

(in compliance with 29 CFR 1910.120(e))

This training program is consistent with the requirements of 29 CFR 1910.120(e) and addresses the following site-specific information:

* training for site workers
* site briefings for visitors and workers
* management and supervisor training

4.1a Training Elements to be Covered for Site Workers:

- names of personnel and alternates responsible for site safety and health
- safety, health and other hazards present on the site
- use of PPE
- work practices by which the employee can minimize risks from hazards
- safe use of engineering controls and equipment on the site
- the emergency response plan detailed in Chapter 3 of this HASP
- the spill containment program detailed in Chapter 5 of this HASP

4.1b Site-Specific Briefings for Visitors

A site-specific briefing is provided to all site visitors who enter this site. For visitors, the site-specific briefing provides information about site hazards, the site lay-out including work zones and places of refuge, the emergency alarm system and emergency evacuation procedures, and other pertinent safety and health requirements as appropriate.

4.1c HASP Information and Site-Specific Briefings for Workers

Site personnel review this HASP and are provided a site-specific briefing prior to the commencement of work to ensure that employees are familiar with this HASP and the information and requirements it contains. Additional briefings are provided as necessary to notify employees of any changes to this HASP as a result of information gathered during ongoing site characterization and analysis. Conditions for which we schedule additional briefings include, but are not limited to: changes in site conditions, changes in the work schedule/plan, newly discovered hazards, and incidents occurring during site work.

4.2 Initial Training

Initial training requirements are based on a worker's potential for exposure.

4.3 Management and Supervisor Training

On-site managers and supervisors who are directly responsible for or who supervise workers engaged in hazardous operations are licensed herbicide applicators in the State of Washington. Mixer/Loaders who work with the applicators are trained and supervised by licensed applicators.

5.0 SPILL CONTAINMENT PROGRAM

(in compliance with 29 CFR 1910.120(b)(4)(ii)(J) and (j)(1)(viii))

This chapter of the Health and Safety Plan describes the potential for hazardous substance spills at this site and procedures for controlling and containing such spills. The purpose of this chapter of the Plan is to ensure that spill containment planning is conducted and appropriate control measures are established.

The spill containment program is consistent with OSHA requirements in 29 CFR 1910.120(b)(4)(ii)(J) and (j)(1)(viii) and addresses the following site-specific information:

* potential hazardous substance spills and available controls
* initial notification and response
* spill evaluation and response
* post-spill evaluation

5.1 Potential Spills and Available Controls

Table 5-1 below lists the location and type of potential hazardous substance spills at this site. This table also describes the activities or situations in which an accidental spill could occur and the type of release--either an incidental or an emergency release -- likely to result.

Wherever spills, leaks, or ruptures can occur, this site keeps suitable spill kits available. Their location is noted in Table 5-1. In addition, all areas subject to potential spills are diked or a means to adequately dike these areas in the event of a spill is available so that the entire volume of the hazardous substance being spilled can be contained and isolated. The type and location of spill containment equipment is also listed in Table 5-1.

Table 5-1 Potential Spills and Controls

Hazardous Substance	Location	Source of spill	Potential maximum qty of spill	Classification of spill	Available Spill Containment Equipment	Equipment Location
Herbicide	Lake shoreline loading herbicide into boats	Equipment failure	Unknown	Emergency	Spill Kit	Trucks & Boats
Herbicide	Lake shoreline loading herbicide into boats	Hose/line rupture	Unknown	Emergency	Spill Kit	Trucks & Boats
Herbicide	Spill in boat	Containers, Hoses, Hoppers, Tanks	Unknown	Emergency	Dispose of spillage in treatment zone not to exceed Aquatic Herbicide Label Concentrations	

5.2 Initial Spill Notification and Response

Any worker who discovers a hazardous substance spill will immediately notify Dave Kluttz, Project Manager. The worker will, to his/her best ability, report the hazardous substance involved, the location of the spill, the estimated quantity of material spilled, the direction/flow of the spill material, related fire/explosion incidents, and any associated injuries. The site Emergency Response Plan, found in Chapter 3 of this HASP, will immediately be implemented if an emergency release has occurred.

5.3 Spill Evaluation and Response

Dave Kluttz, Project Manager is responsible for evaluating spills and determining the appropriate response. When this evaluation is being made, the spill area will be isolated and demarcated.

The procedures of the Emergency Response Chapter of this HASP are implemented when the spill is determined to require emergency precautions and action. If necessary to protect nearby community members, notification of the appropriate authorities is made. Table 5-3 below lists the spill conditions that trigger notification of Federal, state, and local agencies.

Table 5-3 Off-site Notification Requirements

Hazardous Substance	Location	Spill Volume/ Conditions	Required Notification
Herbicide	Lake Shoreline, loading herbicide into boats	TBD By PM	Chris Overland, Moses Lake Irrigation & Rehabilitation District 509-361-8979

When an incidental release occurs, cleanup personnel receive instructions in a pre-cleanup meeting as to spill conditions, PPE, response activities, decontamination, and waste handling. The following are general measures that response/ cleanup personnel take when responding to a spill:

* To minimize the potential for a hazardous spill, hazardous substance and contaminated soils, control/absorbent media, drums and containers, and other contaminated materials are properly stored and labeled.

* When a spill occurs, only those persons involved in overseeing or performing spill containment operations will be allowed within the designated hazard areas. If necessary, the area will be roped, ribboned or otherwise blocked off. Unauthorized personnel are kept clear of the spill area.

* Appropriate PPE, as specified during the pre-cleanup meeting, is donned before entering the spill area.

* Appropriate spill control measures are specified in the pre-cleanup meeting and applied during spill response.

* Whenever possible without endangerment of personnel, the spill is stopped at the source or as close to the source as possible.

* Ignition points are removed if fire or explosion hazards exist.

* Surrounding reactive materials are removed.

* Drains or drainage in the spill area will be blocked or surrounded by berms to exclude the spilled waste and any materials applied to it.

* Provisions are made to contain and recover a neutralizing solution, if used.

* Small spills or leaks from a drum, tank, or pipe will require immediate cleanup to prevent or limit employee exposure. For small spills, sorbent materials such as sand, sawdust, or commercial sorbents from the spill kit are placed directly on the waste to prevent further spreading and aid in recovery.

* If any spill is large and/or continuing, an initial isolation area is created. Large spills are diked at the leading edge of the spill. Berms of earthen or sorbent material are constructed downstream of the leading edge of the spill to contain it. Where feasible, pumps are utilized to transfer the liquid to appropriate containers.

* Spill area is sprayed with appropriate foam where the possibility of volatile emissions exist.

* If the spill results in the formation of a toxic vapor cloud, from vaporization, or reaction with surrounding materials or by the outbreak of fire, further evacuation may be required.

* To dispose of spill waste, all contaminated sorbents, liquid waste, or earthen material will be cleaned up and placed in small quantities (50 pounds) in approved drums for proper storage or disposal as hazardous waste.

5.4 Post-Spill Evaluation

A written spill response report is prepared at the conclusion of clean-up operations. The report includes, at a minimum, the following information:

* date of spill incident
* cause of incident
* spill response actions
* any outside agencies involved, including their incident reports
* lessons learned or suggested improvements

The spill area is inspected to ensure the area has been satisfactorily cleaned. The use of soil, water, and air sampling is utilized in this determination as necessary. The root cause of the spill is examined and corrective steps taken to ensure the engineering and control measures in place have performed as required. If alternative precautions or measures are needed, they are made available and implemented.

6.0 PERSONAL PROTECTIVE EQUIPMENT

(in compliance with 29 CFR 1910.120(b)(4)(ii)(C) and 29 CFR 1910.120(g))

This chapter of the HASP describes how personal protective equipment (PPE) is used to protect against employee exposures to hazardous substances and hazardous conditions on this site.

* PPE selection criteria
* Site-specific PPE ensembles
* Criteria for PPE upgrades and downgrades
* Procedures for determining work duration
* Training in use of PPE
* Respiratory protection
* Hearing conservation
* PPE maintenance && storage
* Evaluation of this program

The person with the overall responsibility for the PPE program is Jake Nesbitt.

6.1 PPE Selection Criteria

Site safety and health hazards are eliminated or reduced to the greatest extent possible through engineering controls and work practices. Where hazards are still present, a combination of engineering controls, work practices, and PPE are used to protect employees.

An initial level of PPE is assigned to each task to provide an adequate barrier to exposure hazards. Initial PPE ensembles are selected based on the anticipated route(s) of entry of the hazardous substances on site and their concentration. Ensemble materials are selected using permeation data supplied by individual manufacturers. Materials providing the greatest duration of protection have been chosen. Tear and seam strength of the PPE are also considered to ensure ensemble durability while work is performed. When necessary, multiple layers of protection are used to accommodate the range of hazards that may be encountered. Where possible, employees are provided with a range of component sizes to ensure properly fitted PPE.

The following criteria are used in selecting PPE levels at this site.

Use of Level D Protection

Employees use Level D protection during tasks that have the following characteristics:

* The atmosphere contains no known or suspected hazardous substances at concentrations that meet or exceed the published exposure limit.

* Contact with hazardous levels of any chemicals through splashes, immersion, or by other means will not occur.

* There is no potential for unexpected inhalation or contact with hazardous levels of any chemical.

6.2 Use of PPE

Site-specific PPE ensembles and materials are identified below in Table 6-2a. These ensembles are consistent with Appendix B of 29 CFR 1910.120. PPE is used in accordance with manufacturers' recommendations.

Table 6-2a Site-Specific PPE Ensembles

Equipment	Model Purchased	Material	Employee
Level D			
Coveralls/Standard Work Clothes	Coveralls or long sleeve shirts and long pants, hats	Cotton or poly cotton	No
Boots/shoes	Shoes with socks		Yes
Gloves	Chemical Resistant		No
Other: Eye protection	Glasses		No
Other: Ear Muffs	Ear Muffs on boats		No

Criteria for PPE Upgrades and Downgrades

Jake Nesbitt has the authority to upgrade or downgrade PPE in a timely manner to respond to changing site conditions and to protect employee health and safety. Routine evaluation of the effectiveness of the PPE program is conducted as identified in Section 6.7 below.

Procedures for Determining Work Duration

Jake Nesbitt identifies task-specific work duration based on the following:

* Physiological requirements of the task

* PPE level for the task

* Ambient temperature and humidity

* Acclimatization of the work force

Employees are informed about task-specific work duration by the SSHO, during initial training and whenever a change is necessary

6.3 Training

Employees receive general training regarding proper selection, use and inspection of PPE during initial training and subsequent refresher training. Site-specific PPE requirements, including task-specific PPE, ensemble components, and inspection and maintenance procedures are communicated as identified in Chapter 4, Training.

6.4 Respiratory Protection

Respiratory protection is not used on this site in accord with the label of the products being applied.

6.5 Hearing Conservation

Employees must use hearing protection when traveling on airboats at speeds which require engine revolutions above 2000 rpm.

6.6 PPE Maintenance & Storage

Table 6-6 describes the PPE maintenance schedule for this site. The person responsible for overseeing PPE maintenance & storage procedures and for maintaining the inspection record is Jake Nesbitt.

Table 6-6 PPE Maintenance

Type of PPE	Model	Inspection Frequency	Done by	Cleaning Frequency	Done by
Level D					
Component	Coveralls or long sleeve	Daily	Applicators	NA	NA
Component	Shoes with socks	Daily	Applicators	NA	NA
Component	Ear Muffs	Daily	Applicators	NA	NA
Component	Glasses	Daily	Applicators	NA	NA
Component	Ear Muffs	Daily	Applicators	NA	NA

Defective or damaged equipment is not used and is reported to Jake Nesbitt so that the equipment can be repaired or discarded.

6.7 Evaluation of PPE Program

Evaluation of the effectiveness of site PPE selections occurs throughout site activities in response employee feedback.