

Attachment E – Notice of Intent

**WATER QUALITY ORDER NO. 2013-0002-DWQ
 GENERAL PERMIT NO. CAG990005**

**STATEWIDE GENERAL NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM
 (NPDES) PERMIT FOR RESIDUAL AQUATIC PESTICIDE DISCHARGES TO WATERS OF
 THE UNITED STATES FROM ALGAE AND AQUATIC WEED CONTROL APPLICATIONS**

I. NOTICE OF INTENT STATUS (see Instructions)

Mark only one item	A. <input checked="" type="checkbox"/> New Applicator	B. <input type="checkbox"/> Change of Information: WDID# _____
	C. <input type="checkbox"/> Change of ownership or responsibility: WDID# _____	

II. DISCHARGER INFORMATION

A. Name Patterson Irrigation District			
B. Mailing Address P.O Box 685			
C. City Patterson	D. County Stanislaus	E. State CA	F. Zip 95363
G. Contact Person Steve Trinta	H. E-mail address strinta@pattersonid.org	I. Title Watermaster	J. Phone (209)892-6233

III. BILLING ADDRESS (Enter Information only if different from Section II above)

A. Name			
B. Mailing Address			
C. City	D. County	E. State	F. Zip
G. E-mail address	H. Title	I. Phone	

IV. RECEIVING WATER INFORMATION

A. Algaecide and aquatic herbicides are used to treat (check all that apply):

1. Canals, ditches, or other constructed conveyance facilities owned and controlled by Discharger.
Name of the conveyance system: Patterson ID Main Canal and Laterals

2. Canals, ditches, or other constructed conveyance facilities owned and controlled by an entity other than the Discharger.
Owner's name: _____
Name of the conveyance system: _____

3. Directly to river, lake, creek, stream, bay, ocean, etc.
Name of water body: _____

B. Regional Water Quality Control Board(s) where treatment areas are located
(REGION 1, 2, 3, 4, 5, 6, 7, 8, or 9): Region Central Valley Region - 5
(List all regions where algaecide and aquatic herbicide application is proposed.)

V. ALGAECIDE AND AQUATIC HERBICIDE APPLICATION INFORMATION

A. Target Organisms: _____
Sago pondweed and Algae.

B. Algaecide and Aquatic Herbicide Used: List Name and Active ingredients
Cascade (AI: Endothal)
Teton (AI: Endothal)

C. Period of Application: Start Date May 1 End Date September 30

D. Types of Adjuvants Used:
None

VI. AQUATIC PESTICIDE APPLICATION PLAN

Has an Aquatic Pesticide Application Plan been prepared and is the applicator familiar with its contents?
 Yes No

If not, when will it be prepared? _____

VII. NOTIFICATION

Have potentially affected public and governmental agencies been notified? Yes No

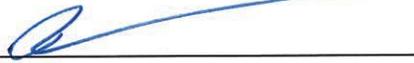
VIII. FEE

Have you included payment of the filing fee (for first-time enrollees only) with this submittal?
 YES NO NA

IX. CERTIFICATION

"I certify under penalty of law that this document and all attachments were prepared under my direction and supervision in accordance with a system designed to ensure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine or imprisonment. Additionally, I certify that the provisions of the General Permit, including developing and implementing a monitoring program, will be complied with."

A. Printed Name: Vince Lucchesi

B. Signature: 

Date: 1/15/2019

C. Title: General Manager

XI. FOR STATE WATER BOARD STAFF USE ONLY

WDID:	Date NOI Received:	Date NOI Processed:
Case Handler's Initial:	Fee Amount Received: \$	Check #:
<input type="checkbox"/> Lyris List Notification of Posting of APAP	Date _____	Confirmation Sent _____

Patterson Irrigation District

Aquatic Pesticide Application Plan

January 14, 2019

Certification:

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.



Vince Lucchesi
General Manager

Date: 1-15-2019

Executive Summary: Patterson Irrigation District is submitting this Aquatic Pesticide Application plan in compliance with General NPDES Permit for Residual Aquatic Pesticide Discharges from Algae and Aquatic Weed Control Applications (Order No. 2013-0002-DWQ). Patterson Irrigation District is located in western Stanislaus County between the San Joaquin River and the city of Patterson. Patterson Irrigation District delivers agricultural supply water through a series of lined and unlined canal laterals and intends use Endothall salts in the form of Cascade and Teton to control algae and aquatic weeds. During the treatment process, lateral spills will be sealed in a way that no treated canal water would leave the District. Established best management practices (BMPs) would be implemented during treatments.

Aquatic Pesticide Application Plan

1. Water Bodies and Systems to Control: Patterson Irrigation District (District) delivers agricultural water to growers within the District (see Figure 1). The conveyance system is made up of one Main Canal with five lifts. At each lift, there is a lateral that runs north and another that runs south. Aquatic weed control is required throughout all laterals: Laterals 1-North, 2-North, 2-South, 3-North, 3 South, 4-North, 4-South, 5-South & M Lateral. Figure 1 shows these laterals, as well as the proposed monitoring locations. It is important to note that the District can control the spills for each of these laterals in such a way that all discharged is collected by a regional recirculation system and stored in District-operated regulating reservoirs. No water would spill into waterbodies that would leave the District.

2. Weeds to Control: Sago Pondweed and Algae are major problems within the District. Weed growth restricts conveyance capacity in each lateral thereby limiting deliveries to farms especially at times of peak demand when it is most important to water crops. Weed growth breaks off at times and plugs screens, turnout gates, siphons, on-farm siphon pipes, and filtration systems resulting in overtopping of canals which cause significant damage to property, increase in maintenance and repair labor, and loss of water.

3. Control Tolerances: Once the weeds reach one foot tall, control is necessary. Weeds taller than one foot start to reduce conveyance capacity especially on hot days and start to plug facilities as described above.

4. Factors Influencing Decision to use Aquatic Pesticides: In addition to a “No Action” alternative, two aquatic vegetation control alternatives are available to the District: mechanical weed control (Canal Chaining) and chemical weed control. The No Action alternative is not acceptable as it dramatically reduces supplies to farms and caused various damage as described above and does not manage the aquatic vegetation problem.

Canal Chaining has been used in the past. This method uses a heavy steel chain, which is dragged through the canal by a tractor to break up the weeds, sending them downstream to be cleaned out at the next canal crossing. This method is somewhat effective in removing vegetation, however it is extremely labor intensive, damages the canals’ concrete lining, and suspends sediment which plugs filtration systems. In addition, the agitated vegetation plug screens, filtration systems, gates, and siphons, inhibiting the District’s ability to deliver water to

farmers. When this method is scheduled, water users are notified 24 hours in advance and most decide to reschedule irrigations, even if it may result in stressing crops, so the poor water quality doesn't damage their irrigation systems. Although this method removes weeds, it causes problems similar to the no action alternative and lasts for only a short period of time (generally two days).

Because the methods described above proved to be ineffective management practices, aquatic pesticides is the best alternative. The use of aquatic pesticides will drastically reduce the equipment and labor resources required by the alternative methods because application and monitoring of the aquatic pesticides will require only one person and one vehicle. The chain method described above requires two to four people in addition to an excavator, dump truck, and two vehicles. The use of aquatic pesticides will eliminate damage to the concrete lining of the canals as compared to the no action and chain alternative. It will also improve water quality because application will not cause sediment to be stirred up. Aquatic pesticide use will not damage grower irrigation systems and will provide increased water supply and reliability to growers.

5. Types(s) of Aquatic Pesticides Used and Application Method: The District intends to use endothal salts to manage aquatic weeds in the form of Cascade aquatic herbicide and Teton aquatic algaecide. These products will be used to control Sago Pondweed and algae applied per product label at a rate of 2.0 to 4.0 ppm for Cascade and 0.2 to 1.0 ppm for Teton. Lower rates will be applied when aquatic weeds are young, actively growing and low in density. Application will be in a uniform manner using drip application at first sign of weed growth. Application will be through a calibrated drip system or metering pump according to the product guidelines.

No adjuvants will be used during application of either pesticide.

6. Description of the Application Area and the Treatment Area: For control of algae, the application and treatment area may be the same if the algae is floating and not traveling downstream. If this condition is present, a surface spray will be used for treatment. If the algae are in its beginning growth stage and found on the canal lining, the application area will be at the headworks of each lateral where a metered drip system will be used for application. The treatment area will be the entire length of the lateral treated. If growth is site specific, the application area will be the same as the treatment area and application will be at a reduced period.

For control of Sago Pondweed, the application area will be at the headworks of each lateral where a drip system or metering pump will be used for application. The treatment area will be the entire length of the lateral treated. If growth is site specific, the application area will be the same as the treatment area and application will be at a reduced period.

During all application periods, the laterals will be managed such that there is no spill from the treated lateral for the duration of treatment or, if spill is necessary for operations, all discharged water will be collected in existing reservoirs designed for the purpose of capturing spills.

7. Description of Alternative Control Methods and Their Limitations: As an alternative to Cascade and Teton application, we have evaluated the mechanical removal of aquatic weeds with an excavator, a dump truck, and at least 2 to 4 men. This alternative is cost prohibitive, damaging to the canal systems, and ineffective. It causes damage to concrete lining; extreme canal bank erosion in unlined sections; and suspends silt and debris which plugs irrigation delivery and filter system. In addition, the mechanical removal alternative costs six to ten times more than the costs associated with application of the aquatic herbicide.

8. Determination of and Quantity of Product Needed: District personnel routinely make the following system evaluations:

- Preliminary site evaluations are used to determine areas in need of a treatment, location of a treatment site (site suitability), and some of the precautions to be used for a particular type of treatment. Pest type and growth stage are also considered in order to help determine the treatment type. These evaluations greatly increase the likelihood of achieving a high level of control.
- Secondary site evaluations and pre-treatment monitoring are routinely made. Some of the factors considered are weed species present, growth stage, weed location, and weed density. These evaluations are used to help determine such things as the appropriate mechanical control measure or herbicide to use, herbicide rate, and may also help in determining the number of treatment sites needed.
- Post-treatment assessment: This evaluation of efficacy is routine and normally starts at about one week after application and continues for the rest of the irrigation season. If a treatment is deemed ineffective then corrective changes are made, which may include elimination of the treatment from a given area or total elimination of a treatment from our program. If the control level is at a higher level than what is considered necessary, the treatment rate will be reduced and/or adjusted.

9. Monitoring Plan: Applications are made when aquatic weed growth hampers the efficient delivery of irrigation water in the District. Due to the cost of product, application and monitoring, aquatic herbicides are used only when necessary. Currently Cascade and Teton are the most cost-effective alternative for controlling aquatic weeds in the District. The basic monitoring plan is as follows:

1. Endothall concentration grab samples collected at the headworks of the lateral during treatment.
2. Endothall concentration grab samples collected at the end of laterals in operation during treatment.
3. Grab samples in receiving water body downstream from the lateral spill to check for presence/ absence after application. Note that these samples will only be collected if there is a discharge from the laterals into the downstream receiving water body.

Samples taken during applications (1 & 2) will be collected and processed by District staff. Results will be filed at the District headquarters. These samples are operational and taken to make sure the correct amount of product is being applied and sustained at levels lethal to the target aquatic weeds and algae. Sample (3) will be taken for compliance with the NPDES permit. The sample will be taken by District staff and processed by an approved laboratory with methods outlined by the BMP's. The sample location will vary depending on which laterals are being used during applications and are indicated on Figure 1. The location of the sample will be taken downstream in the drain from the lateral closest to the District outlet.

In addition to sampling for the active ingredient (endothall), testing for temperature, pH, turbidity, dissolved oxygen, and specific conductivity will be completed for all samples. Collected water quality data will be included in the annual report submitted to the Central Valley Regional Water Quality Control Board prior to March 1 of the year following the treatment activities.

10. List Gates and/or Control Structures and Inspection Schedule: Figure 1 shows the Laterals that will be treated by the District as well as the proposed monitoring locations. At the end of each lateral, there is a control gate or weir structure that controls the spill at each lateral. Spill at the end of the laterals discharges into District drainage facilities. The control gates and weirs are thoroughly inspected during the winter months. If structures found to be bad condition, repairs are made. The structures are also inspected daily as operational personnel monitor the system. These structures will be used to seal off any operational spill during the time of application of the aquatic herbicide.

11. Description of the BMP's to Be Implemented: The following describes the Best Management Practices the District will follow during application of aquatic pesticides:

- Licensing, pesticide labeling and permits. Patterson Irrigation District consults with a licensed Pest Control Advisor and the employee who makes the aquatic applications is licensed with a Qualified Applicator Certificate.
- District Personnel routinely make preliminary site evaluations. These are used to determine areas in need of a treatment, location of a treatment site (site suitability), and some of the precautions to be used for a particular type of treatment. Pest type and growth stage are also considered in order to help determine the treatment type. This greatly increases the likelihood of achieving a high level of control.
- Secondary site evaluations and pre-treatment monitoring are routinely made. Some of the factors considered are weed species present, growth stage, weed location and weed density. These are used to help determine such things as the appropriate mechanical control measure or herbicide to use, herbicide rate, and may also help in determining the number of treatment sites needed.

- Alternative Control Measures. As an alternative to Cascade and Teton application, we have evaluated the mechanical removal of aquatic weeds with an excavator, a dump truck and at least 2 to 4 men. This alternative is cost prohibitive and ineffective. It causes extreme canal bank erosion damage and a silt water quality problem. In addition, the mechanical removal alternative costs six to ten times more than the costs associated with application of the aquatic herbicide.

Canal water quality is considered in the application of Cascade and Teton, and the application amount is adjusted according to the label recommendations to improve efficacy. Site conditions, water use, and weather conditions are all considered in the decision to continue with a treatment or not.

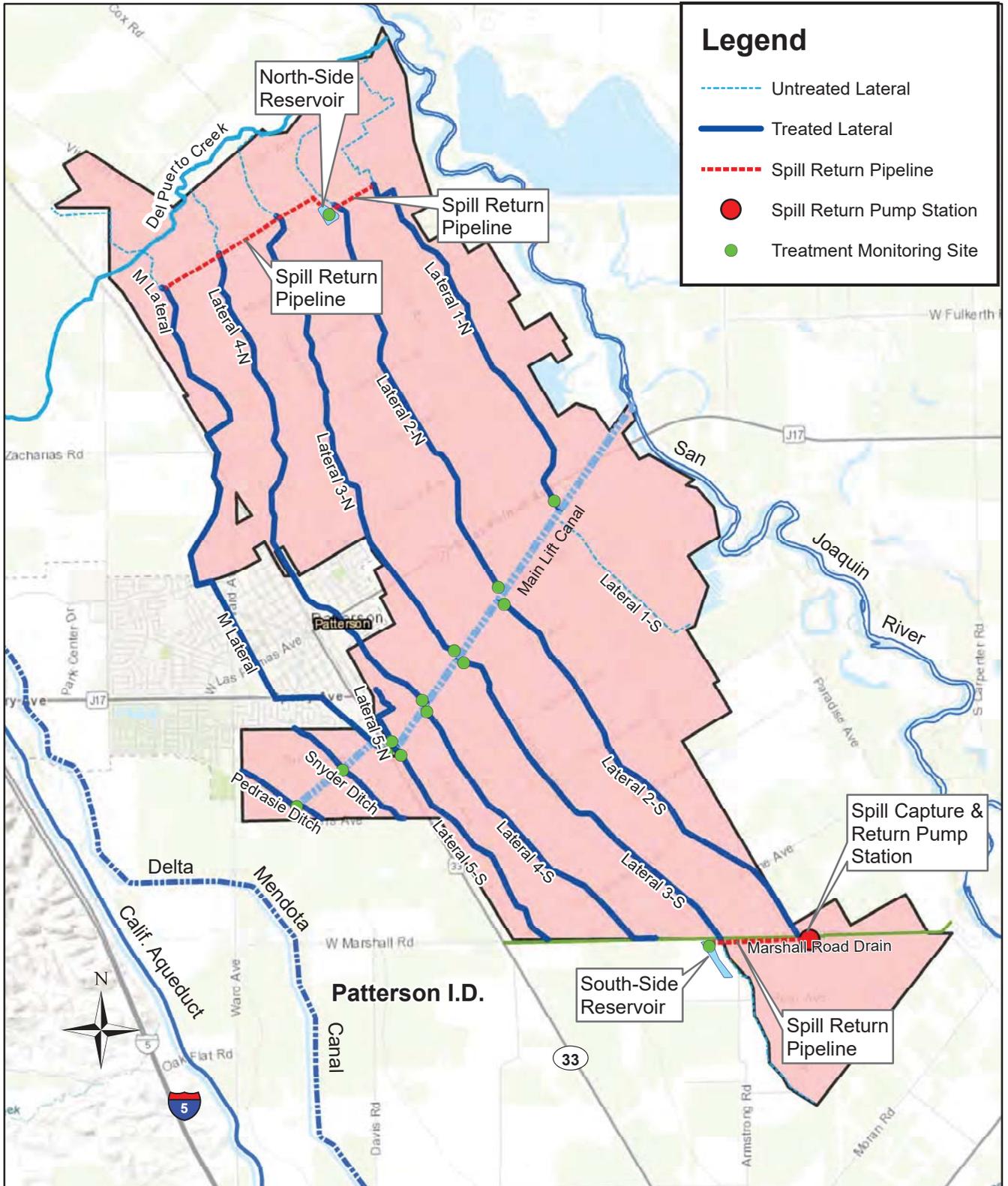
- Post-treatment assessment. This evaluation of efficacy is routine and normally starts at about one week after application and continues for the rest of the irrigation season. If a treatment is deemed ineffective then we make corrective changes, eliminate that treatment type from a given area or totally eliminate a certain type of treatment from our program. If the control level is at a higher level considered necessary, the treatment rate will be reduced and/or adjust the treatment site.

12. Exception under Section 5.3/CEQA - NOT APPLICABLE: The District intends to seal all spills prior to treating the laterals and does not expect any treated water to leave the system. As an alternative, spills can be captured and stored in District regulating reservoirs. The District is not seeking an exception under Section 5.3

13. Evaluation of Other Available BMP's to Determine Feasible Alternatives to the Selected Aquatic Pesticide Application Project That Could Reduce Potential Water Quality

Impacts: Representatives of the Cascade and products participated in the development of the BMPs. No other BMPs were evaluated during this process. The effectiveness of the BMPs will be continuously evaluated through the monitoring program and will be modified as required to assure there are no water quality impacts.

FIGURE 1



**Patterson Irrigation District
Aquatic Pesticide Application Plan
Treated Laterals and Monitoring Locations**

Prepared by:
Summers Engineering, Inc.
Consulting Engineers
Hanford California

Product Label
Cascade & Teton



For aquatic plant control in irrigation systems and other flowing water aquatic sites and quiescent, or slow moving waters.

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

**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 thoroughly after handling and 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.

PRODUCT INFORMATION

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

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.

- Phytotoxicity is not expected on plants or crops irrigated with Cascade treated water, however, all species and cultivars (varieties) have not been tested.
- Undiluted Cascade may be injurious to crops, grass, ornamentals or other foliage.
- Do not use Cascade treated water for chemigation as interactions between Cascade and other pesticides and fertilizers are not known.
- Do not use Cascade in brackish or saltwater.
- Wash out spray equipment with water after each operation.
- Contact of spray concentrate (product) directly or by drift with non-target plants or crops may result in injury.
- United Phosphorus, Inc. recommends not reducing Cascade rates below those specified within this label, when using Cascade in a treatment combination, or as a tank mix, with copper-based product(s), unless specified otherwise on this label or a United Phosphorus, Inc. supplemental label.

HOW TO APPLY:

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

Cascade may 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 must consider

the unique characteristics of the treated waters to assure that endothall 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 Cascade 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 exceeding the MCL of 0.1 ppm does not enter potable water intakes. For Cascade applications, potable water intakes must be closed when treated water exceeding the MCL of 0.1 ppm is present at the intake. In the event the water intake cannot be closed (when treated water will exceed 0.1 ppm), treatments must only be made downstream from the intake in order to assure Cascade treated water exceeding the MCL of 0.1 ppm 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, Cascade 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 Cascade 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 Cascade.

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

PLANTS CONTROLLED AND CASCADE DOSAGE RATES FOR SURFACE OR INJECTED APPLICATIONS TO QUIESCENT OR SLOW-MOVING WATER

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

* Suppression only

PONDS AND SMALL LAKES WITH LITTLE TO NO OUTFLOW

The following directions are intended for ponds and small lakes with minimal outflows to assure adequate contact time with the weeds.

Apply Cascade directly to the perimeter or in multiple locations around the perimeter of the water body.

This will allow for rapid mixing throughout the water body as well as the water column.

For best results, apply in early spring when weeds are actively growing with a minimum of 24 hours contact time.

Apply Cascade at the following rate: PLANTS CONTROLLED AND CASCADE DOSAGE RATES FOR SURFACE OR INJECTED APPLICATION IN PONDS AND SMALL LAKES

Aquatic Plant	Application Rate	Concentration (ppm)
Coontail (<i>Ceratophyllum</i> spp.) Horned Pondweed (<i>Zannichellia palustris</i>) Sago Pondweed (<i>Stuckenia pectinata</i>) Hydrilla (<i>Hydrilla verticillata</i>) Milfoil (<i>Myriophyllum</i> spp.) Parrotfeather (<i>Myriophyllum aquaticum</i>) Water Stargrass (<i>Heteranthera</i> spp.) Naiad (<i>Najas</i> spp.) Pondweed (<i>Potamogeton</i> spp.)	1.25 gallons Cascade per acre ft.	2.0 ppm

The following chart exemplifies the quantity of Cascade to be applied.

Examples of Cascade required for Treatment, Average Depth 4 ft. (2 ppm)

Amount of Cascade to Treat 1/2 Acre	Amount of Cascade to Treat 1 Acre
2.5 gallons	5.0 gallons

The following charts indicate the quantity of Cascade to be applied.

Gallons of Cascade 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 Cascade to Treat 1,000 Square-Foot 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

IRRIGATION SYSTEMS AND FLOWING WATER TREATMENTS: DRIP OR METERING SYSTEM APPLICATIONS

For aquatic plant control in flowing water, Cascade use rates can be found in the following chart. Apply Cascade 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 Cascade efficacy on the target plant species. Although Cascade is a contact herbicide adequate exposure time is critical. The following rate chart has been developed based on Concentration Exposure Time (CET) data for Cascade. The CET concept allows rates and the length of exposure to be adjusted for different treatment scenarios.

**CASCADE APPLICATION RATES FOR DRIP OR METERED
APPLICATIONS TO IRRIGATION SYSTEMS AND FLOWING WATER**

Plant Species	Length of Treatment (hours)							
	6	8	12	18	24	36	48	72
	Rate (ppm)							
Pondweeds (<i>Potamogeton</i> spp.) Sago Pondweed (<i>Stuckenia pectinata</i>)	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 (<i>Myriophyllum</i> spp.) Parrotfeather (<i>Myriophyllum aquaticum</i>) Coontail (<i>Ceratophyllum</i> spp.) Horned pondweed (<i>Zannichellia</i> spp.) Hydrilla (<i>Hydrilla verticillata</i>) Naiad (<i>Najas</i> spp.) Water Stargrass (<i>Heteranthera</i> 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.

Restriction for flowing waters used for irrigation of food crops: 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 Cascade required for a particular treatment use the following formula:

$$\text{[Cubic Feet per Second (CFS) X Length of Treatment (hrs.) X Rate (ppm)] x 0.052947 = Gallons of Cascade Needed for Treatment}$$

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

$$\text{Gallons of Cascade per Hour} = \text{Total Gallons of Cascade} / \text{Length of Treatment (hrs.)}$$

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. To the extent consistent with applicable law, 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.**

United Phosphorus, Inc. and Seller offer this product, and Buyer and User accept it, subject to the foregoing conditions of sale and limitations of warranty and of liability, which may not be modified except by written agreement signed by the duly authorized representative of United Phosphorus, Inc.

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Rev. 10/14/2016

70506-176(101916-6509)



Safety Data Sheet

United Phosphorus, Inc.

Preparation Date 23-Apr-2015

Revision date 23-Apr-2015

Revision Number: 1

1. Identification of the Substance/Preparation and of the Company/Undertaking

Product identifier

Product Description: Cascade

Other means of identification

Item#: 12-204B
UN-No 2902
Synonyms Not Available
Registration number(s) 70506-176

Recommended use of the chemical and restrictions on use

Recommended use Aquatic herbicide.
Uses advised against Activities contrary to label recommendation

Details of the Supplier of the Safety Data Sheet

Supplier Address

United Phosphorus Inc.
630 Freedom Business Center
Suite 402
King of Prussia, PA 19406

Emergency telephone number

Company Phone Number 1-800-438-6071
Emergency telephone number Chemtrec: (800) 424-9300 (24hrs) or (703) 527-3887
Medical: Rocky Mountain Poison Control Center
(866) 673-6671 (24hrs)

2. Hazards Identification

Classification

OSHA Regulatory Status

This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Acute toxicity - Oral	Category 5
Acute toxicity - Inhalation (Vapors)	Category 3
Serious eye damage/eye irritation	Category 1

Label elements

EMERGENCY OVERVIEW

hazard statements

Toxic if inhaled
MAY BE HARMFUL IF SWALLOWED
Causes serious eye damage



appearance Yellow brown**Physical state** liquid**Odor** Slight chlorine**Precautionary Statements - Prevention**

Wash hands thoroughly after handling

Do not get in eyes, on skin, or on clothing

Do not eat, drink or smoke when using this product

Wear protective gloves/protective clothing/eye protection/face protection

Hazards Not Otherwise Classified (HNOC)**OTHER INFORMATION**

- Toxic to mammals.

3. Composition/information on Ingredients

Chemical name	CAS-No	Weight %	Trade secret
Dipotassium endothall salt	2164-07-0	40.3	

If CAS number is "proprietary", the specific chemical identity and percentage of composition has been withheld as a trade secret.

4. First aid measures

FIRST AID MEASURES**Eye contact**

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. Immediate medical attention is required.

Skin contact

Take off contaminated clothing. Rinse skin immediately with plenty of water for 15-20 minutes. Call poison control center or doctor for treatment advice.

Inhalation

Move to fresh air. If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably mouth-to-mouth if possible. Call a physician or poison control center immediately.

Ingestion

Call a physician or poison control center immediately. Never give anything by mouth to an unconscious person. Do not induce vomiting without medical advice.

Most Important Symptoms and Effects, Both Acute and Delayed**Most Important Symptoms and Effects**

Causes serious eye damage.

Indication of Any Immediate Medical Attention and Special Treatment Needed**Notes to physician**

No information available. Treat symptomatically.

5. Fire-fighting measures

Suitable extinguishing media

Carbon dioxide (CO₂). Dry chemical. Water. Foam. Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Unsuitable extinguishing media No information available.

Specific hazards arising from the chemical

No information available.

Hazardous combustion products Extreme temperatures convert Endothall product to endothall anhydride which is a strong vesicant causing blistering of eyes, mucous membranes and skin.

Explosion data

Protective equipment and precautions for firefighters

Use personal protective equipment. As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

Personal Precautions Avoid contact with the skin and the eyes. Use personal protective equipment. Wear protective gloves/clothing and eye/face protection. Wash thoroughly after handling.

Environmental Precautions

Environmental precautions Consult a regulatory specialist to determine appropriate state or local reporting requirements, for assistance in waste characterization and/or hazardous waste disposal and other requirements listed in pertinent environmental permits.

Methods and material for containment and cleaning up

Methods for Clean-Up Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust). Sweep up and shovel into suitable containers for disposal.

7. Handling and Storage

Precautions for safe handling

Handling Do not breathe vapours or spray mist. Keep out of reach of children. Empty containers may contain hazardous residues. Wear personal protective equipment. Remove and wash contaminated clothing before re-use. Avoid contact with skin and eyes. Do not eat, drink or smoke when using this product. Pesticide applicators and workers must refer to product labeling and directions for use. Wash thoroughly after handling.

Conditions for safe storage, including any incompatibilities

Storage Store in an area where cross-contamination with pesticides, fertilizers, food or feed could not occur. Keep containers tightly closed in a cool, well-ventilated place. Keep out of the reach of children.

incompatible materials No information available.

8. Exposure Controls/Personal Protection

Exposure guidelines This product does not contain any hazardous materials with occupational exposure limits established by the region specific regulatory bodies.

Engineering controls Investigate engineering techniques to reduce exposures. Local mechanical exhaust ventilation is preferred. Consult ACGIH ventilation manual or NFPA Standard 91 for design of exhaust systems.

Personal protective equipment

Eye/Face Protection

Use eye protection to avoid eye contact. Where there is potential for eye contact have eye flushing equipment available. Safety glasses with side-shields. If splashes are likely to occur, wear: Goggles.

Skin protection

Chemical resistant gloves. waterproof gloves. Long sleeved clothing. Long pants. Socks and footwear.

Respiratory protection

Mixers & loaders:
A NIOSH approved dust mist filtering respirator with MSA/NIOSH approval number prefix

TC-21C or a NIOSH approved respirator with any N, R, P, or HE filter.

General hygiene considerations

Do not eat, drink or smoke when using this product. Remove and wash contaminated clothing before re-use. Wear suitable gloves and eye/face protection. Wash hands before breaks and immediately after handling the product.

9. Physical and Chemical Properties

Information on basic physical and chemical properties

Physical state	liquid	Odor	Slight chlorine
appearance	Yellow brown		
color	No information available		

<u>Property</u>	<u>VALUES</u>	<u>Remarks/ • Method</u>
pH	7.4	
Melting point/freezing point	8.4 °C / 47 °F	
Boiling Point/Range	>100 °C	
Flash Point		
Evaporation Rate	No information available	
flammability (solid, gas)	No information available	
Flammability limit in air		
Upper Flammability Limit	No information available	
Lower Flammability Limit	No information available	
vapor pressure	No information available	
Vapor Density	No information available	
Specific gravity	1.285	
Water solubility	No information available	
Solubility in Other Solvents	No information available	
Partition coefficient: n-octanol/water	No information available	
Autoignition temperature	No information available	
decomposition temperature	No information available	
Viscosity, kinematic	No information available	
Dynamic viscosity	No information available	
Explosive properties	No information available	
Oxidizing properties	No information available	

OTHER INFORMATION

Softening point	No information available
molecular weight	No information available
VOC Content	No information available
density	No information available
Bulk density	No information available

10. Stability and Reactivity

Reactivity

no data available

Chemical stability

Stable under recommended storage conditions.

Possibility of hazardous reactions

None under normal processing.

Conditions to avoid

No information available.

incompatible materials

No information available.

Hazardous decomposition products

Extreme temperatures may convert endothall product to endothall anhydride, a strong vesicant, causing blistering of eyes, mucous membranes and skin.

11. Toxicological Information

Information on Likely Routes of Exposure

Inhalation	Harmful by inhalation.
Eye contact	May cause irreversible damage to eyes.
Skin contact	Endothall has been shown to cause skin sensitization in susceptible persons.
Ingestion	Endothall = intentional ingestion of endothall of 40 ml led to death within 12 hours.

Component Information

Although no allergic skin reactions were observed in guinea pigs following exposure to this material in water, allergic skin reactions were observed following exposure to this material in ethanol. Repeated application to the skin of rats produced severe skin irritation, liver, and kidney effects considered to be secondary to irritation, and increased mortality. Long-term dietary administration produced no adverse effects in rats. Endothall- Intentional swallowing of 40 ml led to death within 12-hours. Skin allergy was observed in guinea pigs following repeated exposures. Repeated dietary administration (via gelatin capsules) produced vomiting, diarrhea, sluggish movements, and liver, kidney and blood effects in dogs. Long-term dietary administration to rats and mice produced effects in the glandular stomach. High mortality rates and intestinal tumors considered to be secondary to the effects in the stomach were observed in mice. Long-term application to the skin of mice produced no tumors. No birth defects were observed in the offspring of rats exposed orally during pregnancy, even at dosages that produced adverse effects on the mothers. Skeletal anomalies were observed in the offspring of rabbits and mice exposed orally during pregnancy, but only at dosages that produced adverse effects in the mothers. No genetic changes were observed in tests using bacteria, animal cells or animals.

Information on Toxicological Effects

Symptoms No information available.

Delayed and immediate effects as well as chronic effects from short and long-term exposure

sensitization	No information available.
Mutagenic effects	No information available.
Carcinogenicity	There are no known carcinogenic chemicals in this product.
Reproductive effects	Not Available.
STOT - Single Exposure	No information available.
STOT - repeated exposure	No information available.
Aspiration hazard	No information available.

Numerical Measures of Toxicity - Product information

LD50 Dermal	2000 mg/kg (rabbit)
LC50 Inhalation:	0.83 mg/l (4-hr)

12. Ecological Information

ecotoxicity

Endothall dipotassium salt:
 Mallard duck LD50 = 328 mg/kg
 Bluegill sunfish EC50= 1071 ppm
 Rainbow trout EC50 = 363 ppm
 Sheepshed minnow 96 hr EC50 = 340 ppm
 Mysid shrimp 96 hr EC50 = 257 ppm
 Eastern oyster 96 hr EC50 = 335 ppm

Persistence/Degradability

Rapidly biodegraded in aqueous systems indigenous microbial population to CO₂ and other non-toxic products.

Bioaccumulation/ Accumulation

No information available.

Other Adverse Effects

No information available

13. Disposal Considerations

Waste Treatment Methods**Waste Disposal Method**

Pesticide wastes are acutely hazardous. Improper disposal of excess pesticide or rinsate is a violation of Federal law. If the wastes cannot be disposed of by use or 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.

Contaminated packaging

Refer to product label.

14. Transport Information

DOT

UN-No	2902
Proper shipping name	Pesticides, liquid, toxic. n.o.s. (Endothal)
Hazard class	6.1
Packing group	PG III
Reportable Quantity (RQ):	1,000 lbs

ICAO

UN-No	2902
Proper shipping name	Pesticide, liquid, toxic, n.o.s (Endothall)
Hazard class	6.1
Packing group	PG III

IATA

UN-No	2902
Proper shipping name	Pesticide, liquid, toxic, n.o.s (Endothall)
Hazard class	6.1
Packing group	PG III

IMDG/IMO

UN-No	2902
Proper shipping name	Pesticide, liquid, toxic, n.o.s (Endothall)
Hazard class	6.1
Packing group	PG III
EmS No.	F-A, S-A

15. Regulatory Information

This chemical is a pesticide product registered by the Environmental Protection Agency and is subject to certain labeling

requirements under federal pesticide law. These requirements differ from the classification criteria and hazard information required for safety data sheets, and for workplace labels of non-pesticide chemicals. Following is the hazard information as required on the pesticide label:

signal word DANGER!

Ventilation Control PESTICIDE APPLICATORS & WORKERS THESE WORKERS MUST REFER TO PRODUCT LABELING AND DIRECTIONS FOR USE IN ACCORDANCE WITH EPA WORKER PROTECTION STANDARD 40 CFR PART 170.

Causes irreversible eye damage. May be fatal if swallowed. Harmful if inhaled or absorbed through skin. Keep out of Reach of Children. Pesticide is toxic to mammals.

International Inventories

USINV	Not determined
DSL/NDSL	Not determined
EINECS/ ELINCS	Complies
ENCS	Does not comply
China	Does not comply
KECL	Does not comply
PICCS	Does not comply
AICS	Does not comply
TSCA	Complies

TSCA - United States Toxic Substances Control Act Section 8(b) Inventory
DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List
EINECS/ELINCS - European Inventory of Existing Commercial Chemical Substances/EU List of Notified Chemical Substances
ENCS - Japan Existing and New Chemical Substances
IECSC - China Inventory of Existing Chemical Substances
KECL - Korean Existing and Evaluated Chemical Substances
PICCS - Philippines Inventory of Chemicals and Chemical Substances
AICS - Australian Inventory of Chemical Substances

Federal Regulations

SARA 313

Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product contains a chemical or chemicals which are subject to the reporting requirements of the Act and and Title 40n of the Code of Federal Regulations, Part 372:

Chemical name	SARA 313 - Threshold Values
Dipotassium endothall salt - 2164-07-0	1.0

SARA 311/312 Hazardous

Categorization

Acute health hazard	yes
Chronic health hazard	NO
Fire hazard	No
Sudden release of pressure hazard	No
Reactive Hazard	No

CERCLA

SARA Product RQ 0

RCRA

Pesticide Information

State Regulations

State Right-to-Know

Chemical name	Massachusetts	New Jersey	Pennsylvania	Illinois	Rhode Island

Dipotassium endothall salt		X		
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International regulations

U.S. EPA Label information

EPA Pesticide registration number 70506-176

16. Other Information

NFPA **HEALTH 3** **flammability 0** **Instability 1** **Physical hazard -**

Preparation Date 23-Apr-2015
Revision date 23-Apr-2015

Revision Summary
Update to GHS format

Disclaimer

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End of MSDS



AQUATIC ALGAECIDE AND HERBICIDE

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

ACTIVE INGREDIENT:

Mono(N,N-dimethylalkylamine) salt of endothall* 53.0%

OTHER INGREDIENTS: 47.0%

TOTAL 100.0%

*7-oxabicyclo [2.2.1] heptane-2,3-dicarboxylic acid equivalent 23.36%

Contains 2 lbs. endothall acid per gallon

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 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 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 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: Probable mucosal damage may contraindicate the use of gastric lavage. Measures against circulatory shock, respiratory depression and convulsion may be needed.

EPA Registration No. 70506-175

Batch/Lot No.: _____

Net Contents: _____



United Phosphorus, Inc.

630 Freedom Business Center, Suite 402

King of Prussia, PA 19406 • 1-800-438-6071

PRECAUTIONARY STATEMENTS HAZARDS TO HUMANS AND DOMESTIC ANIMALS

DANGER

CORROSIVE. CAUSES IRREVERSIBLE EYE DAMAGE AND SKIN BURNS. MAY BE FATAL IF SWALLOWED, OR ABSORBED THROUGH SKIN. HARMFUL IF INHALED. DO NOT GET IN EYES, ON SKIN OR ON CLOTHING. AVOID BREATHING VAPOR OR SPRAY MIST.

Personal Protective Equipment (PPE)

Mixers, loaders, applicators and other handlers must wear:

- Coveralls over long-sleeved shirt and long pants,
Exception: When the product is applied in a manner in which the applicator will have no contact with the pesticide (such as direct metering or subsurface injection), coveralls need not be worn.
- Chemical-resistant footwear plus socks,
- Chemical-resistant gloves made of any waterproof material,
- Chemical-resistant headgear for overhead exposure,
- Protective eyewear,
- Chemical-resistant apron when mixing, loading, or cleaning equipment,
- 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 release 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 thoroughly after handling and 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 highly toxic to fish and aquatic invertebrates. This pesticide is toxic to wildlife.

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

PRODUCT INFORMATION

Teton is a liquid concentrate soluble in water and is a highly effective aquatic algaecide and herbicide. Apply when target algae and plants are actively growing. Note: Susceptibility of algae may vary due to subspecies, strains or environmental conditions. Dosage rates are measured in parts per million (ppm) endothall acid.

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.

- When used as directed, phytotoxicity is not expected on plants or crops irrigated with Teton treated water, however, all species and cultivars (varieties) have not been tested.
- Undiluted Teton may be injurious to crops, grass, ornamentals or other foliage.
- Do not use Teton treated water for chemigation as interactions between Teton and other pesticides and fertilizers are not known.
- Do not use Teton in waters containing Koi or hybrid goldfish.
- Teton is not intended for use in small volume garden pond systems.
- Fish may be killed by dosages in excess of 0.3 parts per million (ppm).
- Do not use Teton in brackish or saltwater.
- Wash out spray equipment with water after each operation.
- Contact of spray concentrate (product) directly or by drift with non-target plants or crops may result in injury.
- Do not treat more than 10% of the area at one time with doses in excess of 1 ppm.
- United Phosphorus, Inc. recommends not reducing Teton rates below those specified within this label when using Teton in irrigation systems in a treatment combination, or as a tank mix, with copper-based product(s), unless specified otherwise on this label or a United Phosphorus, Inc. supplemental label.

HOW TO APPLY:

Teton is a contact algaecide and herbicide. Apply when target algae and plants are present. Teton may 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. Teton can be applied to floating algae mats as a surface application. In instances where the algae or 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 must 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 Teton 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 exceeding the MCL of 0.1 ppm does not enter potable water intakes. For Teton applications, potable water intakes must be closed when treated water exceeding the MCL of 0.1 ppm is present at the intake. In the event the water intake cannot be closed (when treated water is present that exceeds 0.1 ppm), treatments must only be made downstream from the intake in order to assure Teton treated water above 0.1 ppm does not enter the potable water system.

QUIESCENT OR SLOW MOVING WATER TREATMENTS: SURFACE OR INJECTED APPLICATIONS

ALGAE CONTROL: Teton is effective on a broad range of planktonic, filamentous, and branched algae. Note: Susceptibility of algae may vary due to subspecies, strains or environmental conditions. Generally rates of 0.05 to 0.3 ppm (0.6-3.6 pints per acre foot) are effective for the control of algae. Repeat applications when algae reappear and reach treatment levels. Dosages may be increased (from 0.3 to 3.0 ppm) where greater longevity of control is desired or to improve efficacy on species that prove difficult to control. Due to the potential for fish toxicity at higher rates, it is suggested that applications above 0.3 ppm be made only by commercial applicators as marginal or sectional treatments.

FLOATING ALGAE MATS: Apply Teton when algae is actively growing. Spray Teton over-the-top of floating algae mats using a 3-5% spray solution (based on volume). Use a minimum of 0.5 gal. per surface acre with adequate water volume to assure complete coverage. When used in this manner, coverage is critical; only the algae sprayed will be controlled. Any submerged algae will require additional treatment as described in the ALGAE CONTROL section of this label. Results are usually observed in a few days on algae.

SUBMERGED AQUATIC PLANTS: Apply Teton at 1 to 5 ppm (1.4 gallons to 6.8 gallons per acre foot) for control of aquatic plants. Due to potential fish toxicity, Teton use for submerged aquatic plant control is suggested to be made only by commercial applicators as marginal or sectional treatments. Use application rates over 1.0 ppm only on very narrow margins or in areas where some fish kill is not objectionable.

RATES FOR SURFACE OR INJECTED APPLICATION TO QUIESCENT OR SLOW-MOVING WATER:

Algae or Plant	Rate ppm endothall acid	Amount of Teton per Acre Ft.
Algae Planktonic, Filamentous, Branched (Use in California limited to <i>Cladophora</i> , <i>Pithophora</i> , <i>Spirogyra</i> , <i>Chara</i>)	0.05-3.0	0.6-36 pints
Aquatic Plants		
Fanwort, ^{a,b,c} <i>Cabomba caroliniana</i>	2-5	2.7-6.8 gals.
Brazilian Elodea, <i>Egeria densa</i>	2-5	2.7-6.8 gals.
Elodea, ^c <i>Elodea canadensis</i>	2-5	2.7-6.8 gals.
Hydrilla, <i>Hydrilla verticillata</i>	1-5	1.4-6.8 gals.
Hygrophila, ^{a,b,c} <i>Hygrophila polysperma</i>	2-5	2.7-6.8 gals.
Eelgrass, ^c <i>Vallisneria americana</i>	2-5	2.7-6.8 gals.
Coontail, ^c <i>Ceratophyllum</i> spp.	1.5-5	2.0-6.8 gals.
Horned Pondweed, ^c <i>Zannichellia palustris</i>	1.5-5	2.0-6.8 gals.
Milfoil, ^c <i>Myriophyllum</i> spp.	1.5-5	2.0-6.8 gals.
Sago Pondweed, ^c <i>Stuckenia pectinata</i>	1-5	1.4-6.8 gals.
Naiad, ^c <i>Najas</i> spp.	1.5-5	2.0-6.8 gals.
Pondweed, ^c <i>Potamogeton</i> spp.	0.75-5	1.0-6.8 gals.
Including:		
American, <i>P. nodosus</i>	1.5-5	2.0-6.8 gals.
Largeleaf (Bass Weed), <i>P. amplifolius</i>	1.5-5	2.0-6.8 gals.
Curlyleaf, <i>P. crispus</i>	0.75-5	1.0-6.8 gals.
Flatstem, <i>P. zosteriformis</i>	1.5-5	2.0-6.8 gals.
Floating-leaf, <i>P. natans</i>	1-5	1.4-6.8 gals.
Illinois, <i>P. illinoensis</i>	1.25-5	1.7-6.8 gals.
Narrowleaf, <i>P. pusillus</i>	1-5	1.4-6.8 gals.
Threadleaf, <i>P. filiformis</i>	1.5-5	2.0-6.8 gals.
Variable Leaf, <i>P. diversifolius</i>	1-5	1.4-6.8 gals.
Water Stargrass, ^{a,c} <i>Heteranthera</i> spp.	1.5-5	2.0-6.8 gals.

^a Not for this use in California

^b Suppression only

^c Not for this use in New York

**FLOWING WATER TREATMENTS:
DRIP OR METERING SYSTEMS**

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

FLOATING ALGAE MATS: Apply Teton when algae is actively growing. Spray Teton over-the-top of floating algae mats using a 3-5% spray solution (based on volume). Use a minimum of 0.5 gal. per surface acre with adequate water volume to assure complete coverage. When used in this manner, coverage is critical; only the algae sprayed will be controlled. Any submerged algae will require additional treatment as described in the ALGAE CONTROL section of this label. Results are usually observed in a few days on algae.

RATES FOR DRIP OR METERING APPLICATION TO FLOWING WATER:

Target Species	Rate ppm endothall acid	Duration	Restrictions
Algae: Planktonic, Filamentous, Branched (Use in California limited to <i>Cladophora</i> , <i>Pithophora</i> , <i>Spirogyra</i> , <i>Chara</i>)	0.05-3.0	6-120 hours	A maximum of 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.
Plants: Fanwort, ^{a,b,c} <i>Cabomba caroliniana</i> Coontail, ^c <i>Ceratophyllum</i> spp. Elodea, ^c <i>Elodea canadensis</i> Hydrilla, <i>Hydrilla verticillata</i> Hygrophila, ^{a,b,c} <i>Hygrophila polysperma</i> Milfoil, ^c <i>Myriophyllum</i> spp. Naiad, ^c <i>Najas</i> spp. Pondweed, ^c <i>Potamogeton</i> spp. Water Stargrass, ^{a,c} <i>Heteranthera</i> spp. Eelgrass, ^c <i>Vallisneria americana</i> Horned Pondweed, ^c <i>Zannichellia palustris</i> Sago Pondweed, ^c <i>Stuckenia pectinata</i>	0.2-5	6-120 hours	There is no Pre-harvest Interval (PHI) for crops irrigated with treated water.

^a Not for this use in California

^b Suppression only

^c Not for this use in New York

Restriction for flowing waters used for irrigation of food crops: 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 Teton required for a particular treatment use the following formula:

[Cubic Feet per Second (CFS) X Length of Treatment (hrs.) X Rate (ppm)] x 0.11198 = Gallons of Teton Needed for Treatment

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

Gallons of Teton per hour = Total Gallons of Teton / 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. 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 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. To the extent consistent with applicable law, 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.**

United Phosphorus, Inc. and Seller offer this product, and Buyer and User accept it, subject to the foregoing conditions of sale and limitations of warranty and of liability, which may not be modified except by written agreement signed by the duly authorized representative of United Phosphorus, Inc.

Teton is a registered trademark of United Phosphorus, Inc.

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Rev. 10/14/2016

70506-175(101916-6507)



Safety Data Sheet

United Phosphorus, Inc.

Preparation Date 27-Apr-2015

Revision date 02-Jun-2015

Revision Number: 1

1. Identification of the Substance/Preparation and of the Company/Undertaking

Product identifier

Product Description: Teton

Other means of identification

Item#: 12-174B
UN-No 2902
Synonyms Not Available
Registration number(s) 70506-175

Recommended use of the chemical and restrictions on use

Recommended use Aquatic herbicide. algicide.
Uses advised against Activities contrary to label recommendation

Details of the Supplier of the Safety Data Sheet

Supplier Address

United Phosphorus Inc.
630 Freedom Business Center
Suite 402
King of Prussia, PA 19406

Emergency telephone number

Company Phone Number 1-800-438-6071
Emergency telephone number Chemtrec: (800) 424-9300 (24hrs) or (703) 527-3887
Medical: Rocky Mountain Poison Control Center
(866) 673-6671 (24hrs)

2. Hazards Identification

Classification

OSHA Regulatory Status

This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Acute toxicity - Oral	Category 3
Acute toxicity - Dermal	Category 3
Acute toxicity - Inhalation (Vapors)	Category 2
Skin Corrosion/Irritation	Category 1 Sub-category B
Serious eye damage/eye irritation	Category 1

Label elements

EMERGENCY OVERVIEW

DANGER

hazard statements

Toxic if swallowed
Toxic in contact with skin
Fatal if inhaled

**appearance** Dark yellow light brown**Physical state** liquid**Odor** Slight chlorine**Precautionary Statements - Prevention**

Wash face, hands and any exposed skin thoroughly after handling
 Do not eat, drink or smoke when using this product
 Wear protective gloves/protective clothing/eye protection/face protection
 Do not breathe dust/fume/gas/mist/vapors/spray
 Use only outdoors or in a well-ventilated area
 In case of inadequate ventilation wear respiratory protection

IF ON SKIN: Wash with plenty of soap and water
 Call a POISON CENTER or doctor if you feel unwell
 Remove/Take off immediately all contaminated clothing
 Wash contaminated clothing before reuse
 IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing
 Immediately call a POISON CENTER or doctor/physician
 IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician
 Rinse mouth

Precautionary Statements - Storage

Store locked up
 Store in a well-ventilated place. Keep container tightly closed

Precautionary Statements - Disposal

Dispose of contents/container to an approved waste disposal plant

Hazards Not Otherwise Classified (HNOC)**OTHER INFORMATION**

3. Composition/information on Ingredients

Chemical name	CAS-No	Weight %	Trade secret
Mono(N,N-diethylalkylamine)salt of endothall	66330-88-9	53	

If CAS number is "proprietary", the specific chemical identity and percentage of composition has been withheld as a trade secret.

4. First aid measures

FIRST AID MEASURES

General advice	Immediate medical attention is not required. Show this safety data sheet to the doctor in attendance.
Eye contact	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 a poison control center or doctor for treatment advice.
Skin contact	Wash off immediately with plenty of water for at least 15 minutes. Call poison control center or doctor for treatment advice.
Inhalation	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 a poison control center or doctor for further treatment advice.

Ingestion Call a physician or poison control center immediately. Do not induce vomiting without medical advice. Never give anything by mouth to an unconscious person.

Protection of First-aiders Use personal protective equipment.

Most Important Symptoms and Effects, Both Acute and Delayed

Most Important Symptoms and Effects No information available.

Indication of Any Immediate Medical Attention and Special Treatment Needed

Notes to physician No information available. Treat symptomatically.

5. Fire-fighting measures

Suitable extinguishing media

Carbon dioxide (CO₂). Water. Foam.

Unsuitable extinguishing media No information available.

Specific hazards arising from the chemical

Thermal decomposition can lead to release of irritating gases and vapours.

Hazardous combustion products Extreme temperatures convert Endothall product to endothall anhydride which is a strong vesicant causing blistering of eyes, mucous membranes and skin.

Explosion data

Protective equipment and precautions for firefighters

Use personal protective equipment. As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

Personal Precautions Avoid contact with the skin and the eyes. Use personal protective equipment. Wear protective gloves/clothing and eye/face protection.

Environmental Precautions

Environmental precautions Consult a regulatory specialist to determine appropriate state or local reporting requirements, for assistance in waste characterization and/or hazardous waste disposal and other requirements listed in pertinent environmental permits.

Methods and material for containment and cleaning up

Methods for Clean-Up Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust). Sweep up and shovel into suitable containers for disposal.

7. Handling and Storage

Precautions for safe handling

Handling Keep out of reach of children. Empty containers may contain hazardous residues. Avoid contact with skin, eyes and clothing. Remove and wash contaminated clothing before re-use. Do not eat, drink or smoke when using this product. Wash thoroughly after handling.

Conditions for safe storage, including any incompatibilities

Storage	Keep in a dry place. Keep containers tightly closed in a cool, well-ventilated place. Keep from freezing.
incompatible materials	Strong oxidizing agents.

8. Exposure Controls/Personal Protection

Exposure guidelines	This product does not contain any hazardous materials with occupational exposure limits established by the region specific regulatory bodies.
Engineering controls	Investigate engineering techniques to reduce exposures. Local mechanical exhaust ventilation is preferred. Consult ACGIH ventilation manual or NFPA Standard 91 for design of exhaust systems.

Personal protective equipment

Eye/Face Protection

Use eye protection to avoid eye contact. Where there is potential for eye contact have eye flushing equipment available. Goggles.

Skin protection

Wear protective gloves/clothing. Chemical resistant footwear plus socks.

Respiratory protection

Where airborne exposure is likely, use NIOSH approved respiratory protection equipment appropriate to the material and/or its components. Full facepiece equipment is recommended and, if used, replaces need for face shield and/or chemical goggles. If exposures cannot be kept at a minimum with engineering controls, consult respirator manufacturer to determine appropriate type equipment for given application. Observe respirator use limitations specified by NIOSH or the manufacturer. For emergency and other conditions where there may be a potential for significant exposure, use an approved full face positive-pressure, self-contained breathing apparatus. Respiratory protection programs must comply with 29 CFR 1910.134.

General hygiene considerations

Do not eat, drink or smoke when using this product. Remove and wash contaminated clothing before re-use. Wear suitable gloves and eye/face protection. Wash hands before breaks and immediately after handling the product.

9. Physical and Chemical Properties

Information on basic physical and chemical properties

Physical state	liquid	Odor	Slight chlorine
appearance	Dark yellow light brown		
color	No information available		

<u>Property</u>	<u>VALUES</u>	<u>Remarks/ • Method</u>
pH	No information available	
Melting point/freezing point	No information available	
Boiling Point/Range	100 °C / 212 °F	
Flash Point	> 100 C	
Evaporation Rate	No information available	
flammability (solid, gas)	No information available	
Flammability limit in air		
Upper Flammability Limit	No information available	
Lower Flammability Limit	No information available	
vapor pressure	9.45 X 10 ⁻⁶ Torr(Salt)	
Vapor Density	No information available	
Specific gravity	1.044 @25 C	
Water solubility	No information available	
Solubility in Other Solvents	No information available	
Partition coefficient: n-octanol/water	No information available	
Autoignition temperature	No information available	
decomposition temperature	No information available	
Viscosity, kinematic	No information available	
Dynamic viscosity	No information available	
Explosive properties	No information available	

Oxidizing properties No information available

OTHER INFORMATION

Softening point No information available
molecular weight No information available
VOC Content No information available
density No information available
Bulk density No information available

10. Stability and Reactivity

Reactivity

no data available

Chemical stability

Stable under normal conditions.

Possibility of hazardous reactions

None under normal processing.

Hazardous polymerization Hazardous polymerisation does not occur.

Conditions to avoid

Not known.

incompatible materials

Strong oxidizing agents.

Hazardous decomposition products

Carbon oxides.

11. Toxicological Information

Information on Likely Routes of Exposure

Product information

Single exposure studies indicate:

Oral - Moderately toxic to rats (LD50 233.4 mg/kg)

Dermal - Moderately toxic to rabbits (LD50 480.9 mg/kg)

Inhalation - Slightly toxic to rats (4 hr LC 50 0.7 mg/l)

Skin irritation - Severely irritating to rabbits

Eye irritation - severely irritating to rabbits

No skin allergy was observed in guinea pigs following repeated exposure. Endothall intentional swallowing of 40 ml led to death within 12 hours. Skin allergy was observed in guinea pigs following repeated exposure. Repeated dietary administration (Via gelatin capsules) produced vomiting, diarrhea, sluggish movements, and liver, kidney and blood effects in dogs. Long-term dietary administration to rats and mice produced effects in the glandular stomach. High mortality rates and intestinal tumors considered to be secondary to the effects in the stomach were observed in mice. Long-term application to the skin of mice produced no tumors. No birth defects were observed in the offspring of rats exposed orally during pregnancy, even at dosages that produced adverse effects on the mothers. Skelatal abnormalities were observed in the offspring of rabbits and mice exposed during pregnancy, but only at dosages that produced adverse effects in the mothers. No genetic changes were observed in tests using bacteria, animal cells or animals.

Inhalation

Harmful by inhalation.

Eye contact

Corrosive. May cause irreversible damage to eyes.

Skin contact

Causes severe skin burns.

Ingestion

MAY BE FATAL IF SWALLOWED.

Information on Toxicological Effects

Symptoms No information available.

Delayed and immediate effects as well as chronic effects from short and long-term exposure

sensitization No information available.
Mutagenic effects No information available.
Carcinogenicity There are no known carcinogenic chemicals in this product.
Reproductive effects Not Available.
STOT - Single Exposure No information available.
STOT - repeated exposure No information available.
Aspiration hazard No information available.

Numerical Measures of Toxicity - Product information

LD50 Oral 233 mg/kg (rat)
LD50 Dermal 480.9 mg/kg (rat)
LC50 Inhalation: 0.7 mg/l (rat) (4-hr)

12. Ecological Information

ecotoxicity

Endothall mono amine salt:
 Acute contact toxicity Honey Bee
 Practically non toxic
 Acute Toxicity Avain
 Northern Bobwhite Quail LD50
 736 mg/kg
 Acute Toxicity Freshwater Fish EC50
 Bluegill sunfish 0.94 ppm
 Rainbow trout 0.56 ppm
 Cutthroat trout 0.18 ppm
 Channel catfish 0.49 ppm
 Acute Toxicity Freshwater Invertebrates EC50
 Daphnia magna 0.36 ppm (48 hr)
 Grasshrimp 0.05 ppm (96hr)
 Scud 2.0 ppm (48hr)
 Acute Toxicity Marine Invertebrates (flow thru) EC50 Mysid shrimp 2.2 ppm (96 hr)
 Acute Toxicity Marine Fish (Flow thru) EC50
 Sheepshead minnow 3.5 ppm (96 hr)

Persistence/Degradability

No information available.

Bioaccumulation/ Accumulation

Does not bioaccumulate.

Other Adverse Effects

No information available

13. Disposal Considerations

Waste Treatment Methods

Waste Disposal Method

Pesticide wastes are acutely hazardous. Improper disposal of excess pesticide or rinsate is a violation of Federal law. If the wastes cannot be disposed of by use or 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.

Contaminated packaging Refer to product label.

14. Transport Information

DOT

UN-No	2902
Proper shipping name	Pesticides, liquid, toxic. n.o.s. (Endothal)
Hazard class	6.1
Packing group	PG III
Reportable Quantity (RQ):	1,000 lbs (endothall)

TDG

ICAO

UN-No	2902
Proper shipping name	Pesticide, liquid, toxic, n.o.s (Endothall)
Hazard class	6.1
Packing group	PG III

IATA

UN-No	2902
Proper shipping name	Pesticide, liquid, toxic, n.o.s (Endothall)
Hazard class	6.1
Packing group	PG III

IMDG/IMO

UN-No	2902
Proper shipping name	Pesticide, liquid, toxic, n.o.s (Endothall)
Hazard class	6.1
Packing group	PG III
EmS No.	F-A, S-A

15. Regulatory Information

This chemical is a pesticide product registered by the Environmental Protection Agency and is subject to certain labeling requirements under federal pesticide law. These requirements differ from the classification criteria and hazard information required for safety data sheets, and for workplace labels of non-pesticide chemicals. Following is the hazard information as required on the pesticide label:

signal word DANGER!

Ventilation Control PESTICIDE APPLICATORS & WORKERS THESE WORKERS MUST REFER TO PRODUCT LABELING AND DIRECTIONS FOR USE IN ACCORDANCE WITH EPA WORKER PROTECTION STANDARD 40 CFR PART 170.

Keep out of Reach of Children. Causes irreversible eye damage. May be fatal if swallowed. Harmful if inhaled or absorbed through skin.

International Inventories

USINV	Not determined
DSL/NDL	Not determined
EINECS/	Does not comply
ELINCS	
ENCS	Does not comply
China	Does not comply
KECL	Does not comply

PICCS Does not comply
 AICS Does not comply
 TSCA Does not comply

TSCA - United States Toxic Substances Control Act Section 8(b) Inventory
 DSL/NDL - Canadian Domestic Substances List/Non-Domestic Substances List
 EINECS/ELINCS - European Inventory of Existing Commercial Chemical Substances/EU List of Notified Chemical Substances
 ENCS - Japan Existing and New Chemical Substances
 IECSC - China Inventory of Existing Chemical Substances
 KECL - Korean Existing and Evaluated Chemical Substances
 PICCS - Philippines Inventory of Chemicals and Chemical Substances
 AICS - Australian Inventory of Chemical Substances

Federal Regulations

SARA 313

Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product does not contain any chemicals which are subject to the reporting requirements of the Act and and Title 40n of the Code of Federal Regulations, Part 372.

SARA 311/312 Hazardous

Categorization

Acute health hazard	yes
Chronic health hazard	NO
Fire hazard	No
Sudden release of pressure hazard	No
Reactive Hazard	yes

CERCLA

SARA Product RQ 0

RCRA

Pesticide Information

State Regulations

State Right-to-Know

International regulations

U.S. EPA Label information

EPA Pesticide registration number 70506-175

16. Other Information

NFPA HEALTH 3 flammability 0 Instability 0 Physical hazard -

Preparation Date 27-Apr-2015
 Revision date 02-Jun-2015

Revision Summary
 Update to GHS format

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End of MSDS