

GENERAL NPDES PERMIT FOR RESIDUAL
AQUATIC PESTICIDE DISCHARGES FROM
ALGAE AND AQUATIC WEED CONTROL APPLICATIONS

ORDER NO. 2013-0002-DWQ
NPDES NO. CAG990005

RECEIVED

JUN 03 2016

Attachment E – Notice of Intent

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

DIVISION OF WATER QUALITY

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. New Applicator B. Change of Information: WDID# WDID 4B197900008
C. Change of ownership or responsibility: WDID# _____

II. DISCHARGER INFORMATION

A. Name City of Long Beach Department of Parks, Recreation and Marine			
B. Mailing Address Park Maintenance 2760 Studebaker Rd.			
C. City Long Beach	D. County Los Angeles	E. State CA	F. Zip 90815
G. Contact Person Kelly Parkins	H. E-mail address kelly.parkins@longbeach.gov	I. Title Park Superintendent	J. Phone 562-570-4895

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: El Dorado Park Lakes and Duck Pond

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 4
(List all regions where algaecide and aquatic herbicide application is proposed.)

V. ALGAECIDE AND AQUATIC HERBICIDE APPLICATION INFORMATION

A. Target Organisms: Bulrush, Cattails, Sago Pondweed, Duckweed, Parrotfeather, American Pondweed, Algae, Filamentous Algae, Chara

B. Algaecide and Aquatic Herbicide Used: List Name and Active ingredients
Reward (diquat)
Aquamaster (glyphosate)
Habitat (imazapyr)
Cutrine Plus (chelated copper)
CleanGreen (phycomycin, Sodium Carbonate Peroxyhydrate)

C. Period of Application: Start Date Ongoing as-needed End Date _____

D. Types of Adjuvants Used: Liberate (lecithin, methyl esters of fatty acids & alcohol ethoylate)

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: Marie Knight
 B. Signature: *Marie Knight* Date: 6/1/10
 C. Title: Director

XI. FOR STATE WATER BOARD STAFF USE ONLY

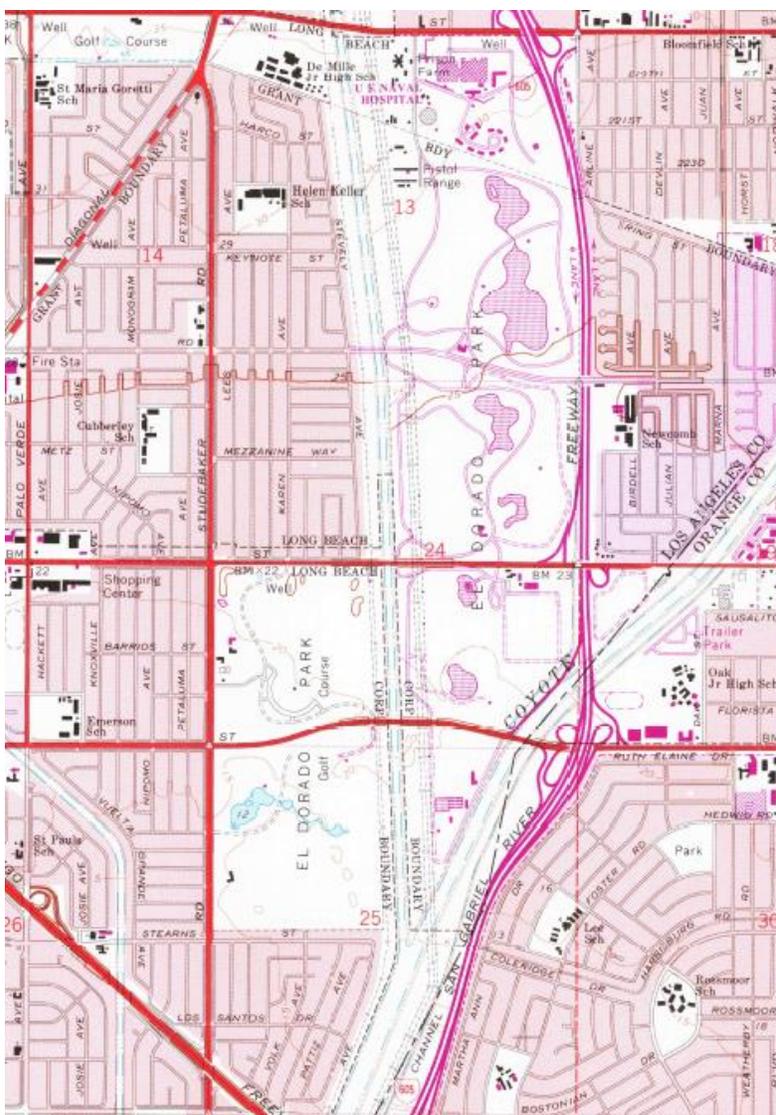
WDID:	Date NOI Received:	Date NOI Processed:
Case Handler's Initial:	Fee Amount Received: \$	Check #:
<input type="checkbox"/> Lyris List Notification of Posting of APAP	Date _____	Confirmation Sent _____

Revised Aquatic Pesticides Application Plan

General Permit No. CAG990005
WDID 4B197900008
CAO R4-2012-0003
Water Quality Order No. 2013-0002-DWQ

Statewide General National Pollutant Discharge Elimination System Permit
for the Discharge of Aquatic Pesticides for Aquatic Weed Control in Waters of the United States

El Dorado Park Lakes and the Duck Pond
Department of Parks, Recreation & Marine
2760 North Studebaker Road
Long Beach, California 90815



April 13, 2016
Revision 2.2

PREFACE: ENVIRONMENTAL AND REGULATORY SETTING

Clark Seif Clark, Inc. (“CSC”) under contract to the City of Long Beach (“City”) prepared this Aquatic Pesticide Application Plan (“APAP”) to guide staff on the use of pesticides in ponds and lakes under the jurisdiction of the Department of Parks, Recreation and Marine. Nothing in this Plan supersedes label directions, applicable laws, regulations and safety precautions for any pesticide.

Preparation of an APAP is required by the State Water Resources Control Board (“SWRCB”) to comply with a National Pollution Discharge Elimination System (“NPDES”) General Permit for aquatic pesticide application. This APAP for the El Dorado Park Lakes and the Duck Pond in West El Dorado Park is modeled on the requirements identified in Water Quality Order No. 2013-0002-DWQ for regulations effective December 1, 2013. This APAP is applicable to all of the six El Dorado Park Lakes and the Duck Pond. Aerial photographs of the lakes and the Duck Pond are attached as Figures 1, 2 and 3. Pre- and Post-Construction Topographic Maps are presented as Figures 4 and 5.

The application frequency of aquatic pesticides is determined by growth of the aquatic vegetation and algae, which is weather dependent. The application season typically begins in May and ends in October; however, due to weather, use of APs may be required at any time during the calendar year.

The aquatic pesticides applied most frequently prior to 2012 were copper-, diquat- and glyphosate-based formulations. No use or discharge of these regulated aquatic pesticides, *i.e.*, diquat, copper and glyphosate, occurred during the calendar years 2012, 2013, 2014 and 2015. However, the Long Beach Department of Parks, Recreation and Marine has determined that in order to maintain its lakes and ponds for recreational and functional purposes, it may be necessary to chemically treat the emerged stems of bulrush and cattails with aquatic pesticides. The pesticide of choice is imazapyr. Imazapyr is a broad-spectrum herbicide in the imidazolinone family. The half-life of imazapyr due to photodegradation in aqueous solution is approximately two days (Mallipudi et al. 1991, Mangels 1991a).

The El Dorado Park Lakes complex is a managed aquatic system consisting of six low-flow, shallow, lined, engineered impoundments located in Long Beach, California in southeast Los Angeles County. The impoundments are divided into two geographically separate areas. The Duck Pond is also a managed aquatic system that is not hydrologically connected to any waters of the United States or the El Dorado Park Lakes.

None of the El Dorado Park Lakes are hydraulically connected to any water bodies outside of El Dorado Park except during a potential flood situation in which case overflow valves are opened. Any storm water discharges into Coyote Creek would be an emergency situation. There were no emergency situation requiring a discharge into Coyote Creek during calendar years 2012, 2013, 2014 and 2015. The overflow valves are tested periodically as part of the maintenance program. Overflow valves are not tested while aquatic pesticides are being applied.

To facilitate review, the [APAP Review Check List](#) for Order No. 2013-0002-DWQ, Aquatic Weed Control Permit is provided on Page iii following the Table of Contents

TABLE OF CONTENTS

Preface: Environmental and Regulatory Setting.....	i
APAP Review Check List.....	iii
Executive Summary	1
Element C.1: Description of the Water System	2
Element C.2: Description of Treatment Area	3
Element C.3: Description of Aquatic Weed Problem.....	4
Element C.4: Aquatic Pesticides and Adjuvants Used	7
Element C.5: Factors Influencing Decision to Use Aquatic Pesticides	9
Element C.6: Gates, Control Structures and Inspection Schedule.....	4
Element C.7: Categorical Exemption	10
Element C.8: Monitoring and Reporting Program.....	10
Reporting.....	12
Record Retention	14
24-Hour Report	15
5-Day Written Report	15
Element C.9: Protection of Sample integrity	16
Element C.10: Description of Best Management Practices	16
Element C.10.a: General Handling, Storage and Disposal of Aquatic Pesticides	16
Element C.10.b: Measures to Ensure Minimal and Consistent Use of APs	18
Element C.10.c: Education and Certification of Applicators	19
Element C.10.d: Notifications.....	19
Element C.10.e: Prevention of Fish Kills	20
Element C.11: Examination of Possible of Alternatives	20
Element C.11.a: Evaluation of Alternatives	21
Element C.11.b: Use of Least Intrusive Method of AP Application	26
Element C.11.c: Decision Matrix for Ensuring Correct Formulation.....	27
Evaluation of El Dorado Lakes Aquatic Weed Control Program.....	27

Figures

Figure 1	Nature Center Lakes (Area 1)
Figure 2	Northern Lakes (Areas 2 and 3)
Figure 3	Duck Pond (West El Dorado Park)
Figure 4	Pre-Construction Topographic Map
Figure 5	Post-Construction Topographic Map

Attachments

Attachment 1	Nuisance Plants of Concern at El Dorado Park
Attachment 2.....	Aquatic Pesticide Labels and Material Safety Data Sheets
Attachment 3	Application Log
Attachment 4.....	Sampling and Analysis Plan

APAP REVIEW CHECK LIST
 Order 2013-0002-DWQ
 Aquatic Weed Control Permit

Element No. ¹	Found on Page No.	Description of Permit Requirement	✓ ³	
C.1	2	Describe the water system where the pesticide ² will be applied.		
C.2	3	Describe the treatment area.		
C.3	4	Types of weeds to be controlled and why.		
C.4	7	Pesticide Products to be used.		
	7	Degradation byproducts of pesticide used if known.		
	7	Method of Application		
	7	Surfactant and adjuvants to be used.		
C.5	8	Discuss factors influencing the decision of using pesticide for weed control.		
C.6	10	List of gates or control structures to be used in receiving water.		
C.7	10	For those with SIP exception:		
	NA	- Exception period (beginning date to ending date).		
	NA	- Justification of exception period.		
C.8	10	Describe Monitoring Program		
C.9	15	How to prevent sample contamination.		
C.10	16	Minimum content of BMPs:		
	16	a. How to prevent pesticide spill and spill containment;		
	17	b. Ensure only minimum and consistent amount of pesticide used for targeted weeds;		
	18	c. Plan for educating applicators on avoiding adverse effect from pesticide application;		
	18	d. Plan on informing the farmers and agencies who have water rights on the receiving water		
	19	e. Plan on preventing fish kills from pesticide application.		
C.11	20	a. Evaluation of alternatives	i. No action.	
			ii. Prevention.	
			iii. Mechanical method.	
			iv. Cultural method.	
			v. Biological control.	
			vi. Pesticide control.	
	24	b. Use least intrusive method of weed control;		
	25	c. Apply decision matrix concept for choosing the most appropriate formulation.		

Notes:

1. Item in the permit.
2. Pesticides refer to algaecides and aquatic herbicides.
3. Mark with ✓ if APAP contains the required information.

Aquatic Pesticides Application Plan (“APAP”)

General Permit No. CAG990005

CAO R4-2012-0003

El Dorado Park Lakes

City of Long Beach, CA

EXECUTIVE SUMMARY

This APAP is required to allow application of Aquatic pesticides to the waters of the State of California under Water Quality Order No. 2013-0002-DWQ, General Permit No. CAG990005 ("General Permit"). Nothing in this Plan supersedes label directions, applicable laws, regulations and safety precautions for any pesticide.

A previous APAP in compliance with Order 2004-0009-DWQ was submitted and approved by the Los Angeles Regional Water Quality Control Board on October 23, 2012. None of the El Dorado Park Lakes are connected hydraulically to any other surface waters except when emergency overflow valves are opened to a spillway during storm events. Excess water discharges occur only when large amounts of water enter the lakes over a short time period or when staff performs tests and maintenance operations on the overflow piping and valves. None of the emergency drainage water flows onto crop land or into directly into drinking water supplies.

The water features in El Dorado Park consist of a series of limited-flow, shallow, lined, engineered impoundments (“El Dorado Park Lakes”) and the Duck Pond in El Dorado Park West. If staff fails to manage aquatic weeds using an integrated systems approach, potential adverse outcomes include:

- Loss of aesthetic appeal
- Interference with maintenance of a balanced wildlife population
- Depletion of dissolved oxygen to levels that produce fish kills
- Creation of habitat pockets that are ideal for mosquito breeding
- Toxic build-up of copper compounds in sediment

In order to control aquatic vegetation and algae in the City of Long Beach El Dorado Park Lakes and the Duck Pond, regulated aquatic pesticides ("APs") are used only as a last resort. The APs include imazapyr-, diquat- and glyphosate-based formulations. The application frequency of these APs is determined by growth of the aquatic vegetation and algae, which, in turn, is weather dependent. The application season typically begins in May and ends in October. However, due to weather conditions, use of APs may be required at any time during the calendar year. The number of instances requiring application of APs is anticipated to be no more than one to six times per year.

APs are not applied over the surface of the entire lake in one event. Typically, the application area is approximately 1/3 or less of the surface area of the lake. All mixing, storage, application and decontamination operations are overseen by a person possessing a Qualified Applicator

Certificate with an Aquatic Certification issued by the California Department of Pesticide Regulation in compliance with the Los Angeles County Agricultural Commission ("CAC") notification and reporting requirements in addition to the requirements of the General Permit.

As required by regulation, the Los Angeles County Agricultural Commission is notified prior to each use of any "Restricted Material" pesticides and approves the use of such Restricted Materials by the Qualified Applicator. Reports of pesticide use are prepared and submitted to the control agencies, as required. An annual report is also submitted to the Los Angeles Regional Water Quality Control board. The City of Long Beach has not and does not anticipate ever needing to use "Restricted Material" pesticides in El Dorado Park or West El Dorado Park.

On a continuing basis, alternative non-toxic pesticides are evaluated as to their effectiveness in controlling aquatic vegetation. Recently, Green Clean[®], a non-copper- based biodegradable granular pesticide has been used with limited success. The copper-based Cutrine Plus[®] will only be used when an excessive growth of algae occurs due to weather conditions.

In addition to the evaluation and use of alternative non-toxic pesticides, Best Management Practices ("BMPs") are followed in the storing, mixing and application of aquatic pesticides. These BMPs are continually evaluated as to their effectiveness; and as new BMPs are identified, they are tested as to their effectiveness and applicability. As appropriate, the use of new BMPs or revisions to existing BMPs are employed using an integrated approach that incorporates mechanical, chemical, cultural and biological methods as appropriate. This approach ensures that beneficial water uses are protected using the least intrusive methods, minimizes the need for application of regulated aquatic pesticides and reduces the risk of over application of ecologically toxic materials into the environment.

ELEMENT C.1: DESCRIPTION OF THE WATER SYSTEM

Pre- and Post-Construction Topographic Maps of El Dorado Park and West El Dorado Park are presented in Figures 4 and 5. The El Dorado Park Lakes consist of six lakes ("Lakes") divided into two geographically separate areas. There are four lakes north of East Spring Street ("Northern Lakes") and two lakes ("Nature Center Lakes") south of East Spring Street. The lakes south of Spring Street are commonly referred to as the Nature Center Lakes because the park's Nature Center is located there. The northern lakes are known as Horseshoe Lake, North Lake, Alamo Lake and Coyote Lake. The nearest surface waters are the channelized San Gabriel River and Coyote Creek, which is also channelized.

The El Dorado Park lakes are limited flow, shallow (11 to 16 feet deep), lined engineered impoundments constructed circa 1957 on the San Gabriel River flood plain. Emergency overflow valves to a spillway are opened only when storms dump excess amounts of water in a short period of time or when testing and performing maintenance on the overflow system. The overflow valves would never be opened during the application of aquatic pesticides.

The four Northern Lakes are interconnected hydraulically; however, they are not connected hydraulically with the Nature Center Lakes. The two Nature Center Lakes are interconnected by the use of a water recirculation system. The Nature Center Lakes, Horseshoe Lake and North Lake have a maximum depth of approximately 11 to 14 feet, with numerous shallow areas along the water's edge. Alamo Lake and Coyote Lake have a maximum depth of approximately 12 to 16 feet. The following table presents the approximate surface area for the six lakes and the Duck Pond.

Lake	Approximate Surface Area in Acres
Horseshoe	2.75
North Lake	7.9
Alamo	20.1
Coyote	4.8
Nature Center North Lake	2.8
Nature Center South Lake	2.8
Duck Pond	3.6

According to the Los Angeles Lakes TMDL (March 2012), the existing beneficial uses assigned to the El Dorado Park lakes include water contact recreation (“REC1”), non-contact water recreation (“REC2”), wildlife habitat (“WILD” and wetland habitat (“WET”). Swimming, wading and water contact is prohibited by Park regulations. The potential beneficial uses are warm freshwater habitat (“WARM”) and municipal and domestic supply (“MUN”). The MUN designation was applied under SB-88-63 and RB-89-03 and may be considered for exemption at a later date.

The Duck Pond is not subject to the Los Angeles Lakes TMDLs as of the date of this Plan.

ELEMENT C.2: DESCRIPTION OF TREATMENT AREA

This APAP is applicable for the two Nature Center Lakes, the four Northern Lakes and the Duck Pond. Aerial photographs showing the lakes are enclosed as Figure 1, Figure 2 and Figure 3, respectively. Historically, APs have not been applied to the Northern Lake in the Nature Center. At this time, it is not likely that applications will occur at this lake. However, depending on the

weather and aquatic growth, including algae, APs could be used at the Nature Center Northern Lake and the Duck Pond in the future.

In general, submerged and "floating" aquatic plants to be controlled by aquatic pesticides are limited to the shallow areas/coves of the Lakes and the Duck Pond. Whenever feasible, aquatic vegetation is physically removed by the use of nets, racks or other mechanical means.

The treatment area is typically limited to no more than 1/3 of the surface area of each lake or pond. Spraying a minor portion of the lake allows the pesticide application to disturb only the immediate habitat thereby limiting pesticide exposure to fish and other aquatic organisms.

Since the application area is a quiescent area of the lake or pond, the gelatinous strings of diquat stay in the application area and are not carried beyond the application area by flowing water. As a result, the treatment zone generally does not extend beyond 5 to 10 feet of the application area.

ELEMENT C.3: DESCRIPTION OF AQUATIC WEED PROBLEM

Identification is the first step in managing aquatic weeds. In general, control methods are aimed a specific weeds or groups of weeds with similar growth habits. Aquatic weeds are typically divided into two botanical groups; algae and flowering plants. Algae are usually very simple in structure with no apparent leaves or stems. However, some algae, *e.g.*, *Chara*, can resemble flowering plants.

Submerged plants are rooted in the bottom sediments and grow up through the water column. Flowers or flowering spikes sometimes emerge above the water surface. The main criteria for identification are leaf arrangement and leaf shape.

Free-floating plants, such as duckweed, are seed-bearing plants which float free on the water's surface. They never become rooted in the soil and are propagated by sexual and/or asexual means. Duckweed can completely cover the surface of a pond. Duckweed is typically no more than one-quarter inch in diameter. This plant is found primarily in nutrient-rich waters.

Emergent shore or marginal plants commonly include cattails, bulrushes and other grass-like perennial plants. Broadleaves include willow trees. Based on past experience, the main aquatic plants of concern at the Nature Center Lakes, Northern Lakes and the Duck Pond are:

- Bulrush and Cattails
- Sago Pondweed
- Duckweed
- Parrotfeather
- American Pondweed
- Algae
- Filamentous Algae

Photographs of these aquatic weeds and algae are presented in Attachment 1.

Due to the small size and shallow depth of the lakes in El Dorado Park and the Duck Pond in West El Dorado Park, control of the non-algae plants is crucial. Otherwise, the lakes could quickly become choked with plants. This outcome would greatly reduce the diversity of aquatic animals present in the lakes. The presence of turtles and other aquatic wildlife is of great interest and enjoyment by park visitors. Additionally, the Northern Lakes are regularly stocked with fish for the enjoyment of the park's urban anglers.

The algae present in the lakes must be managed to improve water clarity (essential at the Nature Center Lakes) and to prevent algae blooms. In the event of an algae bloom, the decay of dead algae could rapidly deplete the lake of oxygen, causing nuisance odors and fish kills.

Bulrush or Bullrush (*sic*) is the common names for several large wetland grass-like plants, typically in the sedge family (*Cyperaceae*). The name is particularly applied to several sedge family genera: *Cyperus*, *Scirpus* a genus commonly known as bulrushes in North America, which in previous circumscriptions has also included species now classified in the genera *Bolboschoenus* and *Schoenoplectus*.

Cattails are wetland plants with a unique flowering spike, flat blade-like leaves that reach heights from 3 to 10 feet. They are one of the most common plants in large marshes and on the edge of ponds. Two species are most common in US: broad leaved cattail (*T. latifolia*) and narrow leaf cattail (*T. angustifolia*). Cattail is a competitively superior wetland plant under stable water conditions. Maintaining open areas in semi-permanent marshes is difficult once the plant is established. The plant can occur in a variety of natural communities and form extensive monocultures rapidly through vegetative reproduction, thereby reducing plant bio-diversity. Cattail can become a problem in irrigated agricultural lands and managed aquatic systems such as the El Dorado Park Lakes. The plant invades farm ponds, irrigation canals, and drainage ditches which can result in impeded water flow and increased siltation.

Sago Pondweed (*Potamogeton Pectinatus*) is a submergent aquatic plant that does not grow out of the water. It only grows to the water surface. Ducks and geese will dive down to get at the tubers (or bulbs) of the plant. It also produces a seed in the fall of the year that the ducks will feed on. Sago Pondweed is fast growing. If the water is very clear, Sago Pondweed will tolerate water that is 3 feet deep. Sunlight needs to filter down to the tubers in the Spring to germinate them. If the tubers are broken off, they will not re-sprout.

Duckweed, or water lens, is a flowering aquatic plant which floats on or just beneath the surface of still or slow-moving bodies of fresh water and wetlands. These plants are very simple, lacking an obvious stem or leaves. The greater part of each plant is a small organized "thallus" or "frond" structure, which is only a few cells thick, often with air pockets (*aerenchyma*) that allow it to float on or just under the water surface. Depending on the species, each plant may have no root or may have one or more simple rootlets.

Parrotfeather (*Myriophyllum aquaticum*) gets its name from its feather-like leaves which are arranged around the stem in whorls of four to six. Parrotfeather has both submersed and emergent leaves, with the submersed form being easily mistaken for [Eurasian watermilfoil](#) (*Myriophyllum spicatum*), a close relative. While parrotfeather may provide cover for some aquatic organisms, it can seriously change the physical and chemical characteristics of lakes and streams. Infestations can alter aquatic ecosystems by shading out the algae in the water column that serve as the basis of the aquatic food web. In addition, the plant provides choice mosquito larvae habitat.

The submersed leaves are 1.5 to 3.5 centimeters long and have 20 to 30 divisions per leaf. The emergent leaves are 2 to 5 centimeters long and have 6 to 18 divisions per leaf. The bright green emergent leaves are stiffer and a darker green than the submersed leaves. The emergent stems and leaves are the most distinctive trait of parrotfeather, as they can grow up to a foot above the water surface and look almost like small fir trees. Submersed leaves are limp and often appear to be decaying but the stems are very robust. Adventitious roots form at the nodes. When attached to a bank, parrotfeather stems can extend out several yards over the water surface. Flowers are inconspicuous and are borne in the axils of the emergent leaves. The white flowers are approximately 1/16 inch long.

American Pondweed (*Potamogeton nodosus*) is a perennial plant that has both floating and a few submerged leaves in an alternate pattern. The floating leaves are elliptical to oval 4 to 7 inches long and up to 2 inches wide on long petioles. Submerged leaves are not abundant and are blade-like, somewhat transparent and smaller than floating leaves. Fruits are on spikes that often stand above the water's surface and are brownish to reddish 3 to 2 inches long and 1/8 to 1/4 inches wide. American pondweed is highly utilized as food by ducks and some other types of wildlife.

Algae are photosynthetic organisms that occur in most habitats. Microscopic algae form scums and or color the water green or yellow-green. Sometimes they cause red, black or oily streaks in the water called "blooms". Blooms typically occur where abundant nutrients are reaching the water. Early intervention with chemicals before they cause a noticeable color. Caution must be taken not to trigger a sudden die-off of algae which can lead to a fish kill.

Filamentous Algae are single algae cells that form long visible chains, threads, or filaments. These filaments intertwine forming a mat that resembles wet wool. Filamentous algae starts growing along the bottom in shallow water or attached to structures in the water (like rocks or other aquatic plants). Often filamentous algae float to the surface forming large mats, which are commonly referred to as "pond scums." There are many species of filamentous algae and often more than one species will be present at the same time in the pond. Filamentous algae have no known direct food value to wildlife.

Chara, or stonewort, usually grows in very hard water and is often calcified and brittle. Although it resembles some flowering plants, it is an algae. The plant is rooted. Leavers are arranged along the stem in whorls. It rows completely underwater and has a musky smell. *Chara* can be difficult to control once it has become established due to the heavy coating of calcium carbonate. Contact herbicides should be applied when the plants are still young and not too heavily calcified. Evidence of *Chara* has not been recorded in El Dorado Park Lakes or the Duck Pond.

ELEMENT C.4: AQUATIC PESTICIDES AND ADJUVANTS USED

The types of pesticides, adjuvants and application methodology used at the El Dorado Park Lakes are presented in the following matrix:

Pesticide	Surfactant	Adjuvant	Application Method
Citrine Plus® (Chelated Elemental Copper)	None	None	Granular: Hand Spreading Liquid: Hand Sprayer
Reward® (Diquat)	None	None	Liquid: Hand Sprayer
Aquamaster® (Glyphosate)	Target Pro Spreader (nonylphenol)	Activator 90	Liquid: Hand Sprayer
GreenClean® a.k.a. Phycomycin (Sodium Carbonate Peroxyhydrate – not subject to monitoring requirements)	None	Peroxyacetic Acid	Granular: Hand Spreading Liquid: Hand Sprayer
Habitat® (isopropylamine salt of imazapyr: 2-[4,5-dihydro-4-(1-methylethyl)-5-oxo-1H-imidazol-2-yl]-3-pyridinecarboxylic acid)	None	Liberate® (Lecithin, Methyl Esters of Fatty Acids and Alcohol Ethoylete)	Low-volume directed applications, e.g., backpack sprayer, handgun or boom sprayer

Pesticide	Degradation Products or Pathway
Cutrine Plus [®] (Chelated Copper)	Copper complexes in water column and copper-containing solids in sediment; thermal decomposition during storage results in hazardous oxides of carbon and nitrogen
Reward [®] (Diquat Bromide)	Photochemical degradation after uptake by targeted weed resulting in a less toxic chemical (TOPPS) ¹
Aquamaster [®] (Glyphosate)	Sediment adsorption followed by microbial degradation
CleanGreen [®] , <i>a.k.a</i> phycomycin, Liquid (Sodium Carbonate Peroxyhydrate)	Hydrogen Peroxide, Sodium Carbonate and Acetic Acid
Habitat [®]	Water: Rapid photochemical degradation to form 7-hydroxyfuro[3,4-b]pyridine-5(7H)-one and 2,3-pyridinedicarboxylic acid and further degradation by decarboxylation to two cyclized compounds: 2,3-pyridinedicarboximide and furo[3,4b]pyridine-5(7H)-one and carbon dioxide ²

1. TOPPS = 1,2,3,4-tetrahydro-1-oxopyrido-[1,2-a]-5-pyrazinium ion

2. Due to its rapid photodegradation by sunlight, water contamination by imazapyr is generally not of concern when applied according to manufacturer's instructions.

To minimize hazards to aquatic resources resulting from depletion of oxygen due to decaying vegetation:

- Treatment area will be less than one-third of the water body.
- 10 to 14 days will elapse between treatments unless manufacturer's instructions specify a shorter time between applications.
- Application will begin along the shore and proceed outwards in bands to allow fish to move into untreated areas.
- Selection of herbicides will be governed by choosing those that will result in the most rapid absorption by the targeted weed.

Before using a chemical control approach, careful consideration will be given to the following factors:

- Proper identification of the weed

- Understanding restrictions on use of post-treatment water
- Calculation of the proper dosage
- Timing for Application
- Temperature of the Water
- Avoidance of Retreatment

If and when effective nuisance control by non-chemical methods is ineffective due to site-specific conditions, aquatic pesticides will be used to inhibit growth rates and to spot treat problem areas followed by mechanical harvesting to control growth and minimize oxygen depletions due to decay of plant biomass.

ELEMENT C.5: FACTORS INFLUENCING DECISION TO USE AQUATIC PESTICIDES

Control tolerances are based on a number of factors. The impact of weed and algae growth on beneficial uses is the primary criteria for determining when to initiate integrated aquatic plant management to control this growth.

Nuisance conditions are established by the sensibilities of the community. Primary impacts resulting from nuisance growth include visual aesthetics and odors and ultimately depletion of oxygen. The El Dorado Park Lakes and the Duck Pond **are not** used for intense contact recreation (*e.g.*, swimming or boating). Policies and procedures based on a decision matrix have been established to ensure that the least intrusive method of weed control is used. Application of the aquatic pesticides based on site-specific conditions further ensures that the minimum amount of pesticide is applied.

The shallowness of these impoundments is the underlying cause of weed problems. The entire bottoms are subject to sunlight exposure. Without early intervention, the entire water volume could become overcome by the biomass. Such a condition creates visual nuisances (swampy appearance, algae); malodorous compounds would be released due to vegetative decay; and water quality would deteriorate resulting in a negative impact on the fishery. Excessive plant density alters the forage capability and success rate of predator fish species, which in turn diminishes their growth and spawn rates. Effective control measures selected by the Park Maintenance Supervisor that are within practical means and have as little adverse environmental impact as possible are based on years of experience managing the El Dorado Lakes and the Duck Pond.

The Park Maintenance Supervisor or designee conducts **visual observations** of the lakes at a **seasonally-adjusted frequency** deemed prudent to identify emerging nuisance conditions and determine the environmentally-preferred treatment strategy. Inspection focuses on monitoring indicators of nuisance growth and spot raking for evidence of weed growth in low visibility waters. Evaluation of conditions is a subjective assessment of the following conditions:

- Floating or suspended matter
- Discoloration
- Bottom deposits
- Aquatic life
- Visible films, sheens or coatings
- Fungi, slimes, or objectionable growths
- Other experienced-based criteria

Predetermined “action levels” facilitate treatment decision-making. Examples of typical action levels are presented below:

- *Weeds*: Rake samples of bottom growth indicate a grass length of six to twelve inches and a life state, when, in the opinion of the Qualified Applicator, *i.e.*, a holder of a Department of Pesticide Regulation Qualified Applicator License, the typical acceleration in growth rate is probably imminent.
- *Algae*: Dots of floating algae begin to accumulate on the surface, or the algae is at a life stage when, in the opinion of the Qualified Applicator, a detachment is imminent.

Once action levels have been reached, the Park Maintenance Supervisor or designee will implement **integrated control strategies** to ensure that the risk of damage to non-target organisms is minimal and repeated applications due to unsatisfactory treatment are eliminated.

The basic control approaches discussed in Sections C.11 are:

1. No Action
2. Preventive Measures
3. Mechanical Control
4. Cultural Control and Habitat Alteration
5. Biological Control
6. Control with Herbicides followed by Mechanical Harvesting, as appropriate

Persons licensed by the California Department of Pesticide are the only personnel allowed to mix and apply aquatic pesticides. In applying the pesticides, the **label instructions** for safely preparing, diluting, storing, disposing, mixing and application govern use of the pesticide. The label instructions are approved by the United States Environmental Protection Agency ("EPA") under the authority of the Federal Insecticide, Fungicide and Rodenticide Act. The EPA has sole authority for the information contained on the label.

ELEMENT C.6: GATES, CONTROL STRUCTURES AND INSPECTION SCHEDULE

There are no gates or control measures at the northern lakes. Fencing and gates control entrance to the Nature Center Lakes. For emergency releases due to potential flooding, overflow valves

to Coyote Creek may be opened to discharge storm water. Storm water discharges necessary to avoid flood damage to park infrastructure are categorized as emergency releases.

Overflow Valve Inspection Schedule: To ensure that the valve is operational, inspections are conducted 3 to 4 times per year. However, these valves would never be in the open position during application of aquatic pesticides.

ELEMENT C.7: CATEGORICAL EXEMPTION

The City has not applied for a Categorical Exception per Section 5.3 of the *Policy for Implementation of Toxic Standards for Inland Surface Waters, Enclosed Bays and Estuaries of California*.

ELEMENT C.8: MONITORING AND REPORTING PROGRAM

The purpose of this section is to provide information demonstrating compliance with permit requirements governing the monitoring and reporting program. The El Dorado Lakes Monitoring and Reporting Program (“MRP”) has been implemented to meet the requirements described in Attachment C of the General Permit. The potential sample analyses are described below:

Analyte	Active Ingredient	EPA Method	Reporting Limit	Hold Time (Days)	Container	Chemical Preservation
Temperature	N/A	Field measured	N/A	N/A	N/A	N/A
Dissolved Oxygen	N/A	Field Measured	N/A	N/A	N/A	N/A
Turbidity ¹	N/A	180.1	0.01 NTU	2	100 mL HDPE	None
Electrical Conductivity ¹	N/A	120.1	0 µS/cm	28	100 mL HDPE	None
pH ¹	N/A	Field Measured	1-14	Immediately	100 mL HDPE	None
Nonylphenol ²	N/A	550.1m	0.5 µg/L	7	2 x 40 mL VOA	None
Citrine Plus®	chelated copper	6010B	0.005 µg/L	28	1 L HDPE	None
Reward®	diquat	549	40 µg/L	14	500 mL Amber Glass	H ₂ SO ₄
Aquamaster®	glyphosate	547	0.5 µg/L	14	2 x 40 mL VOA	None
Habitat®	imazapyr	532m	100 µg/L	14	1 L Amber Glass	None

1. May be field or laboratory measured.
2. Required only when a nonlyphenol-based surfactant is used.

Visual, physical and chemical monitoring requirements for data collection are summarized in a matrix on the following page.

Monitoring Approach	Constituent/Parameter	Units	Sample Method	Minimum Sampling Frequency	Sample Type Required	Required Analytical Test Method
Visual	1. Monitoring Area Description, Appearance of Water Body and Weather Conditions 2. Appearance of waterway (sheen, color, clarity, etc.) 3. Weather conditions (fog, rain, wind, etc.)	Not Applicable	Visual Observation	Note 1	Background, Event and Post-event Monitoring	Not Applicable
Physical	1. Temperature ²	°F	Grab ⁴	Note 5	Background, Event and Post-event Monitoring	Note 6
	2. pH ³	Number				
	3. Turbidity ³	NTU				
	4. Electric Conductivity ³ @ 25°C	µmhos/cm				
Chemical	1. Active Ingredient ⁷	µ/L	Grab ⁴	Note 5	Background, Event and Post-event Monitoring	Note 6
	2. Nonylphenol ⁸	µ/L				
	3. Hardness if copper is monitored	mg/L				
	4. Dissolved Oxygen ²	mg/L				
Note 1	All applications at all sites.					
Note 2	Field testing					
Note 3	Field or laboratory testing					
Note 4	Samples will be collected at three feet below the surface of the water body or at mid-water column depth if the depth is less than three feet.					
Note 5	Collect samples from a minimum of six application events for each active ingredient in each environmental setting (flowing water and non-flowing water) per year, except for glyphosate. If there are less than six application events in a year, collect samples during each application event for each active ingredient in each environmental setting (flowing water and non-flowing water). If the results from six consecutive sampling events show concentration that are less than the receiving water limitation/trigger for an active ingredient in that environmental setting. If the yearly sampling event shows exceedance of the receiving water limitation/trigger for an active ingredient in an environmental setting, then sampling shall return to six application events for the active ingredient in each environmental setting. For glyphosate, collect samples from one application event from each environmental setting (flowing and non-flowing water) per year.					
Note 6	Pollutants shall be analyzed using the analytical methods described in 40 C.F.R. part 136.					
Note 7	2,4-D acrolein, dissolved copper , diquat , endothall, fluridone, glyphosate , imazamox, imazapry , penoxsulam, and tirclopyr.					
Note 8	It is required only when a surfactant is used.					

Compliance with receiving water limitations and monitoring triggers are determined by evaluation of pre-event and post-event monitoring results. A site-specific Sampling and Analysis Plan (“SAP”) for sediment and water column testing is included as a stand-alone document (Attachment 3). The SAP provides the following detailed technical information:

- An Introduction Describing the Water System and Treatment Area
- Water Column Sampling Procedures
 - Sampling Locations
 - Sampling Frequency
 - Sampling Procedures
 - Field Parameter Analysis
 - Sample Analysis (Reward[®], Aquamaster[®], Cutrine Plus[®] and Habitat[®])

- Equipment Decontamination
- Receiving Water Limitations
- Sediment Sampling
 - Sample Locations
 - Sample Containers
 - Sampling Procedures
- Labeling and Chain-of-Custody Requirements
- Field Visual Observations
- Reporting
 - Annual Monitoring Report
 - Certification Statement
 - Annual Report Elements
 - Record Retention
 - 24-Hour and 5-Day Noncompliance Reporting

Reporting

Monitoring results will be reported at the intervals specified in Attachment C of the General Permit [40 C.F.R. §122.22(1)(4)].

Reporting Frequency	Reporting Period	Annual Report Due
Annual	January 1 through December 31	March 1

There are three types of reporting necessary to permit compliance: (1) Annual Report, (2) verbal Report of noncompliance within 24-hours and (3) follow up written report of noncompliance within five days.

A letter dated October 23, 2012 states that the Annual Report should be submitted in electronic format only to the California Regional Water Quality Control Board ("RWQCB"), Los Angeles Region, ATTN: Information Technology Unit at losangeles@waterboards.ca.gov. In addition, electronic copies of all monitoring reports should be sent to Jenny Newman, Chief, TMDL Unit 3. When submitting monitoring or technical reports to the LA RWQCB, a reference to "Compliance File No. CI-9843 and NPDES No. CAG990005" will be included in the subject line.

Documents that are 10 MB and over will be transferred to compact disks. One disk will be mailed to the attention of the Information Technology Unit and the other disk will be mailed to Jenny Newman, Chief, TMDL Unit 3:

California Regional Water Quality Control Board, Los Angeles Region
320 W. 4th Street, Suite 200
Los Angeles, CA 90013

Annual Monitoring Report: The Annual Monitoring Report for the reporting period January 1 to December 31 shall be submitted to the RWQCB no later than March 1 of each calendar year regardless of whether or not any aquatic pesticides were applied during the monitoring period.

Certification: The Annual Monitoring Report shall contain the following certification signed by the appropriate person described in Attachment B of the General Permit Standard Provisions, §V.B(4) or by a duly authorized representative of that person:

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.

Signatory Requirements: All reports required by General Permit GAC990005 must be signed by a person described in the following paragraph or a duly authorized representative of that person. For a municipality, state, federal, or other public agency: by either a principal executive officer or ranking elected official. For purposes of this provision, a principal executive officer of a federal agency includes: the chief executive officer having responsibility for the overall operation of a principal geographic unit of the agency.

To be deemed an authorized representative, the following requirements must be satisfied:

- The authorization is made in writing by a person described in paragraph (a) of this provision.
- The authorization specified either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company (a duly authorized representative may thus be either a named individual or any individual occupying a named position).
- The written authorization is submitted to the Regional Water Board, State Water Board, or USEPA.

Annual Report Elements: Annual reports shall contain the following information:

- An Executive Summary discussing General Permit compliance or violation and the effectiveness of the APAP to reduce or prevent the discharge of pollutants associated with aquatic pesticide applications
- A summary of monitoring data, including the identification of water quality improvements or degradation, and recommendations for improvements to the APAP (including proposed BMPs) based on the monitoring results. All receiving water monitoring data shall be compared to applicable water quality standards
- Identification of BMPs and a discussion of their effectiveness in meeting the General Permit No. CAG990005 requirements
- A discussion of BMP modifications addressing violations of the General Permit No. CAG990005.
- A map showing the location of each application and treatment area
- Types and amounts of aquatic pesticides used at each application location during each application event.
- Information on surface area and/or volume of treatment area and any other information used to calculate dosage and quantity of each pesticide used
- If applicable, list of gates in the treatment area that may discharge to surface waters; time of gate closure and reopening, including any calculations used to determine closure and reopening times
- Sampling results for all monitoring performed under this Monitoring and Reporting Plan and any additional water column or sediment sampling conducted. Sampling results shall indicate the name of the sampling agency or organization, detailed sampling location information (including latitude and longitude), detailed map or description of each sampling site, collection date, name of constituent/parameter and its detected concentration, minimum levels, method detection limits for each constituent analysis, name or description of water body sampled and a comparison with applicable water quality standards, description of analytical QA/Quality Control Plan. Sampling results shall be tabulated so that they are readily discernible
- Recommendations to improve the monitoring program, BMPs, and APAP to ascertain compliance with this General Permit; and
- Proposed changes to the APAP and monitoring program

Record Retention

The following records shall be maintained for a minimum of three years from the date of the sampling, measurement, or report:

- Records of all monitoring information including all calibration and maintenance records
- Copies of all reports required by this General Permit

- Records of all data used to complete the application for the General Permit No. CAG990005

24-Hour Report

All instances of non-compliance with the General Permit No. CAG990005 that may endanger health or the environment shall be orally reported to the RWQCB within 24 hours from the time the city of Long Beach becomes aware of the circumstances. A written submission shall also be provided within five days. The written submission shall contain a description of the noncompliance and its cause, the period of non-compliance, including exact dates and times and, if the non-compliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the non-compliance.

5-Day Written Report

Following submission of a twenty-four hour report, a written report must also be provided to the LA RWQCB and the State Water Board. The report should contain the following information:

1. Date and time the LA RWQCB and State Water Board was contacted regarding the noncompliance and any instructions received from the LA RWQCB and State Water Board
2. A description of the noncompliance and its cause, including exact date and time and species affected, estimated number of individual and approximate size or dead or distressed organisms (other than the pests to be eliminated)
3. Location of incident, including the names of any water affected and appearance of those waters (sheen, color, clarity, etc.)
4. Magnitude and scope of the affected area (e.g. aquatic square area or total stream distance affected)
5. Algaecide and aquatic herbicide application rate, intended use site (e.g. banks, above, or direct to water), method of application, and name of algaecide and herbicide product, description of algaecide and herbicide ingredients and U.S. EPA registration number
6. Description of the habitat and the circumstances under which the noncompliance activity occurred (including any available ambient water data for aquatic algaecides and aquatic herbicide applied)
7. Laboratory tests performed, if any, and timing of tests and provide a summary of the test results within five days after they become available
8. If applicable, explain why the noncompliance could not have been caused by exposure to the algaecides or aquatic herbicides resulting from application
9. Actions to be taken to prevent recurrence of adverse incident

ELEMENT C.9: PROTECTION OF SAMPLE INTEGRITY

Specific measures to reduce risk of cross-contamination and degradation of samples are listed below:

- All equipment that comes in contact with the sediment or water column will be new or decontaminated to prevent the introduction of contaminants into samples from the sampling equipment or other samples;
- Nitrile gloves will be worn during sampling;
- The discrete depth sampling device will be rinsed three times with water from the sampling site before retaining the sample; and,
- Samples will be kept out of the sun and stored in a cooler with ice packs at 4°C.

ELEMENT C.10: DESCRIPTION OF BEST MANAGEMENT PRACTICES

The objective for this section is to discuss best management practices (“BMPs”) that demonstrate an understanding what is required for permit compliance. The key areas of compliance are to ensure that the amount of aquatic pesticides used is minimized, to limit the extent and duration of any impacts that might be caused by the discharge of aquatic pesticides to El Dorado Park Lakes and to ensure that improvements to water and sediment quality will be achieved.

A log for each algaecide and aquatic herbicide application will be maintained (Attachment 2). The application log will contain the following information:

1. Date nuisance condition was observed
2. Description or photograph of nuisance condition
3. Description of factors leading to decision to apply pesticide
4. Date of application
5. Location of application
6. Name of applicator
7. Type and amount of algaecide and aquatic herbicide used
8. Application details such as flow and level of water body, time application started and stopped, algaecide and aquatic herbicide application rate and concentration
9. Visual monitoring assessment leading to decision to take action
10. Certification that applicator(s) followed the APAP

Element C.10.a: General Handling, Storage and Disposal of Aquatic Pesticides

Applicators will take care during mixing and loading operation to reduce the risk of spillage. All label language will be followed to ensure safe handling and loading. Application equipment will be checked regularly to identify and minimize the likelihood of leaks developing or failures that

would lead to a spill. Spills will be reported as required and in a manner consistent with local, state and federal requirements.

Spills will be cleaned up immediately by appropriately trained staff. Spills and leaks will be contained or absorbed with material and procedures recommended by manufacturer as described on the label or in the Material Safety Data Sheet. Particular attention will be paid to ensure compatibility of containers with aquatic pesticide formulations. All appropriate measures will be taken to avoid washing spills into storm drains or land where runoff may reach surface waters.

The Park Maintenance Supervisor will ensure that unopened containers of unwanted pesticides are transferred only to qualified users or are returned to the manufacturer. A matrix summarizing the manufacturer's cleanup and waste disposal recommendations for the aquatic pesticides in use at El Dorado Park is presented on the following page.

Product	Manufacturer's Cleanup and Waste Disposal Recommendations
Cutrine Plus [®]	For small quantities, absorb only in non-combustible material , e.g. SafeSorb [®] or equivalent. Sweep, scoop or vacuum to remove. Once all material is cleaned up and placed in disposal container, seal container and arrange for disposal in accordance with local, state and federal
Reward [®]	Control the spill at its source Contain spill to prevent it from spreading or contaminating soil or from entering sewage and drainage systems or any body of water. Clean up spills immediately, observing the conditions indicated in Section 8 of the MSDS for personal protection. Cover entire spill with absorbing material, e.g. SafeSorb [®] or equivalent, and place into compatible disposal container. Please note that this product reacts with aluminum to produce flammable hydrogen gas. Do not mix or store in containers or systems made of aluminum or that have aluminum fittings. Scrub spill area with hard water detergent (e.g. commercial products such as Tide, Joy, Spic and Span). Pick up was liquid with additional absorbent, e.g. SafeSorb [®] or equivalent, and place into compatible disposal container. Once all material is cleaned up and placed in disposal container, seal container and arrange for disposal in accordance with local, state and federal health and environmental regulations.
Aquamaster [®]	Small quantities are classified as a low environmental hazard. For small quantities, absorb only in non-combustible material , e.g. SafeSorb [®] or equivalent. Sweep, scoop or vacuum to remove. For large quantities, minimize spread and ensure that leaks do not enter drains, sewers, ditches and water ways. Absorb in earth, sand or absorbent material. Dig up heavily contaminated soil and collect in containers for disposal. Flush residues with small quantities of water and take precautions to prevent spread of contaminated water. Compatible materials for storage are stainless steel, fiberglass and plastic. Incompatible materials are galvanized steel and unlined mild steel.
GreenClean [®]	Rinse small amounts to drain when possible. Dike or dam large spills, pump to containers or soak in inert absorbent. Flush residue to sanitary sewer, rinse spill area thoroughly with clean water. Avoid materials that are incompatible with oxidizing agents. Unused product (concentrate is classified as a RCRA waste (D002).
Habitat [®]	Dike and contain the spill with inert materials (sand, earth, etc.) and transfer liquid and solid diking material to separate containers for disposal. Remove contaminated clothing and wash affected skin areas with soap and water. Wash clothing before reuse. Keep the spill out of all sewere and open bodies of water.

Additional measures for the safe handling, storing and disposal of aquatic pesticides are listed below:

- Mix or load herbicides in a safe and prudent manner so as to minimize potential for spillage of concentrate or mixed product
- Mix only as much material as is necessary for treatment
- When changing pesticides or cleaning spray tanks, factor in use of tank rinse water as product within the application area
- Triple rinse empty product containers and dispose in accordance with label instructions of factor in as product within the application area
- Provide spill kits, store kits near product and train employees to use them
- Keep raw product in original container.
- Mix and use product only in labeled containers and in accordance with local law.

Element C.10.b: Measures to Ensure Minimal and Consistent Use of APs

As discussed in Section 4.0, the area to be treated by aquatic pesticides is never more than one-third of the surface area of any lake. The pesticide label dictates how the pesticide is mixed for use and how it is applied. For submerged and floating aquatic plants, the square footage of plants to be treated governs the amount of aquatic pesticide (Reward[®] and Aquamaster[®]) used. With Cutrine Plus[®], the area depth of the water column determines how much pesticide is used. As a result, a defined quantity of pesticide and the areas to be treated are too variable to be discussed in this Section. Copies of the EPA-approved labels and Material Safety Data Sheets for Aquamaster[®], Reward[®] Cutrine Plus[®], GreenClean[®], Habitat[®] and Liberate[®] are included in Attachment 2.

Before pesticide application action levels are reached, the Park Maintenance Supervisor will direct implementation of non-chemical alternatives as part of an integrated strategy to be followed by application of aquatic pesticides only if necessary.

Application of aquatic pesticides will not be made should such action result in a negative impact on beneficial uses.

Receiving Water Limitations: The purpose of BMPs is to ensure that algaecide and aquatic herbicide applications will not cause or contribute to toxicity in receiving waters outside of treatment area. Selection and application of aquatic pesticides will be such that the instantaneous maximum water column concentrations in microgram per liter (“µg/L”) for aquatic pesticides and the adjuvant nonylphenoethoxylate will not be exceeded:

- Diquat – 20 µg/L
- Copper - 8.22 µg/L (Based on the average of 12 hardness samples taken in May 2014)

- Glyphosate – 700 µg/L
- Nonylphenoethoxylate – 6.6 µg/L
- Imazapyr – 11.2 mg/L

When products contain sodium carbonate peroxyhydrate, e.g. GreenClean®, are used in accordance with directions on the label, no harm is expected to freshwater fish or freshwater invertebrates. At the present time, the General Permit does not include any monitoring triggers or monitoring requirements for GreenClean®.

Due to its safe use in the environment and low toxicity to aquatic life as indicated in U.S. EPA's Ecotoxicity Database, the General Permit for Aquatic Pesticide Applications does not have a receiving water limitation for imazapyr. However, the General Permit contains a monitoring trigger of 11.2 mg/L based on one-tenth of the lowest LC50 from U.S. EPA's Ecotoxicity Database and requires receiving water monitoring to collect data, which will provide information on whether imazapyr has water quality impacts.

During the application of aquatic pesticides, the mean dissolved oxygen shall be maintained at or above seven (7.0) milligrams per liter ("mg/L") and no single measurement shall be less than five (5.00 mg/L, except when lesser concentrations are caused by naturally-occurring conditions.

Element C.10.c: Education and Certification of Applicators

Only persons licensed by the California Department of Pesticide ("Qualified Applicator") are allowed to mix and apply aquatic pesticides. Qualified Applicators are required to take periodic training on spill avoidance, proper application techniques and avoidance of adverse environmental impacts.

Element C.10.d: Notifications

Public Notice Requirements: Every calendar year, at least 15 days prior to the first application of algaecide or aquatic herbicide, the City will notify potentially affected public agencies. The City will post the notification on its website if available. The notification will include the following information: 1. A statement of the discharger's intent to apply algaecide or aquatic herbicide(s); 2. Name of algaecide and aquatic herbicide(s); 3. Purpose of use; 4. General time period and locations of expected use; 5. Any water use restrictions or precautions during treatment; and 6. A phone number that interested persons may call to obtain additional information from the City.

Public Agency Notifications: At least 15 days prior to the first application of algaecide or aquatic herbicides each year, dischargers are required by the General Permit to notify potentially affected public agencies. There are no other public agencies or farmers that are potentially affected by the application of pesticides at El Dorado Park Lakes or the Duck Pond.

Restricted Materials: As required by local regulation, the Los Angeles County Agricultural Commission must be notified prior to each use of "Restricted Material" pesticides. This agency has primary jurisdiction and approve the use of such Restricted Materials by the Qualified Applicator. An annual report is also submitted to the Los Angeles Regional Water Quality Control board to meet the requirements of the General Permit. The City of Long Beach does not use any "Restricted Material" pesticides at El Dorado Park.

Element C.10.e: Prevention of Fish Kills

The El Dorado Lakes are limited flow, lined, shallow engineered impoundments totally confined within defined park areas. Downstream movement is minimal and primarily the result of wind and changes in water temperature. Weeds commonly grow in static water up to 12 feet deep. Should an aquatic pesticide be applied for weed control, it is unlikely that any appreciable downstream effect will occur.

Experienced and licensed applicators have been trained to avoid potential fish kills. All currently registered herbicides employed for weed control in the El Dorado Park Lakes are rated a slightly toxic, or non-toxic to fish, birds, insects and other aquatic organisms so long as proper application rates and techniques are employed. Pesticide labels are carefully reviewed to ensure that degradation of the aquatic environment during current and future pest control efforts does not occur.

In Southern California, early spring is usually the best time to initiate effective intervention control practices for flowering and submerged weeds. The weeds are young and actively growing. During this time, water temperature is typically in the 60s in the areas to be treated. Under these conditions, the weeds are most susceptible to herbicides.

Waiting until hot summer months to begin evaluation and treatment increases the risk of killing fish. If vegetation is thick and extensive in warm still water, the sudden kill of all vegetation could seriously deplete the water of its oxygen and cause a fish kill. If treatment is necessary in late summer, the treatment area should be limited to a portion of the weed growth and applied over a period of several days. To the maximum extent possible, mechanical means should be used to remove decaying plant material from the accessible areas of the lake.

ELEMENT C.11: EXAMINATION OF POSSIBLE OF ALTERNATIVES

The basic control approaches discussed in this section are:

1. No Action
2. Preventive Measures
3. Mechanical Control
4. Cultural Control and Habitat Alteration

5. Biological Control
6. Control with Herbicides followed by Mechanical Harvesting

The Park Maintenance Supervisor (or designee) patrols the park's lakes on a frequent basis. A normal patrol activity is observing the condition of the lakes. Experience has proven that controlling floating and submerged weeds when they are small, young and actively growing results in a reduction in the frequency of pesticide use and in the mass of pesticides applied on an annual basis to achieve desired outcomes.

Based on the Park Maintenance Supervisor's observations and experience, a decision is made as to whether non-chemical means will be sufficient to control aquatic weeds. Currently, the prevailing afternoon breeze drives floating aquatic plants such as duckweed and filamentous algae to the shoreline where they are removed by nets or other physical methods. At the El Dorado Lakes, this physical means of aquatic plant control is the preferred method.

If floating and submerged weeds, which require contact pesticides for eradication, are allowed to grow thickly and form clumps, more pesticide must be used. A thick clump of aquatic weeds may require two or three pesticide applications to control the plants since many of the inner (or younger) plants will be blocked by the outer plants and the pesticide won't reach them. For example, it is not possible for the contact pesticide to effectively reach the inner bulrushes in a bunch/clump 10 or more feet in diameter.

Algae, under the right weather conditions such as a heat wave, reproduce quite rapidly. It is not unusual for the quantity of algae present in the lakes to double or triple in only a matter of a few hours or days.

Element C.11.a: Evaluation of Alternatives

No Action: If pre-established nuisance levels have not been observed, then the “no action” alternative is feasible.

Preventative Measures: Proper design and construction of ponds and lakes is an important factor in preventative control of weeds. Shallow water at the margins provides an ideal habitat for immersed weeds such as bulrushes and cattails. These weeds can then spread to deeper water. Banks should be sloped steeply so that water at the edges is greater than two to three feet deep. If banks are leveled and smoothed, hard-to-reach places can be eliminated.

The El Dorado Park Lakes are limited flow, shallow, lined, engineered impoundments. Due to age of the lakes, consideration will be given to removal of sediment along the edges to increase water depth above three feet. However, opportunities for increasing water depth above three feet are limited due to the potential for creating a safety risk to park visitors, especially children and possibility of damaging existing lining.

Mechanical Controls: Mechanical removal is most efficient near the shoreline. Hand-pulling the weeds or dredging the lake are possible methods of control. However, reliance on mechanical for severe infestations is often impractical or uneconomical.

A limitation on mechanical removal occurs when there are large concentrations of aquatic plants or algae in deep water. Under these circumstances, employees must stand up in a boat to remove algae or lean over the gunwale to gather plants. This situation poses a safety hazard to personnel and is not feasible.

Because **Parrotfeather** can spread readily through fragmentation of rhizomes, mechanical controls such as cutting, harvesting, and rotovation (underwater rototilling) should be used only when the extent of the infestation is such that all available niches have been filled. Using mechanical controls while the plant is still invading, will tend to enhance its rate of spread. Parrotfeather populations can be successfully harvested, but the dense tough rhizomes are very heavy and the plant regrows rapidly. Consequently, control of parrotfeather generally lasts only for one growing season.

Cultural Control and Habitat Alteration: Certain methods of manipulating or altering the aquatic environment can be effective in controlling aquatic weeds.

By exposing sediments in the shallow areas of a lake or pond to allow alternate freezing and thawing action, the underground rhizomes of many aquatic weeds are destroyed. This approach is not applicable to the coastal plain of Southern California. Temperatures rarely drop below 40 degrees Fahrenheit.

However, this draw-down technique can also be used periodically to dry-out sediment in shallow areas of the lakes. As the sediment dries, it is compacted and can be removed, thereby increasing the depth of water along the edges. Drawdown also concentrates fish populations which increases the predation of smaller fish by larger ones. Fishing quality often improved following a drawdown.

Many aquatic weeds or their seeds are carried into lakes by wind, birds, fish introduction, fishermen, etc. Many aquatic weeds will only infest a pond if the water conditions are just right. Steps should be taken to ensure that nutrients do not enter the water system. The hallmark of a healthy lake system is water that is sufficiently rich in plankton and other food organisms to support large fish without the need for supplemental fertilization.

Control measures that will aid in reducing infestations of floating plants such as algae and duckweed include maintaining a good sod and grass cover contoured around the lakes to prevent runoff and sediments from entering the water system, and planting grasses and native plants that do not require fertilization near the edges of the lakes

Other types of habitat manipulation that will discourage weed infestation include riprapping shorelines; installing anchoring screens or black plastic sheets on the bottom sediments to prevent rooted plant establishment; and, apply dyes such as Aquashade® to inhibit light penetration through the water column.

Aquashade® does not require mixing and can be applied right out of the bottle. Typically, it disperses throughout the body of water within 24 hours. This dye is only effective if its concentration is maintained and the target is a rooted underwater plant growing at depths greater than two to three feet. General rules for applying Aquashade are as follows:

- Do not apply where water outflow will reduce dye concentrations.
- Apply in the Spring before weeds reach the water surface.
- Midsummer reapplication is usually necessary.
- Do not use in muddy water.

For control of algae, Aquashade® may require coordinated use with a copper sulfite based herbicide. The dye may be susceptible to degradation by oxidizers such as GreenClean®.

Aeration has been publicized as another means of weed control. Although aeration is defiantly beneficial for fish life and can help prevent fish kills, there is no evidence that aeration inhibits weed growth.

Biological Control: Biological controls for aquatic vegetation have received considerable publicity. Several species of fish are herbivorous. Their principal diet is aquatic vegetation.

In 2010, the California Department of Fish and Game was authorized by the legislature to use its management authority to provide for the long-term health of aquatic ecosystem by regulating the use of triploid grass carp either through control of movement, eradication of populations, acquisition of habitat and any other action that the department finds will maintain the biological diversity and the long term, overall health of the state's environment. Introduction of grass carp is not allowed without a permit. Only specimens that have been sterilized immediately after the eggs have been fertilized may be introduced and only on a very limited basis.

Fungal control options for **parrotfeather** have been reported. An isolate of *Pythium carolinianum* Matt. has shown some promise as a potential biocontrol agent (Bernhardt, E.A. and J.M. Duniway, *Root and Stem Rot of Parrotfeather (Myriophyllum brasiliense)* caused by *Pythium carolinianum*. **Plant Disease 68:** 999-1003). Parrotfeather stems that were experimentally inoculated with this fungus produced significantly less growth than control plants. However, it is not available as a commercial product at this time.

Beneficial bacteria may have potential to reduce bioavailability of nutrients. Like dyes, the use of beneficial bacteria that consume the same nutrients as the aquatic weeds to be controlled

requires that the water be static for the application season. This biological approach works best in relatively small pockets with high organic material content, not on larger bodies of water. Experience has shown that copper in algaecides tends to kill beneficial bacteria. While this approach is theoretically possible, it may not be implementable due to the current sediment impairment for copper in the Nature Center Lakes.

Chemical Control Methods: Chemicals used in aquatic weed control are classified as herbicides. Herbicides primarily to control algae are called algaecides, even though they also kill other aquatic plants. For most aquatic weed problems, treatment using herbicides by a Qualified Applicator will destroy nuisance vegetation without harming the fish population.

The Park Maintenance Supervisor's lake inspection along with weather forecasts enable early intervention for algae control before large concentrations of algae have a chance to double or triple in concentration. If the application of pesticide is delayed too long, the quantity of pesticide needed is increased or multiple applications will be required to control an algae bloom.

Citrine Plus[®] (chelated copper) is used to control algae and is applied either as granules or dissolved in a liquid by a sprayer. As with Aquamaster[®] and Reward[®], the Citrine[®] Plus application area is a quiescent area of the lake. The applied Citrine[®] Plus is not carried beyond the application area by flowing water. As a result, the treatment zone generally does not extend more than 5 to 10 feet outside the application area.

For submerged plants (parrotfeather, sego pondweed, American pondweed), Reward[®] (diquat) is used. Reward[®] is applied as an aqueous emulsion by a sprayer directly over the plants to be controlled. Reward[®] forms gelatinous strings which sink in water and adhere to aquatic plants, controlling them. Since the application area is a quiescent area of the lake, the gelatinous strings stay in the application area and are not carried beyond the application area by flowing water. As a result, the treatment zone generally does not extend more than 5 to 10 feet outside the application area.

Efficacy of herbicides on submerged plants is greatly affected by concentration and exposure time of the herbicide surrounding the target plant. Duration of exposure or contact time is related to degradation of the parent molecule and, in some cases, dilution of the herbicide out of treatment areas resulting from water exchange patterns driven by flow, wind, waves, and current. As opposed to some other herbicides, efficacy of diquat can be impacted by inorganic turbidity caused by clay particles in the water column. These particles adsorb the diquat cation before sufficient contact time with the weed is achieved.

Although **parrotfeather** is considered by some to be susceptible to herbicides, it is difficult to achieve complete control once the plant becomes well established. In actual practice, repeated treatments with herbicide are necessary. In fall, parrotfeather typically dies back to the rhizomes.

Once again, early intervention is highly recommended. Excellent control of parrotfeather with several herbicides (2,4-D, diquat, endothall) have been reported. The emergent stems and leaves have a thick waxy cuticle. A wetting agent is required to penetrate this cuticle. Often the weight of the spray will cause the emergent vegetation to collapse into the water where the herbicide is washed off before it can be translocated throughout the plant.

Thus far, hand weeding has been successful in preventing parrotfeather from reaching nuisance stages in the El Dorado Park Lakes.

Aquamaster[®] (glyphosate) is used to control floating above-water aquatic plants (duckweed, cattails, bulrushes). It is a contact pesticide. In other words, Aquamaster[®] applied only to the water does not kill the target floating plant. As a result, great care is taken to apply Aquamaster[®] only to the floating vegetation and only during non-windy conditions to avoid spray drift, thereby minimizing the amount that enters the water column. As with Reward[®], the application area is a quiescent area of the lake. The applied Aquamaster[®] stays in the application area and is not carried beyond the application area by flowing water. As a result, the treatment zone generally does not extend more than 5 to 10 feet outside the application area.

Fair control of parrotfeather has been obtained with glyphosate. The Monsanto Company suggests that applying a 1.75 percent solution of Rodeo[®] (aquatic version of Roundup[®]) with surfactant to the plants in the summer or fall when water levels are low would result in approximately 95 percent control of the plants.

Imazapyr (tradename Habitat[®]) was registered for use in aquatic areas, including brackish and coastal waters, to control emerged, floating, and riparian/wetland species. The half-life of imazapyr due to photodegradation in aqueous solution is approximately two days (Mallipudi et al. 1991, Mangels 1991a).

A recent study from a tidal estuary in Washington showed that imazapyr, even when supplied at concentrations up to 1600 mg/L, did not affect the osmoregulatory capacity of Chinook salmon smolts (Patten 2003). Similarly, the Washington State Department of Agriculture reported that the 96-hour LC50 for rainbow trout fry to be 77,716 mg/L (ppm) to 22,305 ppm of the active ingredient- which represents a greater concentration of imazapyr than found in commercially-sold containers (<http://www.invasive.org/gist/products/handbook/17.Imazapyr>).

Environmental Toxicity Birds and Mammals: Imazapyr is of relatively low toxicity to birds and mammals. The LD50 for rats is > 5,000 mg/kg, and for bobwhite quail and mallard ducks is >2,150 mg/kg (WSSA 1994). American Cyanamid reports that studies with rats indicate that imazapyr was excreted rapidly in the urine and feces with no residues accumulating in the liver, kidney, muscle, fat, or blood (Miller et al. 1991).

Imazapyr *has not* been found to cause mutations or birth defects in animals, and is classified by the U.S. EPA as a Group E compound, indicating that imazapyr shows no evidence of carcinogenicity.

Aquatic Species: Imazapyr is of low toxicity to fish and invertebrates. The LC50s for rainbow trout, bluegill sunfish, channel catfish, and the water flea (*Daphnia magna*) are all >100 mg/L (WSSA 1994).

DFG Frog Toxicity Study: The goal of this study was to develop acute toxicity values for technical imazapyr acid and the imazapyr IPA salt products Habitat® and Stalker®, and technical triclopyr TEA salt and the triclopyr TEA salt product Garlon® 3A to larval ranid frogs (*California Fish and Game* 95(3):122-127 2009). Habitat®, a imazapyr formulation, contains 28.7% of the IPA salt of imazapyr. It is water-based and is commonly used in both terrestrial and aquatic settings.

The toxicity values determined from this study were compared to known or estimated environmental concentrations (“ECs”). These comparisons allowed the authors to assess the acute toxicity hazard for imazapyr based on the risk quotient (“RQ”) method (U.S. EPA 2004). The RQ method estimates risk by comparing an exposure concentration to an effects concentration (exposure/toxicity).

In 2006, the San Francisco Estuary Invasive Spartina Project (“ISP”) conducted imazapyr monitoring as part of its non-native spartina eradication effort. The imazapyr herbicide Habitat® was used at its maximum label rate (96 ounces Habitat®/acre) during the project. Application event samples were collected immediately adjacent to the treatment area approximately 3 hours post-treatment. Sampling points were purposefully selected in areas that might retain herbicide residues longer than sites that would receive a high volume flush of water immediately upon the return of the tide. The maximum imazapyr concentration detected during the project was 0.4 mg a.e./L (mean concentration = 0.23 mg a.e./L).

When the maximum concentration was used in an RQ analysis in the DFG Frog Toxicity Study, the resulting RQ value for Habitat® is 0.0002. The U.S. EPA uses an RQ value of 0.05 as the level of concern (“LOC”) for listed aquatic species (U.S. EPA 2004). These results indicate a very low toxicity risk to larval frogs that are present in aquatic sites that receive direct applications of imazapyr IPA salt herbicides

The authors concluded that Habitat®, with its low aquatic toxicity, can be used in water.

Element C.11.b: Use of Least Intrusive Method of AP Application

The Park Maintenance Supervisor will instruct staff to use the application techniques that will result in the least intrusive method of application that will ensure rapid and accurate delivery to the treatment area. Algaecides and herbicides are chosen and will be applied based upon manufacturer's recommendations by experience, certified applicators.

Element C.11.c: Decision Matrix for Ensuring Correct Formulation

When selecting the appropriate formulation for aquatic weed and algae control, several factors must be evaluated. Care should be taken to ensure that:

- Identification of the weed is accurate.
- Nuisance thresholds and tolerances have been verified
- External influences such as flow, water volume and water use restrictions have been taken into consideration.
- Correct application method has been chosen based on manufacturer's recommendation.
- Duration of application is consistent with protection of beneficial uses.
- All appropriate mitigation measures for treatment effects on lake ecology are in place.
- Equipment used for applying aquatic pesticides is in good condition.
- Spill control supplies are in place during mixing and transport.

A decision matrix for application of aquatic pesticides is presented on the following page.

EVALUATION OF EL DORADO LAKES AQUATIC WEED CONTROL PROGRAM

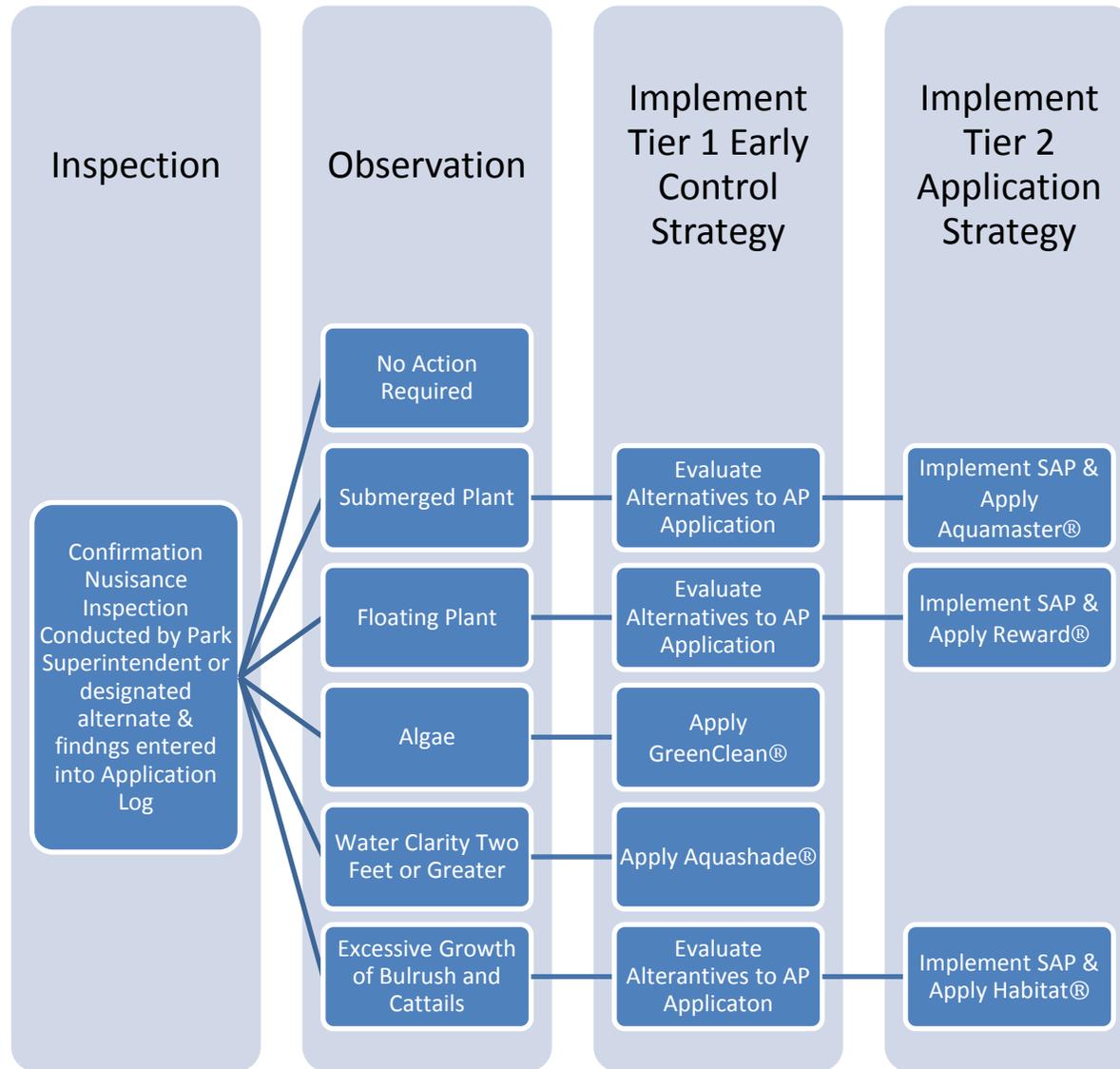
Years of experience have demonstrated that effective nuisance control is not attainable by the use of non-chemical methods alone. Control methods are initiated in a sequence that minimizes but may not completely eliminate the use of aquatic pesticides due to weather conditions. The City of Long Beach Parks, Recreation and Marine Department will continue to explore BMPs based on non-toxic or less toxic means to control aquatic plants and algae.

Initial control actions will continue to focus on early intervention using Aquashade[®] and Green Clean[®] to inhibit growth and treat hot spots when non-chemical alternatives are not feasible. Aquashade[®], a pond dye, is currently being used during cooler months for aquatic plant and algae control. Green Clean[®] is a non-copper-based biodegradable granular pesticide. Use of Cutrine Plus[®] will be limited to eradication of extreme algae bloom conditions.

As a result of these efforts, no use or discharge of the regulated aquatic pesticides diquat, copper and glyphosate was necessary during the calendar years 2012, 2013, 2014 and 2015. However, the Long Beach Department of Parks, Recreation and Marine has determined that in order to maintain the lakes for recreational and functional purposes, it may be necessary to chemically treat the emerged stems

of bulrush and cattails. The pesticide of choice is imazapyr. The half-life of imazapyr due to photodegradation in aqueous solution is approximately two days (Mallipudi et al. 1991, Mangels 1991a). A monitoring program for imazapyr will be initiated in 2016.

Note: SAP = Sampling & Analysis Plan in Attachment 4



Figures

Figure 1 Nature Center Lakes (Area 1)
Figure 2 Northern Lakes (Areas 2 and 3)
Figure 3 Duck Pond (West El Dorado Park)
Figure 4 Pre-Construction Topographic Map
Figure 5 Post-Construction Topographic Map

Attachments

Attachment 1	Nuisance Plants of Concern at El Dorado Park
Attachment 2	Aquatic Pesticide Labels and Material Safety Data Sheets
Attachment 3	Application Log
Attachment 4	Sampling and Analysis Plan

Attachment 1: Nuisance Plants of Concern at El Dorado Park



Duckweed



Algae Bloom



Filamentous Algae



Bulrushes



Cattails



Sago Pondweed



Parrotfeather



American Pondweed

Attachment 2: Aquatic Pesticide Labels and Material Safety Data Sheets

[Home](#) [Order](#) [Facts](#) [Label](#) [FAQ](#) [Links](#) [Application](#) [Contact](#) [Miscellaneous](#)



Cutrine Plus Herbicide Label

Live chat by

[Boldchat](#)

[Live help via](#)

[Boldchat](#)



CUTRINE[®]-PLUS SPECIMEN LABEL - (Text Only)

CUTRINE[®]-PLUS ALGAECIDE/HERBICIDE

Pat. No. 3,930,834 EPA Reg. No. 8959-10 EPA Est. No. 42291-GA-1

FOR USE IN LAKES – POTABLE WATER RESERVOIRS

FARMS, FISH AND INDUSTRIAL PONDS, FISH HATCHERIES AND

RACEWAYS, CROP AND NON-CROP IRRIGATION CONVEYANCE

SYSTEMS, DITCHES, CANALS AND LATERALS

ACTIVE INGREDIENTS:

COPPER AS ELEMENTAL.....*9.0%

INERT INGREDIENTS:.....91.0%

CUTRINE-PLUS contains 0.909 lbs. of elemental copper per gallon.

*From mixed Copper-Ethanolamine complexes contains 0.909 lbs. of elemental copper per gallon.

*From mixed Copper-Ethanolamine complexes contains 0.909 lbs. of elemental copper per gallon.

*From mixed Copper-Ethanolamine complexes

KEEP OUT OF REACH OF CHILDREN**DANGER****STATEMENT OF PRACTICAL TREATMENT****FIRST AID**

If in eyes: Call a physician. Hold eyelids open and flush with a steady gentle stream of water for 15 minutes.

If on skin: Wash with plenty of soap and water. Get medical attention.

If swallowed: Drink promptly a large quantity of milk, egg white, gelatin solution, or, if these are not available, large quantities of water. Avoid alcohol. Get medical attention. Do not induce vomiting or give anything by mouth to an unconscious person.

Note to Physician: Probable mucosal damage may contraindicate the use of gastric lavage.

See Additional Precautions Below

GENERAL INFORMATION

CUTRINE-PLUS, under field conditions, is effective in controlling a broad range of algae including: Chara, Spirogyra, Cladophora, Vaucheria, Ulothrix, Microcystis and Oscillatoria. **CUTRINE-PLUS** has also been proven effective in controlling the rooted aquatic plant, **Hydrilla verticillata**. The ethanolamines in **CUTRINE-PLUS** prevent the precipitation of copper with carbonates and bicarbonates in the water. Waters treated with **CUTRINE-PLUS** may be used for swimming, fishing, drinking, livestock watering or irrigating turf, ornamental plants or crops immediately after treatment.

DIRECTIONS FOR USE

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

SURFACE SPRAY/INJECTION**ALGAECIDE APPLICATION**

For effective control, proper chemical concentration should be maintained for a minimum of three hours contact time. The application rates in the chart are based on static or minimal flow situations. Where significant dilution or loss of water from unregulated inflows or outflows occur (raceways) within a three hour period, chemical may have to be metered in.

Identify the algae growth present as one of the following types: Planktonic (suspended), Filamentous (mat forming), or Chara/Nitella.

Determine the surface acreage (1 acre=43,560 sq. ft.) and average depth of infested area.

Refer to the chart below to determine gallons of **CUTRINE-PLUS** to apply per surface acre.

Application Rates

Gallons Per Surface Acre

ALGAE TYPE	PPM COPPER	DEPTH IN FEET			
		1	2	3	4
Planktonic	0.2	0.6	1.2	1.8	2.4
Filamentous	0.2	0.6	1.2	1.8	2.4
Chara/Nitella	0.4	1.2	2.4	3.6	4.8

For planktonic algae (suspended) algae and free-floating filamentous algae mats, application rates should be based upon treating only the upper 3 to 4 feet of water where algae is growing. Under conditions of heavy infestation, treat only 1/3 to 1/2 of the water body at a time to avoid fish suffocation caused by oxygen depletion from decaying algae. Before applying, dilute the required amount of **CUTRINE-PLUS** with enough water to ensure even distribution with the type of equipment being used. For most effective results, apply under calm and sunny conditions when water temperature is at least 60° F. Break up floating algae mats before spraying or while application is being made. Use hand or power sprayer adjusted to rain-sized droplets. Spray shoreline areas first to avoid trapping fish.

CUTRINE-PLUS Granular Algaecide may be used as an alternative in low volume flow situations, spot treatments or treatment of bottom-growing algae in deep water.

HERBICIDE APPLICATION

(For Hydrilla Control)

CUTRINE-PLUS:

Control of **Hydrilla verticillata** can be obtained from copper concentrations of

0.4 to 1.0 ppm resulting from **CUTRINE-PLUS** treatment. Choose the application rate based upon stage and density of Hydrilla growth and respective water depth from the chart below.

Application Rates

Gallons/Surface Acre*

Growth/Stage Relative Density	PPM Copper	DEPTH IN FEET					
		1	2	3	4	5	6
Early Season Low Density	0.4	1.2	2.4	3.6	4.8	6.0	7.2
	0.5	1.5	3.0	4.5	6.0	7.5	9.0
Mid-Season Moderate Density	--0.6--	--1.8--	--3.6--	--5.4--	--7.2--	--9.0--	--10.8--
	0.7	2.1	4.2	6.3	8.4	10.5	12.6
Late Season/ High Density	--0.8--	--2.4--	--4.8--	--7.3--	--9.6--	--12.0--	--14.4--
	0.9	2.7	5.4	8.1	10.8	13.5	16.2
	1.0	3.0	6.0	9.0	12.0	15.0	18.0

CUTRINE[®]-PLUS: REWARD[®] TANK MIX

On waters where enforcement of use restrictions for recreational, domestic and irrigation uses are acceptable, the following mixture can be used as an alternative Hydrilla control method.

Tank mix 3 gallons of **CUTRINE-PLUS** with 2 gallons of **REWARD[®]**. Apply mixture at the rate of 5½ gallons per surface acre. Dilute with at least 9 parts water and apply as a surface spray or underwater injection. Observe all cautions and restrictions on the labels of both products used in this mixture.

***REWARD[®]** is a trademark of Zeneca Group Company

PERMITS:

Some states may require permits for the application of this product to public waters. Check with your local authorities.

DRIP SYSTEM APPLICATION

FOR USE IN POTABLE WATER AND IRRIGATION CONVEYANCE SYSTEMS

-CUTRINE[®]-PLUS should be applied as soon as algae or Hydrilla begins to

interfere noticeably with normal delivery of water (clogging of lateral headgates, suction screens, weed screens and siphon tubes). Delaying treatment could perpetuate the problem causing massing and compacting of plants. Heavy infestations and low flow conditions increasing water flow rate during application may be necessary.

-Prior to treatment it is important to accurately determine water flow rates. In the absence of weirs, orifices, or similar devices which give accurate water flow measurements, volume of flow may be estimated by the following formula:

$$\text{Average Width (feet) x Average Depth (feet) x Velocity* (feet/second) x 0.9 =} \\ \text{Cubic Feet per Second (C.F.S.)}$$

*Velocity is the time it takes a floating object to travel a given distance. Dividing the distance traveled (feet) by the time (seconds) will yield velocity (feet/second). This measurement should be repeated at least three times at the intended application site and then averaged.

-After accurately determining the water flow rate in C.F.S. or gallons/minute, find the corresponding **CUTRINE-PLUS** drip rate on the chart below.

WATER FLOW RATE		CUTRINE-PLUS DRIP RATE*		
C.F.S.	Gal/Min	Qts./Hr.	ml/Min.	FL.Oz./Min.
1	450	1	16	0.5
2	900	2	32	1.1
3	1350	3	47	1.6
4	1800	4	63	2.1
5	2250	5	79	2.7

-Calculate the amount of **CUTRINE-PLUS** needed to maintain the drip rate for a period of 3 hours by multiplying Qts./Hr. x 3; ml/Min. x 180; or FL. Oz./Min. x 180. Dosage will maintain 1.0 ppm Copper concentration in the treated water for the 3 hour period. Introduction of the chemical should be made in the channel at weirs or other turbulence-creating structures to promote the dispersion of chemical.

-Pour the required amount of **CUTRINE-PLUS** into a drum or tank equipped with a brass needle valve and constructed to maintain a constant drip rate. Use a stop watch and appropriate measuring container to set the desired drip rate. Readjust accordingly if flow rate changes during the 3 hour treatment period.

-Distance of control obtained down the waterway will vary depending upon density of vegetation growth. Periodic maintenance treatments may be required to maintain seasonal control.

*Application rates for depths greater than six feet may be obtained by adding the rates given for the appropriate combination of depths. Application rates should not result in excess of 1.0 ppm copper concentration within treated water.

GENERAL TREATMENT NOTES

The following suggestions apply to the use of **CUTRINE-PLUS** as an algaecide or herbicide in all approved use sites:

For optimum effectiveness...

-Apply early in the day under calm, sunny conditions when water temperatures are at least 60° F.

-Treat when growth first begins to appear or create a nuisance, if possible.

-Apply in a manner that will ensure even distribution of the chemical within the treatment area.

-Re-treat areas if regrowth begins to appear and seasonal control is desired. Allow one to two weeks between consecutive treatments.

-Allow seven to ten days to observe the effects of treatment (bleaching and breaking apart of plant material).

PRECAUTIONARY STATEMENTS

HAZARDS TO HUMANS AND DOMESTIC ANIMALS

DANGER

CORROSIVE. Causes irreversible eye damage and skin burns. Do not get in eyes, on skin, or on clothing. Wear goggles or face shield and rubber gloves when handling this product. Wash thoroughly with soap and water after handling and before eating, drinking or using tobacco. Remove and wash contaminated clothing before reuse. Prolonged or frequently repeated skin contact may cause allergic reaction in some individuals.

STORAGE & DISPOSAL:

Keep container closed when not in use. Do not contaminate water, food or feed by storage or

disposal. Open dumping is prohibited. **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 DISPOSAL: Reseal container and offer for recondition or triple rinse (or equivalent) and offer for recycling, reconditioning or disposal in approved landfill, or incineration, or, if allowed by state and local authorities, by burning. If burned, stay out of smoke. Consult Federal, State or local authorities for approved alternative procedures.

ENVIRONMENTAL HAZARDS:

This product may be toxic to trout and other species of fish. Fish toxicity is dependent upon the hardness of water. Do not use in water containing trout if the carbonate hardness of water does not exceed 50 ppm.

NOTICE

Neither the manufacturer nor the seller makes any warranty, expressed or implied concerning the use of this product other than indicated on the label. Buyer assumes risk of use of this material when such use is contrary to label instructions. Read and follow the label directions carefully.

© Applied Biochemists 1988 12/98

Milwaukee, WI 53022

1-800-558-5106

[Order Hydrilla Weed Killer](#)

Make sure you check with your local authorities aquatic weed control regulations.
for website questions, contact webmaster@hydrilla-weed-killer.com

Copyright © [Hydrilla Weed Killer](#) 2004.

GROUP	22	HERBICIDE
-------	-----------	-----------

REWARD®

Aquatic Herbicide

Solution

RESTRICTED

For control of weeds in still or slow-moving water of farm dugouts, farm ponds, farmditches, lakes and canals, and for weed control in non-crop land and chemical mowing.

GUARANTEE:

diquat ion, 240 g per litre
(present as dibromide)

**READ THE LABEL AND BOOKLET BEFORE USING
KEEP OUT OF REACH OF CHILDREN**

WARNING



POISON

CAUTION – EYE AND SKIN IRRITANT

REGISTRATION NO. **26271**
PEST CONTROL PRODUCTS ACT

Syngenta Crop Protection Canada, Inc.
140 Research Lane, Research Park
Guelph, Ontario
N1G 4Z3
Telephone: 1-877-964-3682

WARNING!
***HARMFUL OR FATAL IF SWALLOWED.**
HARMFUL IF INHALED, AVOID INHALING/BREATHING DUST,
SPRAYS, ETC.
***CAUSES SUBSTANTIAL, BUT TEMPORARY, EYE INJURY.**
***DO NOT GET IN EYES, SKIN OR ON CLOTHING.**
***NEVER TRANSFER TO OTHER CONTAINERS.**
*** KEEP OUT OF REACH OF CHILDREN AND ANIMALS.**
MAY IRRITATE THE SKIN, AVOID CONTACT WITH SKIN.

NOTICE TO USER

This pest control product is to be used only in accordance with the directions on the label. It is an offence under the *Pest Control Products Act* to use this product in a way that is inconsistent with the directions on the label. The user assumes the risk to persons or property that arises from any such use of this product.

NATURE OF RESTRICTION: This product is to be used only in the manner authorized, consult local pesticide regulatory authorities about use permits which may be required.

RESTRICTED USES

For the control of water weeds such as Coontail (***Ceratophyllum sp***), Duckweed (***Lemna sp***), Canada Water Weed (***Elodea, Anacharis sp***), Pondweeds (***Potamogeton sp***), and Water Milfoil (***Myriophyllum sp***) in still or slow flowing water of farm dugouts, farm ponds, farm ditches, lakes and canals, apply REWARD at 18.3 L/ha (1 ha = 10,000 m² or 100 m x 100 m). 1.9 litres of REWARD will treat a farm dugout 25 m x 50 m. Milfoil may be controlled at 9.2 L/ha in the early stages of growth. For the control of growing weeds in 1.5 m of water or less, use 18.3 L/ha of REWARD. For the control of growing weeds in more than 1.5 m of water, apply 25-29.2 L/ha of REWARD.

Algae: *Cladophora, Spirogyra, and Pithophora sp.* will be temporarily controlled at the above rates. Repeat treatments may be required for full season control of these species. REWARD will not control ***Chara*** (Stonewort, Muskgrass). REWARD, after suitable dilution with clean water, may be injected below the water surface, sprayed over the water surface or poured directly onto the surface while moving over the surface in a boat, or may be applied from the banks of small bodies of water.

To inject below the water surface, a suction type of boat bailer is mounted on the cavitation plate of an outboard motor and the end of the inlet tube inserted into a solution containing 1 part REWARD diluted with at least 10 parts of clean water. Make lines of travel at regular intervals through the water (3 m or less apart) over the area to be treated until the whole area has received a uniform application.

For Surface application, dilute 1 part REWARD with at least 4 parts clean water and spray over water surface, pour directly onto water surface or apply from the banks of small bodies of water.

Timing of Application: Apply only after weeds are visible and in an active stage of growth which is normally sometime in late May through June as growth is dependent on water temperatures. Application should be made to actively growing weeds before they become so thick that they make application difficult. **Application to dense growth of mature weeds will not give satisfactory control.**

Repeat treatments may be required if weed growth reappears. For temporary control of water weeds growing above the surface of the water, such as waterlilies, uniformly spray with REWARD at 9.2 to 26.7 L in 1700 to 2200 L of water per hectare to thoroughly wet the foliage. Use AGRAL[®] 90 at 1 L per 1000 L of water.

LIMITATIONS

In some provinces of Canada permits are required before chemicals such as REWARD can be added to water. Consult local authorities before applying REWARD to ascertain whether such a permit is required in your area. Do not use treated water for at least 24 hours after treatment for swimming and animal consumption. For human consumption and irrigation do not use for at least 5 days after treatment. To protect the fish in small lakes and ponds with a dense weed growth, treat not more than 1/4 to 1/3 of the area at one time, otherwise the dying weeds over a large area will cause a serious loss of oxygen which may injure or kill the fish. Do not apply to muddy water and do not agitate water excessively during 1 or 2 days after treatment or the effectiveness of the chemical will be reduced. Use clean water for diluting the chemical.

Do not use wetting agents for water treatment, except as specified. Avoid application or drift onto crops, ornamental plants, lawns, grazing areas or other desirable growth. Do not apply through mist blowers.

It is important to thoroughly wash equipment after spraying - use a detergent or wetting agent (AGRAL 90 at 60 mL per 100 L of water), flush and spray out, then thoroughly rinse with clean water. When possible, the equipment should be filled with clean water and left overnight. Spray out before storing equipment or using for other materials.

DIRECTIONS FOR USE

Weed Control in Non-Crop Land and Chemical Mowing - Apply 2.3 to 4.5 litres in a minimum of 225 litres per hectare of water. Use the higher rate and higher water volumes for dense weed growth. Maximum solution strength should not exceed 200 mL REWARD in 10 litres water. Thoroughly wet all foliage. Avoid spray mist contacting the foliage or green bark of desirable plants.

REWARD will provide a rapid top-kill of weeds and grasses when applied as a foliar spray. REWARD may be added to tank mixes of certain soil sterilants where immediate top-kill and long term soil sterilization is required. The combined use with soil sterilants should be based on previous experimental experience, and recommendations on the label of the residual herbicide.

PRODUCT INFORMATION

REWARD is a non-volatile fast acting herbicide for the control of water weeds and when used as directed, presents no hazard to fish, other aquatic life or animals and humans making use of the treated water within the limitations prescribed. Control of susceptible weeds generally occurs within 1 to 2 weeks.

REWARD is inactivated upon contact with soil, mud or lake bottoms. Therefore, it has no residual herbicidal effect.

FIRST AID

Take container, label or product name and Pest Control Product Registration Number with you when seeking medical attention.

If swallowed, call a poison control centre or doctor **IMMEDIATELY** for treatment advice. Do not induce vomiting unless told to do so by a poison control centre or doctor. Do not give anything by mouth to an unconscious person.

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 eye. Call a poison control centre 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 centre or doctor for treatment advice.

If inhaled, move person to fresh air. If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably by mouth-to-mouth, if possible. Call a poison control centre or doctor for further treatment advice.

TOXICOLOGICAL INFORMATION

To be effective, treatment for ingestion of the product must begin IMMEDIATELY. If swallowed, give stomach a wash-out and test urine and gastric aspirate for diquat. If positive, give up to 1 litre of adsorbent suspension (e.g., activated charcoal, bentonite clay, etc.) mixed with a purgative (MgSO_4 , Na_2SO_4 or mannitol). Repeat administration of adsorbent suspension every 2 hrs for first 24 hrs and every 4 hrs for the next 24 hrs, plus purgatives as required. Maintain and monitor electrolyte and fluid status daily. Consider haemodialysis or haemoperfusion using charcoal column.

If in eyes, treat symptomatically, using antibiotics and steroids as necessary.

PRECAUTIONS

EXCESSIVE EXPOSURE TO DIQUAT MAY CAUSE A HEALTH HAZARD. FOLLOWING THE DIRECTIONS AND PRECAUTIONS WILL REDUCE EXPOSURE.

Wear chemical resistant apron over coveralls, chemical resistant gloves, chemical resistant footwear and goggles or face shield during mixing and loading. Wear coveralls, chemical resistant gloves, chemical resistant footwear and chemical resistant goggles or face shield during clean up and repair. Most exposure to pesticides is by absorption through skin, especially from concentrated material handled at the time of mixing and loading. Since most of this exposure is on the hands and forearms, use of long-sleeve chemical resistant water proof gloves will reduce exposure substantially. Rolling down the sleeve end of the glove will prevent drips of liquid from running down the glove onto your arm.

If concentrate splashes onto the side of the spray tank, and you subsequently lean against the tank, the clothing and skin over the abdomen will be exposed to REWARD Aquatic Herbicide concentrate. Use of a chemical resistant apron will reduce this likelihood. If clothing has been contaminated, remove it and launder it as soon as possible. Do not leave wet contaminated clothing in contact with skin for extended periods. Wash clothing in detergent and hot water before reuse. REWARD Aquatic Herbicide is irritating to eyes. Always use chemical resistant goggles and/or a face shield. AVOID WORKING IN SPRAY MIST. If ventilation is not adequate, wear an appropriate pesticide respirator. If necessary wear an approved face mask and eyeshield.

Do not eat, drink, handle or use tobacco, or apply cosmetics in areas where there is potential for exposure to this product. Wash hands and face before eating, drinking, handling tobacco or using the toilet. Store and wash all protective clothing separately from household laundry.

Do not contaminate food, feed, domestic or irrigation water supplies, lakes, streams and ponds.

STORE IN ORIGINAL CONTAINER tightly closed in a safe place away from children.

If this pest control product is to be used on a commodity that may be exported to the U.S. and you require information on acceptable residue levels in the U.S., visit CropLife Canada's website at www.croplife.ca.

STORAGE

Store in original container, tightly closed, in a safe place away from children.

Store above 0 °C. If crystallization occurs because of storage below this, warm to room temperature and agitate gently until reconstituted.

DECONTAMINATION AND DISPOSAL

For information on disposal of unused, unwanted product, contact the manufacturer or the provincial regulatory agency. Contact the manufacturer and the provincial regulatory agency in case of a spill, and for clean up of spills.

CONTAINER DISPOSAL:

FOR DISPOSAL OF PLASTIC JUGS:

Do not reuse this container for any purpose. This is a recyclable container, and is to be disposed of at a container collection site. Contact your local distributor/dealer or municipality for the location of the nearest collection site. Before taking the container to the collection site:

1. Triple- or pressure-rinse the empty container. Add the rinsings to the spray mixture in the tank.
2. Make the empty, rinsed container unsuitable for further use.

If there is no container collection site in your area, dispose of the container in accordance with provincial requirements.

**IN CASE OF EMERGENCY INVOLVING A MAJOR SPILL, FIRE OR POISONING,
CALL 1-800-327-8633 (FASTMED)**

Resistance-Management Recommendations

For resistance management, REWARD is a Group 22 herbicide. Any weed population may contain or develop plants naturally resistant to REWARD and other Group 22 herbicides. The resistant biotypes may dominate the weed population if these herbicides are used repeatedly in the same field. Other resistance mechanisms that are not linked to site of action, but specific for individual chemicals, such as enhanced metabolism, may also exist. Appropriate resistance-management strategies should be followed.

To delay herbicide resistance:

Where possible, rotate the use of REWARD or other Group 22 herbicides with different herbicide groups that control the same weeds in a field.

Use tank mixtures with herbicides from a different group when such use is permitted.

Herbicide use should be based on an IPM program that includes scouting, historical information related to herbicide use and crop rotation, and considers tillage (or other mechanical), cultural, biological and other chemical control practices.

Monitor treated weed populations for resistance development. Prevent movement of resistant weed seeds to other fields by cleaning harvesting and tillage equipment and planting clean seed.

Contact your local extension specialist or certified crop advisors for any additional pesticide resistance-management and/or integrated weed-management recommendations for specific crops and weed biotypes.

For further information and to report suspected resistance, contact company representatives at 1-877-SYNGENTA (1-877-964-3682) or at www.syngenta.ca.



PRO-SPREADER ACTIVATOR

BIO-DEGRADABLE

**NO FOAM • NONIONIC SURFACTANT
FOR TERRESTRIAL / AQUATIC USE SITES**

PRINCIPAL FUNCTIONING AGENTS:

Nonylphenoxy polyethoxy ethanols, isopropanol

and Fatty acids 90.0%

CONSTITUENTS INEFFECTIVE AS SPRAY ADJUVANT: 10.0%

TOTAL 100.0%

CALIFORNIA REGISTRATION NO. 1050775-50022-AA

NET CONTENTS: 1 U.S. GALLON

DISTRIBUTED BY

TARGET SPECIALTY PRODUCTS, INC.

THIS PRODUCT IS MANUFACTURED BY
CREATIVE MARKETING & RESEARCH, INC.

P.O. BOX 35000 • FRESNO, CA 93745-5000

TM — Trademark of TARGET SPECIALTY PRODUCTS, INC.

PRO-SPREADER/ACTIVATOR is used to give optimum wetting and spreading of agricultural insecticides, miticides, fungicides, herbicides, and growth regulating hormones. **PRO-SPREADER/ACTIVATOR** is formulated from materials which do not tend to burn foliage or leave harmful residues. There will be no excessive foaming when high pressures are used. Use of correct quantity for smooth wetting reduces the possibility of spot injury from large pesticide droplets.

SUGGESTED APPLICATIONS

Quantity to use will vary with the type of equipment, water volume per acre, temperature, type of foliage to be wet, and the pesticide formulation. **Also, higher rates than those below may be used if recommended by pesticide labeling. Follow pesticide label directions. However, do not add this product at a rate which exceeds 5% of the finished spray volume.**

- A. Ground Spraying:** Use 2 to 8 oz. per 100 gallons of water.
- B. Concentrate Air Blower Sprayers or Aircraft:** Use 6 to 12 oz. per 100 gallons of water, except where drift hazard is critical. Consult local agricultural authorities for any restrictions on use with hazardous materials.

For use with Rodeo® Herbicide: Use 1-2 quarts per 100 gallons of finished spray solution. Consult the Rodeo® label for proper rates and volume.

•Trademark of Monsanto, The Agricultural Group.

STORAGE AND DISPOSAL

DO NOT CONTAMINATE WATER, FOOD OR FEED BY STORAGE OR DISPOSAL.

STORAGE: Store in a dry location away from children, animals, foods, feeds and seeds. Handle in accordance with Precautionary Statements. In the event of spillage or leakage, soak up the material with absorbent clay, sand, sawdust or other absorbent material. Scrape up and dispose in accordance with Product Disposal.

PRODUCT DISPOSAL: Wastes resulting from the use of this product may be disposed of on site or at an approved waste disposal facility.

CONTAINER DISPOSAL: Triple rinse (or equivalent), then offer for recycling or reconditioning, or puncture and dispose of in a sanitary landfill, or by incineration. If allowed by state and local authorities, dispose of containers by burning. If burned, stay out of smoke.

KEEP OUT OF REACH OF CHILDREN

CAUTION

PRECAUTIONARY STATEMENTS

HAZARDS TO HUMANS AND DOMESTIC ANIMALS

CAUTION: Harmful if swallowed. May cause irritation of eyes, nose, throat and skin. Avoid contact with eyes, skin and clothing. Avoid breathing spray mist. Wash thoroughly after handling. Remove contaminated clothing and wash thoroughly before reuse. Do not contaminate feed and foodstuffs.

Do not apply this product in such a manner as to directly or through drift expose workers or other persons. The area being treated must be vacated by unprotected persons.

STATEMENT OF PRACTICAL TREATMENT

IF SWALLOWED: Call a physician or Poison Control Center. Drink 1 or 2 glasses of water. If so advised by a physician or Poison Control Center, induce vomiting by touching back of throat with finger. Do not induce vomiting or give anything by mouth to an unconscious person.

IF IN EYES: Immediately flush eyes with plenty of water and get medical attention.

IF ON SKIN: Immediately wash skin with plenty of soap and water while removing contaminated clothing and shoes. If irritation persists, seek medical attention.

IF INHALED: Remove victim to fresh air.

ENVIRONMENTAL HAZARDS

Do not contaminate water when disposing of equipment washwaters.

STATEMENT OF WARRANTY

Seller's guarantee shall be limited to the terms of the label. Subject thereto, the buyer assumes any risk to persons or property arising from use or handling and accepts the product on these conditions.

SHAKE WELL BEFORE USING

0189/0193(04)

AQUASHADE®

AQUATIC PLANT GROWTH CONTROL

PRODUCT INFORMATION

Aquashade contains a blend of blue and yellow dyes designed to absorb specific wavelengths of light critical to plant photosynthesis. Treated water will retain a light aqua-blue tint following application.

WHERE TO USE

For use in: Natural and Manmade contained lakes and ponds (ornamental, recreational, fish rearing or fish farming) with little or no outflow of water, golf course ponds, and watering turf.

WHEN TO USE

For best results, apply Aquashade as a pre-emergent (prior to plant germination) before the growing season. Aquashade may even be applied directly onto ice cover, (where applicable). Use during the growing season will suppress the rate and extent of underwater growth, but may not eliminate it. Aquashade has reduced effectiveness in waters less than 2 feet deep and on matured submersed aquatic plants. It does not control floating algae mats, free floating plants, or emergent (shoreline) vegetation. These plants can be physically removed or treated with an appropriate EPA registered aquatic herbicide or algaecide if more complete control is desired. When using algaecides or aquatic herbicides, always follow label restrictions, precautions and directions for use.

Either allow at least one hour for Aquashade to disperse throughout the water body before using water for **swimming, irrigation or livestock watering** or avoid pouring concentrate within 50 ft. of these intake/use areas, allowing dye to self-disperse into them.

HOW TO APPLY

Measure out required amount of Aquashade into a pourable container or apply directly from the product container by pouring around shoreline water and/or in offshore areas from a boat. Aquashade will mix throughout the water on its own, however, more widespread application or aeration devices/fountains will provide quicker dispersion.

In freezing climates, Aquashade may be poured onto the ICE in a 3 foot (1 meter) diameter circle it will melt a hole and disperse underneath. (Be certain ice conditions are safe before making application.)

HOW MUCH TO USE:

1. Calculate total volume of your water body into Gallons (Liters) or Acre-Feet (Cubic Meters):

$$\text{Length (ft.)} \times \text{Width (ft.)} \times \text{Avg. Depth (ft.)} \times 7.5 = \text{Gallons}$$

$$\text{Length (ft.)} \times \text{Width (ft.)} \times \text{Avg. Depth (ft.)} / 43,560 = \text{Acre-Feet}$$

Avg. Depth can be determined by taking a number of depth readings and calculating the average or estimated as 1/2 the maximum depth in evenly contoured bodies of water.

Dosage Rates for Aquashade*

	Aquashade (ppm)	0.5	0.8	1.5	2.0
Total Volume	10,000 gal (37,850 L)	0.6 oz. 18 mL	1.0 oz. 30 mL	1.8 oz. 54 mL	2.4 oz. 72 mL
	1 Acre-foot (326,000 gal) 1,234 cubic meters	20 oz. 0.6 L	32 oz. 0.95 L	60 oz. 1.8 L	80 oz. 2.4 L
	4 Acre-feet (1.3M gal.) 4,936 cubic meters	80 oz. 2.4 L	1 gal. 3.8 L	1.9 gal. 7.2 L	2.5 gal. 9.6 L

*Use the lower (0.5-0.8 ppm) rates early for suppression of submersed plants (Leafy Pondweed, Chara, Slender Naiad, Watermilfoil, Hydrilla) and Filamentous Green (Spirogyra sp.) and Bluegreen algae growing at depths greater than 2 feet of the surface. Use higher rates (1.5- 2.0 ppm) in shallow waters or in-season where growth is within 2 feet of surface.

2. Based upon water volume, determine dosage rate from the chart above.

3. Apply in season maintenance dosages, as needed, to restore loss of color due to dilution or dye degradation.

U.S. Pat. No. 4,042,367
EPA Reg. No. 33068-1
EPA Est. No. 42291-GA-1

For Use In Natural and Man-made Contained Lakes and Ponds (Ornamental, Recreational, Fish Rearing & Fish Farming Bodies) With Little or No Outflow of Water.

ACTIVE INGREDIENTS:

Acid Blue 9*.....12.60%
Acid Yellow 23**.....1.04%
INERT INGREDIENTS.....86.36%
TOTAL.....100.00%
Contains 1.11 lbs. of Erioglaucine*
and 0.09 lbs. of Tartrazine**
as Pure Dye Content per gallon.



Manufactured by:

ab applied biochemists

an Arch Chemicals, Inc. company
W175N11163 Stonewood Dr. Suite 234
Germantown, WI 53022

1-800-558-5106 • www.appliedbiochemists.com

DIRECTIONS FOR USE

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

Do not apply directly to streams, other natural bodies of water, or any body of water not under total control of the user. Do not apply to water that will be used for human consumption.

KEEP OUT OF REACH OF CHILDREN

CAUTION

FIRST AID

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 to do so 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 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 eye. Call a poison control center or doctor for treatment advice.

EMERGENCY NUMBER: Have the product container or label with you when calling a poison control center or doctor, or going for treatment. If a medical emergency arises contact Arch Chemicals Emergency Action Network in the US call 1-800-654-6911 or outside the US call 423-780-2970.

For help with a spill, leak, fire or exposure involving this material call CHEMTREC 1-800-424-9300.

PRECAUTIONARY STATEMENTS

HAZARDS TO HUMANS AND DOMESTIC ANIMALS

CAUTION: Harmful if swallowed or absorbed through skin. Causes moderate eye irritation. Avoid contact with eyes, skin, or clothing. Wear long-sleeved shirt, long pants, shoes, socks, and chemical-resistant gloves made of any waterproof material. Wash thoroughly with soap and water after handling and before eating, drinking, chewing gum, using tobacco or using the toilet. Remove and wash contaminated clothing before reuse.

ENVIRONMENTAL HAZARDS

Shoreline non-target plants (cattails, water lilies) may suffer contact burn if accidentally poured on them.

PHYSICAL AND CHEMICAL HAZARDS

Color and effectiveness of Aquashade will be lost in waters containing active chlorine residual such as treated swimming ponds, fountains and water features.

Concentrated product can stain fabric and other porous surfaces. Avoid direct contact with these materials.

PERMITS

Some states may require permits for application of this product to public waters or to bodies of water discharging into public waters. Check with your local authorities.

STORAGE AND DISPOSAL

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

PESTICIDE STORAGE: Store in original container in a cool, dry place. Keep from freezing. **PESTICIDE DISPOSAL:** Wastes resulting from the use of this product must be disposed of onsite or at an approved waste disposal facility. **CONTAINER DISPOSAL:** Nonrefillable container. Do not refill or reuse container. Triple rinse (or equivalent) promptly after emptying. Then offer for recycling or reconditioning if available or puncture and dispose of in approved landfill, or incineration, or by other procedures approved by State and Local authorities. Waste resulting from this product may be disposed of onsite or at an approved waste disposal facility.

WARRANTY

To the extent consistent with applicable law neither the manufacturer nor the seller makes any warranty, expressed or implied concerning the use of this product other than indicated on the label.

To the extent consistent with applicable law buyer assumes risk of use of this material when such use is contrary to label instructions. Read and follow the label directions.

ATTENTION:

This specimen label is provided for general information only.

- This pesticide product may not yet be available or approved for sale or use in your area.
- It is your responsibility to follow all Federal, state and local laws and regulations regarding the use of pesticides.
- Before using any pesticide, be sure the intended use is approved in your state or locality.
- Your state or locality may require additional precautions and instructions for use of this product that are not included here.
- Monsanto does not guarantee the completeness or accuracy of this specimen label. The information found in this label may differ from the information found on the product label. You must have the EPA approved labeling with you at the time of use and must read and follow all label directions.
- You should not base any use of a similar product on the precautions, instructions for use or other information you find here.
- Always follow the precautions and instructions for use on the label of the pesticide you are using.

2119514-25



Complete Directions for Use in Aquatic and Other Non-crop Sites.

AVOID CONTACT OF HERBICIDE WITH FOLIAGE, STEMS, EXPOSED NON-WOODY ROOTS OR FRUIT OF CROPS, DESIRABLE PLANTS AND TREES, BECAUSE SEVERE INJURY OR DESTRUCTION MAY RESULT.

EPA Reg. No. 524-343

2009-2

GROUP 9 HERBICIDE

Read the entire label before using this product.

Use only according to label instructions.

Not all products listed on this label are registered for use in California. Check the registration status of each product in California before using.

Read the "LIMIT OF WARRANTY AND LIABILITY" statement at the end of the label before buying or using. If terms are not acceptable, return at once unopened.

THIS IS AN END-USE PRODUCT. MONSANTO DOES NOT INTEND AND HAS NOT REGISTERED IT FOR REFORMULATION (OR REPACKAGING). SEE INDIVIDUAL CONTAINER LABEL FOR REPACKAGING LIMITATIONS.

PRODUCT INFORMATION

1.0 INGREDIENTS

ACTIVE INGREDIENT:

*Glyphosate, N-(phosphonomethyl)glycine, in the form of its isopropylamine salt..... 53.8%

OTHER INGREDIENTS:..... 46.2%
100.0%

*Contains 648 grams per liter or 5.4 pounds per U.S. gallon of the active ingredient glyphosate, in the form of its isopropylamine salt. Equivalent to 480 grams per liter or 4.0 pounds per U.S. gallon of the acid, glyphosate.

No license granted under any non-U.S. patent(s).

2.0 IMPORTANT PHONE NUMBERS

FOR PRODUCT INFORMATION OR ASSISTANCE IN USING THIS PRODUCT,
CALL TOLL-FREE,
1-800-332-3111.

IN CASE OF AN EMERGENCY INVOLVING THIS PRODUCT, OR FOR MEDICAL
ASSISTANCE, CALL COLLECT, DAY OR NIGHT,
(314) 694-4000.

3.0 PRECAUTIONARY STATEMENTS

3.1 Hazards to Humans and Domestic Animals

Keep out of reach of children.

CAUTION!

Remove contaminated clothing and wash clothing before reuse.
Wash thoroughly with soap and water after handling.

3.2 Environmental Hazards

Do not contaminate water when cleaning equipment or disposing of equipment washwaters. Treatment of aquatic weeds can result in oxygen depletion or loss due to decomposition of dead plants. This oxygen loss can cause fish suffocation.

In case of: SPILL or LEAK, soak up and remove to a landfill.

3.3 Physical or Chemical Hazards

Spray solutions of this product should be mixed, stored and applied using only stainless steel, fiberglass, plastic or plastic-lined steel containers.

DO NOT MIX, STORE OR APPLY THIS PRODUCT OR SPRAY SOLUTIONS OF THIS PRODUCT IN GALVANIZED STEEL OR UNLINED STEEL (EXCEPT STAINLESS STEEL) CONTAINERS OR SPRAY TANKS. This product or spray solutions of this product react with such containers and tanks to produce hydrogen gas which may form a highly combustible gas mixture. This gas mixture could flash or explode, causing serious personal injury, if ignited by open flame, spark, welder's torch, lighted cigarette or other ignition source.

DIRECTIONS FOR USE

It is a violation of Federal law to use this product in any manner inconsistent with its labeling. This product can only be used in accordance with the Directions for Use on this label or in separately published Monsanto Supplemental Labeling. Supplemental labeling can be found on the www.cdms.net or www.greenbook.net websites or obtained by contacting your Authorized Monsanto Retailer or Monsanto Company representative. For any requirements specific to your State or Tribe, consult the agency responsible for pesticide regulations.

4.0 STORAGE AND DISPOSAL

Proper pesticide storage and disposal are essential to protect against exposure to people and the environment due to leaks and spills, excess product or waste, and vandalism. Do not allow this product to contaminate water, foodstuffs, feed or seed by storage and disposal.

PESTICIDE STORAGE: STORE ABOVE 5°F (-15°C) TO KEEP PRODUCT FROM CRYSTALLIZING. Crystals will settle to the bottom. If allowed to crystallize, place in a warm room 68°F (20°C) for several days to redissolve and roll or shake container or recirculate in mini-bulk containers to mix well before using. Store pesticides away from food, pet food, feed, seed, fertilizers, and veterinary supplies. Keep container closed to prevent spills and contamination.

PESTICIDE DISPOSAL: To avoid wastes, use all material in this container, including rinsate, by application according to label directions. If wastes cannot be avoided, offer remaining product to a waste disposal facility or pesticide disposal program. Such programs are often run by state or local governments or by industry. All disposal must be in accordance with applicable Federal, state and local regulations and procedures.

CONTAINER HANDLING AND DISPOSAL: See container label for container handling and disposal instructions and refilling limitations.

5.0 GENERAL INFORMATION (How This Product Works)

Product Description: This product is a postemergence, systemic herbicide with no residual soil activity. It gives broad-spectrum control of many annual weeds, perennial weeds, woody brush and trees. It is formulated as a water-soluble liquid and may be applied through standard equipment after dilution and mixing with water or other carriers according to label instructions.

Time to Symptoms: This product moves through the plant from the point of foliage contact to and into the root system. Visible effects are a gradual wilting and yellowing of the plant which advances to complete browning of above-ground growth and deterioration of underground plant parts. Effects are visible on most annual weeds within 2 to 4 days, but on most perennial weeds may not occur for 7 days or more. Extremely cool or cloudy weather following treatment may slow activity of this product and delay development of visual symptoms.

Stage of Weeds: Annual weeds are easiest to control when they are small. Best control of most perennial weeds is obtained when treatment is made at late growth stages approaching maturity. Refer to the "WEEDS CONTROLLED" sections for specific weed instructions. Always use the higher product application rate in the labeled range

when weed growth is heavy or dense, or when weeds are growing in an undisturbed (non-cultivated) area. Reduced weed control may result from treating weeds with disease or insect damage, weeds heavily covered with dust, or weeds under poor growing conditions.

Cultural Considerations: Reduced control may result when applications are made to annual or perennial weeds that have been mowed, grazed or cut, and have not been allowed to regrow to the specified stage for treatment.

Rainfastness: Heavy rainfall soon after application may wash this product off of the foliage and a repeat application may be required for adequate control.

Mode of Action in Plants: The active ingredient in this product inhibits production of an enzyme in plants and microorganisms that is essential to formation of specific amino acids.

No Soil Activity: Weeds must be emerged at the time of application to be controlled by this product. Weeds germinating from seed after application will not be controlled. Unemerged plants arising from unattached underground rhizomes or rootstocks of perennials will not be affected by the herbicide and will continue to grow.

Maximum Application Rates: The maximum application or use rates stated throughout this label are given in units of volume (fluid ounces or quarts) of this product per acre. However, the maximum allowed application rates apply to this product combined with the use of any and all other herbicides containing the active ingredient glyphosate, whether applied separately or as tank mixtures, on a basis of total pounds of glyphosate (acid equivalents) per acre. If more than one glyphosate-containing product is applied to the same site within the same year, you must ensure that the total use of glyphosate (pounds acid equivalents) does not exceed the maximum allowed. The combined total of all treatments must not exceed 8 quarts of this product (8 pounds of glyphosate acid) per acre per year. See the "INGREDIENTS" section of this label for necessary product information.

ATTENTION

AVOID CONTACT OF HERBICIDE WITH FOLIAGE, STEMS, EXPOSED NON-WOODY ROOTS OR FRUIT OF CROPS, DESIRABLE PLANTS AND TREES, BECAUSE SEVERE INJURY OR DESTRUCTION MAY RESULT.

AVOID DRIFT. EXTREME CARE MUST BE USED WHEN APPLYING THIS PRODUCT TO PREVENT INJURY TO DESIRABLE PLANTS AND CROPS.

Do not allow the herbicide solution to mist, drip, drift or splash onto desirable vegetation since minute quantities of this product can cause severe damage or destruction to the crop, plants or other areas on which treatment was not intended. The likelihood of injury occurring from the use of this product increases when winds are gusty, as wind velocity increases, when wind direction is constantly changing or when there are other meteorological conditions that favor spray drift. When spraying, avoid combinations of pressure and nozzle type that will result in splatter or fine particles (mist) that are likely to drift. AVOID APPLYING AT EXCESSIVE SPEED OR PRESSURE.

NOTE: Use of this product in any manner not consistent with this label may result in injury to persons, animals or crops, or other unintended consequences.

5.1 Weed Resistance Management

GROUP	9	HERBICIDE
-------	---	-----------

Glyphosate, the active ingredient in this product, is a Group 9 herbicide based on the mode of action classification system of the Weed Science Society of America. Any weed population may contain plants naturally resistant to Group 9 herbicides. Weed species resistant to Group 9 herbicides may be effectively managed utilizing another herbicide from a different Group or using other cultural or mechanical practices.

To minimize the occurrence of glyphosate-resistant biotypes observe the following general weed management recommendations:

- Scout your application site before and after herbicide applications.
- Control weeds early when they are relatively small.
- Incorporate other herbicides and cultural or mechanical practices as part of your weed control system where appropriate.
- Use the labeled rate for the most difficult weed in the site. Avoid tank mixtures with other herbicides that reduce this product's efficacy (through antagonism) or with tank mixtures that encourage rates of this product below those specified on this label.
- Control weed escapes and prevent weeds from setting seeds.
- Clean equipment before moving from site to site to minimize spread of weed seed.
- Use new commercial seed as free of weed seed as possible.
- Report any incidence of repeated non-performance of this product on a particular weed to your Monsanto representative, local retailer, or county extension agent.

5.2 Management Recommendations for Glyphosate-Resistant Weed Biotypes

NOTE: Appropriate testing is critical in order to confirm weed resistance to glyphosate. Contact your Monsanto representative to determine if resistance in any particular weed biotype in your area has been confirmed. Control recommendations for biotypes confirmed as resistant to glyphosate are made available on separately published supplemental

labeling or Fact Sheets for this product and may be obtained from your local retailer or Monsanto representative.

Since the occurrence of new glyphosate-resistant weeds cannot be determined until after product use and scientific confirmation, Monsanto Company is not responsible for any losses that may result from the failure of this product to control glyphosate-resistant weed biotypes.

The following good weed management practices are recommended to reduce the spread of confirmed glyphosate-resistant biotypes:

- If a naturally occurring resistant biotype is present at your site, this product may be tank mixed or applied sequentially with an appropriately labeled herbicide with a different mode of action to achieve control.
- Cultural and mechanical control practices may also be used as appropriate.
- Scout treated sites after herbicide applications and control weed escapes of resistant biotypes before they set seed.
- Thoroughly clean equipment before leaving sites known to contain resistant biotypes.

6.0 MIXING

Clean sprayer parts immediately after using this product by thoroughly flushing with water.

NOTE: REDUCED RESULTS MAY OCCUR IF WATER CONTAINING SOIL IS USED, SUCH AS VISIBLY MUDDY WATER OR WATER FROM PONDS AND DITCHES THAT IS NOT CLEAR.

6.1 Mixing with Water

This product mixes readily with water. Mix spray solutions of this product as follows: Fill the mixing or spray tank with the required amount of water. Add the labeled amount of this product near the end of the filling process and mix well. Use caution to avoid siphoning back into the carrier source. Use approved anti-back-siphoning devices where required by state or local regulations. During mixing and application, foaming of the spray solution may occur. To prevent or minimize foam, avoid the use of mechanical agitators, terminate by-pass and return lines at the bottom of the tank and, if needed, use an approved anti-foam or defoaming agent.

6.2 Tank Mixtures

When this product is tank mixed with other products, refer to the tank-mix product labels for approved non-crop sites and application rates. Read and carefully observe the cautionary statements and all other information appearing on the labels of all herbicides used. Use according to the most restrictive precautionary statements for each product in the mixture. Any labeled rate of this product may be used in a tank mix.

When this label lists a tank mixture with a generic active ingredient such as diuron, 2,4-D, or dicamba, the user is responsible for ensuring the mixture product label allows the specific application.

Buyer and all users are responsible for all loss or damage in connection with the use or handling of mixtures of this product with herbicides or other materials that are not expressly listed in this label. Mixing this product with herbicides or other materials not specified on this label may result in reduced performance.

6.3 Tank Mixing Procedure

When tank mixing, read and carefully observe label directions, cautionary statements and all information on the labels of all products used. Add the tank-mix product to the tank as directed by the label. Maintain agitation and add the labeled amount of this product.

Maintain good agitation at all times until the contents of the tank are sprayed. If the spray mixture is allowed to settle, thorough agitation is required to resuspend the mixture before spraying is resumed.

Keep by-pass line on or near the bottom of the tank to minimize foaming. Screen size in nozzle or line strainers should be no finer than 50-mesh.

Always predetermine the compatibility of labeled tank mixtures of this product with water carrier by mixing small proportional quantities in advance. Ensure that the specific tank mixture product is registered for application at the desired site.

Refer to the "Tank Mixtures" section for additional precautions.

6.4 Mixing Percent Solutions

Prepare the desired volume of spray solution by mixing the amount of this product in water as shown in the following table:

Desired Volume	Amount of AquaMaster herbicide					
	0.5%	0.75%	1%	1.5%	4%	8%
1 gal	2/3 oz	1 oz	1.3 oz	2 oz	5 oz	10 oz
25 gal	1 pt	1.5 pt	1 qt	1.5 qt	4 qt	2 gal
100 gal	2 qt	3 qt	1 gal	1.5 gal	4 gal	8 gal

2 tablespoons = 1 fluid ounce

For use in backpack, knapsack or pump-up sprayers, it is suggested that the amount of this product be mixed with water in a larger container. Fill sprayer with the mixed solution.

6.5 Surfactant

This product requires the use of a nonionic surfactant unless otherwise specified. When using this product, unless otherwise specified, mix 2 or more quarts of a nonionic surfactant per 100 gallons of spray solution. Increasing the rate of surfactant may enhance performance. Examples of when to use the higher surfactant rate include, but are not limited to: hard to control woody brush, trees and vines, high water volumes, adverse environmental conditions, tough to control weeds, weeds under stress, surfactants with less than 70 percent active ingredient, tank mixes, etc. These surfactants should not be used in excess of 1 quart per acre when making broadcast applications. Always read and follow the manufacturer's surfactant label for best results. Carefully observe all cautionary statements and other information appearing in the surfactant label.

6.6 Colorants or Dyes

Approved colorants or marking dyes may be added to this product. Colorants or dyes used in spray solutions of this product may reduce performance, especially at lower rates or dilution. Use colorants or dyes according to the manufacturer's instructions.

6.7 Drift Reduction Additives

Drift reduction additives may be used with all equipment types, except wiper applicators, and sponge bars. When a drift reduction additive is used, read and carefully observe the precautionary statements and all other information appearing on the additive label. The use of drift reduction additives can affect spray coverage which may result in reduced performance.

7.0 APPLICATION EQUIPMENT AND TECHNIQUES

Do not apply this product through any type of irrigation system.

APPLY THESE SPRAY SOLUTIONS IN PROPERLY MAINTAINED AND CALIBRATED EQUIPMENT CAPABLE OF DELIVERING DESIRED VOLUMES.

SPRAY DRIFT MANAGEMENT

AVOID DRIFT. EXTREME CARE MUST BE USED WHEN APPLYING THIS PRODUCT TO PREVENT INJURY TO DESIRABLE PLANTS AND CROPS.

Do not allow the herbicide solution to mist, drip, drift or splash onto desirable vegetation since minute quantities of this product can cause severe damage or destruction to the crop, plants or other areas on which treatment was not intended.

Avoiding spray drift at the application site is the responsibility of the applicator. The interaction of many equipment- and weather-related factors determines the potential for spray drift. The applicator and the grower are responsible for considering all these factors when making decisions.

7.1 Aerial Equipment

DO NOT APPLY THIS PRODUCT USING AERIAL SPRAY EQUIPMENT EXCEPT UNDER CONDITIONS AS SPECIFIED WITHIN THIS LABEL.

FOR AERIAL APPLICATION IN CALIFORNIA, REFER TO THE FEDERAL SUPPLEMENTAL LABELING FOR AERIAL APPLICATIONS IN THAT STATE OR COUNTY FOR SPECIFIC INSTRUCTIONS, RESTRICTIONS AND REQUIREMENTS.

This product, when tank mixed with dicamba, may not be applied by air in California. Only 2,4-D amine formulations may be applied by air in California.

TO PREVENT INJURY TO ADJACENT DESIRABLE VEGETATION, APPROPRIATE BUFFER ZONES MUST BE MAINTAINED.

Avoid direct application to any body of water.

Use the labeled rates of this herbicide in 3 to 25 gallons of water per acre.

Ensure uniform application. To avoid streaked, uneven or overlapped application, use appropriate marking devices.

AERIAL SPRAY DRIFT MANAGEMENT

The following drift management requirements must be followed to avoid off-target drift movement from aerial applications to agricultural field crops. These requirements do not apply to public health uses.

1. The distance of the outermost nozzles on the boom must not exceed 3/4 the length of the wingspan or rotor.
2. Nozzles must always point backward parallel with the air stream and never be pointed downwards more than 45 degrees. Where states have more stringent regulations, they should be observed.

Importance of Droplet Size

The most effective way to reduce drift potential is to apply large droplets. The best drift management strategy is to apply the largest droplets that provide sufficient coverage and control. Applying larger droplets reduces drift potential, but will not prevent drift if applications are made improperly, or under unfavorable environmental conditions (see

the "Wind", "Temperature and Humidity", and "Temperature Inversions" sections of this label).

Controlling Droplet Size

- **Volume:** Use high flow rate nozzles to apply the highest practical spray volume. Nozzles with the higher rated flows produce larger droplets.
- **Pressure:** Use the lower spray pressures recommended for the nozzle. Higher pressure reduces droplet size and does not improve canopy penetration. When higher flow rates are needed, use higher flow rate nozzles instead of increasing pressure.
- **Number of nozzles:** Use the minimum number of nozzles that provide uniform coverage.
- **Nozzle orientation:** Orienting nozzles so that the spray is released backwards, parallel to the air stream, will produce larger droplets than other orientations. Significant deflection from the horizontal will reduce droplet size and increase drift potential.
- **Nozzle type:** Use a nozzle type that is designed for the intended application. With most nozzle types, narrower spray angles produce larger droplets. Consider using low-drift nozzles. Solid stream nozzles oriented straight back produce larger droplets than other nozzle types.
- **Boom length:** For some use patterns, reducing the effective boom length to less than 3/4 of the wingspan or rotor length may further reduce drift without reducing swath width.
- **Application height:** Applications should not be made at a height greater than 10 feet above the top of the largest plants unless a greater height is required for aircraft safety. Making applications at the lowest height that is safe reduces the exposure of the droplets to evaporation and wind.

Swath Adjustment

When applications are made with a crosswind, the swath will be displaced downwind. Therefore, on the up and downwind edges of the field, the applicator must compensate for this displacement by adjusting the path of the aircraft upwind. Swath adjustment distance should increase, with increasing drift potential (higher wind, smaller droplets, etc.).

Wind

Drift potential is lowest between wind speeds of 2 to 10 miles per hour. However, many factors, including droplet size and equipment type determine drift potential at any given speed. Application should be avoided below 2 miles per hour due to variable wind direction and high inversion potential. **NOTE:** Local terrain can influence wind patterns. Every applicator should be familiar with local wind patterns and how they affect drift.

Temperature and Humidity

Set up equipment to produce larger droplets when making applications in low relative humidity to compensate for evaporation. Droplet evaporation is most severe when conditions are both hot and dry.

Temperature Inversions

Applications should not occur during a temperature inversion because drift potential is high. Temperature inversions restrict vertical air mixing, which causes small suspended droplets to remain in a concentrated cloud. This cloud can move in unpredictable directions due to the light variable winds common during inversions. Temperature inversions are characterized by increasing temperatures with altitude and are common on nights with limited cloud cover and light to no wind. They begin to form as the sun sets and often continue into the morning. Their presence can be indicated by ground fog; however, if fog is not present, inversions can also be identified by the movement of smoke from a ground source or an aircraft smoke generator. Smoke that layers and moves laterally in a concentrated cloud (under low wind conditions) indicates an inversion, while smoke that moves upward and rapidly dissipates indicates good vertical air mixing.

Sensitive Areas

This product should only be applied when the potential for drift to adjacent sensitive areas (e.g., residential areas, bodies of water, known habitat for threatened or endangered species, non-target crops) is minimal (e.g., when wind is blowing away from the sensitive areas).

Aircraft Maintenance

PROLONGED EXPOSURE OF THIS PRODUCT TO UNCOATED STEEL SURFACES MAY RESULT IN CORROSION AND POSSIBLE FAILURE OF THE PART. The maintenance of an organic coating (paint) which meets aerospace specification MIL-C-38413 may prevent corrosion. To prevent corrosion of exposed parts, thoroughly wash aircraft after each day of spraying to remove residues of this product accumulated during spraying or from spills. Landing gear is most susceptible.

7.2 Ground Broadcast Equipment

For broadcast ground applications, unless otherwise specified in this label or in separate supplemental labeling or Fact Sheets published by Monsanto, use this product at the rate of 1.5 to 3 pints per acre for annual weeds, 3 to 7.5 pints per acre for perennial weeds and 3 to 7.5 pints per acre for woody brush and trees. When used according to label directions this product will give control or partial control of herbaceous weeds, woody brush and trees listed in the "WEEDS CONTROLLED" section of this label.

Use the labeled rates of this product in 3 to 40 gallons of water per acre as a broadcast spray unless otherwise specified. As density of weeds increases, spray volume should be increased within the labeled range to ensure complete coverage. Carefully select proper nozzles to avoid spraying a fine mist. For best results with ground application equipment, use flat-fan nozzles. Check spray pattern for even distribution of spray droplets.

7.3 Hand-Held Equipment

Apply to foliage of vegetation to be controlled. For applications made on a spray-to-wet basis, spray coverage should be uniform and complete. Do not spray to the point of runoff. Use coarse sprays only.

For control of weeds listed in the "Annual Weeds" section of "WEEDS CONTROLLED", apply a 0.5-percent solution of this product to weeds less than 6 inches in height or runner length. For annual weeds over 6 inches tall, or unless otherwise specified, use a 1-percent solution. Apply prior to seedhead formation in grass or bud formation in broadleaf weeds.

For best results, use a 1.5-percent solution on harder-to-control perennials, woody vines, brush and trees. Make applications to perennials after seedhead emergence in grasses or bud formation in broadleaf weeds, woody brush and trees for best results.

For low-volume directed spray applications, use a 4- to 8-percent solution of this product for control or partial control of annual weeds, perennial weeds, or woody brush and trees. Spray coverage should be uniform with at least 50 to 75 percent of the foliage contacted. Coverage of the top one half of the plant is important for best results. If a straight stream nozzle is used, start the application at the top of the targeted vegetation and spray from top to bottom in a lateral zigzag motion. For flat-fan and cone nozzles and with hand-directed mist blowers, mist the application over the foliage of the targeted vegetation. To ensure adequate spray coverage, spray both sides of large or tall woody brush and trees, when foliage is thick and dense, or where there are multiple sprouts. For best results, apply to actively growing woody brush and trees after full leaf expansion and before fall color and leaf drop.

Unless otherwise specified, use the rates listed in the following "Application Rates" table for various methods of foliar application using high-volume, backpack, knapsack and similar types of hand-held equipment. When used according to label directions this product will give control or partial control of herbaceous weeds, woody brush and trees listed in the "WEEDS CONTROLLED" section of this label.

Application Rates

APPLICATION	AQUAMASTER HERBICIDE	SPRAY VOLUME GALLONS/ACRE
SPRAY-TO-WET		
Handgun or Backpack	0.5 to 1.5% by volume	spray-to-wet*
LOW-VOLUME DIRECTED SPRAY		
Backpack	4 to 8% by volume	15 to 25**
Modified High-Volume	1.5 to 3% by volume	40 to 60**

*For applications made on a spray-to-wet basis, spray coverage should be uniform and complete. Do not spray to the point of runoff.

**Low-volume directed applications with backpacks work best when treating weeds and brush less than 10 feet tall. For taller weeds and brush, high-volume handguns can be modified by reducing nozzle size and spray pressure to produce a low-volume directed spray.

7.4 Selective Equipment

This product may be applied through shielded applicators, hooded sprayers, wiper applicators or sponge bars, after dilution and thorough mixing with water, to listed weeds growing in any aquatic or non-crop site specified on this label.

AVOID CONTACT OF HERBICIDE WITH DESIRABLE VEGETATION, AS SERIOUS INJURY OR DEATH IS LIKELY TO OCCUR.

Applicators used above desired vegetation should be adjusted so that the lowest spray stream or wiper contact point is at least 2 inches above the desirable vegetation. Droplets, mist, foam or splatter of the herbicide solution settling on desirable vegetation is likely to result in discoloration, stunting or destruction.

Better results may be obtained when more of the weed is exposed to the herbicide solution. Weeds not contacted by the herbicide solution will not be affected. This may occur in dense clumps, severe infestations or when the height of the weeds varies so that not all weeds are contacted. In these instances, repeat treatment may be necessary.

Shielded and Hooded Applicators

A shielded or hooded applicator directs the herbicide solution onto weeds, while shielding desirable vegetation from the herbicide. Use nozzles that provide uniform coverage within the treated area. Keep shields on these sprayers adjusted to protect desirable vegetation. **EXTREME CARE MUST BE EXERCISED TO AVOID CONTACT OF HERBICIDE WITH DESIRABLE VEGETATION.**

Wiper Applicators and Sponge Bars

Wiper applicators are devices that physically wipe appropriate amounts of this product directly onto the weed.

Equipment must be designed, maintained and operated to prevent the herbicide solution from contacting desirable vegetation. Operate this equipment at ground speeds no greater than 5 miles per hour. Performance may be improved by reducing speed in areas of heavy weed infestations to ensure adequate wiper saturation. Better results may be obtained if 2 applications are made in opposite directions.

Avoid leakage or dripping onto desirable vegetation. Adjust height of applicator to ensure adequate contact with weeds. Keep wiping surfaces clean. Be aware that, on sloping ground, the herbicide solution may migrate, causing dripping on the lower end and drying of the wicks on the upper end of a wiper applicator.

Do not use wiper equipment when weeds are wet.

Mix only the amount of solution to be used during a 1-day period, as reduced activity may result from the use of leftover solutions. Clean wiper parts immediately after using this product by thoroughly flushing with water.

Nonionic surfactant at a rate of 10 percent by volume of total herbicide solution is recommended with all wiper applications.

For Rope or Sponge Wick Applicators—Solutions ranging from 33 to 75 percent of this product in water may be used.

For Panel Applicators—Solutions ranging from 33 to 100 percent of this product in water may be used in panel wiper applicators.

8.0 SITE AND USE INSTRUCTIONS

Unless otherwise specified, applications may be made to control any weeds listed in the "Annual Weeds", "Perennial Weeds" and "Woody Brush and Trees" rate tables. Refer also to the "Selective Equipment" section.

8.1 Aquatic Sites

This product may be applied to emerged weeds in all bodies of fresh and brackish water which may be flowing, nonflowing or transient. This includes lakes, rivers, streams, ponds, estuaries, rice levees, seeps, irrigation and drainage ditches, canals, reservoirs, wastewater treatment facilities, wildlife habitat restoration and management areas.

This product may also be used to control the labeled weeds, woody brush and trees growing in other terrestrial non-crop sites listed on this label or in aquatic sites within these areas.

If aquatic sites are present in a non-crop area and are part of the intended treatment, read and observe the following directions:

This product does not control plants which are completely submerged or have a majority of their foliage under water.

There is no restriction on the use of treated water for irrigation, recreation or domestic purposes.

Consult local state fish and game agency and water control authorities before applying this product to public water. Permits may be required to treat such water.

NOTE: Do not apply this product **directly to water** within 0.5 mile upstream of an active potable water intake in flowing water (i.e., river, stream, etc.) or within 0.5 mile of an active potable water intake in a standing body of water such as lake, pond or reservoir. To make aquatic applications around and within 0.5 mile of active potable water intakes, the water intake must be turned off for a minimum period of 48 hours after the application. The water intake may be turned on prior to 48 hours if the glyphosate level in the intake water is below 0.7 parts per million as determined by laboratory analysis. These aquatic applications may be made **ONLY** in those cases where there are alternative water sources or holding ponds which would permit the turning off of an active potable water intake for a minimum period of 48 hours after the applications. This restriction does **NOT** apply to intermittent inadvertent overspray of water in terrestrial use sites.

For treatments after drawdown of water or in dry ditches, allow 7 or more days after treatment before reintroduction of water to achieve maximum weed control. Apply this product within 1 day after drawdown to ensure application to actively growing weeds.

Floating mats of vegetation may require retreatment. Avoid wash-off of sprayed foliage by spray boat or recreational boat backwash or by rainfall within 6 hours of application. Do not retreat within 24 hours following the initial treatment.

Applications made to moving bodies of water must be made while traveling upstream to prevent concentration of this herbicide in water. When making any bankside applications, do not overlap more than 1 foot into open water. Do not spray in bodies of water where weeds do not exist. The maximum application rate of 7.5 pints per acre must not be exceeded in any single broadcast application that is being made over water except as follows, where any labeled rate may be applied:

- Stream crossings in utility rights-of-way.
- Where applications will result in less than 20 percent of the total water area being treated.

When emerged infestations require treatment of the total surface area of impounded water, treating the area in strips may avoid oxygen depletion due to decaying vegetation. Oxygen depletion may result in fish kill.

Tank Mixtures

Tank mixtures of this product plus 2,4-D amine may be used to increase the spectrum of vegetation controlled in aquatic sites. Use 1.5 to 2 pints of this product plus 1 to 2 quarts of 2,4-D amine (4 pounds active ingredient per gallon, labeled for aquatic sites) for control of annual weeds. Use 3 to 7.5 pints of this product plus 2 to 4 quarts of 2,4-D amine (4 pounds active ingredient per gallon, labeled for aquatic sites) for control or partial control of perennial weeds, woody brush and trees.

When tank mixing, read and carefully observe the label claims, cautionary statements and all information on the labels of all products used. Use according to the most restrictive precautionary statements for each product in the mixture. Mix in the following sequence: Fill sprayer tank one-half full with water, add AquaMaster herbicide, then 2,4-D amine and finally surfactant. Fill sprayer tank to final volume of water.

NOTE: DO NOT MIX AQUAMASTER HERBICIDE AND 2,4-D AMINE CONCENTRATES WITHOUT WATER CARRIER. DO NOT MIX AQUAMASTER HERBICIDE AND 2,4-D AMINE IN BYPASS INJECTOR-TYPE SPRAY EQUIPMENT.

For Control of Cordgrass (*Spartina* spp.)

The presence of debris and silt on the surface of cordgrass plants will reduce product performance. It may be necessary to wash targeted plants prior to application to improve herbicide uptake. Where cordgrass has been cut or mowed prior to application, allow significant regrowth before application to ensure adequate interception and uptake of the herbicide solution. Rainfall within 2 hours or immersion within 4 hours after application may reduce effectiveness.

Prior to application, survey the areas to be treated to determine if shellfish beds exist within the intended treatment area. Wait either until shellfish have been harvested before application is made or do not harvest shellfish for 14 days following treatment.

Add 1 to 2 quarts or more of nonionic surfactant or other adjuvant approved for use on aquatic sites and compatible with this product per 100 gallons of spray solution for broadcast applications (ground or air) and when using optical sensing application equipment.

Do not apply this product through any type of irrigation system.

APPLICATION: Under ideal application conditions, that is, where silt and debris are not present on plant surfaces, good spray coverage is achievable, target plants are actively growing and labeled rates and application volumes are used, allow at least 4 hours drying time before plants are covered by tidewater. Where one or more of these conditions are not met, schedule applications to allow at least 5 hours drying time before plants are covered by tidewater. Do not apply when wind speed at the application site exceed 10 miles per hour.

Broadcast Application (Ground): Apply 2 to 8 quarts of this herbicide in 5 to 100 gallons of spray solution per acre. For best results, complete coverage of cordgrass clumps is required.

Broadcast Application (Ground/Optical Sensing Application Equipment): Apply 2 to 8 quarts of this product in 5 to 100 gallons of spray solution per acre using equipment designed and calibrated to deliver spray solution only when cordgrass plants are present and detected by optical sensors. For best results, complete coverage of cordgrass clumps is required.

Hand-Held Backpack or High-Volume Equipment: Apply a 5 to 8 percent solution of this product. Ensure that complete coverage of cordgrass clumps is achieved. Do not spray to the point of runoff.

Broadcast Application (Air): Apply 2 to 8 quarts of this product in 5 to 10 gallons of spray solution per acre. Maintain at least a 50-foot buffer between commercial shellfish beds and treated areas. The potential for spray drift is dependent upon weather- and equipment-related factors. The applicator must be familiar with local wind patterns and monitor and record temperature and wind speed prior to and periodically during application. Schedule application in order to allow at least 5 hours before treated plants are covered by tidewater.

For Control of Giant Salvinia

For control of Giant Salvinia, this product may be applied as a 2.0% v/v spray-to-wet solution with 0.5 to 2.0% v/v of a nonionic surfactant containing at least 70 percent active ingredient. Ensure thorough coverage when using spray-to-wet treatments using hand-held equipment.

For broadcast applications, apply 3 to 3.75 quarts of this product with an aquatic approved surfactant system containing 0.1% v/v nonionic organosilicone and 0.25% v/v nonionic spreader sticker surfactant in 3 to 40 gallons per acre as a broadcast treatment.

Allow at least 3 days after application before disturbing treated vegetation. This product does not control plants which are completely submerged or have a majority of their foliage under water.

8.2 Hollow Stem Injection

This product may be applied through hand-held injection devices that deliver labeled amounts of this product into targeted hollow stem plants growing in any aquatic or non-crop site specified on this label. For control of the following hollow stem plants, follow the use instructions below:

Castorbean (*Ricinus communis*)

Inject 4 mL/plant of this product into the lower portion of the main stem.

Hemlock, Poison (*Conium maculatum*)

Inject one leaf cane per plant 10 to 12 inches above root crown with 5 mL of a 5% v/v solution of this product.

Hogweed, Giant (*Heracleum mantegazzianum*)

Inject one leaf cane per plant 12 inches above root crown with 5 mL of a 5% v/v solution of this product.

Horsetail, Field (*Equisetum arvense*)

Inject one segment above the root crown with 0.5 mL/stem of this product. Use a small syringe that calibrates to this rate.

Iris, Yellow Flag (*Iris pseudocorus*)

Cut flower stems with clippers 8 to 9 inches above the root crown. Use a cavity needle that is pushed into the stem center and then slowly removed as 0.5 mL/stem of this product is injected into the stem.

Knotweed, Bohemian (*Polygonum bohemicum*),

Knotweed, Giant (*Polygonum sachalinense*), and

Knotweed, Japanese (*Polygonum cuspidatum*)

Inject 5 mL/stem of this product between second and third internode.

Reed, Giant (*Arundo donax*)

Inject 6 mL/stem of this product between second and third internode.

Thisle, Canada (*Cirsium arvense*)

Cut 8 to 9 of the tallest plants at bud stage in a clump with clippers. Use a cavity needle that is pushed into the stem center and then slowly removed as 0.5 mL/stem of this product is injected into the stem.

NOTE: Based on the maximum annual use rate of glyphosate for these non-crop sites, the combined total for all treatments must not exceed 8 quarts of this product per acre. At 5 mL per stem, 8 quarts should treat approximately 1500 stems.

8.3 Cut Stump

Cut stump treatments may be made on any site listed on this label. This product will control many types of woody brush and tree species. Apply this product using suitable equipment to ensure coverage of the entire cambium. Cut trees or resprouts close to the soil surface. Apply a 50- to 100-percent solution of this product to the freshly-cut surface **immediately after cutting**. Delays in application may result in reduced performance. For best results, applications should be made during periods of active growth and full leaf expansion.

For control of *Ailanthus altissima* (Tree-of-heaven) make a cut stump treatment according to the directions in this section using a spray mixture of 50 percent AquaMaster herbicide and 10 percent Arsenal.

DO NOT MAKE CUT STUMP APPLICATIONS WHEN THE ROOTS OF DESIRABLE WOODY BRUSH OR TREES MAY BE GRAFTED TO THE ROOTS OF THE CUT STUMP. Some sprouts, stems, or trees may share the same root system. Adjacent trees having a similar age, height and spacing may signal shared roots. Whether grafted or shared, injury is likely to occur to non-treated stems/trees when one or more trees sharing common roots are treated.

8.4 General Non-crop Areas and Industrial Sites

Use in areas such as airports, apartment complexes, commercial sites, ditch banks, driveways, dry ditches, dry canals, fencerows, forestry sites, golf courses, greenhouses, industrial sites, lumber yards, manufacturing sites, municipal sites, natural areas, office complexes, ornamentals, parks, parking areas, pastures, petroleum tank farms and pumping installations, railroads, rangeland, recreational areas, residential areas, rights-of-way, roadsides, schools, sod or turf seed farms, sports complexes, storage areas, substations, utility sites, warehouse areas, and wildlife management areas.

General Weed Control, Trim-and-Edge and Bare Ground

This product may be used in general non-crop areas. It may be applied with any application equipment described in this label. This product may be used to trim-and-edge around objects in non-crop sites, for spot treatment of unwanted vegetation and to eliminate unwanted weeds growing in established shrub beds or ornamental plantings. This product may be used prior to planting an area to ornamentals, flowers, turfgrass (sod or seed), or prior to laying asphalt or beginning construction projects.

Repeated applications of this product may be used, as weeds emerge, to maintain bare ground.

TANK MIXTURES: This product may be tank mixed with the following products. Refer to these product labels for approved non-crop sites and application rates. Read and carefully observe the cautionary statements and all other information appearing on the labels of all herbicides used. Use according to the most restrictive precautionary statements for each product in the mixture.

Arsenal	Outrider®
Barricade 65WG	Pendulum 3.3 EC
Certainty®	Pendulum WDG
diuron*	Plateau
Endurance	Princep DF
Escort XP	Princep Liquid
Garlon 3A	Ronstar 50 WP
Garlon 4	Sahara
Hyvar X	simazine*
Karmex	Surflan
Krovar I DF	Telar
Oust XP	2,4-D*

*User is responsible for ensuring that tank mixtures with products containing this generic active ingredient may be made provided the specific product is registered for this use.

This product plus dicamba tank mixtures may not be applied by air in California.

Brush Control Tank Mixtures

TANK MIXTURES: Tank mixtures of this product may be used to increase the spectrum of control for herbaceous weeds, woody brush and trees. When tank mixing, read and carefully observe the label claims, cautionary statements and all information on the labels of all products used. Use according to the most restrictive precautionary statements for each product in the mixture. Any labeled rate of this product may be used in a tank mix.

For control of herbaceous weeds, use the lower tank mixture rates. For control of dense stands or tough-to-control woody brush and trees, use the higher rates.

NOTE: For side trimming treatments, this product may be used alone or in tank mixture with Garlon 4.

PRODUCT

Arsenal
Escort XP
Garlon 3A*
Garlon 4

*Ensure that Garlon 3A is thoroughly mixed with water according to label directions before adding this product. Have spray mixture agitating at the time this product is added to avoid spray compatibility problems.

8.5 Habitat Management

Habitat Restoration and Management

This product may be used to control exotic and other undesirable vegetation in habitat management and natural areas, including riparian and estuarine areas, rangeland and wildlife refuges. Applications can be made to allow recovery of native plant species, prior to planting desirable native species, and for similar broad-spectrum vegetation control requirements. Spot treatments can be made to selectively remove unwanted plants for habitat management and enhancement.

Wildlife Food Plots

This product may be used as a site preparation treatment prior to planting wildlife food plots. Any wildlife food species may be planted after applying this product, or native species may be allowed to repopulate the area. If tillage is needed to prepare a seedbed, wait 7 days after application before tillage to allow translocation into underground plant parts.

8.6 Injection and Frill (Woody Brush and Trees)

This product may be used to control woody brush and trees by injection or frill applications. Apply this product using suitable equipment that must penetrate into the living tissue. Apply 1 mL of this product per each 2 to 3 inches of trunk diameter at breast height (DBH). This is best achieved by applying a 50- to 100-percent concentration of this product either to a continuous frill around the tree or as cuts evenly spaced around the tree below all branches. As tree diameter increases in size, better results are achieved by applying diluted material to a continuous frill or more closely spaced cuttings. Avoid application techniques that allow runoff to occur from frilled or cut areas in species that exude sap freely. In species such as this, make the frill or cuts at an oblique angle to produce a cupping effect and use a 100-percent concentration of this product. For best results, application should be made during periods of active growth and after full leaf expansion.

8.7 Roadsides

All of the instructions in the "General Non-Crop Areas and Industrial Sites" section apply to roadsides.

Shoulder Treatments

This product may be used on road shoulders. It may be applied with boom sprayers, shielded boom sprayers, high-volume off-center nozzles, hand-held equipment, and similar equipment.

Guardrails and Other Obstacles to Mowing

This product may be used to control weeds growing under guardrails and around signposts and other objects along the roadside.

Spot Treatment

This product may be used as a spot treatment to control unwanted vegetation growing along roadsides.

TANK MIXTURES: This product may be tank mixed with the following products for shoulder, guardrail, spot and bare ground treatments, provided that the specific tank mixture product is registered for use on such sites. Refer to these product labels for approved non-crop sites and application rates. Read and carefully observe the cautionary statements and all other information appearing on the labels of all herbicides used. Use according to the most restrictive precautionary statements for each product in the mixture.

atrazine*	Landmark MP	Sahara DG
Crossbow L	Landmark XP	simazine*
dicamba*	Oust XP	Surflan AS
diuron*	Outrider	Surflan WDG
Endurance	pendimethalin*	Telar DF
Escort XP	Plateau	Velpar DF
Gallery 75 DF	Plateau DG	Velpar L
Krovar I DF	Poast	2,4-D*
Landmark II MP	Ronstar 50 WSP	

*User is responsible for ensuring that tank mixtures with products containing this generic active ingredient may be made provided the specific product is registered for this use.

See the "MIXING" section of this label for general instructions for tank mixing.

Release of Bermudagrass or Bahiagrass

Dormant Applications

This product may be used to control or partially control many winter annual weeds and tall fescue for effective release of dormant bermudagrass or bahiagrass. Treat only when turf is dormant and prior to spring greenup. This product may also be tank mixed with Outrider herbicide or Oust XP for residual control. Tank mixtures of this product with Oust XP may delay greenup.

For best results on winter annuals, treat when plants are in an early growth stage (below 6 inches in height) after most have germinated. For best results on tall fescue, treat when fescue is at or beyond the 4- to 6-leaf stage.

Apply 6 to 48 ounces of this product in a tank mixture with 0.75 to 1.33 ounces Outrider herbicide per acre. Read and follow all label directions for Outrider herbicide.

TANK MIXTURES: Apply 6 to 48 fluid ounces of this product per acre alone or in a tank mixture with 0.25 to 1 ounce per acre of Oust XP. Apply the labeled rates in 10 to 40 gallons of water per acre. Use only in areas where bermudagrass or bahiagrass are desirable ground covers and where some temporary injury or discoloration can be tolerated. To avoid delays in greenup and minimize injury, add no more than 1 ounce of Oust XP per acre on bermudagrass and no more than 0.5 ounce of Oust XP per acre on bahiagrass and avoid treatments when these grasses are in a semi-dormant condition.

Actively Growing Bermudagrass

This product may be used to control or partially control many annual and perennial weeds for effective release of actively growing bermudagrass. Apply 12 to 36 fluid ounces of this product in 10 to 40 gallons of spray solution per acre. Use the lower rate when treating annual weeds below 6 inches in height (or runner length). Use the higher rate as weeds increase in size or as they approach flower or seedhead formation. These rates will also provide partial control of the following perennial species:

Bahiagrass	Johnsongrass
Bluestem, silver	Trumpetcreeper
Fescue, tall	Vaseygrass

This product may be tank mixed with Outrider herbicide for control or partial control of Johnsongrass and other weeds listed in the Outrider herbicide label. Use 6 to 24 ounces of this product with 0.75 to 1.33 ounces of Outrider herbicide. Use the higher rates of both products for control of perennial weeds or annual weeds greater than 6 inches in height.

TANK MIXTURES: This product may be tank mixed with Oust XP. If tank mixed, use no more than 12 to 24 fluid ounces of this product with 1 to 2 ounces of Oust XP per acre. Use the lower rates of each product to control annual weeds less than 6 inches in height (or runner length) that are listed in this label and the Oust XP label. Use the higher rates as annual weeds increase in size and approach the flower or seedhead stages. These rates will also provide partial control of the following perennial weeds:

Bahiagrass	Fescue, tall
Bluestem, silver	Johnsongrass
Broomsedge	Poorjoe
Dallisgrass	Trumpetcreeper
Dock, curly	Vaseygrass
Dogfennel	Vervain, blue

Use only on well-established bermudagrass. Bermudagrass injury may result from the treatment, but regrowth will occur under moist conditions. Repeat applications of the tank mix in the same season are not recommended, since severe injury may occur.

Actively Growing Bahiagrass

For suppression of vegetative growth and seedhead inhibition of bahiagrass for approximately 45 days, apply 4 fluid ounces of this product in 10 to 40 gallons of water per acre. Apply 1 to 2 weeks after full greenup or after mowing to a uniform height of 3 to 4 inches. This application must be made prior to seedhead emergence.

For suppression up to 120 days, apply 3 fluid ounces of this product per acre, followed by an application of 2 to 3 fluid ounces per acre about 45 days later. Make no more than 2 applications per year.

This product may be used for control or partial control of Johnsongrass and other weeds listed on the Outrider herbicide label in actively growing bahiagrass. Apply 1.5 to 3.5 fluid ounces of this product with 0.75 to 1.33 ounces of Outrider herbicide per acre. Use the higher rates for control of perennial weeds or annual weeds greater than 6 inches in height. Use only on well established bahiagrass.

TANK MIXTURES: A tank mixture of this product plus Oust XP may be used. Apply 4 fluid ounces of this product plus 0.25 ounce of Oust XP per acre 1 to 2 weeks following an initial spring mowing. Make only one application per year.

9.0 WEEDS CONTROLLED

Always use the higher rate of this product per acre within the labeled range when weed growth is heavy or dense or weeds are growing in an undisturbed (non-cultivated) area.

Reduced results may occur when treating weeds heavily covered with dust. For weeds that have been mowed, grazed or cut, allow regrowth to occur prior to treatment.

Refer to the following label sections for application rates for the control of annual and perennial weeds and woody brush and trees. For difficult to control perennial weeds and woody brush and trees, where plants are growing under stressed conditions, or where infestations are dense, this product may be used at 4.5 to 8 quarts per acre for enhanced results.

9.1 Annual Weeds

Apply to actively growing annual grasses and broadleaf weeds.

Allow at least 3 days after application before disturbing treated vegetation. After this period the weeds may be mowed, tilled or burned. See the "GENERAL INFORMATION" and "MIXING" and "APPLICATION EQUIPMENT AND TECHNIQUES" sections for labeled uses and specific application instructions.

Use 1.5 pints per acre if weeds are less than 6 inches in height or runner length and 1 to 4 quarts per acre if weeds are over 6 inches in height or runner length or when weeds are growing under stressed conditions.

For spray-to-wet applications, apply a 0.5-percent solution of this product to weeds less than 6 inches in height or runner length. Apply prior to seedhead formation in grass or bud formation in broadleaf weeds. For annual weeds over 6 inches tall, or for smaller weeds growing under stressed conditions, use a 0.75- to 1.5-percent solution. Use the higher rate for tough-to-control species or for weeds over 24 inches tall.

WEED SPECIES

Anoda, spurred	Lamb's-quarters*
Balsamapple**	Lettuce, prickly*
Barley*	Mannagrass, eastern*
Barley, little*	Mayweed
Barnyardgrass*	Medusahead*
Bassia, fivehook	Morningglory (<i>Ipomoea spp</i>)
Bittercress*	Mustard, blue*
Bluegrass, annual*	Mustard, tansy*
Bluegrass, bulbous*	Mustard, tumble*
Brome, downy*	Mustard, wild*
Brome, Japanese*	Nightshade, black*
Broomsedge	Oats
Buttercup*	Panicum, browntop*
Castorbean	Panicum, fall*
Cheatgrass*	Panicum, Texas*
Cheeseweed	Pennycress, field*
(<i>Malva parviflora</i>)	Pepperweed, Virginia*
Chervil*	Pigweed*
Chickweed*	Puncturevine
Cocklebur*	Purslane, common
Copperleaf, hophornbeam	Pusley, Florida
Copperleaf, Virginia	Ragweed, common*
Coreopsis, plains/tickseed*	Ragweed, giant
Corn*	Rice, red
Crabgrass*	Rocket, London*
Cupgrass, woolly*	Rocket, yellow
Dwarfdandelion*	Rye*
Eclipta*	Ryegrass*
Falsedandelion*	Sandbur, field*
Falseflax, smallseed*	Sesbania, hemp
Fiddleneck	Shattercane*
Filaree	Shepherd's-purse*
Fleabane, annual*	Sicklepod
Fleabane, hairy	Signalgrass, broadleaf*
(<i>Conyza bonariensis</i>)*	Smartweed, ladythumb*
Fleabane, rough*	Smartweed, Pennsylvania*
Foxtail*	Sorghum, grain (milo)*
Foxtail, Carolina*	Sowthistle, annual
Geranium, Carolina	Spanishneedles***
Goatgrass, jointed*	Speedwell, corn*
Goosegrass	Speedwell, purslane*
Groundsel, common*	Sprangletop*
Henbit	Spurge, annual
Horseweed/Marestail	Spurge, prostrate*
(<i>Conyza canadensis</i>)	Spurge, spotted*
itchgrass*	Spurry, umbrella*
Johnsongrass, seedling	Starthistle, yellow
Junglerice	Stinkgrass*
Knotweed	Sunflower*
Kochia	Teaweed/prickly sida

Thistle, Russian	Wild oats*
Velvetleaf	Witchgrass
Wheat*	

*When using field broadcast equipment (aerial applications or boom sprayers using flat-fan nozzles) these species will be controlled or partially controlled using 12 fluid ounces of this product per acre. Applications must be made using 3 to 10 gallons of carrier volume per acre. Use nozzles that ensure thorough coverage of foliage and treat when weeds are in an early growth stage.

**Apply with hand-held equipment only.

***Apply 3 pints of this product per acre.

9.2 Perennial Weeds

Best results are obtained when perennial weeds are treated after they reach the reproductive stage of growth (seedhead initiation in grasses and bud formation in broadleaves). For non-flowering plants, best results are obtained when the plants reach a mature stage of growth. In many situations, treatments are required prior to these growth stages. Under these conditions, use the higher application rate within the labeled range.

Ensure thorough coverage when using spray-to-wet treatments using hand-held equipment. When using hand-held equipment for low-volume directed spot treatments, apply a 4- to 8-percent solution of this product.

Allow 7 or more days after application before tillage. If weeds have been mowed or tilled, do not treat until regrowth has reached the specified stages. Fall treatments must be applied before a killing frost.

Repeat treatments may be necessary to control weeds regenerating from underground parts or seed.

WEED SPECIES	RATE (QT/A)	HAND-HELD % SOLUTION
Alfalfa*	0.7	1.5
Alligatorweed*	3.0	1.3
Anise (fennel)	1.5 - 3.0	1.0 - 1.5
Bahiagrass	2.3 - 3.75	1.5
Beachgrass, European		
(<i>Ammophila arenaria</i>)	-	3.5
Bentgrass*	1.0	1.5
Bermudagrass	4.0	1.5
Bermudagrass, water		
(knotgrass)	1.0	1.5
Bindweed, field	3.0 - 3.75	1.5
Bluegrass, Kentucky	1.5 - 2.3	0.75
Blueweed, Texas	3.0 - 3.75	1.5
Brackenfern	2.3 - 3.0	0.75 - 1.0
Bromegrass, smooth	1.5 - 2.3	0.75
Bursage, woolly-leaf	-	1.5
Canarygrass, reed	1.5 - 2.3	0.75
Cattail	2.3 - 3.75	0.75
Clover, red, white	2.3 - 3.75	1.5
Cogongrass	2.3 - 3.75	1.5
Cordgrass	2.3 - 3.75	1.0-2.0
Cutgrass, giant	3.0	1.0
Dallisgrass	2.3 - 3.75	1.5
Dandelion	2.3 - 3.75	1.5
Dock, curly	2.3 - 3.75	1.5
Dogbane, hemp	3.0	1.5
Fescue (except tall)	2.3 - 3.75	1.5
Fescue, tall	2.3	1.0
Guineagrass	2.3	0.75
Hemlock, poison	1.5 - 3.0	0.75 - 1.5
Horsenettle	2.3 - 3.75	1.5
Horseradish	3.0	1.5
Iceland	1.5	1.5
Ivy, German, cape	1.5 - 3.0	0.75 - 1.5
Jerusalem artichoke	2.3 - 3.75	1.5
Johnsongrass	1.5 - 2.3	0.75
Kikuyugrass	1.5 - 2.3	0.75
Knapweed	3.0	1.5
Lantana	-	0.75 - 1.0
Lespedeza	2.3 - 3.75	1.5
Loosestrife, purple	2.0	1.0 - 1.5
Lotus, American	2.0	0.75
Maidencane	3.0	0.75
Milkweed, common	2.3	1.5
Muhly, wirestem	1.5 - 2.3	0.75
Mullein, common	2.3 - 3.75	1.5
Napiergrass	2.3 - 3.75	1.5
Nightshade, silverleaf	3.0 - 3.75	1.5
Nutsedge, purple, yellow	2.3	0.75
Orchardgrass	1.5 - 2.3	0.75
Pampasgrass	2.3 - 3.75	1.5

WEED SPECIES	RATE (QT/A)	HAND-HELD % SOLUTION
Paragrass	3.0	0.75
Pepperweed, perennial	3.0	1.5
Phragmites*	2.0 – 3.75	0.75 – 1.5
Quackgrass	1.5 – 2.3	0.75
Redvine*	1.5	1.5
Reed, giant (<i>Arundo donax</i>)	3.0 – 3.75	1.5
Ryegrass, perennial	1.5 – 2.3	0.75
Salvinia, giant	3.0 – 3.75	2.0
Smartweed, swamp	2.3 – 3.75	1.5
Spatterdock	3.0	0.75
Spurge, leafy*	–	1.5
Starthistle, yellow	–	1.5
Sweet potato, wild*	–	1.5
Thistle, artichoke	1.5 – 2.3	2.0
Thistle, Canada	1.5 – 2.3	1.5
Timothy	1.5 – 2.3	1.5
Torpedograss*	3.0 – 3.75	0.75 – 1.5
Trumpet creeper*	1.5 – 2.3	1.5
Tules, common	–	1.5
Vaseygrass	2.3 – 3.75	1.5
Velvetgrass	2.3 – 3.75	1.5
Waterhyacinth	2.5 – 3.0	0.75 – 1.0
Waterlettuce	–	0.75 – 1.0
Waterprimrose	–	0.75
Wheatgrass, western	1.5 – 2.3	0.75

*Partial control

Alligatorweed—Apply 3 quarts of this product per acre as a broadcast spray or as a 1.3-percent solution with hand-held equipment to provide partial control of alligatorweed. Apply when most of the target plants are in bloom. Repeat applications will be required to maintain such control.

Beachgrass, European—Apply an 8-percent solution of this products plus 0.5- to 1.5-percent nonionic surfactant on a low-volume spray-to-wet basis. Best results are obtained when applications are made when European beachgrass is actively growing through the boot to the full heading stages of growth. Make applications prior to the loss of more than 50 percent green leaf color in the fall. Do not treat when weeds are under drought stress. Repeat applications may be necessary.

Bermudagrass—Apply 4 quarts of this product per acre as a broadcast spray or as a 1.5-percent solution with hand-held equipment. Apply when target plants are actively growing and when seed heads appear.

Bindweed, field / Silverleaf Nightshade / Texas Blueweed—Apply 3 to 3.75 quarts of this product per acre east of the Mississippi River and 2.3 to 3 quarts of this product per acre west of the Mississippi River. With hand-held equipment, use a 1.5-percent solution. Apply when target plants are actively growing and are at or beyond full bloom. For silverleaf nightshade, best results can be obtained when application is made after berries are formed. Do not treat when weeds are under drought stress. New leaf development indicates active growth. For best results apply in late summer or fall.

Brackenfern—Apply 2.3 to 3 quarts of this product per acre as a broadcast spray or as a 0.75- to 1-percent solution with hand-held equipment. Apply to fully expanded fronds which are at least 18 inches long.

Cattail—Apply 2.3 to 3 quarts of this product per acre as a broadcast spray or as a 0.75-percent solution with hand-held equipment. Apply when target plants are actively growing and are at or beyond the early-to-full bloom stage of growth. Best results are achieved when application is made during the summer or fall months.

Cogongrass—Apply 2.3 to 3.75 quarts of this product per acre as a broadcast spray. Apply when cogongrass is at least 18 inches tall and actively growing in late summer or fall. Allow 7 or more days after application before tillage or mowing. Due to uneven stages of growth and the dense nature of vegetation preventing good spray coverage, repeat treatments may be necessary to maintain control.

Cordgrass—Apply 2.3 to 3.75 quarts of this product per acre as a broadcast spray or as a 1- to 2-percent solution with hand-held equipment. Schedule applications in order to allow 6 hours before treated plants are covered by tidewater. The presence of debris and silt on the cordgrass plants will reduce performance. It may be necessary to wash targeted plants prior to application to improve uptake of this product into the plant.

Cutgrass, giant—Apply 3 quarts of this product per acre as a broadcast spray or as a 1-percent solution with hand-held equipment to provide partial control of giant cutgrass. Repeat applications will be required to maintain such control, especially where vegetation is partially submerged in water. Allow for substantial regrowth to the 7- to 10-leaf stage prior to retreatment.

Dogbane, hemp / Knapweed / Horseradish—Apply 3 quarts of this product per acre as a broadcast spray or as a 1.5-percent solution with hand-held equipment. Apply when target plants are actively growing and most have reached the late bud-to-flower stage of growth. For best results, apply in late summer or fall.

Fescue, tall—Apply 2.3 quarts of this product per acre as a broadcast spray or as a 1-percent solution with hand-held equipment. Apply when target plants are actively growing and most have reached the boot-to-head stage of growth. When applied prior to the boot stage, less desirable control may be obtained.

Guineagrass—Apply 2.3 quarts of this product per acre as a broadcast spray or as a 0.75-percent solution with hand-held equipment. Apply when target plants are actively growing and when most have reached at least the 7-leaf stage of growth.

Johnsongrass / Bluegrass, Kentucky / Bromegrass, smooth / Canarygrass, reed / Orchardgrass / Ryegrass, perennial / Timothy / Wheatgrass, western—Apply 1.5 to 2.3 quarts of this product per acre as a broadcast spray or as a 0.75-percent solution with hand-held equipment. Apply when target plants are actively growing and most have reached the boot-to-head stage of growth. When applied prior to the boot stage, less desirable control may be obtained. In the fall, apply before plants have turned brown.

Lantana—Apply this product as a 0.75- to 1-percent solution with hand-held equipment. Apply to actively growing lantana at or beyond the bloom stage of growth. Use the higher application rate for plants that have reached the woody stage of growth.

Loosestrife, purple—Apply 2 quarts of this product per acre as a broadcast spray or as a 1- to 1.5-percent solution using hand-held equipment. Treat when plants are actively growing at or beyond the bloom stage of growth. Best results are achieved when application is made during summer or fall months. Fall treatments must be applied before a killing frost.

Lotus, American—Apply 2 quarts of this product per acre as a broadcast spray or as a 0.75-percent solution with hand-held equipment. Treat when plants are actively growing at or beyond the bloom stage of growth. Best results are achieved when application is made during summer or fall months. Fall treatments must be applied before a killing frost. Repeat treatment may be necessary to control regrowth from underground parts and seeds.

Maidencane / Paragrass—Apply 3 quarts of this product per acre as a broadcast spray or as a 0.75-percent solution with hand-held equipment. Repeat treatments will be required, especially to vegetation partially submerged in water. Under these conditions, allow for regrowth to the 7- to 10-leaf stage prior to retreatment.

Milkweed, common—Apply 2.3 quarts of this product per acre as a broadcast spray or as a 1.5-percent solution with hand-held equipment. Apply when target plants are actively growing and most have reached the late bud-to-flower stage of growth.

Nutsedge, purple, yellow—Apply 2.3 quarts of this product per acre as a broadcast spray, or as a 0.75-percent solution with hand-held equipment to control existing nutsedge plants and immature nutlets attached to treated plants. Apply when target plants are in flower or when new nutlets can be found at rhizome tips. Nutlets which have not germinated will not be controlled and may germinate following treatment. Repeat treatments will be required for long-term control.

Pampasgrass—Apply a 1.5-percent solution of this product with hand-held equipment when plants are actively growing.

Phragmites—For partial control of phragmites in Florida and the counties of other states bordering the Gulf of Mexico, apply 3.75 quarts per acre as a broadcast spray or apply a 1.5-percent solution with hand-held equipment. In other areas of the U.S., apply 2 to 3 quarts per acre as a broadcast spray or apply a 0.75-percent solution with hand-held equipment for partial control. For best results, treat during late summer or fall months when plants are actively growing and in full bloom. Due to the dense nature of the vegetation, which may prevent good spray coverage and uneven stages of growth, repeat treatments may be necessary to maintain control. Visual control symptoms will be slow to develop.

Quackgrass / Kikuyugrass / Muhly, wirestem—Apply 1.5 to 2.3 quarts of this product per acre as a broadcast spray or as a 0.75-percent solution with hand-held equipment when most quackgrass or wirestem muhly is at least 8 inches in height (3- to 4-leaf stage of growth) and actively growing. Allow 3 or more days after application before tillage.

Reed, giant / Ice Plant—For control of giant reed and ice plant, apply a 1.5-percent solution of this product with hand-held equipment when plants are actively growing. For giant reed, best results are obtained when applications are made in late summer to fall.

Salvinia, giant—Apply as a 2.0% v/v spray-to-wet solution with 0.5 to 2.0% v/v of a nonionic surfactant containing at least 70% active ingredient. For broadcast applications, apply 3 to 3.75 quarts of this product with an aquatic approved surfactant system containing 0.1% v/v nonionic organosilicone and 0.25% v/v nonionic spreader sticker surfactant in 3 to 40 gallons per acre as a broadcast treatment.

Spatterdock—Apply 3 quarts of this product per acre as a broadcast spray or as a 0.75-percent solution with hand-held equipment. Apply when most plants are in full bloom. For best results, apply during the summer or fall months.

Sweet potato, wild—Apply this product as a 1.5-percent solution using hand-held equipment. Apply to actively growing weeds that are at or beyond the bloom stage of growth. Repeat applications will be required. Allow the plant to reach the specified stage of growth before retreatment.

Thistle, Canada, artichoke—Apply 1.5 to 2.3 quarts of this product per acre as a broadcast spray or as a 1.5-percent solution with hand-held equipment for Canada thistle. To control artichoke thistle, apply a 2-percent solution as a spray-to-wet application. Apply when target plants are actively growing and are at or beyond the bud stage of growth.

Torpedograss—Apply 3 to 3.75 quarts of this product per acre as a broadcast spray or as a 0.75- to 1.5-percent solution with hand-held equipment to provide partial control of torpedograss. Use the lower rates under terrestrial conditions, and the higher rates under partially submerged or a floating mat condition. Repeat treatments will be required to maintain such control.

Tules, common—Apply this product as a 1.5-percent solution with hand-held equipment. Apply to actively growing plants at or beyond the seedhead stage of growth.

After application, visual symptoms will be slow to appear and may not occur for 3 or more weeks.

Waterhyacinth—Apply 2.5 to 3 quarts of this product per acre as a broadcast spray or apply a 0.75- to 1-percent solution with hand-held equipment. Apply when target plants are actively growing and at or beyond the early bloom stage of growth. After application, visual symptoms may require 3 or more weeks to appear with complete necrosis and decomposition usually occurring within 60 to 90 days. Use the higher rates when more rapid visual effects are desired.

Waterlettuce—For control, apply a 0.75- to 1-percent solution of this product with hand-held equipment to actively growing plants. Use higher rates where infestations are heavy. Best results are obtained from mid-summer through winter applications. Spring applications may require retreatment.

Waterprimrose—Apply this product as a 0.75-percent solution using hand-held equipment. Apply to plants that are actively growing at or beyond the bloom stage of growth, but before fall color changes occur. Thorough coverage is necessary for best control.

Other perennials listed on this label—Apply 2.3 to 3.75 quarts of this product per acre as a broadcast spray or as a 0.75- to 1.5-percent solution with hand-held equipment. Apply when target plants are actively growing and most have reached early head or early bud stage of growth.

9.3 Woody Brush and Trees

Apply this product after full leaf expansion, unless otherwise directed. Use the higher rate for larger plants and/or dense areas of growth. On vines, use the higher rate for plants that have reached the woody stage of growth. Best results are obtained when application is made in late summer or fall after fruit formation.

In arid areas, best results are obtained when applications are made in the spring to early summer when brush species are at high moisture content and are flowering.

Ensure thorough coverage when using spray-to-wet treatments using hand-held equipment. When using hand-held equipment for low-volume directed-spray spot treatments, apply a 4- to 8-percent solution of this product.

Symptoms may not appear prior to frost or senescence with fall treatments.

Allow 7 or more days after application before tillage, mowing or removal. Repeat treatments may be necessary to control plants regenerating from underground parts or seed. Some autumn colors on undesirable deciduous species are acceptable provided no major leaf drop has occurred. Reduced performance may result if fall treatments are made following a frost.

WEED SPECIES	BROADCAST RATE (QT/A)	HAND-HELD SPRAY-TO-WET % SOLUTION
Alder	2.3 – 3.0	0.75 – 1.2
Ash*	1.5 – 3.75	0.75 – 1.5
Aspen, quaking	1.5 – 2.3	0.75 – 1.2
Bearclover (Bearmat)*	1.5 – 3.75	0.75 – 1.5
Beech*	1.5 – 3.75	0.75 – 1.5
Birch	1.5	0.75
Blackberry	2.3 – 3.0	0.75 – 1.2
Blackgum	1.5 – 3.75	0.75 – 1.5
Bracken	1.5 – 3.75	0.75 – 1.5
Broom; French, Scotch	1.5 – 3.75	1.2 – 1.5
Buckwheat, California*	1.5 – 3.0	0.75 – 1.5
Cascara*	1.5 – 3.75	0.75 – 1.5
Castorbean	—	1.5
Catsclaw*	—	1.2 – 1.5
Ceanothus*	1.5 – 3.75	0.75 – 1.5
Chamise*	1.5 – 3.75	0.75
Cherry; bitter, black, pin	1.5 – 3.75	1.0 – 1.5
Cottonwood, eastern	1.5 – 3.75	0.75 – 1.5
Coyote brush	2.3 – 3.0	1.2 – 1.5
Cypress; swamp, bald	1.5 – 3.75	0.75 – 1.5
Deerweed	1.5 – 3.75	0.75 – 1.5
Dewberry	2.3 – 3.0	0.75 – 1.2
Dogwood*	3.0 – 3.75	1.0 – 2.0
Elderberry	1.5	0.75
Elm*	1.5 – 3.75	0.75 – 1.5
Eucalyptus	—	1.5
Gallberry	1.5 – 3.75	0.75 – 1.5
Gorse*	1.5 – 3.75	0.75 – 1.5
Hackberry, western	1.5 – 3.75	0.75 – 1.5
Hasardia*	1.5 – 3.0	0.75 – 1.5
Hawthorn	1.5 – 2.3	0.75 – 1.2
Hazel	1.5	0.75
Hickory*	3.0 – 3.75	1.0 – 2.0
Honeysuckle	2.3 – 3.0	0.75 – 1.2
Hornbeam, American*	1.5 – 3.75	0.75 – 1.5
Huckleberry	1.5 – 3.75	0.75 – 1.5
Ivy, poison	3.0 – 3.75	1.5

Knotweed; Bohemian, Giant, Japanese**	—	—
Kudzu	3.0	1.5
Locust, black*	1.5 – 3.0	0.75 – 1.5
Madrone resprouts*	—	1.5
Magnolia, sweetbay	1.5 – 3.75	0.75 – 1.5
Manzanita*	1.5 – 3.75	0.75 – 1.5
Maple, red	1.0 – 3.75	0.75 – 1.2
Maple, sugar	—	0.75 – 1.2
Maple, vine*	1.5 – 3.75	0.75 – 1.5
Monkey flower*	1.5 – 3.0	0.75 – 1.5
Oak; black, white*	1.5 – 3.0	0.75 – 1.5
Oak; northern, pin	1.5 – 3.0	0.75 – 1.2
Oak, poison	3.0 – 3.75	1.5
Oak, post	2.3 – 3.0	0.75 – 1.2
Oak, red	—	0.75 – 1.2
Oak, scrub*	1.5 – 3.0	0.75 – 1.5
Oak, southern red	1.5 – 3.75	1.0 – 1.5
Orange, Osage	1.5 – 3.75	0.75 – 1.5
Peppertree, Brazilian (Florida holly)*	1.5 – 3.75	1.5
Persimmon*	1.5 – 3.75	0.75 – 1.5
Pine	1.5 – 3.75	0.75 – 1.5
Poplar, yellow*	1.5 – 3.75	0.75 – 1.5
Prunus	1.5 – 3.75	1.0 – 1.5
Raspberry	2.3 – 3.0	0.75 – 1.2
Redbud, eastern	1.5 – 3.75	0.75 – 1.5
Redcedar, eastern	1.5 – 3.75	0.75 – 1.5
Rose, multiflora	1.5	0.75
Russian olive*	1.5 – 3.75	0.75 – 1.5
Sage, black	1.5 – 3.0	0.75
Sage, white*	1.5 – 3.0	0.75 – 1.5
Sage brush, California	1.5 – 3.0	0.75
Salmonberry	1.5	0.75
Saltbush	—	1.0
Saltcedar**	1.5 – 3.75	0.75 – 1.5
Sassafras*	1.5 – 3.75	0.75 – 1.5
Sea Myrtle	—	1.0
Sourwood*	1.5 – 3.75	0.75 – 1.5
Sumac; laurel, poison, smooth, sugarbush, winged*	1.5 – 3.0	0.75 – 1.5
Sweetgum	1.5 – 2.3	0.75 – 1.5
Swordfern*	1.5 – 3.75	0.75 – 1.5
Tallowtree, Chinese	—	0.75
Tan oak resprouts*	—	1.5
Thimbleberry	1.5	0.75
Tobacco, tree*	1.5 – 3.0	0.75 – 1.5
Toyon*	—	1.5
Trumpet creeper	1.5 – 2.3	0.75 – 1.2
Vine maple*	1.5 – 3.75	0.75 – 1.5
Virginia creeper	1.5 – 3.75	0.75 – 1.5
Waxmyrtle, southern*	1.5 – 3.75	1.5
Willow	2.3	0.75
Yerba Santa, California*	—	1.5

*Partial control

**Refer to specific instructions below

Alder / Blackberry / Dewberry / Honeysuckle / Oak, Post / Raspberry—For control, apply 2.3 to 3 quarts per acre as a broadcast spray or as a 0.75- to 1.2-percent solution with hand-held equipment.

Aspen, Quaking / Hawthorn / Trumpet creeper—For control, apply 1.5 to 2.3 quarts of this product per acre as a broadcast spray or as a 0.75- to 1.2-percent solution with hand-held equipment.

Birch / Elderberry / Hazel / Salmonberry / Thimbleberry—For control, apply 1.5 quarts per acre of this product as a broadcast spray or as a 0.75-percent solution with hand-held equipment.

Broom: French, Scotch—For control, apply a 1.2- to 1.5-percent solution with hand-held equipment.

Buckwheat, California / Hasardia / Monkey Flower / Tobacco, Tree—For partial control of these species, apply a 0.75- to 1.5-percent solution of this product as a foliar spray with hand-held equipment. Thorough coverage of foliage is necessary for best results.

Castorbean—For control, apply a 1.5-percent solution of this product with hand-held equipment.

Catsclaw—For partial control, apply a 1.2- to 1.5-percent solution with hand-held equipment when at least 50 percent of the new leaves are fully developed.

Cherry: Bitter, Black, Pin / Oak, Southern Red / Sweet Gum / Prunus—For control, apply 1.5 to 3.75 quarts of this product per acre as a broadcast spray or as a 1- to 1.5-percent solution with hand-held equipment.

Coyote brush—For control, apply a 1.2- to 1.5-percent solution with hand-held equipment when at least 50 percent of the new leaves are fully developed.

Dogwood / Hickory—For partial control, apply a 1- to 2-percent solution of this product with hand-held equipment or 3 to 3.75 quarts per acre as a broadcast spray.

Eucalyptus, Bluegum—For control of eucalyptus resprouts, apply a 1.5-percent solution of this product with hand-held equipment when resprouts are 6- to 12-foot tall. Ensure complete coverage. Apply when plants are actively growing. Avoid application to drought-stressed plants.

Knottweed: Bohemian, Giant, Japanese (*Polygonum bohemicum*, *P. sachalinense* and *P. cuspidatum*)

Stem Injection. See the "Hollow Stem Injection" section of this label.

Cut Stem. Cut stems cleanly just below the 2nd or 3rd node above the ground. Immediately apply 0.36 fluid ounce (10 mLs) of a 50-percent solution of this product into the 'well' or remaining internode. Ensure that removed upper plant material is carefully gathered and discarded so that it will not contact soil and regenerate plants from sprouting buds. Use of a bio-barrier such as cardboard, plywood or plastic sheeting is recommended.

The combined total for all treatments must not exceed 8 quarts per acre. At 10 mL of a 50-percent solution, approximately 1500 stems per acre may be treated.

Kudzu—For control, apply 3 quarts of this product per acre as a broadcast spray or as a 1.5-percent solution with hand-held equipment. Repeat applications will be required to maintain control.

Maple, Red—For control, apply as a 0.75- to 1.2-percent solution with hand-held equipment when leaves are fully developed. For partial control, apply 1 to 3.75 quarts of this product per acre as a broadcast spray.

Maple, Sugar / Oak: Northern, Pin, Red—For control, apply as a 0.75- to 1.2-percent solution with hand-held equipment when at least 50 percent of the new leaves are fully developed.

Peppertree, Brazilian (Holly, Florida) / Waxmyrtle, Southern—For partial control, apply this product as a 1.5-percent solution with hand-held equipment.

Poison Ivy / Poison Oak—For control, apply 3 to 3.75 quarts of this product per acre as a broadcast spray or as a 1.5-percent solution with hand-held equipment. Repeat applications may be required to maintain control. Fall treatments must be applied before leaves lose green color.

Rose, Multiflora—For control, apply 1.5 quarts of this product per acre as a broadcast spray or as a 0.75-percent solution with hand-held equipment. Treatments should be made prior to leaf deterioration by leaf-feeding insects.

Sage, Black / Sagebrush, California / Chamise / Tallowtree, Chinese—For control of these species, apply a 0.75-percent solution of this product as a foliar spray with hand-held equipment. Thorough coverage of foliage is necessary for best results.

Saltbush, Sea myrtle—For control, apply this product as a 1-percent solution with hand-held equipment.

Saltcedar—For partial control, apply a 1- to 2-percent solution of this product with hand-held equipment or 3 to 3.75 quarts per acre as a broadcast spray. For control, apply a 1- to 2-percent solution of this product mixed with 0.25 percent Arsenal with hand-held equipment. For control using broadcast applications, apply 1.5 quarts of this product in a tank-mix with 1 pint of Arsenal to plants less than 6 feet tall. To control saltcedar greater than 6 feet tall using broadcast applications, apply 3 quarts of this product in a tank-mix with 2 pints of Arsenal.

Willow—For control, apply 2.3 quarts of this product per acre as a broadcast spray or as a 0.75-percent solution with hand-held equipment.

Other woody brush and trees listed in this label—For partial control, apply 1.5 to 3.75 quarts of this product per acre as a broadcast spray or as a 0.75- to 1.5-percent solution with hand-held equipment.

10.0 LIMIT OF WARRANTY AND LIABILITY

Monsanto Company warrants that this product conforms to the chemical description on the label and is reasonably fit for the purposes set forth in the Complete Directions for Use label booklet ("Directions") when used in accordance with those Directions under the conditions described therein. NO OTHER EXPRESS WARRANTY OR IMPLIED WARRANTY OF FITNESS FOR PARTICULAR PURPOSE OR MERCHANTABILITY IS MADE. This warranty is also subject to the conditions and limitations stated herein.

Buyer and all users shall promptly notify this Company of any claims whether based in contract, negligence, strict liability, other tort or otherwise.

To the fullest extent permitted by law, buyer and all users are responsible for all loss or damage from use or handling which results from conditions beyond the control of this Company, including, but not limited to, incompatibility with products other than those set forth in the Directions, application to or contact with desirable vegetation, unusual weather, weather conditions which are outside the range considered normal at the application site and for the time period when the product is applied, as well as weather conditions which are outside the application ranges set forth in the Directions, application in any manner not explicitly set forth in the Directions, moisture conditions outside the moisture range specified in the Directions, or the presence of products other than those set forth in the Directions in or on the soil, crop or treated vegetation.

This Company does not warrant any product reformulated or repackaged from this product except in accordance with this Company's stewardship requirements and with express written permission from this Company.

THE EXCLUSIVE REMEDY OF THE USER OR BUYER, AND THE LIMIT OF THE LIABILITY OF THIS COMPANY OR ANY OTHER SELLER FOR ANY AND ALL LOSSES, INJURIES OR DAMAGES RESULTING FROM THE USE OR HANDLING OF THIS PRODUCT (INCLUDING CLAIMS BASED IN CONTRACT, NEGLIGENCE, STRICT LIABILITY, OTHER TORT OR OTHERWISE) SHALL BE THE PURCHASE PRICE PAID BY THE USER OR BUYER FOR THE QUANTITY OF THIS PRODUCT INVOLVED, OR, AT THE ELECTION OF THIS COMPANY OR ANY OTHER SELLER, THE REPLACEMENT OF SUCH QUANTITY, OR, IF NOT ACQUIRED BY PURCHASE, REPLACEMENT OF SUCH QUANTITY TO THE FULLEST EXTENT PERMITTED BY LAW, IN NO EVENT SHALL THIS COMPANY OR ANY OTHER SELLER BE LIABLE FOR ANY INCIDENTAL, CONSEQUENTIAL OR SPECIAL DAMAGES.

Upon opening and using this product, buyer and all users are deemed to have accepted the terms of this LIMIT OF WARRANTY AND LIABILITY which may not be varied by any verbal or written agreement. If terms are not acceptable, return at once unopened.

AquaMaster, Certainty, Outrider, and Monsanto and Vine Design are registered trademarks of Monsanto Technology LLC.

All other trademarks are the property of their respective owners.

EPA Reg No. 524-343

Packed For:
MONSANTO COMPANY
800 N. LINDBERGH BLVD.
ST. LOUIS, MISSOURI, 63167 U.S.A.
©2009
061709



Habitat[®]

Herbicide

SPECIMEN



For the control of undesirable vegetation growing within specified aquatic sites and nonirrigation ditchbanks.

Active Ingredient

isopropylamine salt of imazapyr: (2-[4,5-dihydro-4-methyl-4-(1-methylethyl)-5-oxo-1H-imidazol-2-yl]-3-pyridinecarboxylic acid) †: . . . 27.77%

Other Ingredients 72.23%

TOTAL 100.0%

† Equivalent to 22.6% 2-[4,5-dihydro-4-methyl-4-(1-methylethyl)-5-oxo-1H-imidazol-2-yl]-3-pyridinecarboxylic acid or 2 pounds acid per gallon.

Keep Out of Reach of Children

CAUTION / PRECAUCIÓN

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.)

Refer to inside of label booklet for additional precautionary information and directions for use, including first aid and storage and disposal.

NOTICE: Read the entire label before using. Use only according to label directions. **Before buying or using this product, read Terms and Conditions of Use, Warranty Disclaimer, Inherent Risks of Use and Limitation of Remedies** inside label booklet.

Habitat is a registered trademark of BASF Corporation.

Manufactured for: **SePRO Corporation** 11550 N. Meridian St. EPA Reg. No. 241-426-67690
Suite 600, Carmel, IN 46032 U.S.A. FPL20120613

KEEP OUT OF REACH OF CHILDREN CAUTION/PRECAUCIÓN

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 swallowed	<ul style="list-style-type: none">• Call a poison control center or doctor immediately for treatment advice.• Have person sip a glass of water if able to swallow.• DO NOT induce vomiting unless told to do so by a poison control center or doctor.• DO NOT give anything by mouth to an unconscious person.
---------------------	---

HOTLINE 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 INFOTRAC for emergency medical treatment information: 1-800-535-5053.

PRECAUTIONARY STATEMENTS

Hazards to Humans and Domestic Animals

CAUTION. Harmful if swallowed

PERSONAL PROTECTIVE EQUIPMENT (PPE)

Some materials that are chemically resistant to this product are listed below. If you want more options, follow the instructions for **Category A** on an EPA chemical-resistance category selection chart.

Mixers, loaders, applicators and other handlers must wear:

- Long-sleeved shirt and long pants
- Chemical-resistant gloves (except for pilots)
- Shoes plus socks.

Follow manufacturer's instructions for cleaning and maintaining PPE. If no such instructions are given for washables, use detergent and hot water. Keep and wash PPE separately from other laundry. Discard clothing and other absorbent materials that have been drenched or heavily contaminated with this product's concentrate. **DO NOT** reuse them.

ENGINEERING CONTROLS

Pilots must use an enclosed cockpit that meets the requirements listed in the Worker Protection Standard (WPS) for agricultural pesticides [40 CFR 170.240 (d)(6)].

USER SAFETY RECOMMENDATIONS

Users should:

- Wash hands with plenty of soap and water 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.

PHYSICAL AND CHEMICAL HAZARDS

Spray solutions of **Habitat[®] herbicide** should be mixed, stored and applied only in stainless steel, fiberglass, plastic and plastic-lined steel containers.

Thoroughly clean application equipment, including landing gear, immediately after use of this product. Prolonged exposure of this product to uncoated steel (except stainless steel) surfaces may result in corrosion and failure of the exposed part. The maintenance of an organic coating (paint) may prevent corrosion.

ENVIRONMENTAL HAZARDS

This product is toxic to plants. Drift and runoff may be hazardous to plants in water adjacent to treated areas. **DO NOT** apply to water except as specified in this label. Treatment of aquatic weeds may result in oxygen depletion or loss due to decomposition of dead plants. This oxygen loss may cause the suffocation of some aquatic organisms. **DO NOT** treat more than 1/2 of the surface area of the water in a single operation and wait at least 10 to 14 days between treatments. Begin treatment along the shore and proceed outward in bands to allow aquatic organisms to move into untreated areas. **DO NOT** contaminate water when disposing of equipment washwaters or rinsate. See Directions for Use for additional precautions and requirements.

This pesticide is toxic to vascular plants and must be used strictly in accordance with the drift precautions on the label.

DIRECTIONS FOR USE

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

Habitat must be used only in accordance with the instructions on the leaflet label attached to the container. Keep containers closed to avoid spills and contamination.

DO NOT apply this product in a way that will contact workers or other persons, either directly or through drift. Only protected handlers may be in the area during application.

NONAGRICULTURAL USE REQUIREMENTS

The requirements in this box apply to uses of this product that are **NOT** within the scope of the Worker Protection Standard (WPS) for agricultural pesticides (40 CFR Part 170). The WPS applies when this product is used to produce agricultural plants on farms, forests, nurseries, or greenhouses.

Noncrop weed control is not within the scope of the Worker Protection Standard. See the **Product Information** section of this label for a description of noncrop sites.

DO NOT enter or allow others to enter treated areas until sprays have dried.

STORAGE AND DISPOSAL

DO NOT contaminate water, food or feed by storage or disposal.

Pesticide Storage

DO NOT store below 10° F.

Pesticide Disposal

Wastes resulting from the use of this product must be disposed of on-site or at an approved waste disposal facility.

Container Handling

Nonrefillable Container. DO NOT reuse or refill this container. Triple rinse or pressure rinse container (or equivalent) promptly after emptying; then offer for recycling, if available, or reconditioning, if appropriate, or puncture and dispose of in a sanitary landfill, or by incineration, or by other procedures approved by state and local authorities.

Triple rinse containers small enough to shake (capacity ≤ 5 gallons) 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 ¼ 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.

Triple rinse containers too large to shake (capacity >5 gallons) as follows: Empty the remaining contents into application equipment or a mix tank. Fill the container ¼ 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 the 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.

Pressure rinse as follows: Empty the remaining contents into application equipment or 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.

Refillable Container. Refill this container with pesticide only. **DO NOT** reuse this container for any other purpose. Triple rinsing the container before final disposal is the responsibility of the person disposing of the container. Cleaning before refilling is the responsibility of the refiller.

Triple rinse as follows: 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% 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.

When this container is empty, replace the cap and seal all openings that have been opened during use; return the container to the point of purchase or to a designated location. This container must only be refilled with a pesticide product. Prior to refilling, inspect carefully for damage such as cracks, punctures, abrasions, worn-out threads and closure devices. Check for leaks after refilling and before transport. **DO NOT** transport if this container is damaged or leaking. If the container is damaged, or leaking, or obsolete and not returned to the point of purchase or to a designated location, triple rinse emptied container and offer for recycling, if available, or dispose of container in compliance with state and local regulations.

IN CASE OF EMERGENCY

In case of large-scale spillage regarding this product, call:

- INFOTRAC 1-800-535-5053

In case of medical emergency regarding this product, call:

- Your local doctor for immediate treatment
- Your local poison control center (hospital)
- INFOTRAC 1-800-535-5053.

Steps to be taken in case material is released or spilled:

- Dike and contain the spill with inert material (sand, earth, etc.) and transfer liquid and solid diking material to separate containers for disposal.
- Remove contaminated clothing and wash affected skin areas with soap and water.
- Wash clothing before reuse.
- Keep the spill out of all sewers and open bodies of water.

PRODUCT USE PRECAUTIONS AND RESTRICTIONS

Applications may be made for the control of undesirable vegetation growing within specified aquatic sites. Aquatic sites consist of standing and flowing water, estuarine/marine, wetland and riparian areas and nonirrigation ditchbanks.

Restrictions

- **DO NOT** use on food crops.
- **DO NOT** apply this product within 1/2 mile upstream of an active potable water intake in flowing water (i.e., river, stream, etc.) or within 1/2 mile of an active potable water intake in a standing body of water, such as a lake, pond or reservoir.
- **DO NOT** apply to water used for irrigation except as described in **Product Use Precautions and Restrictions** section of this label.
- Keep from contact with fertilizers, insecticides, fungicides and seeds.
- **DO NOT** drain or flush equipment on or near desirable trees or other plants, or on areas where their roots may extend, or in locations where the treated soil may be washed or moved into contact with their roots.
- **DO NOT** side trim desirable vegetation with this product unless severe injury and plant death can be tolerated. Prevent drift of spray to desirable plants.
- Clean application equipment after using this product by thoroughly flushing with water.

Aquatic Sites

- **DO NOT** apply more than 1.5 lbs ae imazapyr (equivalent to 96 fl ozs of **Habitat® herbicide**) per acre per year.
- **Public waters.** Application of **Habitat** to water can only be made by federal or state agencies, such as Water Management District personnel, municipal officials, and the U.S. Army Corps of Engineers, or those applicators who are licensed or certified as aquatic pest control applicators and are authorized by the state or local government. Treatment to other than non-native invasive species is limited to only those plants that have been determined to be a nuisance by a federal or state government entity.
- **Permitting.** Consult local state fish and game agency and water control authorities before applying this product to public water. Permits may be required to treat such water.
- **Private waters.** Applications may be made to private waters that are still, such as ponds, lakes and drainage ditches where there is minimal or no outflow to public waters.
- **Aerial application.** Aerial application to aquatic sites is restricted to helicopter only.
- **Irrigation water.** Application to water used for irrigation that results in **Habitat** residues > 1.0 ppb **MUST NOT** be used for irrigation purposes for 120 days after application or until **Habitat** residue levels are determined by laboratory analysis or other appropriate means of analysis to be 1.0 ppb or less. When applications are made within 500 feet of an active irrigation intake, **DO NOT** irrigate for at least 24 hours following application to allow for dissipation.

Recreational use of water in treatment area. There are no restrictions on the use of water in the treatment area for recreational purposes, including swimming and fishing.

Livestock use of water in/from treatment area. There are no restrictions on livestock consumption of water from the treatment area.

Precautions for potable water intakes. DO NOT apply **Habitat** directly to water within 1/2 mile upstream of an active potable water intake in flowing water (i.e., river, stream, etc.) or within 1/2 mile of an active potable water intake in a standing body of water such as a lake, pond or reservoir. To make aquatic applications around and within 1/2 mile of active potable water intakes, the water intake **must** be turned off during application and for a minimum of 48 hours after the application. These aquatic applications may be made only in the cases where there are alternative water sources or holding ponds that would permit the turning off of an active potable water intake for a minimum period of 48 hours after the applications.

NOTE: Existing potable water intakes that are no longer in use, such as those replaced by connections to wells or a municipal water system, are not considered to be active potable water intakes.

Quiescent or Slow-moving Waters. In lakes and reservoirs, **DO NOT** apply **Habitat** within one (1) mile of an active irrigation water intake during the irrigation season. Applications less than one (1) mile from an active irrigation water intake may be made during the off-season, provided that the irrigation intake will remain inactive for a minimum of 120 days after application or until **Habitat** residue levels are determined by laboratory analysis or other appropriate means of analysis to be 1.0 ppb or less.

PRODUCT INFORMATION

Habitat® herbicide is an aqueous solution to be mixed with water and a surfactant and applied as a spray solution to control undesirable vegetation growing within specified aquatic sites. Aquatic sites consist of standing and flowing water, estuarine/marine, wetland, riparian areas and nonirrigation ditchbanks.

Herbicidal Activity. **Habitat** will control most annual and perennial grasses and broadleaf weeds in addition to many brush and vine species with some residual control of undesirable species that germinate above the waterline. **Habitat** is readily absorbed through emergent leaves and stems and is translocated rapidly throughout the plant with accumulation in the meristematic regions. For maximum activity, weeds should be growing vigorously at the time of application, and the spray solution should include a surfactant (see **Adjuvants** section for specific use directions). Treated plants stop growing soon after spray application. Chlorosis appears first in the newest leaves, and necrosis spreads from this point. In perennials, the herbicide is translocated into, and kills, underground or submerged storage organs, which prevents regrowth. Chlorosis and tissue necrosis may not be apparent in some plant species until 2 or more weeks after application. Complete kill of plants may not occur for several weeks. Applications of **Habitat** are rainfast 1 hour after treatment.

Application Methods. **Habitat** may be selectively applied by using low-volume directed application techniques or may be broadcast applied by using ground equipment, watercraft, or aircraft (aerial applications to aquatic sites must be made by helicopter). In addition, **Habitat** may also be applied using cut stump, cut stem, and frill and girdle treatment techniques within aquatic sites (see **Aerial Application** and **Ground Application** sections for additional details).

PRECAUTIONS FOR AVOIDING INJURY TO NONTARGET PLANTS

Untreated desirable plants can be affected by root uptake of **Habitat** from treated soil. Injury or loss of desirable plants may result if **Habitat** is applied on or near desirable plants, on areas where their roots extend, or in locations where the treated soil may be washed or moved into contact with their roots. When making applications along shorelines where desirable plants may be present, caution should be exercised to avoid spray contact with their foliage or spray application to the soil in which they are rooted. Shoreline plants that have roots which extend into the water in an area where **Habitat** has been applied generally will not be adversely affected by uptake of the herbicide from the water. If treated vegetation is to be removed from the application site, **DO NOT** use the vegetative matter as mulch or compost on or around desirable species.

Wind Erosion

Avoid treating powdery, dry or light sandy soils when conditions are favorable for wind erosion. Under these conditions, the soil surface should first be settled by rainfall or irrigation.

Spray Drift Requirements

Aerial Application

- Applicators are required to use a coarse or coarser droplet size (ASABE S572) or, if specifically using a spinning atomizer nozzle, applicators are required to use a volume mean diameter (VMD) of 385 microns or greater for release heights below 10 feet. Applicators are required to use a very coarse or coarser droplet size or, if specifically using a spinning atomizer nozzle, applicators are required to use a VMD of 475 microns or greater for release heights above 10 feet. Applicators must consider the effects of nozzle orientation and flight speed when determining droplet size.
- Applicators are required to use upwind swath displacement.
- The boom length must not exceed 60% of the wingspan or 90% of the rotor blade diameter to reduce spray drift.
- Applications with wind speeds less than 3 mph and with wind speeds greater than 10 mph are prohibited.
- Applications into temperature inversions are prohibited.

Ground Boom Application

- Applicators are required to use a nozzle height below 4 feet above the ground or plant canopy and coarse or coarser droplet size (ASABE S572) or, if specifically using a spinning atomizer nozzle, applicators are required to use a volume mean diameter (VMD) of 385 microns or greater.
- Applications with wind speeds greater than 10 mph are prohibited.
- Applications into temperature inversions are prohibited.

ADJUVANTS

Postemergence applications of **Habitat** require the addition of a spray adjuvant. When making aquatic applications, only spray adjuvants that are approved or appropriate for aquatic use must be utilized.

Nonionic Surfactants. Use a nonionic surfactant (NIS) at the rate of 0.25% volume/volume (v/v) or higher (see manufacturer's label) of the spray solution (0.25% v/v is equivalent to 1 quart in 100 gallons). For best results, select a nonionic surfactant with an HLB (hydrophilic to lipophilic balance) ratio between 12 and 17 with at least 70% surfactant in the formulated product (alcohols, fatty acids, oils, ethylene glycol or diethylene glycol should not be considered as surfactants to meet the above requirements).

Methylated Seed Oils or Vegetable Oil Concentrates. Instead of a surfactant, a methylated seed oil (MSO) or vegetable-based seed oil concentrate may be used at the rate of 1.5 to 2 pints per acre. When using spray volumes greater than 30 gallons per acre, methylated seed oil or vegetable-based seed oil concentrates should be mixed at a rate of 1% of the total spray volume, or alternatively use a nonionic surfactant as described above. Research indicates that these oils may aid in **Habitat** deposition and uptake by plants under moisture or temperature stress.

Silicone-based Surfactants. See manufacturer's label for specific rates. Silicone-based surfactants may reduce the surface tension of the spray droplet allowing greater spreading on the leaf surface as compared to conventional nonionic surfactants. However, some silicone-based surfactants may dry too quickly, limiting herbicide uptake.

Invert Emulsions. **Habitat** can be applied as an invert emulsion. The spray solution results in an invert (water-in-oil) spray emulsion designed to minimize spray drift and spray runoff, resulting in more herbicide on the target foliage. The spray emulsion may be formed in a single tank (batch mixing) or injected (in-line mixing). Consult the invert chemical label for proper mixing directions.

Other. An antifoaming agent, spray pattern indicator, or drift-reducing agent may be applied at the product labeled rate if necessary or desired.

TANK MIXES

Habitat may be tank mixed with other herbicides.

Consult manufacturer's labels for specific rate restrictions and weeds controlled. Always follow the more restrictive label restrictions and precautions for all products used when making an application involving tank mixes.

AERIAL APPLICATION

All precautions must be taken to minimize or eliminate spray drift. Only helicopters can be used for aquatic applications. **DO NOT** make applications by helicopter unless appropriate buffer zones can be maintained to prevent spray drift out of the target area. Aerial equipment designed to minimize spray drift, such as a helicopter equipped with a **Microfoil™ boom, Thru-Valve™ boom**, or raindrop nozzles, must be used and calibrated. Except when applying with a **Microfoil boom**, a drift control agent may be added at the specified label rate. **DO NOT** side trim with **Habitat** unless death of treated tree can be tolerated.

Uniformly apply the specified amount of **Habitat** in 2 to 30 gallons of water per acre. A foam-reducing agent may be added at the specified label rate, if needed.

IMPORTANT: Thoroughly clean application equipment, including landing gear, immediately after use of this product. Prolonged exposure of this product to uncoated steel (except stainless steel) surfaces may result in corrosion and failure of the exposed part. The maintenance of an organic coating (paint) may prevent corrosion.

GROUND APPLICATION

FOLIAR APPLICATIONS

Low-volume Foliar Application

Use equipment calibrated to deliver 5 to 20 gallons of spray solution per acre. To prepare the spray solution, thoroughly mix in water 0.5% to 5% **Habitat** plus surfactant (see the **Adjuvants** section of this label for specific use directions). A foam-reducing agent may be applied at the specified label rate, if needed. For control of difficult species (see **Aquatic Weeds Controlled** section for relative susceptibility of weed species), use the higher concentrations of herbicide and/or spray volumes, but **DO NOT** apply more than 6 pints of **Habitat** per acre in aquatic sites. Excessive wetting of foliage is not necessary. See **Spray Solution Mixing Guide for Low-volume Foliar Applications** following for specified volumes of **Habitat** and water.

For low-volume foliar application, select proper nozzles to avoid overapplication. Proper application is critical to ensure desirable results. Best results are achieved when the spray covers the crown and approximately 70 percent of the plant. The use of an even, flat-fan tip with a spray angle of 40 degrees or less will aid in proper deposition.

Appropriate tip sizes include 4004E or 1504E. For a straight-stream and cone pattern, adjustable cone nozzles, such as 5500 X3 or 5500 X4, may be used. Attaching a rollover valve onto a Spraying Systems Model 30 gunjet or other similar spray gun allows for the use of both flat-fan and cone tips on the same gun.

Moisten, but **DO NOT** drench target vegetation causing spray solution to run off.

Low-volume Foliar Application with Backpacks

For low-growing species, spray down on the crown, covering crown and penetrating approximately 70% of the plant.

For target species 4 to 8 feet tall, swipe the sides of target vegetation by directing spray to at least 2 sides of the plant in smooth vertical motions from the crown to the bottom. Make sure to cover the crown whenever possible.

For target species over 8 feet tall, lace sides of the target vegetation by directing spray to at least 2 sides of the target in smooth zigzag motions from crown to bottom.

Low-volume Foliar Application with Hydraulic Handgun Application Equipment

Use the same technique as described above for **Low-volume Foliar Application with Backpacks**.

For broadcast applications, simulate a gentle rain near the top of target vegetation allowing spray to contact the crown and penetrate the target foliage without falling to the understory. Herbicide spray solution that contacts the understory may result in severe injury or death of plants in the understory.

Spray Solution Mixing Guide for Low-volume Foliar Applications

Spray Solution Prepared (gallons)	Desired Concentration (% v/v)				
	0.5%	0.75%	1%	1.5%	5%
	(amount of Habitat [®] herbicide to use)				
1	0.6 fl oz	0.9 fl oz	1.3 fl ozs	1.9 fl ozs	6.5 fl ozs
3	1.9 fl ozs	2.8 fl ozs	3.8 fl ozs	5.8 fl ozs	1.2 pints
4	2.5 fl ozs	3.8 fl ozs	5.1 fl ozs	7.7 fl ozs	1.6 pints
5	3.2 fl ozs	4.8 fl ozs	6.5 fl ozs	9.6 fl ozs	2 pints
50	2 pints	3 pints	4 pints	6 pints	10 quarts
100	4 pints	6 pints	8 pints	6 quarts	5 gallons

2 tablespoons = 1 fluid ounce

High-volume Foliar Application

For optimum performance when spraying medium-density to high-density vegetation, use equipment calibrated to deliver up to 100 gallons of spray solution per acre (GPA). Spray solutions exceeding 100 GPA may result in excessive spray runoff, causing increased ground cover injury, and injury to desirable species. To prepare the spray solution, thoroughly mix **Habitat** in water and add a surfactant (see **Adjuvants** section for specific use directions and rates for surfactants). A foam-reducing agent may be added at the specified label rate, if needed. For control of difficult species (see **Aquatic Weeds Controlled** chart for relative susceptibility of weed species), use the higher concentrations of herbicide and/or spray volumes, but **DO NOT** apply more than 6 pints of **Habitat** per acre in aquatic sites. Uniformly cover the foliage of the vegetation to be controlled, but **DO NOT** apply to runoff. Excessive wetting of foliage is not necessary.

Side Trimming

DO NOT side trim with **Habitat** unless severe injury or death of the treated tree can be tolerated. **Habitat** is readily translocated and can result in death of the entire tree.

CUT-SURFACE TREATMENT

Habitat may be used to control undesirable woody vegetation by applying the **Habitat** solution to the cambium area of freshly cut stump surfaces or to fresh cuts on the stem of the target woody vegetation. Applications can be made at any time of the year except during periods of heavy sap flow in the spring. **DO NOT** overapply solution causing runoff from the cut surface.

Injury may occur to desirable woody plants if the shoots extend from the same root system or their root systems are grafted to those of the treated tree.

Cut-surface Application with Dilute and Concentrate Solutions

Habitat may be mixed as either a concentrated or dilute solution. The dilute solution may be used for applications to the cut surface of the stump or to cuts on the stem of the target woody vegetation. Concentrated solutions may be used for applications to cuts on the stem. Use of the concentrated solution permits application to fewer cuts on the stem, especially for large-diameter trees. Follow the application instructions to determine proper application techniques for each type of solution.

- To prepare a dilute solution, mix 8 to 12 fluid ounces of **Habitat** with 1 gallon of water. The use of a surfactant or penetrating agent may improve uptake through partially callused cambiums.
- To prepare a concentrated solution, mix 2 quarts of **Habitat** with no more than 1 quart of water.

Cut-stump Treatment

- **Dilute Solution.** Spray or brush the solution onto the cambium area of the freshly cut stump surface. Ensure that the solution thoroughly wets the entire cambium area (the wood next to the bark of the stump).

Cut-stem (injection, hack and squirt) Treatment

- **Dilute Solution.** Using standard injection equipment, apply 1 milliliter of solution at each injection site around the tree with no more than 1-inch intervals between cut edges. Ensure that the injector completely penetrates the bark at each injection site.
- **Concentrate Solution.** Using standard injection equipment, apply 1 milliliter of solution at each injection site. Make at least 1 injection cut for every 3 inches of Diameter at Breast Height (DBH) on the target tree. For example, a 3-inch DBH tree will receive 1 injection cut, and a 6-inch DBH tree will receive 2 injection cuts. On trees requiring more than 1 injection site, place the injection cuts at approximately equal intervals around the tree.

Frill or Girdle Treatment

- Using a hatchet, machete, or chainsaw, make cuts through the bark and completely around the tree to expose the cambium. The cut should angle downward extending into the cambium enough to expose at least 2 growth rings. Using a spray applicator or brush, apply a 25% to 100% solution of **Habitat** into each cut until thoroughly wet. Avoid applying so much herbicide that runoff to the ground or water occurs.

AQUATIC WEED CONTROL

Habitat may be applied for the control of floating and emergent undesirable vegetation (see the **Aquatic Weeds Controlled** section) in or near bodies of water that may be flowing, nonflowing, or transient. **Habitat** may be applied to aquatic sites that include lakes, rivers, streams, ponds, seeps, drainage ditches, canals, reservoirs, swamps, bogs, marshes, estuaries, bays, brackish water, transitional areas between terrestrial and aquatic sites, riparian sites, and seasonal wet areas. See **Product Use Precautions and Restrictions** section of this label for precautions, restrictions, and instructions on aquatic uses.

Habitat must be applied to the emergent foliage of the target vegetation and has little-to-no activity on submerged aquatic vegetation. **Habitat** concentrations resulting from direct application to water are not expected to be of sufficient concentration nor duration to provide control of target vegetation. Application should be made in such a way as to maximize spray interception by the target vegetation while minimizing the amount of overspray that enters the water.

Habitat does not control plants that are completely submerged or have a majority of their foliage under water.

Habitat should be applied with surface or helicopter application equipment in a minimum of 2 gallons of water per acre. When applying by helicopter, follow directions under the **Aerial Application** section of this label; otherwise, refer to the **Ground Application** section when using surface equipment.

Applications made to moving bodies of water should be made while traveling upstream to prevent concentration of this herbicide in water. **DO NOT** apply to bodies of water or portions of bodies of water where emergent and/or floating weeds do not exist.

When application is to be made to target vegetation that covers a large percentage of the surface area of impounded water, treating the area in strips may avoid oxygen depletion due to decaying vegetation. Oxygen depletion may result in the suffocation of some sensitive aquatic organisms. If oxygen depletion is a concern, treat no more than 1/2 of the surface area of the water in a single operation and wait at least 10 to 14 days between treatments. Begin treatment along the shore and proceed outward in bands to allow aquatic organisms to move into untreated areas.

Avoid washoff of sprayed foliage by spray boat or recreational boat backwash for 1 hour after application.

Apply **Habitat® herbicide** at 2 to 6 pints per acre depending on species present and weed density. **DO NOT** exceed the maximum label rate of 6 pints per acre (1.5 lbs ae/A) per year. Use the higher labeled rates for heavy weed pressure. Consult the **Aquatic Weeds Controlled** section of this label for specific rates.

Habitat may be applied as a draw-down treatment in areas described above. Apply **Habitat** to weeds after water has been drained and allow 14 days before reintroduction of water.

WEEDS CONTROLLED

Aquatic Weeds Controlled

Habitat will control the following target species as specified in the **Use Rates and Application Directions** column of the table. Rates are expressed in terms of product volume for broadcast applications and as a % solution for directed applications including spot treatments. **For % solution applications, DO NOT apply more than the equivalent of 6 pints of Habitat per acre.**

Common Name	Scientific Name	Use Rates and Application Directions
Floating		
*Floating heart	<i>Nymphodes</i> spp.	2 to 4 pints/A (0.5 to 1.0% solution) applied in 100 GPA water mix. Ensure 100% coverage of actively growing emergent foliage.
*Frogbit	<i>Limnobium spongia</i>	1 to 2 pints/A (0.5% solution) applied in 100 GPA water mix. Ensure 100% coverage of actively growing emergent foliage.
*Spatterdock	<i>Nuphar luteum</i>	Apply a tank mix of 2 to 4 pints/A Habitat + 4 to 6 pints/A glyphosate (0.5% Habitat + 1.5% glyphosate) in 100 GPA water for best control. Ensure 100% coverage of actively growing emergent foliage.
*Water hyacinth	<i>Eichhornia crassipes</i>	1 to 2 pints/A (0.5% solution) applied in 100 GPA water to actively growing foliage.
*Water lettuce	<i>Pistia stratiotes</i>	1 to 2 pints/A (0.5% solution) applied in 100 GPA water mix. Ensure 100% coverage of actively growing emergent foliage.
Emerg		
*Alligatorweed	<i>Alternanthera philoxeroides</i>	1 to 4 pints/A (0.5% solution) applied in 100 GPA water mix. Ensure 100% coverage of actively growing emergent foliage.
*Arrowhead, duck-potato	<i>Sagittaria</i> spp.	1 to 2 pints/A (0.5% solution) applied in 100 GPA water mix. Ensure 100% coverage of actively growing emergent foliage.
*Bacopa, lemon	<i>Bacopa</i> spp.	1 to 2 pints/A (0.5% solution) applied in 100 GPA water mix. Ensure 100% coverage of actively growing emergent foliage.
*Parrot feather	<i>Myriophyllum aquaticum</i>	Must be foliage above water for sufficient Habitat uptake. Apply 2 to 4 pints/A to actively growing emergent foliage.
*Pennywort	<i>Hydrocotyle</i> spp.	1 to 2 pints/A (0.5% solution) applied in 100 GPA water mix. Ensure 100% coverage of actively growing emergent foliage.
*Pickerelweed	<i>Pontederia cordata</i>	2 to 3 pints/A (1% solution) applied in 100 GPA water mix. Ensure 100% coverage of actively growing emergent foliage.

* Use not permitted in California unless otherwise directed by supplemental labeling.

(continued)

Aquatic Weeds Controlled (continued)

Common Name	Scientific Name	Use Rates and Application Directions
Emerg (continued)		
*Taro, wild Dasheen Elephant's ear Coco yam	<i>Colocasia esculentum</i>	4 to 6 pints/A (1.5% solution) applied in 100 GPA with a high quality "sticker" adjuvant. Ensure good coverage of actively growing emergent foliage.
*Water chestnut	<i>Trappa natans</i>	4 to 6 pints/A (1.5% solution) applied in 100 GPA with a high quality "sticker" adjuvant. Ensure good coverage of actively growing emergent foliage.
*Water lily	<i>Nymphaea odorata</i>	2 to 3 pints/A (1% solution) applied in 100 GPA water mix. Ensure 100% coverage of actively growing emergent foliage.
*Water primrose	<i>Ludwigia uruguayensis</i>	4 to 6 pints/A (1.5% solution). Ensure 100% coverage of actively growing emergent foliage.
Terrestrial/Marginal		
*Soda apple Aquatic nightshade	<i>Solanum tampicense</i>	2 pints/A applied to foliage
*Bamboo, Japanese	<i>Phyllostachys</i> spp.	3 to 4 pints/A applied to the foliage when plant is actively growing; before setting seed head. More foliage will result in greater herbicide uptake, resulting in greater root kill.
Beach, vitex	<i>Vitex rotundifolia</i>	5% solution + 1% MSO foliar spray. 17% solution stem injection (hack and squirt)
Brazilian pepper Christmasberry	<i>Schinus terebinthifolius</i>	2 to 4 pints/A applied to foliage
Cattail	<i>Typha</i> spp.	2 to 4 pints/A (1% solution) applied to actively growing green foliage after full leaf elongation. Lower rates will control cattail in the North; higher rates are needed in the South.
Chinese tallow tree	<i>Sapium sebiferum</i>	16 to 24 fl ozs/A applied to foliage
Cogon grass	<i>Imperata cylindrica</i>	Burn foliage, till area; then fall-spray 2 quarts/A Habitat + MSO applied to new growth.
Cordgrass, prairie	<i>Spartina</i> spp.	4 to 6 pints/A applied to actively growing foliage
*Cutgrass	<i>Zizaniopsis miliacea</i>	4 to 6 pints/A applied to actively growing foliage
*Elephant grass Napier grass	<i>Pennisetum purpureum</i>	3 pints/A applied to actively growing foliage
*Flowering rush	<i>Butomus umbellatus</i> L.	2 to 3 pints/A applied to actively growing foliage
Giant reed Wild cane	<i>Arundo donax</i>	4 to 6 pints/A applied in spring to actively growing foliage
*Golden bamboo	<i>Phyllostachys aurea</i>	3 to 4 pints/A applied to foliage when plant is actively growing; before setting seed head. More foliage will result in greater herbicide uptake, resulting in greater root kill.
Junglerice	<i>Echinochloa colonum</i>	3 to 4 pints/A applied to actively growing foliage
Knapweed	<i>Centaurea</i> spp.	Russian knapweed: 2 to 3 pints + 1 quart/A MSO fall-applied after senescence begins

* Use not permitted in California unless otherwise directed by supplemental labeling.

(continued)

Aquatic Weeds Controlled (continued)

Common Name	Scientific Name	Use Rates and Application Directions
Terrestrial/Marginal (continued)		
Knotweed, Japanese	<i>Polygonum cuspidatum</i> <i>Fallopia japonica</i>	3 to 4 pints/A applied post-emergence to actively growing foliage
Melaleuca Paperbark tree	<i>Melaleuca quinquenervia</i>	For established stands, apply 6 pints/A Habitat ® herbicide + 6 pints/A glyphosate + spray adjuvant. For best results, use 4 quarts/A methylated seed oil as an adjuvant. For ground foliar application, uniformly apply to ensure 100% coverage. For broadcast foliar control, apply aerially in a minimum of 2 passes at 10 gallons/A applied cross treatment. For spot treatment, use a 25% Habitat + 25% solution of glyphosate + 1.25% MSO in water applied as a frill or stump treatment.
*Nutmeg Kili'p'opu	<i>Cyperus rotundus</i>	2 pints Habitat + 1 quart/A MSO applied early post-emergence
*Nutsedge	<i>Cyperus</i> spp.	2 to 3 pints post-emergence to foliage or pre-emergence incorporated, nonincorporated, pre-emergence applications will not control.
Phragmites Common reed	<i>Phragmites australis</i>	4 to 6 pints/A applied to actively growing green foliage after full leaf elongation. Ensure 100% coverage. If stand has a substantial amount of old stem tissue, mow or burn, allow to regrow to approximately 5 feet tall before treatment. Lower rates will control phragmites in the North; higher rates are needed in the South.
*Poison hemlock	<i>Conium maculatum</i>	2 pints Habitat + 1 quart/A MSO applied pre-emergence to early post-emergence to rosette prior to flowering
Purple loosestrife	<i>Lythrum salicaria</i>	1 pint/A applied to actively growing foliage
Reed canarygrass	<i>Phalaris arundinacea</i>	3 to 4 pints/A applied to actively growing foliage
Rose, swamp	<i>Rosa palustris</i>	2 to 3 pints/A applied to actively growing foliage
Russian olive	<i>Elaeagnus angustifolia</i>	2 to 4 pints/A or a 1% solution applied to foliage
Saltcedar Tamarisk	<i>Tamarix</i> spp.	Aerial apply 2 quarts Habitat + 0.25% v/v NIS applied to actively growing foliage during flowering. For spot spraying, use 1% solution of Habitat + 0.25% v/v NIS and spray to wet foliage. After application, wait at least 2 years before disturbing treated saltcedar. Earlier disturbance can reduce overall control.
Smartweed	<i>Polygonum</i> spp.	2 pints/A applied early post-emergence
Sumac	<i>Rhus</i> spp.	2 to 3 pints/A applied to foliage
Swamp morningglory Water spinach Kangkong	<i>Ipomoea aquatica</i>	1 to 2 pints/A Habitat + 1 quart/A MSO applied early post-emergence
Torpedo grass	<i>Panicum repens</i>	4 pints/A (1 to 1.5% solution); ensure good coverage to actively growing foliage.
*White top Hoary cress	<i>Cardaria draba</i>	1 to 2 pints/A applied in spring to foliage during flowering
Willow	<i>Salix</i> spp.	2 to 3 pints/A Habitat applied to actively growing foliage. Ensure good coverage.

* Use not permitted in California unless otherwise directed by supplemental labeling.

TERMS AND CONDITIONS OF USE

If terms of the following *Warranty Disclaimer, Inherent Risks of Use and Limitation of Remedies* are not acceptable, return unopened package at once to the seller for a full refund of purchase price paid. Otherwise, to the extent consistent with applicable law, use by the buyer or any other user constitutes acceptance of the terms under *Warranty Disclaimer, Inherent Risks of Use, and Limitation of Remedies*.

WARRANTY DISCLAIMER

SePRO Corporation warrants that the product conforms to the chemical description on the label and is reasonably fit for the purposes stated on the label when used in strict accordance with the directions, subject to the inherent risks set forth below. TO THE EXTENT CONSISTENT WITH APPLICABLE LAW, SEPRO CORPORATION MAKES NO OTHER EXPRESS OR IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR ANY OTHER EXPRESS OR IMPLIED WARRANTY.

INHERENT RISKS OF USE

It is impossible to eliminate all risks associated with use of this product. Plant injury, lack of performance, or other unintended consequences may result because of such factors as use of the product contrary to label instructions (including conditions noted on the label such as unfavorable temperatures, soil conditions, etc.), abnormal conditions (such as excessive rainfall, drought, tornadoes, hurricanes), presence of other materials, the manner of application, or other factors, all of which are beyond the control of SePRO Corporation or the seller. To the extent consistent with applicable law, all such risks shall be assumed by buyer.

LIMITATION OF REMEDIES

To the extent consistent with applicable law, the exclusive remedy for losses or damages resulting from this product (including claims based on contract, negligence, strict liability, or other legal theories) shall be limited to, at SePRO Corporation's election, one of the following:

- (1) Refund of purchase price paid by buyer or user for product bought, or
- (2) Replacement of amount of product used.

To the extent consistent with applicable law, SePRO Corporation shall not be liable for losses or damages resulting from handling or use of this product unless SePRO Corporation is promptly notified of such losses or damages in writing. In no case shall SePRO Corporation be liable for consequential or incidental damages or losses.

The terms of the *Warranty Disclaimer, Inherent Risks of Use* and this *Limitation of Remedies* cannot be varied by any written or verbal statements or agreements. No employee or sales agent of SePRO Corporation or the seller is authorized to vary or exceed the terms of the *Warranty Disclaimer* or this *Limitation of Remedies* in any manner.

Habitat is a registered trademark of BASF Corporation.
Microfoil is a trademark of Rhone Poulenc Ag Company.
Thru-Valve is a trademark of Waldrum Specialties.

NVA 2011-04-246-0167
 FPL20120613

SePRO Corporation
 11550 N. Meridian St., Ste. 600
 Carmel, IN 46032



Conforms to HazCom 2012/United States

SAFETY DATA SHEET



Habitat Herbicide

Section 1. Identification

GHS product identifier : Habitat Herbicide
Other means of identification : Not available.

EPA Registration No. : 241-426-67690

Relevant identified uses of the substance or mixture

Herbicide

Supplier's details : SePRO Corporation
11550 North Meridian Street
Suite 600
Carmel, IN 46032 U.S.A.
Tel: 317-580-8282
Toll free: 1-800-419-7779
Fax: 317-580-8290
Monday - Friday, 8am to 5pm [E.S.T.](http://www.sepro.com)
www.sepro.com

Emergency telephone number (with hours of operation) : INFOTRAC - 24-hour service 1-800-535-5053

The following recommendations for exposure controls and personal protection are intended for the manufacture, formulation and packaging of this product. For applications and/or use, consult the product label. The label directions supersede the text of this Safety Data Sheet for application and/or use.

Section 2. Hazards identification

According to Regulation 2012 OSHA Hazard Communication Standard; 29 CFR Part 1910.1200

Classification of the product

Skin Corr./Irrit.	1A	Skin corrosion/irritation
Aquatic Acute	1	Hazardous to the aquatic environment – acute
Aquatic Chronic	1	Hazardous to the aquatic environment – chronic

Label Elements**Pictogram:**

Signal Word: Danger

Hazard Statement: Causes severe skin burns and eye damage. Very toxic to aquatic life. Very toxic to aquatic life with long lasting effects.

Precautionary Statements

Prevention: Wear protective gloves/protective clothing/eye protection/face protection. Avoid release to the environment. Do not breathe dust or mist. Wash with plenty of water and soap thoroughly after handling.

Response: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER or doctor/physician. IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Wash with plenty of soap and water. IF INHALED: Remove person to fresh air and keep comfortable for breathing. IF SWALLOWED: Rinse mouth. Do NOT induce vomiting. Collect spillage.

Storage: Store locked up.

Disposal: Dispose of contents/container to hazardous or special waste collection point.

Hazards not otherwise classified**Labeling of special preparations (GHS):**

The following percentage of the mixture consists of component(s) with unknown hazards regarding the acute toxicity: 0 – 1% dermal

The following percentage of the mixture consists of component(s) with unknown hazards regarding the acute toxicity: 0 – 1% oral

The following percentage of the mixture consists of component(s) with unknown hazards regarding the acute toxicity: 0 – 1% inhalation – vapour

The following percentage of the mixture consists of component(s) with unknown hazards regarding the acute toxicity: 0 – 1% inhalation – mist

According to Regulation 1994 OSHA Hazard Communication Standard; 29 CFR Part 1910.1200**Emergency overview**

CAUTION: KEEP OUT OF REACH OF CHILDREN.
Avoid contact with the skin, eyes and clothing.
Avoid inhalation of mists/vapors.

Section 3. Composition/information on ingredients

According to Regulation 2012 OSHA Hazard Communication Standard; 29 CFR Part 1910.1200

CAS Number	Content (W/W)	Chemical name
75-31-0	≥ 3.0 - < 7.0 %	isopropylamine
81-334-34-1	≥ 20.0 - < 25.0%	Imazapyr

According to Regulation 2012 OSHA Hazard Communication Standard; 29 CFR Part 1910.1200

CAS Number	Content (W/W)	Chemical name
81510-83-0	≥ 27.77 - ≤ 27.8% 72.2%	Isopropylamine salt of imazapyr Proprietary ingredients

Section 4. First aid measures

Description of first aid measures

General advice:

First aid providers should wear personal protective equipment to prevent exposure. Remove contaminated clothing. 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 physician for treatment advice. Have the product container or label with you when calling a poison control center or doctor or going for treatment.

First aid personnel should pay attention to their own safety. If the patient is likely to become unconscious, place and transport in stable sideways position (recovery position). Immediately remove contaminated clothing.

If inhaled:

Remove the affected individual into fresh air and keep the person calm. Assist in breathing if necessary. Keep patient calm, remove to fresh air, seek medical attention. Immediately administer a corticosteroid from a controlled/metered dose inhaler.

If on skin:

Rinse skin immediately with plenty of water for 15 - 20 minutes. Immediately wash thoroughly with plenty of water, apply sterile dressings, consult a skin specialist.

If in eyes:

Hold eyes open and rinse slowly and gently with water for 15 to 20 minutes. Remove contact lenses, if present, after first 5 minutes, then continue rinsing. Immediately wash affected eyes for at least 15 minutes under running water with eyelids held open, consult an eye specialist.

If swallowed:

Have person sip a glass of water if able to swallow. Do not induce vomiting unless told to by a poison control center or doctor. Never induce vomiting or give anything by mouth if the victim is unconscious or having convulsions. Do not induce vomiting. Immediately rinse mouth and then drink 200-300 ml of water, seek medical attention.

Most important symptoms and effects, both acute and delayed

Symptoms: No significant reaction of the human body to the product known.

**Indication of any immediate medical attention and special treatment needed**Note to physician

Treatment: Treat according to symptoms (decontamination, vital functions), no known specific antidote.

Section 5. Fire-fighting measures**Extinguishing media**

Suitable extinguishing media: Foam, dry powder, carbon dioxide, water spray

Special hazards arising from the substance or mixture

Hazards during fire-fighting: carbon monoxide, carbon dioxide, nitrogen oxide, nitrogen dioxide, Hydrocarbons, If product is heated above decomposition temperature, toxic vapours will be released. The substances/groups of substances mentioned can be released if the product is involved in a fire.

Advice for fire-fighters

Protective equipment for fire-fighting: Firefighters should be equipped with self-contained breathing apparatus and turn-out gear.

Further information

Evacuate area of all unnecessary personnel. Contain contaminated water/firefighting water. Do not allow to enter drains or waterways.

Section 6. Accidental release measures**Personal precautions**

Take appropriate protective measures. Clear area. Shut off source of leak only under safe conditions. Extinguish sources of ignition nearby and downwind. Ensure adequate ventilation. Wear suitable personal protective clothing and equipment.

Environmental precautions

Do not discharge into the subsoil/soil. Do not discharge into drains/surface waters/groundwater. Contain contaminated water/firefighting water.

Methods and material for containment and cleaning up

Dike spillage. Pick up with suitable absorbent material. Place into suitable containers for reuse or disposal in a licensed facility. Spilled substance/product should be recovered and applied according to label rates whenever possible. If application of spilled substance/product is not possible, then spills should be contained, solidified, and placed in suitable containers for disposal. After decontamination, spill area can be washed with water. Collect wash water for approved disposal.

Section 7. Handling and storage**Precautions for safe handling**

RECOMMENDATIONS ARE FOR MANUFACTURING, COMMERCIAL BLENDING, AND PACKAGING WORKERS. PESTICIDE APPLICATORS & WORKERS must refer to the Product Label and Directions for Use attached to the product for Agricultural Use Requirements in accordance with the EPA Worker Protection Standard 40 CFR part 170. Ensure adequate ventilation. Provide good ventilation of working area (local exhaust ventilation if necessary). Keep away from sources of ignition - No smoking. Keep container tightly sealed. Protect contents from the effects of light. Protect against heat. Protect from air. Handle and open container with care. Do not open until ready to use. Once container is opened, content should be



used as soon as possible. Avoid aerosol formation. Avoid dust formation. Provide means for controlling leaks and spills. Do not return residues to the storage containers. Follow label warnings even after container is emptied. The substance/product may be handled only by appropriately trained personnel. Avoid all direct contact with the substance/product. Avoid contact with the skin, eyes and clothing. Avoid inhalation of dusts/mists/vapors. Wear suitable personal protective clothing and equipment.

Protection against fire and explosion:

The relevant fire protection measures should be noted. Fire extinguishers should be kept handy. Avoid all sources of ignition: heat, sparks, open flame. Sources of ignition should be kept well clear. Avoid extreme heat. Keep away from oxidizable substances. Electrical equipment should conform to national electric code. Ground all transfer equipment properly to prevent electrostatic discharge. Electrostatic discharge may cause ignition.

Conditions for safe storage, including any incompatibilities

Segregate from incompatible substances. Segregate from foods and animal feeds. Segregate from textiles and similar materials.

Further information on storage conditions: Keep only in the original container in a cool, dry, well-ventilated place away from ignition sources, heat or flame. Protect containers from physical damage. Protect against contamination. The authority permits and storage regulations must be observed.

Protect from temperature below: 0 °C

Changes in the properties of the product may occur if substance/product is stored below indicated temperature for extended periods of time.

Protect from temperatures above: 40 °C

Changes in the properties of the product may occur if substance/product is stored above indicated temperature for extended periods of time.

Section 8. Exposure controls/personal protection

Users of a pesticidal product should refer to the product label for personal protective equipment requirements.

Components with workplace control parameters

isopropylamine	OSHA PEL	PEL 5 ppm 12 mg/m ³ ; STEL value 10 ppm
	ACGIH TLV	24 mg/m ³ ; TWA value 5 ppm 12 mg/m ³ TWA value 5 ppm; STEL value 10 ppm

Advice on system design:

Whenever possible, engineering controls should be used to minimize the need for personal protective equipment.

Personal protective equipment

RECOMMENDATIONS FOR MANUFACTURING, COMMERCIAL BLENDING, AND PACKAGING WORKERS:

Respiratory protection:

Wear respiratory protection if ventilation is inadequate. Wear a NIOSH-certified (or equivalent) TC23C Chemical/Mechanical type filter system to remove a combination of particles, gas and vapours. For situations where the airborne concentrations may exceed the level for which an air purifying respirator is effective, or where the levels are unknown or Immediately Dangerous to Life or Health (IDLH), use NIOSH-certified full face piece pressure demand self-contained breathing apparatus (SCBA) or a full facepiece pressure demand supplied-air respirator (SAR) with escape provisions.

Hand protection:

Chemical resistant protective gloves, Protective glove selection must be based on the user's assessment of the workplace hazards.



Eye protection:	Safety glasses with side-shields. Tightly fitting safety goggles (chemical goggles). Wear face shield if splashing hazard exists.
Body protection:	Body protection must be chosen depending on activity and possible exposure, e.g. head protection, apron, protective boots, chemical-protection suit.
General safety and hygiene measures:	Wear long sleeved work shirt and long work pants in addition to other stated personal protective equipment. Work place should be equipped with a shower and an eye wash. Handle in accordance with good industrial hygiene and safety practice. Personal protective equipment should be decontaminated prior to reuse. Gloves must be inspected regularly and prior to each use. Replace if necessary (e.g. pinhole leaks). Take off immediately all contaminated clothing. Store work clothing separately. Hands and/or face should be washed before breaks and at the end of the shift. No eating, drinking, smoking or tobacco use at the place of work. Keep away from food, drink and animal feeding stuffs.

Section 9. Physical and chemical properties

Form:	liquid
Odor:	ammonia-like, faint odor
Odor threshold:	not applicable, odor not perceivable
Color:	blue, clear
pH value:	6.6 – 7.2
Freezing point:	approx. 0 °C (1,013.3 hPa) Information applies to the solvent.
Boiling point:	approx. 100 °C (1,013.3 hPa) Information applies to the solvent.
Flash point:	A flash point determination is unnecessary due to the high water content.
Flammability:	not applicable
Lower explosion limit:	As a result of our experience with this product and our knowledge of its composition we do not expect any hazard as long as the product is used appropriately and in accordance with the intended use.
Upper explosion limit:	As a result of our experience with this product and our knowledge of its composition we do not expect any hazard as long as the product is used appropriately and in accordance with the intended use.
Autoignition:	Based on the water contents the product does not ignite.
Vapor pressure:	approx. 23.3 hPa (20 °C) Information applies to the solvent. < 100 hPa (50 °C) Information applies to the solvent.
Density:	1.04 – 1.09 g/ml
Vapor density:	not applicable
Partitioning coefficient	not applicable

n-octanol/water (log Pow):

Thermal decomposition:	carbon monoxide, carbon dioxide, nitrogen oxide. Stable at ambient temperature. If product is heated above decomposition temperature toxic vapors may be released. If product is heated above decomposition temperature hazardous fumes may be released.
Viscosity, dynamic:	approx. 26.3 mPa.s (20 °C) approx. 15.8 mPa.s (40 °C)
Solubility in water:	miscible
Molar mass:	320.4 g/mol
Evaporation rate:	not applicable
Other information:	If necessary, information on other physical and chemical parameters is indicated in this section.

Section 10. Stability and reactivity

Reactivity	No hazardous reactions if stored and handled as prescribed/indicated.
Corrosion to metals:	Corrosive effects on: mild steel brass
Oxidizing properties:	Not an oxidizer.
Chemical stability	The product is stable if stored and handled as prescribed/indicated.
Possibility of hazardous reactions	The product is chemically stable.
Conditions to avoid	Avoid all sources of ignition; heat, sparks, open flame. Avoid prolonged storage. Avoid electro-static discharge. Avoid contamination. Avoid prolonged exposure to extreme heat. Avoid extreme temperatures.
Incompatible materials	Oxidizing agents, reducing agents
Hazardous decomposition products	
Decomposition products:	Hazardous decomposition products: No hazardous decomposition products if stored and handled as prescribed/indicated. Prolonged thermal loading can result in products of degradation being given off.
Thermal decomposition:	
Possible thermal decomposition products:	carbon monoxide, carbon dioxide, nitrogen oxide Stable at ambient temperature. If product is heated above decomposition temperature toxic vapors may be released. If product is heated above decomposition temperature hazardous fumes may be released.

Section 11. Toxicological information

Primary routes of exposure Routes of entry for solids and liquids are ingestion and inhalation, but may include eye or skin contact. Routes of entry for gases include inhalation and eye contact. Skin contact may be a route of entry for liquefied gases.

Acute Toxicity/Effects

Acute toxicity Assessment of acute toxicity: Relatively nontoxic after single ingestion. Slightly toxic after short-term skin contact. Relatively nontoxic after short-term inhalation.

Information on: isopropylamine *Assessment of acute toxicity: of high toxicity after single ingestion. Of pronounced toxicity after short-term inhalation. Of pronounced toxicity after short-term skin contact.*

Product/ingredient name	Result	Species	Dose	Exposure
Habitat	LC50 Inhalation Vapor	Rat	>5.3 mg/L	4 hours
	LD50 Dermal	Rabbit	>2000 mg/kg	-
	LD50 Oral	Rat	>5000 mg/kg	-

Irritation / corrosion

Assessment of irritating effects: May cause slight but temporary irritation to the eyes. May cause slight irritation to the skin.

Information on: isopropylamine *Assessment of irritating effects: Highly corrosive! Damages skin and eyes. Causes temporary irritation of the respiratory tract.*

Product/ingredient name	Result	Species	Score	Exposure	Observation
Habitat	Eyes – non-irritating	Rabbit	-	-	-
	Skin – Slightly irritating	Rabbit	-	-	-

Sensitization

Assessment of sensitization: Skin sensitizing effects were not observed in animal studies.

Sensitization

Species: guinea pig: Skin sensitizing effects were not observed in animal studies.

Chronic Toxicity/Effects

Repeated dose toxicity Assessment of repeated dose toxicity: The product has not been tested. The statement has been derived from the properties of the individual components. No substance-specific organotoxicity was observed after repeated administration to animals.

Genetic toxicity

Assessment of mutagenicity. The product has not been tested. The statement has been derived from the properties of the individual components. Mutagenicity tests revealed no genotoxic potential.

Carcinogenicity

Assessment of carcinogenicity: The product has not been tested. The statement has been derived from the properties of the individual components. The results of various animal studies gave no indication of a carcinogenic effect.

Reproductive toxicity

Assessment of reproduction toxicity: The product has not been tested. The statement has been derived from the properties of the individual components. The results of animal studies gave no indication of a fertility impairing effect.

Teratogenicity

Assessment of teratogenicity: The product has not been tested. The statement has



been derived from the properties of the individual components. Animal studies gave no indication of a developmental toxic effect at doses that were not toxic to the parental animals.

Other Information

Misuse can be harmful to health.

Symptoms of Exposure

No significant reaction of the human body to the product known.

Medical conditions aggravated by overexposure

Data available do not indicate that there are medical conditions that are generally recognized as being aggravated by exposure to this substance/product. See MSDS section 11 – Toxicological information.

Section 12. Ecological information

Toxicity

Aquatic toxicity

Assessment of aquatic toxicity:

There is a high probability that the product is not acutely harmful to fish. There is a high probability that the product is not acutely harmful to aquatic invertebrates. Acutely harmful for aquatic plants.

Aquatic toxicity

Information on: Imazapyr

Assessment of aquatic toxicity:

There is a high probability that the product is not acutely harmful to aquatic organisms.

Toxicity to fish

Information on: Imazapyr

*LC50 (96 h) >100PPM, Oncorhynchus mykiss (static)
LC50 (96 h) >100 ppm, Lepomis macrochirus (static)*

Aquatic invertebrates

Information on: Imazapyr

EC50 (24 h) > 100 ppm, Daphnia magna

Aquatic plants

Information on: Imazapyr

*EC50 (96 h) >1 ppm, Selenastrum capricornutum (static)
EC50 (14 d) 24, Lemna gibba*

Assessment of terrestrial toxicity

With high probability not acutely harmful to terrestrial organisms.

Other terrestrial non-mammals

Information on: imazapyr

*LC50, Anas platyrhynchos
With high probability not acutely harmful to terrestrial organisms.
LD50 > 100 ug/bee, Apis mellifera
With high probability not acutely harmful to terrestrial organisms.*

Persistence and degradability

Assessment biodegradation and elimination (H2O)

The product has not been tested. The statement has been derived from the properties of the individual components.

Elimination information

Not readily biodegradable (by OECD criteria).



Bioaccumulative potential

Assessment bioaccumulation potential The product has not been tested. The statement has been derived from the properties of the individual components.

Assessment bioaccumulation potential
Information on: Imazapyr Does not accumulate in organisms.

Mobility in soil

Assessment transport between environmental compartments The product has not been tested. The statement has been derived from the properties of the individual components.

Information on: Imazapyr The substance will not evaporate into the atmosphere from the water surface. Following exposure to soil, the product trickles away and can - dependant on degradation – be transported to deeper soil areas with larger water loads.

Additional information

Other ecotoxicological advice: The ecological data given are those of the active ingredient. Do not release untreated into natural waters.

Section 13. Disposal considerations

Waste disposal of substance: Pesticide wastes are regulated. Improper disposal of excess pesticide, spray mix or rinsate is a violation of federal law. If pesticide wastes cannot be disposed of according to label instructions, contact the State Pesticide or Environmental Control Agency or the Hazardous Waste representative at the nearest EPA Regional Office for guidance.

Container disposal: Rinse thoroughly at least three times (triple rinse) in accordance with EPA recommendations. Consult state or local disposal authorities for approved alternative procedures such as container recycling. Recommend crushing, puncturing or other means to prevent unauthorized use of used containers.

RCRA: This product is not regulated by RCRA.

Section 14. Transport information

Land transport
USDOT

Not classified as a dangerous good under transport regulations

Sea transport
IMDG

Hazard class: 9
Packing group: III
ID number: UN 3082
Hazard label: 9, EHS
Marine pollutant: YES
Proper shipping name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (contains SOLVENT NAPHTHA)

**Air transport**

IATA/ICAO

Hazard class: 9

Packing group: III

ID number: UN 3082

Hazard label: 9, EHS

Proper shipping name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.
(contains SOLVENT NAPHTHA)**Section 15. Regulatory information****Federal Regulations****Registration status:**

Chemical TSCA, US blocked / not listed

Crop Protection TSCA, US released / exempt

OSHA hazard category: IARC 1, 2A or 2B carcinogen; NTP listed carcinogen; Chronic target organ effects reported; ACGIH TLV established; Combustible Liquid**EPCRA 311/312 (Hazard categories):** Acute; Chronic**State regulations****CA Prop. 65:** There are no listed chemicals in this product.**NFPA Hazard codes:** Health : 1 Fire: 1 Reactivity: 1 Special:**Labeling requirements under FIFRA**

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 workplace labels of non-pesticide chemicals. Following is the hazard information as required on the pesticide label.

CAUTION: KEEP OUT OF REACH OF CHILDREN.

Avoid contact with the skin, eyes and clothing. Avoid inhalation of mists/vapours.

Section 16. Other information**SDS Prepared by:**

SePRO Corporation

SDS Prepared on: 05/13/15

Notice to reader

To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein. Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.



Liberate®



**PENETRANT • DEPOSITION AID
DRIFT CONTROL AGENT**

Principal Functioning Agents:

Lecithin, methyl esters of fatty acids, and alcohol ethoxylate.....	100%
TOTAL	100%

CA Reg. No. 34704-50030; WA Reg. No. 34704-04008
Patent No. 6,797,673

KEEP OUT OF REACH OF CHILDREN



WARNING

Precautionary Statements: May be harmful in contact through skin. Harmful if inhaled. Causes eye irritation. Wash hands thoroughly after handling. Use only outdoors or in a well-ventilated area. Avoid breathing dust/fume/gas/mist/vapors/spray. Avoid release to the environment. **Environmental Precautions:** Prevent further leakage or spillage if safe to do so. Do not contaminate water. Do not allow to enter drains, sewers, or watercourses.

Personal Protective Equipment: Wear protective gloves and eye/face protection.

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 eye. 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 a person sip a glass of water if able to swallow. Do not induce vomiting unless told to do so by the poison control center or doctor. 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 an ambulance, then give artificial respiration, preferably by mouth-to-mouth, if possible. Call a poison control center or doctor for further treatment advice.

FOR A MEDICAL EMERGENCY INVOLVING THIS PRODUCT CALL: 1-866-944-8565.

Have the product container or label with you when calling a poison control center or doctor, or going for treatment.

GENERAL: LIBERATE® is a non-ionic, low foam penetrating surfactant. LIBERATE may be used as a surfactant to enhance the activity and effectiveness of agricultural and industrial chemicals. LIBERATE provides more uniform coverage of spray solutions and aids in penetration. LIBERATE improves deposition and retards drift by producing a more uniform spray pattern. The degree of drift hazard varies with the type of pesticide and application conditions. Common sense and sound application technology must be followed when spraying pesticides. LIBERATE will retard, but not eliminate drift. LIBERATE is compatible with most pesticide formulations including water-soluble, flowable and wettable powders. For tank mix compatibility concerns, conduct a jar test of the proposed mixture to ensure compatibility of all components. Mix components in the same ratio as the proposed tank mix. Application may be by ground or air.

DIRECTIONS FOR USE: LIBERATE may be used on and has demonstrated excellent plant safety on a wide variety of crops including fruits, tree fruits, vegetables, row crops, citrus, small grains, forage crops, vine crops and others. LIBERATE may be used in a variety of non-crop sites including Aquatic (wetlands), Forestry (site preparation and release), Industrial (storage areas, plant sites, and other similar areas including governmental and private lands), Grasslands (including pastures, rangeland and fence rows), Rights-of-way (utility, railroad and roadsides), Turf (Golf Courses, parks, and Sod farms), Ornamentals (container, field or greenhouse) and other turf, ornamental and landscaping sites. Some pesticides have stated adjuvant use rates. In all cases, the pesticide manufacturer's label should be consulted regarding specific adjuvant use recommendations and that rate followed. Do not add adjuvant at a level that would exceed 5% of the finished spray volume unless otherwise specified by the pesticide label.

GENERAL USE:

Herbicides (Terrestrial or Aquatic), Defoliants, Desiccants: 1 to 4 pints per 100 gallons of spray mixture when used as a penetrant.

Insecticides, Fungicides, Acaricides, Plant Growth Regulators, Foliar Nutrients: ½ to 2 pints per 100 gallons of spray mixture.

Drift Reduction: 1 to 2 quarts per 100 gallons of spray mixture.

Non Crop Sites: 1 to 8 pints per 100 gallons (1 to 6 fluid ounces per 5 gallons) of spray mixture.

Turf and Ornamentals: ½ to 2 pints per 100 gallons (1/2 to 1-1/2 fluid ounces per 5 gallons) of spray mixture.

Note: This product has demonstrated excellent plant safety; however, not all species and varieties of plants have been tested. Before treating a large area, test on a small area and observe prior to full-scale application. **Do not use on pears.**

Environmental Hazards: Do not contaminate water when cleaning equipment or disposing of equipment washwaters.

STORAGE AND DISPOSAL

STORAGE: Store in a cool, dry place. Store in original container. Keep tightly closed. Do not reuse empty container. Product will become thicker at cold temperatures but effectiveness of the product will not be affected. Warm product before use.

DISPOSAL: Do not contaminate water, food or feed by storage or disposal. Dispose of contents/container on-site or at an approved waste disposal facility. Triple rinse (or equivalent) adding rinse water to spray tank. Offer container for recycling or dispose of container in sanitary landfill, or by other procedures approved by appropriate authorities. Recycling decontaminated containers is the best option of container disposal. The Agricultural Container Recycling Council (ACRC) operates the national recycling program. To contact your state and local ACRC recycler, visit the ACRC web page at www.acrcycle.org.

For help with any spill, leak, fire or exposure involving this material, call day or night CHEMTREC 1-800-424-9300.

CONDITIONS OF SALE AND LIMITATION OF WARRANTY AND LIABILITY

BEFORE BUYING OR USING THIS PRODUCT, read the Directions for Use and the following Conditions of Sale and Limitation of Warranty and Liability. By buying or using this product, the buyer or user accepts the following Conditions of Sale and Limitation of Warranty and Liability, which no employee or agent of LOVELAND PRODUCTS, INC. or the seller is authorized to vary. LOVELAND PRODUCTS, INC. warrants that this product conforms to the chemical description on the label and is reasonably fit for the purposes stated in the Directions for Use, when the product is used in accordance with such Directions for Use under normal conditions of use. LOVELAND PRODUCTS, INC. MAKES NO OTHER WARRANTY, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. THE BUYER'S OR USER'S EXCLUSIVE REMEDY FOR ANY INJURY, LOSS, OR DAMAGE RESULTING FROM THE HANDLING OR USE OF THIS PRODUCT SHALL BE LIMITED TO ONE OF THE FOLLOWING, AT THE ELECTION OF LOVELAND PRODUCTS, INC. OR THE SELLER: DIRECT DAMAGES NOT EXCEEDING THE PURCHASE PRICE OF THE PRODUCT OR REPLACEMENT OF THE PRODUCT. LOVELAND PRODUCTS, INC. AND THE SELLER SHALL NOT BE LIABLE TO THE BUYER OR USER OF THIS PRODUCT FOR ANY CONSEQUENTIAL, SPECIAL, OR INDIRECT DAMAGES, OR DAMAGES IN THE NATURE OF A PENALTY.

LIBERATE® and LECI-TECH® are registered trademarks of Loveland Products, Inc.

NET CONTENTS.

30 GAL. (113.55 L)

275 GAL. (1040.87 L)

_____ GAL. (_____ L)

Attachment 3: Aquatic Pesticide Application Log

Part 1: Pre-Application Evaluation	
Date Nuisance Condition Observed:	
Describe Nuisance Condition or Attach Photographs:	
Briefly Describe Factors Influencing Decision to Use Pesticides:	
Completed by:	
Part 2: Implementation	
Date of Application:	
Location of Application:	
Name of Applicator:	
Type and Amount of Each Pesticide Used:	
Application Detail¹:	
Part 3: Applicator's Certification	
I have followed the Aquatic Pesticide Application Plan for the El Dorado Park Lakes:	
Signature of Applicator:	Date:

1. For example, time application started and stopped; pesticide application rate and concentrations; and, other pertinent comments

Attachment 4: Sampling and Analysis Plan

Monitoring, Sampling and Reporting Plan

El Dorado Park Lakes
City of Long Beach, CA

Aquatic Pesticides Application Plan

General Permit No. CAG990005

April 13, 2016

Revision 2.2



City of Long Beach
Department of Parks, Recreation & Marine
7600 E. Spring Street
Long Beach, CA 90815

Table of Contents

	Page
1.0 Introduction.....	1
2.0 Water Column Sampling Procedure	2
2.1 Sampling Locations	2
2.2 Field Sampling Kit.....	2
2.3 Sampling Frequency	3
2.4 Sampling Procedures	3
2.5 Field Parameter Analysis	4
2.6 Sample Analysis.....	5
2.6.1 Habitat [®] Analytical Method.....	5
2.6.2 Reward [®] Analytical Method.....	5
2.6.3 Aquamaster [®] Analytical Method.....	5
2.6 Equipment Decontamination	6
Prevention of Sample Contamination and Degradation.....	6
2.7 Receiving Water Limitation.....	6
3.0 Annual Sediment Sampling	6
3.1 Sample Locations.....	7
3.2 Sample Containers	7
3.3 Sampling Procedure	7
3.3.1 Sediment Sampling.....	7
3.3.2 Water Sampling For Hardness Analysis.....	7
3.4 Labeling and Chain-of Custody Requirements.....	8
3.5 Field Visual Observations.....	8
4.0 Reporting.....	8
4.1. Annual Monitoring Report.....	8
4.2 Certification	9
4.3 Signatory Requirements.....	9
4.4 Annual Report Elements.....	9
4.5 Record Retention	10
5.0 24-Hour and 5-Day Reporting of Non-compliance	11

Figures

Figure 1	Aerial Photograph of Northern Lakes
Figure 2	Aerial Photograph Nature Center Lakes
Figure 3	Example Aerial Photograph Sample Location Map
Figure 4	Sediment Sampling Locations Map South Nature Center Lake
Figure 5	Sediment Sampling Locations Map North Nature Center Lake

Attachments

Attachment A	Representative Chain-of-Custody Form
Attachment B	Water Column Sampling Form
Attachment C	Sediment Sampling Form

**Monitoring and Reporting Plan
El Dorado Park Lakes
City of Long Beach, CA**

**April 13, 2016
Revision 2.1**

1.0 Introduction

This Monitoring and Reporting Plan is prepared for the application of Aquatic Pesticides at the City of Long Beach El Dorado Park Lakes. The El Dorado Park Lakes consist of six lakes ("Lakes") divided into 2 geographically separate areas. There are four lakes north of E. Spring Street ("Northern Lakes") and two lakes ("Nature Center Lakes") south of E. Spring Street. The southern lakes are commonly referred to as the Nature Center Lakes because the park's Nature Center is located there. The northern lakes are known as Horseshoe Lake, North Lake, Alamo Lake and Coyote Lake. Aerial photographs showing the lakes are enclosed as Figure 1 and Figure 2.

There six limited-flow, shallow, lined engineered, impoundments constructed *circa* 1960 on the San Gabriel River flood plain. These impoundments are not connected hydraulically via surface water to the San Gabriel River or Coyote Creek. The four Northern Lakes are interconnected hydraulically; however, they are not connected hydraulically with the two southern Nature Center Lakes. The Nature Center Lakes are interconnected by the use of a recirculation system.

In order to control aquatic vegetation and algae at the City of Long Beach El Dorado Park Lakes, aquatic pesticides ("APs") are used. The APs include copper-, diquat- and glyphosate-based formulations. The application frequency of these APs is determined by growth of the aquatic vegetation and algae, which, in turn, are weather dependent. The application season typically begins in May and ends in October. Depending on the weather, it is not unusual for APs to be applied five to six times during the calendar year.

Historically, APs have not been applied at the North Nature Center Lake, and there are no anticipations that future applications will occur at this lake. However, depending on the weather and aquatic growth, including algae, APs could be used at the North Nature Center Lake.

APs are not applied over the surface of the entire lake. Typically, the application area is approximately 1/3 or less of the surface area of the lake. All mixing, storage, application and decontamination operations are overseen by a person possessing a Qualified Applicator Certificate with an Aquatic Certification issued by the California Department of Pesticide Regulation in compliance with the Los Angeles County Agricultural Commissioner ("CAC") notification and reporting requirements.

As required by regulation, the Los Angeles County Agricultural Commission is notified prior to each use of "Restricted Material" pesticides and approves the use of such Restricted Materials by

the Qualified Applicator. Reports of pesticide use are prepared and submitted to the control agencies as required.

This APAP is submitted as required in order to apply APs to the waters of the State of California under Water Quality Order No. 2013-0002 DWQ, General Permit No. CAG990005 ("General Permit").

2.0 Water Column Sampling Procedure

2.1 Sampling Locations

2.1.1 Lakes and Ponds

The area of each lake or Pond where AP is to be applied is variable; however, no more than 1/3 of the lake's surface will be treated during any one application. As such, it is not possible to have dedicated sampling locations.

Prior to application of AP, the Park Maintenance Supervisor or designee will determine the area to be treated with AP. The area to be treated will be drawn on a scaled aerial photograph of the lake(s) and the square footage and volume of water to be treated determined. Two sample locations (two locations at each lake to be treated if multiple lakes are treated) will be chosen for water column sampling. These sampling locations will be added to the aerial photograph. Background Monitoring samples and Post-Event Monitoring samples will be taken at the same locations and depth.

Prior to sampling, the sampling location's latitude and longitude (GPS Coordinates) will be obtained using a handheld GPS unit.

An example of an aerial photograph is attached as Figure 3.

2.1.2 Habitat® Compliance Sampling Point

Unlike the other APs, Habitat® has a monitoring trigger and will be sampled at the point of compliance for the discharge. The compliance point is the location at which the lake or pond water is discharged into the San Gabriel River or Coyote Creek at the time of release.

2.2 Field Sampling Kit

Each field sampling kit will contain the following equipment:

- Appropriate sampling container as provided by certified lab
- COC's
- Field collection forms
- Sample i.d. labels

- Deionized water
- Cooler or ice chest
- Ice packs
- Sub surface sampler
- Non powdered plastic or nitrile gloves
- GPS for sampling location collection
- Plastic storage bags for samples and or paperwork

2.3 Sampling Frequency

For each application of AP, three water column sampling events will occur, with two water column samples taken from the background zone, treatment zone and post-treatment application zones (six water column samples per AP application event).

Since the lakes are quiescent, background zone (Background Monitoring) water column samples will be obtained from the application area within 24 hours prior to the application of the AP.

Following the application of the AP, Event Monitoring water column samples will be obtained approximately 5 feet from the edge of the AP treatment zone between 60 and 90 minutes following the application of the AP. The treatment zone typically extends 5 to 10 feet from the edge of the AP application area.

Within seven (7) days of the AP application, Post-Event Monitoring will commence with the taking of water column samples from the application area at the same locations as the Background Monitoring samples.

2.4 Sampling Procedures

After obtaining the GPS coordinates for the sampling location (or maneuvering to the background sample location), water column samples will be taken at 3 feet below the surface or mid-depth if the sample location is less than 6 feet in depth.

Unfiltered samples of the water column will be obtained by the use of a peristaltic pump. New sections of silicon tubing will be used at each sample location. New polyethylene tubing will be attached to the peristaltic pump, the other end lowered to the sampling depth and the peristaltic pump activated. A minimum of 3 tubing volumes will be purged prior to samples being taken for field parameter analysis.

A pre-cleaned or new glass jar will be filled¹ with the water column sample and analyzed for the field parameters described in Section 2.3.

¹ The discharge rate of water to the sample jar must be slow enough that the water sample is not aerated.

Pre-cleaned sample containers for active ingredient and nonylphenoethoxylate analysis will be supplied by the certified laboratory and will consist of 1-liter amber glass or plastic bottles. A laboratory-supplied pre-cleaned 500 milliliter plastic bottle will be used to collect water column samples for hardness analysis.

Following the field parameter analysis, sampling of the water column sample for pesticide or copper analysis will commence. Immediately following sample collection, the filled sample containers will be labeled, sealed into plastic zip-lock bags and placed in a cooler containing ice or blue ice.

All sample containers will be properly labeled. The information entered on each label will include the following:

- Project name
- Sample identification
- Project Manager
- Date and time of sampling
- Analysis to be performed
- Preservatives used

Standard Chain-of-Custody procedures will be maintained on all samples. The Chain-of-Custody Record with a request for analysis will be initiated in the field by sampling personnel. Each time responsibility for custody of the samples changes, the receiving and relinquishing custodians will sign the record and enter the date and time of transfer of the samples. The laboratory will sign for the receipt of the samples and return a copy of the Chain-of-Custody Record. A copy of the Chain-of-Custody, which also serves as the sample request form, is enclosed as Attachment A.

2.5 Field Parameter Analysis

Each time a water column sample is taken, the following visual observations are to be conducted and the results entered on the Water Column Sampling Data Log. An example is included as Attachment B.

- Date, time and name of person performing the observations
- Site designation and percentage estimate of percent covered by vegetation/algae
- Appearance of waterway (sheen, color, clarity, etc.)
- Weather conditions (fog, rain, wind, etc)

Once the field parameter water column sample has been obtained, it will be analyzed as quickly as possible using portable field instruments for the following parameters:

- Temperature
- Turbidity
- Electrical conductivity/salinity

- pH
- Dissolved oxygen

The results of this testing will be entered on the Water Column Sampling Data Log Form, along with the name of the person conducting the testing, the make, model and calibration date of the field instrument and the time of field testing.

2.6 Sample Analysis

All laboratory analyses will be conducted by a laboratory certified for such analyses by the California Department of Health Services. All analyses shall be conducted in accordance with the latest edition of "Guidelines Establishing Test Procedures for Analysis of Pollutants (Guidelines) 40 CFR part 136. Hardness will be determined by calculation or titration method. Methods for the active ingredients in APs used at El Dorado Park and El Dorado Park West are summarized below:

Analyte	Active Ingredient	EPA Method	Reporting Limit	Hold Time (Days)	Container	Chemical Preservation
Nonylphenol	Same as Analyte	550.1m	0.5 µg/L	7	2 x 40 mL VOA	None
Citrine Plus®	chelated copper	6010B	0.005 µg/L	28	1 L HDPE	None
Reward®	diquat	549	40 µg/L	14	500 mL Amber Glass	H ₂ SO ₄
Aquamaster®	glyphosate	547	0.5 µg/L	14	2 x 40 mL VOA	None
Habitat®	imazapyr	532m	100 µg/L	14	1 L Amber Glass	None

2.6.1 Habitat® Analytical Method

The active ingredient in Habitat® is the isopropylamine salt of imazapyr (CAS 81510-83-0). It is an imidazolinone herbicide. The analytical method to be used on water column samples is USEPA Method 532m. Note: The half-life of imazapyr due to photodegradation in aqueous solution is approximately two days (Mallipudi et al. 1991, Mangels 1991a).

2.6.2 Reward® Analytical Method

The active ingredient in Reward® AP is diquat [(1,1'-ethylene-2,2'-bipyridilium dibromide salt, CAS 85-00-7). The diquat analytical method to be used on water column samples is USEPA Method 549.2.

2.6.3 Aquamaster® Analytical Method

The active ingredient in Aquamaster® is glyphosate [N-(phosphonomethyl)glycine isopropylamine salt, CAS 1071-83-6]. The surfactant Target Pro Spreader is used in conjunction with Aquamaster® use. Nonylphenoethoxylate is an ingredient in Target Pro Spreader. The Nonylphenoethoxylate's analytical method to be used on water column samples is USEPA Method 3535 Liquid Chromatograph-Fluorescence.

2.6.4 Citrine Plus® Analytical Method

Citrine Plus[®] is a copper-based aquatic pesticide. The analytical method to be used on water column samples for copper analysis is USEPA Method 200.7. In addition to copper analysis, the water column sample will also be analyzed for hardness using EPA Method 2340.

2.6 Equipment Decontamination

Prevention of Sample Contamination and Degradation

Specific measures to reduce risk of cross-contamination are listed below:

- All equipment that comes in contact with the sediment or water column will be new or decontaminated to prevent the introduction of contaminants into samples from the sampling equipment or other samples;
- Nitrile gloves will be worn during sampling;
- The discrete depth sampling device will be rinsed three times with water from the sampling site before retaining the sample;
- Silicon tubing and the 0.45 micron disposable filter for the peristaltic pump will be used for one application event for that day only, then replaced or thoroughly decontaminated before future use; and,
- Samples will be kept out of the sun and stored in a cooler with ice packs at 4°C.

2.7 Receiving Water Limitation

The following water column concentrations for aquatic pesticides and Nonylphenoethoxylate shall not be exceeded in water column samples:

Diquat – 20 µg/L
Copper² - 8.22 µg/L
Glyphosate – 700 µg/L
Nonylphenoethoxylate – 6.6 µg/L

The mean dissolved oxygen shall be maintained at or above 7 mg/L and no single measurement shall be less than 5.0 mg/L, except when natural conditions cause lesser concentrations.

There is no receiving water limitation for imazapyr. The monitoring trigger is 11.2 mg/L.

3.0 Annual Sediment Sampling

The Nature Center Lakes are required by Cleanup and Abatement Order No. 2012-003 to conduct annual sediment sampling for copper analysis due to exceedences of the developed

² Based on the average of 12 hardness samples taken in May 2014.

TMDL for copper in the lakes. Samples will be selected for toxicity testing based on the results of the copper analysis.

3.1 Sample Locations

Sediment will be sampled at six locations at each of the Nature Center Lakes. The approximate locations of the sampling points are shown on Figures 4 and 5.

3.2 Sample Containers

The sediment samples will be retained in pre-cleaned capped and Teflon sheet 4 ounce glass as described in Section 3.3.1. A laboratory-supplied pre-cleaned 500 milliliter plastic bottle will be used to collect water column samples for hardness analysis.

3.3 Sampling Procedure

Great care must be taken when taking sediment samples because the bottom of the lakes contain a constructed clay liner one foot thick. This clay liner cannot be punctured.

Prior to sampling, the sampling location's latitude and longitude (GPS Coordinates) will be obtained using a handheld GPS unit.

3.3.1 Sediment Sampling

Sediment samples will be obtained using a core barrel equipped with a pre-cleaned acetate sleeve that is approximately two inches in diameter by six inches long. The end of the core barrel will be equipped with a sediment egg catcher to retain the collected sample.

Upon retrieval, the sediment in the acetate sleeve will be removed and placed into the 4 ounce glass jars and half-gallon glass jars (toxicity testing). The sample bottles will be capped with a Teflon lid, labeled and packed for transport to the laboratory as described in the following sections.

3.3.2 Water Sampling For Hardness Analysis

Grab sample of the lake's water approximately 6 inches below the water's surface will be obtained for hardness analysis. The sample bottle will be inverted, submerged to the 6-inch depth and slowly filled with minimal aeration. Once full, the sample bottle will be capped with a Teflon lid, labeled and packed for transport to the laboratory as described in the following sections.

3.4 Labeling and Chain-of Custody Requirements

Immediately following sample collection, the filled sample containers will be labeled, sealed into plastic zip-lock bags and placed in a cooler containing ice or blue ice.

All sample containers will be properly labeled. The information entered on each label will include the following:

- Project name
- Sample identification
- Project Manager
- Date and time of sampling
- Analysis to be performed
- Preservatives used

Standard Chain-of-Custody procedures will be maintained on all samples. The Chain-of-Custody Record with a request for analysis will be initiated in the field by sampling personnel. Each time responsibility for custody of the samples changes, the receiving and relinquishing custodians will sign the record and enter the date and time of transfer of the samples. The laboratory will sign for the receipt of the samples and return a copy of the Chain-of-Custody Record. A copy of the Chain-of-Custody, which also serves as the sample request form, is enclosed as Attachment A.

3.5 Field Visual Observations

Prior to the initiation of sediment sampling, the following visual observations are to be conducted and the results entered on the Sediment Sampling Data Log. An example is included as Attachment C.

- Date, time and name of person performing the observations
- Site designation and percentage estimate of percent covered by vegetation/algae
- Appearance of waterway (sheen, color, clarity, etc.)
- Weather conditions (fog, rain, wind, etc)

4.0 Reporting

All reports will be submitted to the California Regional Water Quality Control Board ("RWQCB"), Los Angeles Region, 320 W. 4th Street, Suite 200, Los Angeles, CA 90013 to the attention of Ms. Jenny Newman, Chief, TMDL Unit 3.

4.1. Annual Monitoring Report

The Annual Monitoring Report for the reporting period January 1 to December 31 shall be submitted to the RWQCB no later than March 1 of each year.

4.2 Certification

The Annual Monitoring Report shall contain the following certification signed by the appropriate person described in Section 4.3

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.

4.3 Signatory Requirements

All reports required by General Permit GAC990005 must be signed by a person described in the following paragraph or a duly authorized representative of that person. For a municipality, state, federal, or other public agency: by either a principal executive officer or ranking elected official. For purposes of this provision, a principal executive officer of a federal agency includes: the chief executive officer having responsibility for the overall operation of a principal geographic unit of the agency.

To be deemed an authorized representative, the following requirements must be satisfied:

- The authorization is made in writing by a person described in paragraph (a) of this provision.
- The authorization specified either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company (a duly authorized representative may thus be either a named individual or any individual occupying a named position).
- The written authorization is submitted to the Regional Water Board, State Water Board, or USEPA.

4.4 Annual Report Elements

Annual reports shall contain the following information:

- An Executive Summary discussing General Permit compliance or violation and the effectiveness of the APAP to reduce or prevent the discharge of pollutants associated with aquatic pesticide applications

- A summary of monitoring data, including the identification of water quality improvements or degradation, and recommendations for improvements to the APAP (including proposed BMPs) based on the monitoring results. All receiving water monitoring data shall be compared to applicable water quality standards
- Identification of BMPs and a discussion of their effectiveness in meeting the General Permit No. CAG990005 requirements
- A discussion of BMP modifications addressing violations of the General Permit No. CAG990005.
- A map showing the location of each application and treatment area
- Types and amounts of aquatic pesticides used at each application location during each application event.
- Information on surface area and/or volume of treatment area and any other information used to calculate dosage and quantity of each pesticide used
- List of gates in the treatment area that may discharge to surface waters; time of gate closure and reopening, including any calculations used to determine closure and reopening times, if applicable
- Sampling results for all monitoring performed under this Monitoring and Reporting Plan and any additional water column or sediment sampling conducted. Sampling results shall indicate the name of the sampling agency or organization, detailed sampling location information (including latitude and longitude), detailed map or description of each sampling site, collection date, name of constituent/parameter and its detected concentration, minimum levels, method detection limits for each constituent analysis, name or description of water body sampled and a comparison with applicable water quality standards, description of analytical QA/Quality Control Plan. Sampling results shall be tabulated so that they are readily discernible
- Recommendations to improve the monitoring program, BMPs, and APAP to ascertain compliance with this General Permit; and
- Proposed changes to the APAP and monitoring program

4.5 Record Retention

The following record shall be maintained for a minimum of three years from the date of the sampling, measurement, or report:

- Records of all monitoring information including all calibration and maintenance records
- Copies of all reports required by this General Permit
- Records of all data used to complete the application for the General Permit No. CAG990005

5.0 24-Hour and 5-Day Reporting of Non-compliance

All instances of non-compliance with the General Permit No. CAG990005 that may endanger health or the environment shall be orally reported to the RWQCB within 24 hours from the time the city of Long Beach becomes aware of the circumstances. A written submission shall also be provided within five days. The written submission shall contain a description of the noncompliance and its cause, the period of non-compliance, including exact dates and times and, if the non-compliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the non-compliance.

5-Day Written Report: Following submission of a twenty-four hour report, a written report must also be provided to the LA RWQCB and the State Water Board. The report should contain the following information:

1. Date and time the LA RWQCB and State Water Board was contacted regarding the noncompliance and any instructions received from the LA RWQCB and State Water Board
2. A description of the noncompliance and its cause, including exact date and time and species affected, estimated number of individual and approximate size or dead or distressed organisms (other than the pests to be eliminated)
3. Location of incident, including the names of any water affected and appearance of those waters (sheen, color, clarity, etc.)
4. Magnitude and scope of the affected area (e.g. aquatic square area or total stream distance affected)
5. Algaecide and aquatic herbicide application rate, intended use site (e.g. banks, above, or direct to water), method of application, and name of algaecide and herbicide product, description of algaecide and herbicide ingredients and U.S. EPA registration number
6. Description of the habitat and the circumstances under which the noncompliance activity occurred (including any available ambient water data for aquatic algaecides and aquatic herbicide applied)
7. Laboratory tests performed, if any, and timing of tests and provide a summary of the test results within five days after they become available
8. If applicable, explain why the noncompliance could not have been caused by exposure to the algaecides or aquatic herbicides resulting from application
9. Actions to be taken to prevent recurrence of adverse incident

Figure 1

Aerial Photograph of Northern Lakes



Figure 1

**El Dorado East
Areas 2 and 3 Lakes**

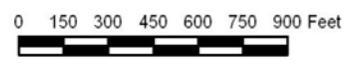
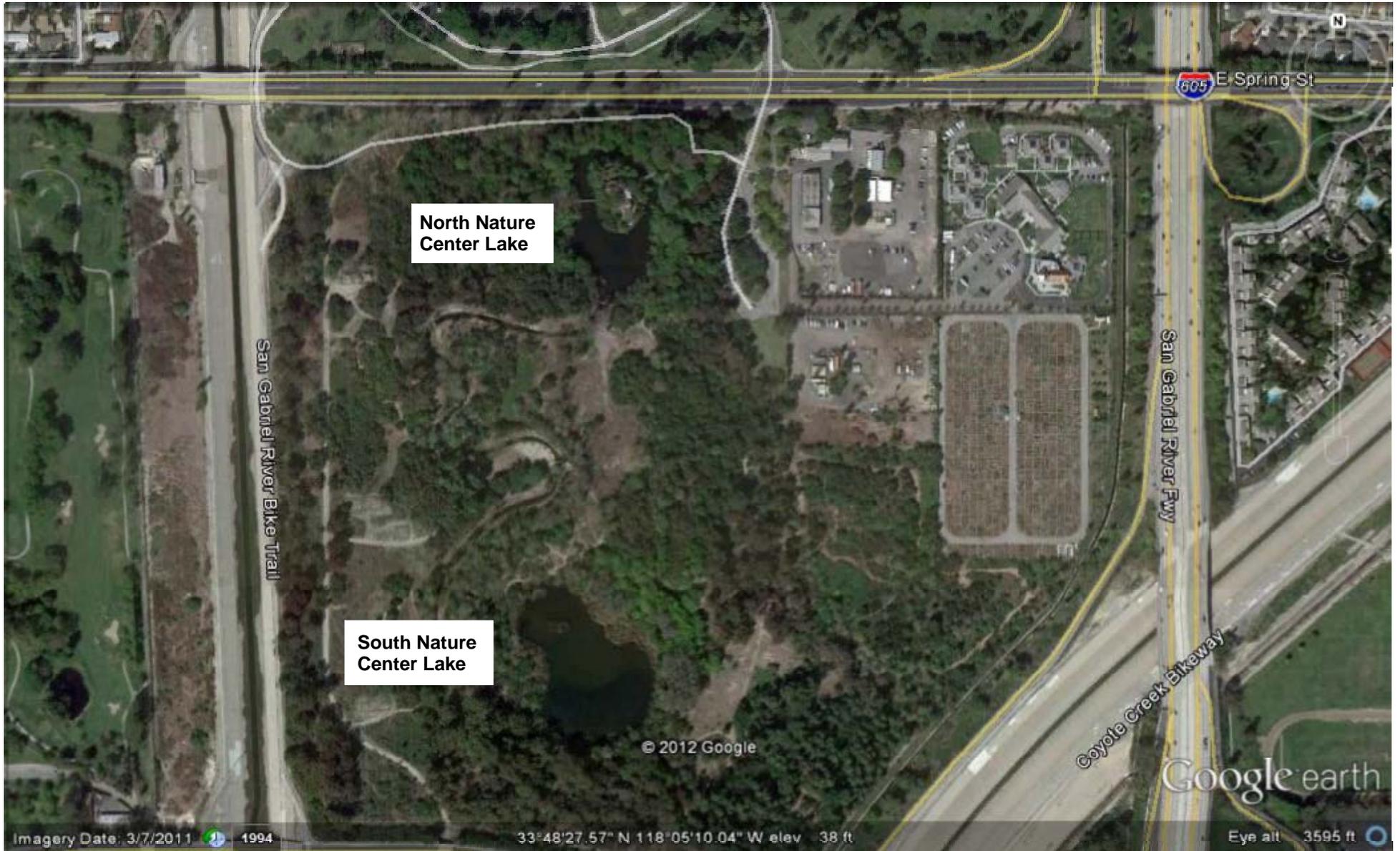


Figure 2

Aerial Photograph of Nature Center Lakes



Figure 2



Nature Center Lakes

Figure 3

Example Aerial Photograph Sample Location Map

Figure 3
Treatment and Sampling Plot Map
Application Date */*/****

Example



Scale
0 100



Figure 4

Sediment Sampling Locations Map

South Nature Center Lake

Figure 4
South Nature Center Lake

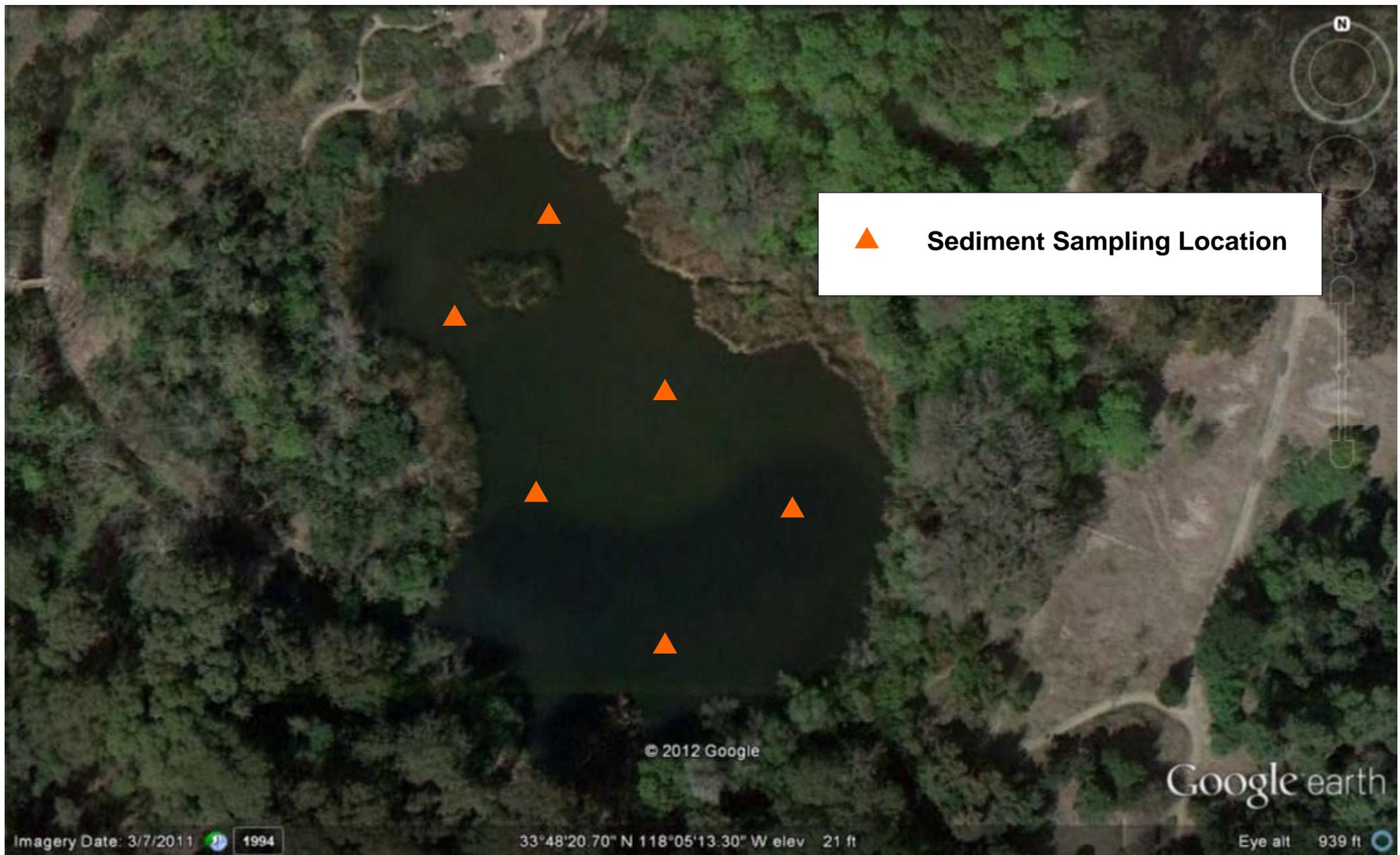


Figure 5

Sediment Sampling Locations Map

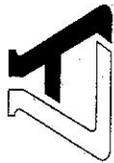
North Nature Center Lake

Figure 5
North Nature Center Lake



Attachment A

Representative Chain-of-Custody Form



ASSOCIATED LABORATORIES
 806 North Batavia - Orange, California 92868
 714/771-6900 FAX 714/538-1209

CHAIN OF CUSTODY RECORD

Assigned LR# _____

CLIENT: _____ ADDRESS: _____ Is this the address the final report is to be sent to? Yes <input type="checkbox"/> No <input type="checkbox"/> If "No" list mailing address in "Special Instructions" section at the bottom of this Chain of Custody.	PROJECT IDENTIFICATION/LOCATION: _____ PURCHASE ORDER #: _____ SAMPLER: (Print AND Sign) _____ PHONE #: () () _____ FAX #: () () _____	SAMPLE TURNAROUND TIME: Requested Turnaround Time (CIRCLE ONE)* <i>Priority Charges Apply to Rush Turn Around Times</i> RUSH: Same Day 24 Hr 48 Hr 72 Hr STANDARD: Standard TAT *(5 to 10 Working Days) Other _____ * Availability of Same Day/24/48/72 Hr TAT Varies Based Upon Test Method Requirements. **Standard TAT Varies According to Analyses.	SAMPLE CONDITION INFO - FOR LAB USE ONLY: Samples Intact: Yes <input type="checkbox"/> No <input type="checkbox"/> Sample Seals Intact: Yes <input type="checkbox"/> No <input type="checkbox"/> N/A _____ Cooler Seals Intact: Yes <input type="checkbox"/> No <input type="checkbox"/> N/A _____																																																																													
CONTACT PERSON: _____ SAMPLED BY (Circle One): Client <input type="checkbox"/> Assoc. Lab Personnel <input type="checkbox"/>	<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th style="width:10%;">SAMPLE ID</th> <th style="width:30%;">SAMPLE OR LOCATION DESCRIPTION</th> <th style="width:10%;">DATE</th> <th style="width:10%;">TIME</th> <th style="width:10%;">MATRIX (See Codes Below)</th> <th style="width:10%;"># OF CONTAINERS</th> <th style="width:10%;">TEST REQUIRED</th> </tr> </thead> <tbody> <tr><td>1</td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>2</td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>3</td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>4</td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>5</td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>6</td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>7</td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>8</td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>9</td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>10</td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </tbody> </table>			SAMPLE ID	SAMPLE OR LOCATION DESCRIPTION	DATE	TIME	MATRIX (See Codes Below)	# OF CONTAINERS	TEST REQUIRED	1							2							3							4							5							6							7							8							9							10						
SAMPLE ID	SAMPLE OR LOCATION DESCRIPTION	DATE	TIME	MATRIX (See Codes Below)	# OF CONTAINERS	TEST REQUIRED																																																																										
1																																																																																
2																																																																																
3																																																																																
4																																																																																
5																																																																																
6																																																																																
7																																																																																
8																																																																																
9																																																																																
10																																																																																
MATRIX: GW=Ground Water DW=Drinking Water WW=Waste Water S=Solid/Soil A=Air L=Liquid F=Food SW=Storm Water																																																																																
Relinquished by: (Print AND Sign)*** Relinquished by: (Print AND Sign)*** Relinquished by: (Print AND Sign)***	Received By: (Print AND Sign) Received By: (Print AND Sign) Received by Lab for Analysis: (Print AND Sign)	Date/Time: Date/Time: Date/Time:	Special Instructions: _____ _____ _____																																																																													
***By signing this Chain of Custody you are authorizing the analyses shown above. _____ (Print AND Sign)																																																																																
COC DISTRIBUTION: White with report. Yellow to AL. Pink to Client's Courier.																																																																																

Attachment B

Water Column Sampling Form

Attachment B

Water Column Sampling Form

Lake:

Date:

Time:

Weather:

Lake Vegetative Cover: %

Water Appearance:

Sheen: Yes No

Color: Yes No

Clarity: Yes No

Sample Location GPS

Latitude:

Longitude:

Sample Depth:

Field Measurements

Analyte	Result	Instrument MFG	Calibration Date
pH			
Turbidity			
EC			
Dissolved Oxygen			
Temperature			

Name: _____

Attachment C

Sediment Sampling Form

Attachment C

Sediment Sampling Form

Lake:

Date:

Time:

Weather:

Lake Vegetative Cover: %

Water Appearance:

Sheen: Yes No

Color: Yes No

Clarity: Yes No

Sample Location GPS

Latitude:

Longitude:

Sample Depth:

Name: _____